

Science and Spirit

Institution: The University of Waikato, New Zealand

Instructor: Dr C.M. King

Course Number: 0220.210B

COURSE SYLLABUS

PREAMBLE

This course will be aimed at 2nd year students, and comprise two sessions a week in seminar format (13--2 hrs. each) over 12 weeks in B (July-October) semester. For each teaching session, set readings will be specified well in advance, and everyone will be assumed to have read them before coming to class. A lead speaker will summarise some key ideas arising from them, and then chair the ensuing discussions. The readings will be a mixture of selections from the required text, I.G. Barbour (1997), *Religion and Science: Historical and Contemporary Issues* (HarperCollins), plus various extracts from other works. The readings lists given below are not final, but will be supplemented, modified and improved during the detailed preparation of each session. The University guidelines require students to invest about 200 hours in each course, to include class attendance, reading assignments and preparation for essays and tests. For a course of 24, 2-hour sessions, set readings and other regular outside-class time therefore should amount to about 4-5 hours per session. Reading lists for the course will be distributed at the first session, so the ideas discussed in that session will have to be presented "cold." However, the readings to back them up also underpin the course as a whole, so students will be expected to incorporate them into their reading programme as soon as practicable. So far as possible, the various themes and perspectives to be discussed (science and religion, Maori and European, local and global) will be integrated within and between sessions, rather than separated into different blocks. Inevitably, the subjects chosen for discussion are only a subset from a huge range of possibilities, and we do not wish to specify them too closely at this stage. However, it seems fair to predict that the list as it stands at present will strike readers from overseas as rather different from that in similar courses offered in other countries. We draw your attention to the section below: additional background for non-New Zealanders. Certain subjects, such as the philosophical grounds of knowledge, are universal and can be treated here in the same way as anywhere else. But the particular details of the science-religion dialogue that are of most immediate interest in New Zealand, and which are most important as unstated assumptions behind many matters of urgent public debate, will often be locally unique (for example, those discussed in sessions 18 and 20). Most of the discussion leaders, to whom we refer as the "teaching team," will be members of various Departments of the University, each leading a limited number of seminars. Teamwork spreads the extra time required to develop such a multi-disciplinary project, and ensures that a wide range of views is represented, each, if possible, by someone with authority/experience in the field to be discussed. Continuity will be ensured by the presence in every session of the Course Coordinator, and by

regular team meetings over lunch throughout the year, at which we will debate the issues and attempt to harmonise our presentations. Because the class is likely to include students with a very wide range of ages, ethnic/religious and academic backgrounds and commitment to study (Waikato actively encourages part-time and mature students), who will have very different interests and previous knowledge, we see it as important to emphasise the group learning approach, and to provide plenty of opportunity for the teaching team and the students to get to know each other and to learn from each other. This is therefore not a didactic course in the sense that most university courses are -- yet that puts more than usual responsibility on every member of the group to understand the intellectual foundations of the various sorts of knowledge that will be discussed and shared. The extent of every member's progress in this quest will be probed as rigorously as in any other university course. Grades will be awarded by a mixture of internal and formal assessments, including essay(s), extended book reviews (titles chosen from a list to be supplied nearer the time) and a conventional final exam. Credit will be offered according to the standard formula: a pass will be counted as one full paper towards a 21 - paper Bachelor's degree. The University's rules allow science students to include some humanities papers in their programmes and vice versa, and the course announcements will emphasise the advantages of interdisciplinary study. Because no such course has been offered before, it is not possible to estimate the expected enrollment. For the same reason, the syllabus will remain open to revision throughout the semester. Due to the University's planning procedures and the southern-hemisphere academic calendar, the first opportunity to offer the course will be the second semester (starting in mid July) of 1999. As with every course at Waikato, students will be asked to fill in a course assessment form during the final session in October, which will be analysed by the Teaching and Learning Development Unit.

SCHEDULE Two sessions a week, each comprising a summary of relevant ideas by one or more of the teaching team, followed by ample time for class discussion. Ratio of coursework to final examination 50:50. Course text: Ian Barbour (1997) *Religion and Science: Historical and Contemporary Issues*, supplemented by a book of readings from relevant New Zealand literature.

SESSION

Week 1, Lecture 1 Subject: Introduction and overview. Intellectual methods: models of invisible realities in science and religion

Week 1, Lecture 2 Subject: Religion as a way of knowing

Week 2, Lecture 3 Subject: Science as a way of knowing

Week 2, Lecture 4 Subject: The biblical doctrine of creation and the roots of western science

Week 3, Lecture 5 Subject: Religion and science in Europe since the middle ages. The natural world of the European

Week 3-4, Lecture 6-7 Subject: The natural world of the Maori. Maori cosmology and science. The meeting of the two cultures, 1769-1870

Week 4, Lecture 8 Subject: Determinism and objectivity in physics

Week 5, Lecture 9 Subject: Indeterminacy and subjectivity in physics

Week 5, Lecture 10 Subject: Physics and religion: two perspectives of a single reality

Week 6, Lecture 11-12 Subject: Evolution: the path, the mechanisms and the origins of morality

STUDY BREAK

Week 7, Lecture 13 Subject: The Galileo story

Week 7, Lecture 14 Subject: Teilhard de Chardin

Week 8, Lecture 15 Subject: Modern creationism

Week 8, Lecture 16 Subject: Science and other religious traditions, especially Islam

Week 9, Lecture 17 Subject: The Gaia hypothesis: science or religion?

