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Great are the works of the LORD: they are studied by all who delight in them Ps 111:2 (NASB)

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website: www.iscast.org.au

Chairman:

Prof. JW White CMG FAA FRS, Research School
of Chemistry ANU. Email: jww@rsc.anu.edu.au

Secretary:

Dr Robert Stening, 5 Savoy Ave, Killara NSW
2052 Ph h (02) 9498 2710 w (02) 9385 4584
Email: rjs@newt.phys.unsw.edu.au

NSW Contact:

Dr. Lewis Jones 202/35-47 Wilson Lane,
Darlington, NSW 2008 (02) 9519-0189 Email:
lewis.jones@unsw.edu.au

Queensland contacts:

Dr Ken Smith ISCAST Ltd., 110 White St
Graceville Qld. 4075 Ph (07) 3379 6117
Email: kgs@maths.uq.edu.au

Ms Susan Steensma

Email: at_qld@iscast.org.au.

Victoria contact:

Dr Helen Joynt, Administrative Secretary ISCAST
(Vic), 8 Mabel Street Camberwell Vic 3124
Ph/Fax (03) 9836 6871
Email: vic@iscast.org.au

Bulletin Editor:

Dr Jonathan Clarke, 43 Michell St. Monash, ACT
2904. Ph (02) 62920969 (h) Email:
act@iscast.org.au

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Editorial

How we argue and what we argue

I reviewed Bjorn Lomborg's *The Skeptical Environmentalist* for ISCAST Bulletin 35. The central thesis of this book is that many of the claims for widespread environmental degradation are overstated. Rather, on average, the majority of the world's population is better fed, housed, educated, has higher actual income, enjoys improved health, access to fresh water and clean air than 50 years ago. During this time the gap between the richest and poorest 20% of the population has narrowed. Furthermore this has been achieved despite a doubling of the world's population. Because good environmental protection is a feature of wealthy societies, rather than poor ones, this increase in economic conditions has resulted in improved environmental protection. Lomborg also argues that the commonly quoted values for extinctions of species, forest clearance, and other forms of environmental degradation are greatly exaggerated.

As could be predicted, this thesis is highly controversial. Lomborg has been labelled a courageous independent thinker and a dangerous crank. The January 2002 English language edition of *Scientific American* was especially harsh, publishing a series of feature articles in their edition. *Scientific American* claimed that Lomborg's book typified the worst sort of pseudoscience, and equated it to scientific creationism. Ironically the Italian edition of *Scientific American* (*Le Scienze*) reviewed the book favourably.

So far well and good, an author publishes a controversial review of major proportions that excites considerable debate, which was its intention. Some errors came to light, as is inevitable in any review. As one would expect, Lomborg responded to these criticisms, acknowledging some minor errors. Corrections are posted on his web site (Lomborg.com). However, when he attempted to respond to the *Scientific American* articles he ran into major difficulties. First they refused to publish

Lomborg's response and then, when he posted his response on his web site, threatened legal action if it was not removed. Eventually, after a series of highly critical letters to the magazine and some embarrassing publicity (the editors of *The Economist* and Patrick Moore, one of the founders of Greenpeace took them to task for censorship) they eventually published Lomborg's response in the May 2002 issue. However criticism has continued, with the Danish Committee on Scientific Dishonesty finding, in their report published in January 2003, that Lomborg was systematically one-sided. This report seems to parrot the rather superficial approach of the *Scientific American* articles and to have ignored Lomborg's response to them. This approach echoes the strategy of one of Lomborg's *Scientific American* critics who in a 1989 interview for *Discover* magazine said of the use of misleading data and scare tactics by the environmental lobby: "Each of us has to decide what the right balance is between being effective and being honest." In other words, if the facts get in the way of a good story, so much the worse for the facts.

What is the relevance in this public debate for ISCAST and ISCASTians? There are similarities between Lomborg and ISCAST in some respects, regardless of the merits, or otherwise, of Lomborg's position. ISCAST is also criticising well-entrenched myths such as God of the Gaps, Reductionism, and the Warfare myth. These myths are widely held by many Christians and non-Christians, and widely publicised in the Christian and secular media. Like Lomborg we have been subjected

to trenchant and passionate criticism. I suggest the following lessons:

The first is that discussion should be based on fact, not hearsay. Lomborg clearly showed that many of the facts widely quoted by the environmental movement are not factual at all. If we get our facts wrong, we should acknowledge our errors, and move on.

Secondly, we need to react to criticism graciously, and not hysterically. Lomborg has acknowledged some factual errors, however the response of those defending positions he has criticised has not been so measured.

Thirdly, we must recognise that criticism of established positions will engender strong and not always rational response. The great myths about science and theology are deeply entrenched among Christians and non-Christians alike, and will be defended passionately, though not always rationally or graciously.