Week 9, Lecture 18 Subject: Conservation science and the history of New Zealand wildlife. Environmentalism as an alternative religion

Week 10, Lecture 19-20 Subject: Traditional knowledge and science. The science and religion of resource management. Customary use and the Treaty of Waitangi

Week 11, Lecture 21 Subject: Postmodernism

Week 11, Lecture 22 Subject: Contemporary developments in Christian spirituality

Week 12, Lecture 23 Subject: The global environmental crisis - can science or religion help?

Week 12, Lecture 24 Subject: Conclusion: Ways of relating science and religion in New Zealand

THE TEACHING TEAM Dr. C. M. King, Department of Biological Sciences (Course Co-ordinator); Dr. J. D. Henderson, Department of Physics; Mr. J. R. Leathwick, Manaaki Whenua Landcare New Zealand, Hamilton; Prof. F. W. Marshall, formerly of the Department of French; Rev. Sonny Melbourne, University Chaplain; Prof. Wharehuia Milroy, School of Maori and Pacific Studies; Dr. D. Pratt, Department of Religious

Studies; Prof. W. Silvester, Department of Biological Sciences; Dr. C. Wallace, formerly of the Department of Biological Sciences

SESSION OUTLINES

SESSION 1. INTRODUCTION AND OVERVIEW

The members of the teaching team will introduce themselves to the class, and each will give a brief glimpse of their own backgrounds and the topics they will be presenting. The students will introduce themselves to the staff, and each will give a brief summary of their previous experience in the field, why they are interested in the course, and what they hope to learn from it. We consider it essential to establish from the start that the whole group, staff and students together, see themselves as people who seek to learn from each other. This session will also help staff gauge at what level to pitch their presentations and what prior interests or puzzles particularly need catering for. A guest lecturer from the Department of Philosophy (Dr. E. Hung) will briefly introduce the basic ideas to be raised in this session, and help field the questions afterwards. They will include: what is the nature of knowledge? How do we know anything at all? Is scientific knowledge different from religious knowledge? How reliable are the models we make of invisible realities, such as atoms, or God? What are the roles of myth and metaphor in science and in religion? What are the distinctions between faith, religion and theology, or science and technology, and in what senses might these terms be understood in this course?

Possible readings (in addition to set portions of the course text; lists not final)

Peacocke, A. R. 1993. The theological and scientific enterprises. In *Theology for a Scientific Age*, 2e, Ch. 1, p.p. 1- 23. SCM London

Peacocke, A. R. 1995. The challenge of science to the thinking church. *Modern Believing* 36: 15-26.

McFague, S. 1987. *Models of God*, Ch. 1-2. Fortress, Philadelphia

Hung, E. 1996. *The Nature of Science: Problems and Perspectives*. Wadsworth, Belmont CA

SESSION 2. RELIGION AS A WAY OF KNOWING

A brief introduction to religious epistemology and related issues, with particular reference to the development of process theology. We will discuss questions such as: what is the nature of religious experience? What does it mean to talk about meaning and interpretation in religion? What are the implications of claiming room for an interplay of religion and reason? How do we understand the place of revelation? What is the impact of religious language on belief, and vice versa?

Readings

Peacocke, A. R. 1985. Intimations of Reality: Critical Realism in Science and Religion. *Religion and Intellectual Life*, 4:7-26.

Macgregor, G. 1964. The Epistemological Implicates of Faith. *Introduction to Religious Philosophy*, Ch. 22

SESSION 3. SCIENCE AS A WAY OF KNOWING

Science holds an esteemed position in western society, due largely to the enormous advances in standards of living of ordinary people that the scientific method and its products have achieved. Scientific methodology is based on a fruitful interplay between theoretical and/or mathematical analysis and objective observation and experimentation in the real world. By progressive and mutually instructive exchange of ideas and data, theory and practice have combined to produce general theories of great explanatory power, able to account for most natural phenomena. Their success has led many people to the view that the scientific method is the only reliable path to knowledge, and that matter and energy are the fundamental realities of the universe. But other people point out that part of the reason that science is so successful is that it is (in theory at least) restricted in the kinds of questions it can ask and the kinds of realities it can deal with, ignoring many other kinds of questions and realities which are also important to understanding the world and human experience in it. This session will debate questions such as: are the assumptions of science valid? Is scientific knowledge reliable? Or useful? What is the effect of excluding questions of meaning and purpose from the scientific enterprise? What is “the real world”?

Readings

Chalmers, A. F. 1982. *What is This Thing Called Science?* University of Queensland Press, 2nd edition

Hung, E. 1996. *The Nature of Science: Problems and Perspectives*. Wadsworth, Belmont CA

Appleyard, B. 1992. *Understanding the Present: Science and the Soul of Modern Man*. Picador, London.