Finally, we must recognise *how* we discuss is as important as *what* we actually say. The merits (or otherwise) of popular environmentalism and Lomborg's criticism of it has been lost amidst the rancour of the debate. As ISCAST and ISCASTians discuss a range of controversial issues on the science-faith interface it is surely this lesson we must take most to heart. Let us make sure that we never have to choose between saying what is effective and what is honest.

News

National

John Arthur Thompson MSc BA BEd BD PhD(Cantab.) died recently in Melbourne at the age of 89. He had significant achievements: teaching science, pioneering Christian student work (Crusaders and Evangelical Unions), in biblical archaeology; Bible translation, and Old Testament lecturing (NSW Baptist Theological College and Melbourne University). John gave his help and friendship generously to his students outside his lecture program. He was a loyal supporter of ISCAST since its inception, and his groundbreaking paper ("Genesis 1-3: Science? History? Theology?") is the one most downloaded of all on the ISCAST web-site. Through all he was sustained by a strong and

simple faith in Jesus Christ as Saviour and Lord, and by a loving relationship with his wife Marion, who survives him.

John Thompson was born and educated in Queensland. Dr. Howard Guinness' visit to his school in 1930 had a strong impact on John, setting the subsequent direction of his life. Following university, John returned to teach at his old school, continuing his biblical studies in his own time. In 1947 John became director of the Australian Institute of Archaeology in Melbourne, which enabled him to take part in various archaeological digs and complete further studies. He wrote several books on biblical archaeology as well as biblical commentaries, and numerous articles, serving on various translation committees and mission Boards.

John was described by some, to his horror, as a fundamentalist, and by others as “a red hot liberal”. He was rigorously honest as a scholar, and yet, in his personal devotion he was as evangelical as the most conservative of his critics. John combined rigorous biblical scholarship with a profound personal faith, and the skill of a wise educator.

Peter Young, Rodney Wetherell and Helen Joynt.

Have you looked at the ISCAST web site recently? There is a steady flow of new articles and the “Thinklings” discussion group is up and running, with topics on forgiveness, space travel, and appropriate technology already being discussed. The web site is also looking for high quality papers for peer review.

NSW

The next in the series of meetings leading up to the COSAC2003 conference based on the book, "Science, Life and Christian Belief" by Jeeves & Berry will be in March 2003. The title is: "Human Nature I—Biblical and Biological Evidence and Human Evolution". The venue is the Physics library at UNSW, at 7.30 pm.

QLD

Are you a Queensland ISCASTian interested in becoming more involved?

ISCAST provides an opportunity to network with other scientists with similar beliefs and interests. Furthermore, in today's post-modern world, there is certainly a place for organisations like ISCAST to make an impact in universities, academia and the professional world.

If you are a Queensland ISCASTian and are interested in becoming more involved, just contact Sue Steensma at qld@iscast.org.au.

Too busy to join the committee, but still interested in meeting up with other ISCASTians for regular, casual workshops or discussion groups? If this sounds like you, please email Sue Steensma at the above address to register your interest.

VIC

Fire in the Belly and AGM

The annual Victorian chapter of ISCAST's AGM was held on November 23rd at the home of Dr. Denise Cooper-Clarke. This was followed by two “Fire in the Belly” talks, one by Dr Jonathan Clarke about “Christians on Mars”, and the other by Professor Allan Day: "Theological and Hermeneutic Implications of Contemporary Biology". A summary of the two talks follow.

Theological Responses to Contemporary Biology

Recent developments in human biology have raised questions about our definition of what it means to be human. On the one hand humans are considered as something unique and distinct from other animals: On the other, detailed scientific investigation is defining the basic scientific aspects of the human person. Information from human genetics (Human Genome Program), from human evolutionary biology and from neurophysiology are increasingly describing what is considered unique in human characteristics. It is easy to conclude that we are nothing more than our genes or the responses of our neurones. These issues were considered in this session. Firstly some of the recent developments from genetics, evolutionary biology and neurophysiology were considered and the conclusion reached by reductionist biologists critiqued.

Three possible responses to these findings were addressed.

- * We can adopt a reductionist understanding of humanity—that we are no more than our genes or neurones. This view is rejected.
- * There is a danger however of retreating to non scientific preconceptions of theological anthropology which envisage a dipartite or tripartite understanding with a separation of a physical body and a spiritual soul. It is suggested that these preconceptions should be reexamined.
- * If this is done it is asserted that a biblical anthropology in both the Old Testament and the New Testament portrays a holistic understanding in which Christian hope is not dependant on the intrinsic immortality of a separate spirit or soul, but rather on the resurrection of the whole person. Such views are consistent with both contemporary biology and biblical anthropology.

Theological and ethical issues of going to Mars

The planet Mars is the only planet whose surface can be clearly seen from earth. Telescopic studies and visits by space probes over the past 30 years have revealed diverse geological features including giant volcanoes and rifts, possible former lakes and oceans, ancient cratered terrain and valley networks that were possibly carved by water. These features indicate complex planetary history, a dynamic atmospheric and climatic regime, and a hydrosphere which is now frozen. Mars also has the potential to have been an abode for life in the past, and possibly even the present. Even a lifeless Mars would be extremely interesting from an astrobiological perspective.

The moon and Mars are the only other bodies in the solar system that humans can explore using current technology. Chemically fueled rockets would make the journey to Mars in six months and allow crews to spend up to eighteen months exploring the surface before another six-month return trip. Unlike the moon, Mars has a wide range of easily available atmospheric resources which can be readily utilised for consumables such as fuel, gases, water, and oxygen, as well as solar and wind energy.

Why go to Mars? The planet offers many opportunities for science, adventure, and delight. Scientific reasons include the planet's unique history and dynamic environment, its significance as a contrast and control for terrestrial processes, and as a possible past and present abode of life. Because Mars is the only other planet in the solar system whose surface humans can explore using current technology it is therefore the 21st century frontier for both adventure and technological challenge. Finally, Mars is a beautiful and awesome place, and

going there will provide new perspectives of humanity and our planet. If the human exploration of the moon provides any guide, going to Mars will elicit spiritual responses from those who take part. During the Apollo program, astronauts Aldrin, Anders, Borman, Duke, Irwin and Lovell all found a spiritual dimension to their journey.

The Christian theological dimension of missions to Mars comes from our understanding of the creation mandate to humanity to act as God's regent, fill and subdue the earth, exercise dominion, name and understand creation, and to care for it. In the three tier cosmology of Genesis the "earth" is the entire inhabitable space of creation. In the 21st century this inhabitable space can expand to include Mars. One of the challenges for Christians in the 21st century therefore includes stewardship of other bodies in the solar system. How do we rise to this challenge?

Questions for Christian theology and ethics therefore will include:

- How does space exploration affect our understanding of God?
- How does space exploration change our understanding of the world?
- Does the Biblical command to take responsibility for the earth indeed extend to other planets?
- Does care for planet Earth require us to enter space?
- Do justice and social responsibility compel space travel?
- Can we go to Mars and meet terrestrial obligations?

These and related questions can be discussed in the "Thinklings" discussion group which can be accessed from the ISCAST web site.

COSAC 2003

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Articles

NOMA – Not Orthodox Madam

Introduction

Many people do not want to see a conflict between science and religion. But if there is to be peace, how will it be achieved and at what cost? The late Stephen Jay Gould proposed NOMA or Non Overlapping Magesteria, which is discussed in detail in *Rock of Ages: Science and Religion in the Fullness of Life* (Vintage 2002). The ball has been picked up and carried by some Christians, such as biologist Jean Pond in her chapter in *Science & Christianity: Four Views*, (ed.) Richard F. Carlson (IVP 2000). In this brief review, I intend to show that while Jean's attempt is admirable, NOMA in the form Gould advances it is not for the orthodox.

What is religion?

Thinking that Gould is somehow a friend of religion would be a mistake. He is an agnostic (p8), and this is not merely his opinion, but the “only rational position” – so why does he bother to spend so much time defending non-conflict? Because he does not have any sort of orthodoxy in mind, in fact he is antagonistic toward it. He extols religion without theology (p42), and sees religion as grounds for moral contemplation and not for unquestioned dogmas. To which we might say fair enough, but what about dogmas which have been questioned and have not been found wanting?

Fact or faith?

So what is the relationship between science and religion? Both are magesteria, and magesteria are “a site for dialogue and debate, not a set of eternal and invariable rules”, by which he seems to mean that there are no givens, which is a trifle philosophically naïve. No one starts off *tabula rasa*, and no field of endeavour is without givens. Argument from first principles is rarely done, and I recommend *The Restaurant at the End of the Universe* by Douglas Adams (chapter 29) to show how absurd that can become. His use of the words eternal and invariable is no accident, for the Christian bible presents us with an eternal and immutable (however understood) God.

And now to the heart of the matter. Science and religion cannot be at odds, since one is about facts and the other about meaning, purpose and values (p4). They are of equal value, but employ different styles of inquiry (p59). With religion removed from the world of facts, we remove miracles. Quoting J.S. Haldane, he affirms the idea that there is no connection between true religion and miracles (p91). Religion is not about dogma but moral contemplation (p42). To which we might ask, on what basis? And he would answer on any basis, since morality has meaning without religion (p60-61) and philosophy will do just as well. Indeed, behind churches lies the true church to which all may belong (p92), a philosophical universalism.

Gould maintains that we cannot claim that “God directly ordains important events in the history of nature by special interference knowable only through revelation and not accessible to science.” Now this is useful in science when we simply want to “use the right tool for the right job” (Pond, p71). We should all agree that “God did it” is not an intellectually satisfying answer in science (p96). But we might add “need it be”? Is there a point where we might have to settle for this (Romans 11 or Job 40-41 are meant to make us humble)? Now the main thrust of Gould's quote is no doubt certain readings of Genesis, but does that mean we are onto a winner with NOMA?

No! By history of nature, this surely includes all creatures that are natural (i.e. all creatures). And so it can include all conceptions and deaths. So it includes Jesus conception and death. His conception should have involved sperm and his death been final. Now a physician of the day could pronounce him dead on the cross (or a spear in the side would also show it) or alive in the Upper Room. But what could science say about what happened between the two events? If equipment was set up to observe the corpse, what then when it passed through the grave clothes? It would be accessible to science! But why not also to religion? Surely the proposition that “God did it” would be a valid one, especially if He said so before hand! Yet Gould, by asserting a break between religion and miracles even prevents us from ascribing meaning to the event, let alone commenting on the facts of the event.

Since no observations of the modern scientific sort were made, on the supposition of NOMA, we deny religion comment on the facts and hence deny the facts. Despite Pond's comments (p244) that science can never dispel our belief in God, while new cosmological theories might not, the body of Jesus of Nazareth would destroy the Christian God.

Jean Pond says of miracles "we do not depend on them. If they could be depended on they would not be miracles" (p92). This is the result of NOMA. Stop praying for anything, including the conversion of friends (which is a miracle in bible terms). Stop believing in the resurrection. Maybe this is not what Pond meant to imply, but when the horse has bolted, it is too late to shut the gate.

Fact or interpretation?

What does NOMA do for our exegesis? Since it denies miracles it challenges the facts, not merely the interpretation (contra Pond, p103). If the bible says in a clearly literal manner "x occurred", then either it did or it didn't. Now Gould uses NOMA against certain ways of reading Genesis (p93), but he has liberal views on Scripture anyway (see footnote p130). Pond sees inerrancy as bibliolatry (p53), and prefers Scripture guided by reason and tradition (p54) as ways of avoiding schism (p87). NOMA is just another tradition to direct Scripture, waiting for the church to adopt. Yet she seems to ignore sin's role in schism when reason or tradition (such as that of medieval Catholicism) placed shackles on Scripture, in favour of attacking schism caused by those who would free Scripture from tradition. Schism was a necessary evil for the Reformers. They would find the stool with the legs of Scripture, reason and tradition hard to sit on, since unlike Pond, not all the legs were meant to be the same length (p54). Might NOMA be a sin?

Pond chides us for coming to the bible with preconceived ideas (p86) but then states categorically that the bible is not a scientific text, at the same time acknowledging she can't prove this claim! But this would be like saying that since the bible (by and large), is not a text in systematic theology, we cannot do systematic theology! There are many claims in Scripture about scientific topics. Luke was a doctor and includes specific medical references. Healing and exorcism are made quite distinct. Joseph knew enough biology to know that there should have been another man involved (see C.S. Lewis, *God in the Docks*, Fount 1998 p38). So when he acknowledged the virgin conception, it was not because of his

ignorance but because of his knowledge! Did the Sun really stop as we are told in Joshua? Does it matter? Plainly it does because the event is told "like an event" and not "like a myth". So when we reject miracles, we challenge fact, not fancy. Some things may be read non-literally, but on the basis of why and how it was written, not on some independence forced on us by NOMA.

Likewise, does not Gould break NOMA by denying the meaning of Psalm 8 using the apparent randomness of evolution (p178)? Or does he read intrinsic superiority, where extrinsic superiority is meant, that is all things are placed under the feet? We may only be a side branch of an evolutionary tree, but domestication and hunting techniques placed much under the feet of the Psalmist's contemporaries, and technology much more under ours. Why not see this as a gift from God? If he had considered Genesis 3, he'd see dominion includes struggle.

Oil and water?

Gould tells us that science and religion are like oil and water, in contact all the time but never mixing (p65), i.e. religion does not dictate to science, but they meet in the lives of the individual. Pond (p90) denies the charge of being a bifurcated person, but does little to explain what she means by the "interdigitating" of science and religion in real life. Whether or not her faith informs her science, either ethically or motivationally, is not discussed, since despite her sharing Gould's oil and water, NOMA is used more as a wedge by her.

Pond also quotes Lewis about the moving target of science, that we should have pinned our belief on current theory (p92). This might be so, but cannot the eye of faith (Heb 11.3) see what the eye of unbelief cannot? If theology is allowed all of human experience and not just the bible as its subject matter (Howard Van Till's response to Pond, p123), then NOMA is nonsense. What Gould dismisses as Goldilocks science (anthropic principle, p210) and syncretic (p212) is preferable because God is creator and Lord of heaven and earth, not a watch winder.

I agree with Pond on many points, and sense her deep hurt at what some Christians have accused her of, given the highly polemical tone of what she writes. However she may be right on many points, NOMA is a Trojan horse. To her I say "it is not orthodox madam". It is a peace paid with too high a price.

Mike Pope

Science and Christian Belief

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

Cost: Aust\$50 for one year's subscription

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PILGRIM'S PROGRESS: WHY WE SHOULD GO TO MARS

Jennifer Laing is conducting post-graduate research into space tourism at the School of Tourism & Hospitality, Latrobe University. She is also PR Director for Mars Society Australia. In the following paper she develops some themes summarised by the editor in his "Fire in the Belly" talk to ISCAST Victoria. This is a condensed version of a longer paper, those wishing the full version, including citations for the quotes in it should contact the editor.

Should Christians support sending people to Mars? Should we explore space at all? I am often asked this question by fellow Christians; once they find out my interest in space and that I am conducting research into space tourism as an industry of the future. Their next question is usually to ask me how I, or anyone else, can justify human beings spending huge amounts of money to send people into space, when others are starving here on Earth or lack fresh water, shelter and other basic needs. This article looks at space exploration from a Christian perspective, argues that it can indeed be reconciled with Christian beliefs, and examines the ethical issues behind funding space activities.

God and the cosmos

The Bible is full of references to stars, the heavens, or the cosmos, ranging from the creation story in Genesis to some of the more lyrical Psalms to be found in the Holy Book. It is clear that God created the heavens (Genesis 1:1) and the heavenly bodies such as the Sun, Moon and stars.

“God made two great lights—the greater light to govern the day and the lesser light to govern the night. He also made the stars. God set them in the expanse of the sky to give light on the earth, to govern the day and the night, and to separate light

from darkness. And God saw that it was good.” (Genesis 1:16 - 18)

It is also clear that they were created by God for ALL humankind (Deuteronomy 4:19).

“And when you look up to the sky and see the sun, the moon and the stars - all the heavenly array do not be enticed into bowing down to them and worshiping things the LORD your God has apportioned to all the nations under heaven.”

Their beauty and glory stirred David to write in Psalm 19:1: “The heavens declare the glory of God; the skies proclaim the work of his hands”.

These words are echoed in astronaut John Glenn's comments in an interview aboard the Space Shuttle Discovery in 1998:

“To look out at this kind of creation out here and not believe in God is to me impossible. It just strengthens my faith.”

Husband and wife astronauts, Tammy Jernigan and Jeff Wisoff, who recently retired from NASA, have expressed similar views.

"God made a truly beautiful planet" [Jernigan] added, saying that their Christian faith was only renewed by their missions.”

God uses the imagery of the multitude of stars as part of his covenant to Abraham, to illustrate the extent of his promise.

“He took him outside and said, "Look up at the heavens and count the stars—if indeed you can count them". Then he said to him, "So shall your offspring be".

And later, in Genesis 22: 17, the Lord says,

“I will surely bless you and make your descendants as numerous as the stars in the sky and as the sand on the seashore”.

This phrase is scattered throughout the Bible (see 1 Chronicles 27:23, Nehemiah 9:23, Hebrews 11:12), to emphasise God's grace and the importance of faith.

We are encouraged by our reading of the Bible to look up and to marvel at the glories of the skies. Some of us, in the latter part of the 20th and first part of the 21st century, have gone a step further.

Sacred space

Throughout history, many Christians have taken part in pilgrimages to sacred places, to find spiritual enlightenment or to liberate oneself from profane social structures. Space is acknowledged as a spiritual or sacred place, perhaps partly because of its associations with God and heaven, and partly because of its extraordinary beauty.

Exploring space is to explore God's kingdom, which has been created for us. Many of those who have been privileged to have ventured into low-earth orbit and beyond, are cognisant of God's involvement in what they can see from the window of their spacecraft or when they set foot on the surface of the Moon.

Astronaut Lieutenant Colonel Carl Walz, who recently completed a period living and working on the International Space Station, says he has known Jesus all his life, but from high above the earth, he has become more keenly aware of Creation and its Creator.

"From two hundred fifty miles up you can really see the details of the landscape, the mountains, the rivers, the lakes, the islands, and all the many different colors of the ocean. There's the beauty of the weather, the clouds, the sunrises and sunsets. It's just extraordinary to look at all that beauty."

Walz and another astronaut took communion in space during his second Shuttle flight. He is not however the first astronaut to have the distinction of taking communion in space. The second man to walk on the moon, Buzz Aldrin, took a wafer and some wine in a tiny chalice with him to the lunar surface in the Lunar Excursion Module (LEM) in 1969 and read the portion of the Book of John used in the traditional communion ceremony.

The three Apollo astronauts, who orbited the moon on Christmas Eve 1968, read from the Book of Genesis during their official broadcast back to Earth. Commander Frank Borman later explained, "I had an enormous feeling that

there had to be a power greater than any of us—that there was a God, that there was indeed a beginning."

Two Apollo moonwalkers later took up careers in the Christian Church, the late Jim Irwin (Apollo 15) as a Minister and Charles Duke (Apollo 16) founding the Duke Ministry for Christ where he works as a speaker and Christian Lay Witness. Both have used their experiences on the Moon as a way to spread the Gospel.

Shannon Lucid, who spent 188 days on the Russian Space Station Mir in 1996, was born in Shanghai, China, to parents who were Christian missionaries, and is a Christian herself. She has been quoted as saying, perhaps with tongue firmly in-cheek, "The Baptists wouldn't let women preach, so I became an astronaut to get closer to God than my father". The first sermon in space was preached to Lucid and her Russian crewmembers on Mir, at her father's instigation, by tape recorded by a Baptist minister and sent to her by a visiting spacecraft.

Other Christian astronauts include Apollo 13 astronaut Jim Lovell, and current NASA astronauts Bill McArthur, Patrick Forrester, and Jeffrey Williams. I am sure there are many others. Exploring space appears to attract many Christians and could be seen as a modern form of Christian pilgrimage. As Jim Irwin said of his moonwalking feats, "I felt the power of God as I'd never felt it before".

Our fragile world

Exploring space also helps us to realise what a precious, fragile gift we have in Planet Earth, and was instrumental in the growth of the environmental movement in the 1970's, based on Christian principles of stewardship. Photos of Earth, taken by the Apollo astronauts, allowed people for the first time to see what it looked like in space. The thin blue line of our atmosphere, all that stands between us and extinction, made many value what they had previously taken for granted.

As Kathryn Sullivan, the first American woman to walk in space, says,

"After just one or two laps [of the Earth], you feel, maybe for the first time, like a citizen of a planet ... We must recognize immediately what it means to be citizens of this planet. It means accepting our obligation to be stewards of the earth's

life-giving capacities”.

Political and cultural differences take on a different perspective from space. Many astronauts note the absence of artificial boundaries between nations when they see the globe as a whole. Says John Glenn:

"When you're up there, you're viewing things from a different vantage point than human beings have ever looked at Earth ... You fly over the Middle East, and you look down, not a cloud in the sky, and you think of all the problems through the centuries that have come out of that area, and it's so beautiful, looking down on it. You think, with all these manmade problems we've got there, why can't we solve some of these things. You can't help but think a few things like that".

One could only imagine the effect of this multiplied on a grand scale. While it may not stop wars or disagreements between people, there would perhaps be a shift in the world-view towards a greater sense of brotherhood, if more people were able to fly into space.

Exploring the universe—the scientific challenge

It is no coincidence that many who have felt the call to explore have been Christians. For example, Christians, who have left evidence of their faith in journals and letters, have explored much of the Australian continent. Their journeys have provided us with greater knowledge of our world and helped us to understand more about its species, processes and systems.

The explorer Charles Sturt referred to a Bible “which has been my companion and rested under my pillow during the whole journey”, while Edward Eyre wrote in his journal, “ ... the result we humbly left to that Almighty Being who guided and guarded us hitherto, amidst all our difficulties, and in all our wanderings, and who, whatever he might ordain, would undoubtedly order everything for the best”. Both men help open up the continent of Australia and contributed greatly to scientific discovery.

The same argument can be used in support of space exploration. There is still so much we do not understand about the universe, and we have still not sent human beings to another planet. While robotic missions can be used to gather samples for analysis or data, it often

needs a human being to analyse this in context. Buzz Aldrin, talking about the Apollo space program, refers to the criticisms of the cost (approximately US \$24 billion).

“Many would say that man’s traveling to the moon was not only a drain on the nation’s financial resources but also useless. Something is useless only if we do not know how to use it. If we use our moon experience wisely in the years to come, there is no doubt it will be a vital basis for greatly expanding our knowledge of the universe.”

Scientific disciplines that have and will benefit from human space exploration include geology, astrobiology and microbiology. Sending humans to Mars might also answer one of the great scientific as well as philosophical questions—are we alone in the universe? Christians these days are generally open to the possibility of life on other planets, albeit with differing conclusions about the role of Christ in this plurality of worlds and the relationship of ET with God.

Inspiration and cooperation

Space exploration inspires people, especially the young, to develop an interest in science and to set themselves goals for achievement. Millions of people around the world sat in awe around television sets and radios as Neil Armstrong set foot on the Moon: “One small step for man—one giant leap for mankind”. How many more would view the first landing on Mars, given the diffusion of technology even throughout the Third World! It would provide a message of hope, and perhaps a unifying force in troubled times.

Australian astronaut Dr. Andy Thomas is clear about the role of vision in society and the importance of encouraging the next generation to take an active interest in space exploration and research programs:

"This provides them with a sense of hope—something to look forward to—and helps to define the future of our society. If we don't do this, we risk a producing a society which is bland, rather than inspired and visionary".

His words mirror those used by President John F. Kennedy in Houston the night before he died, quoting from Proverbs 29:18: “Where there is no vision, the people perish...”

Buzz Aldrin wrote of the first moon landing:

“The manifest beauty of all that had been

done lay in its precision and the ability of man to achieve the fulfillment of his dreams. If nothing else, our voyage was a tribute to man's restless imagination and creativity".

Traveling to Mars is likely to take an international effort, as the costs and technology required to make this possible are probably beyond what one country could contribute. A Mars project involving international partners, would follow the precedent set by recent cooperative space projects such as the International Space Station

The morality of funding space travel

The cost of space travel is high. Estimates of the cost of sending humans to Mars range from US\$50 billion to US\$20-\$30 billion. How can we justify this level of expenditure, given things on Earth that need urgent attention, like starvation, outbreaks of disease or the curing of cancer?

Millions of dollars are spent each year by governments on the arts or sport. It is not necessary for survival of the species, but adds to the quality of life, provides inspiration and enjoyment for many, and generates income back to the funding source. The same can be said for space exploration.

Much of this expenditure goes into research and development, which is then used to help people in their everyday lives, including healthcare. It is interesting to watch a re-release of Stanley Kubrick's movie *2001—A Space Odyssey* and see how many of the then 'way-out' sci-fi predictions have in fact come to pass. Many people see space, and the technology that surrounds it, as somehow removed from their everyday lives. Not so. The last forty years have seen a breathtaking array of new technology introduced into our homes and workplaces. Many are a direct spin-off of space activities. This technology was then applied by industry and commercialised, allowing the public to reap the benefits of the billions of dollars poured into space research.

Technology used to purify water on the Apollo spacecraft is now used to kill bacteria and algae in water supply systems and cooling towers. Fire resistant fabric created for spacesuits has been used in protective clothing for fire fighters. Australian scientist Dr. Vaughan Clift, along with Peggy Whitson, a NASA astronaut, has recently invented and

patented a device to collect and preserve serum samples in space, known as 'dried blood technology.' This technology could be used to support HIV research in Africa, where storage of blood samples could otherwise be a problem.

NASA estimates that the Space Shuttle program alone has generated over 100 technology spin-offs, covering products in the medical, environmental, automotive, sports, computer and refrigeration markets. While some may argue that this represents less than a fair trade-off for the huge amounts of money spent on the space program, it is undeniable that much of this technology would not have been developed, or at least not with the same urgency, without this impetus, particularly as a result of Project Apollo.

And the money spent on space exploration is not exorbitant. If you want to be flippant about it, 12 astronauts walked on the Moon for one third of the amount of money that is spent by Americans each year on pizza!

Consider these other statistics:

- The NASA budget is less than 1/10 of one per cent of the TOTAL U.S. Federal Budget.
- For every dollar that NASA spends, the U.S. gets 25 dollars back into their economy.
- Each year, video games take in enough loose change to finance 5 space missions to Jupiter and Saturn.

For what it has cost us, the world has seen huge paybacks for space exploration. Going to Mars, is also likely to result in commercial spin-offs, by acting as a catalyst for innovation and technological change.

Why we should explore space

Christians should rejoice at the fact that we are moving into an age where space exploration and travel could be available to many of us, as opposed to an elite few. Unlike the Psalmist David, we have the opportunity to explore "the glory of God" rather than just observe it from afar.

Charles Colson, the American evangelist, wrote recently, "What is it about being in space that seems to spark our innate religious sense?". Two centuries ago the philosopher

Immanuel Kant said there are two things that "fill the mind with ever new and increasing admiration and awe: the starry heavens above me and the moral law within me". Reflections about these things, Kant wrote, lead our minds to contemplate God Himself—the moral law revealing His goodness, the heavens revealing His power.

When the first person—whenever and whoever that may be—sets foot on Mars, it will be a moment so profound and so awe-inspiring that we can only imagine how people everywhere

will feel and behave. Given the world's reaction to the first moon landing, we can safely assume that it will bring people together, even for a short time, and move many to prayer and thanksgiving, at the wonders of our Universe and its Maker.

Rather than view it as a wasteful and pointless exercise, let's see space exploration and travel in a positive light, as an opportunity for hope and evangelism.

Books on Science and Religion from the Australian Theological Fellowship

"God, Life, Intelligence, & the Universe." Edited by Terrance J Kelly and Hillary D. Regan. ATF Science and Theology Series: One, 2001. \$35.00

"Interdisciplinary Perspectives on Cosmology and Biological Evolution." Edited by Hillary D. Regan and Mark Worthing. ATF Science and Theology Series: Two, 2001. \$25.00

"Habitats of Grace: biology, Christianity, and the global environmental crisis." Carolyn M. King, ATF Science and Theology Series: Three, 2001. \$25.00

These books can be ordered from the Australian Theological Forum, P.O. Box 504 Hindmarsh SA 5007

Reviews

Interdisciplinary perspectives on cosmology & biological evolution, ATF science and theology series: Two, Hilary Regan & Mark Worthing (eds.)

Like any such collection, this book is a mixture of authors, ideas, length and quality. Overall it is a very satisfying and well-referenced volume (there are several pages of recommended books), covering history, philosophy and theology. I can happily recommend it for the thinking, biblically minded Christian's bookshelf. I could not do justice to all of the essays here, so I will comment on one example of each.

John Brooke looks at the relationship between science and religion. More specifically, he looks at Christianity and various sciences, since science and religion are not monolithic. The relationships we see are those we construct (p4), they do not exist in a vacuum. Since both science and theology can change, so can relationships, and not always towards secularism (Pasteur's destruction of spontaneous generation could be used to argue against materialism, p6). He warns against exegesis based on science (e.g. geological

observations as evidence for the flood), and that theological reactions to science are not monolithic. For example, whilst evolution has presented problems, it has also "emancipated Christianity from infantile images of a magician God".

Nancy Murphy contributes two essays on physicalism, arguing against a dualistic anthropology. She identifies Hebraic religion rightly as holistic and physicalist, but ignores Sheol when dismissing Hebrew doctrine of life after death as not well developed (contra John Cooper's 'Body, Soul and Life Everlasting'). Neuroscience is able to study the functions of the brain traditionally ascribed to the soul hence doing away with the need for the soul. She identifies that the concept has been abused in many ways by the church, but does not deal with them adequately nor the evidence for the intermediate state, nor the philosophical problems for causality, human identity and soul sleep. Her second essay provides a model for avoiding reductionism from her thesis.

Mark Worthing's essay asks the question, is God along for the ride? If we adopt the idea that God intervenes, do we throw away the

laws of nature? If we do not allow for intervention, because it implies that creation is broken, or God fickle, does he merely play dice with the universe? Briefly, Worthing advances three ideas that are not uncommonly employed (Polkinghorne for example). Firstly, that the uncertainty principle is an avenue for divine intervention. Secondly, that many (maybe all?) of the laws of nature are statistical. And thirdly, chaos gives us the concept of deterministic indeterminism, which provides (without solving) a paradigm for understanding predestination and free will. Ultimately though, since God sustains all that is, "God is the ride".

Michael Pope

Habitat of grace: Biology, Christianity and the global environmental crisis, ATF Science and Theology Series: Three, Carolyn M King, ATF 2002

Carolyn King's program is to revise the didache of the church whilst maintaining the kerygma (p17). This is done by examining how advances in evolutionary biology might impact upon Christian ideas about creation and human responsibility.

Chapter 3 is an interesting discussion of environmental (mis)management, of what King calls "the tragedy of the unmanaged commons", governed by three laws:

1. Muldoon's law: in managing a common resource, strategies that are individually rational can be collectively disastrous
2. Berk's law: depletion of an uncontrolled resource increases its value and accelerates its decline
3. Bolger's law: individuals will resist restriction of private access to common resources, even if it is to protect them.

All this is neatly described by game theory (85f), but why does it happen?

Chapter 4 is devoted to a discussion of human nature, which "for thinking Christians", "anthropology has shown human social behaviour has evolved in gradual stages". King calls herself a "Christian empiricist", by which she means that she accepts evolutionary psychology without agreeing that we are only "naked apes" and that all that is natural is good (93-4). Our ethics come from our genes and not from God (a transcendental sky hook?). Natural morality is self-deception as our genes working through our evolved emotions are important in reciprocal altruism (109-10). Even Mother Theresa did good because she knew she had a reward (referring to E O Wilson). Yet both miss that Catholic theology insists the reward is partly earned, whereas reformed teaching insists that reward is not earned, and that Jesus taught love and duty, not reward. Yet thankfully there seems room for God still in Christian empiricism since "evolved morality cannot tell us who our neighbour is" (121).

In King's program, there is no room for biblical Christianity. Divine thought does not pervade scripture as "they developed" it in OT times (126 -7), and the NT writers were influenced by Greek philosophy. The doctrine of creation is only a human construct (138). Eden and Adam must be abandoned in favour of sociobiology (147). Systematic theology is to fall before the reforming axe of the environmental crisis and the shining lights of feminist and process theology, because, after all, the Bible was never acceptably 'green' (159). We are to abandon "stewardship" as anthropocentric (168). We should be "more tolerant and less concerned with personal righteousness, more emphasis on peace and joy and less on sin..." (162). In short, whilst there is much here that is interesting and useful, the environmental cart is pushing the theological horse.

Michael Pope

The deadline for submissions for the next issue of the Bulletin is the end of March 2003

Word limit for articles is 1,000 words, for letters, reflections and book reviews 600 words. Exceptions may be made in exceptional cases. Please submit to Jonathan Clarke at the address on the front page. Electronic submissions preferred.