SESSION 4. THE HISTORIC DOCTRINE OF CREATION AND THE ROOTS OF WESTERN SCIENCE

The historic Biblical doctrine of creation is far older and more fundamental than the recent concept of “creationism” espoused by modern fundamentalist sects (to be discussed in session 15), and the two have very little in common. It developed in the last two centuries BC, and asserts that (1) the natural world is comprehensible because it reflects the rational mind of the Creator, and it is accessible to human understanding because humans share to some extent the same powers of reason; that (2) contrary to previous ideas, heaven and earth are made of the same sorts of matter; and that (3) nature operates according to self-sufficient laws, and this independence introduces a measure of contingency into the natural world. In the Christian era, a fourth idea was added: that rational understanding of nature can and should be used to minister to human needs, especially as part of the Christian ministry of healing and restoration. The Judeo-Christian tradition therefore laid the foundations of science, by insisting that the world was both rational and contingent (without rationality, it would not be worth studying, and

without contingency, it would not be necessary to study it). The historic creationist tradition is one of several important reasons why modern science arose in the Christian west rather than, say, ancient Greece or Rome.

Readings

Kaiser, C. B. 1991. *Creation and the History of Science*, Ch. 1. Eerdmans, Grand Rapids.

Grant, E. 1986. Science and theology in the Middle Ages. Ch. 2 in DC Lindberg, RL Numbers 1986: *God and Nature -Historical Encounters between Christianity and Science*. University of California Press, Berkeley

Ward, K. 1996. *God, Chance and Necessity*. Oneworld Publications, Oxford

SESSION 5. RELIGION AND SCIENCE IN EUROPE: THE NATURAL WORLD OF THE EUROPEAN

In this session we will briefly outline the world view of the early church, and then discuss the impact on it of the recovery of Greek science in the twelfth century. The challenge of Aristotle to theology in the thirteenth century was fundamental, and the questions it raised are still relevant today: how can we reconcile a science which owes nothing to Christian faith, and may actively conflict with it, with a faith that encourages belief in the possibility of science and the value of its benefits, yet cannot sanction its teachings or its applications without further scrutiny? The thirteenth-century church responded to this crisis by adapting and incorporating (through the work of Thomas Aquinas) teleological Aristotelian science into medieval theology. This episode in Christian history is enormously significant for two reasons: (1) it illustrates the general, necessary interaction between the religious and the scientific understandings of the world, which requires continuing adjustment by each to the insights provided by the other, and (2) it shows that the challenge of science to the twentieth-century church is not a new experience, that such a dialogue has been engaged in before. We will discuss some reasons why, despite the later challenge posed by the rise of Renaissance science from the time of Galileo onwards, the European perception of the natural world has remained strongly influenced by the theology of Aquinas. Some of his ideas not only still influence our prejudices today, but contribute to contemporary arguments, such as whether humans are separate from nature (the view generally held by Europeans) or are a part of nature (the Maori view).

Readings

Kaiser 1991, ch. 2

Lindberg, D. C. 1992. *The Beginnings of Western Science*, Ch. 10. University of Chicago Press.

Thomas, K. 1983. *Man and The Natural World*. Penguin, Harmondsworth

SESSIONS 6 AND 7. THE NATURAL WORLD OF THE MAORI. MAORI COSMOLOGY AND SCIENCE. THE MEETING OF THE TWO CULTURES,

1769-1870

The first Polynesians to arrive from the eastern Pacific in the land they called Aotearoa (in about 1000 AD) brought their own understanding of the world and of their genesis within it. They too adjusted their concepts to meet the changes in their culture required by their shift from small tropical islands to a much larger temperate landmass. The stories of Maori cosmology that evolved over the next few hundred years describe the creation of the world from the void, followed by light, space and time, then spiritual beings, nature and humanity, all engaged together in an on-going struggle for survival. The same ideas live in tribal genealogies and carvings, and in myths, legends, songs and dances.

Bicultural development in New Zealand has proceeded rapidly in the last 20 years. Maori concepts of mana (prestige, status and inherited power) and Maori mythology both live on the ceremonies and speeches which are now usually included in the opening formalities of mainstream scientific conferences and new buildings (such as the multi-million-dollar Te Papa, formerly known as the National Museum of New Zealand, Wellington). These two sessions will include an analysis of Maori customary beliefs, traditional cosmologies and selected tribal perspectives. Customary lifestyles, rituals, philosophy and social organisation will be examined. The Maori traditional and contemporary definitions of the natural world, and their commonly-held spiritual beliefs, will be compared. How did Maori see themselves and their place in nature? What was the impact of the sudden contact with the very different European view of the world?

Readings

Te Rangi, Hiroa 1949. *The Coming of the Maori*. Whitcomb & Tombs, Wellington

Irwin, J. 1984. *An Introduction to Maori Religion*. Australian Association for the Study of Religions

King, M. (Ed) 1975. *Te Ao Hurihuri: The World Moves On*. Hicks Smith

King, M. (Ed) 1978. *Tihei Mauri Ora: Aspects of Maoritanga*. Methuen

Salmond, A. 1997. *Between Worlds: Early Exchanges Between Maori and Europeans, 1773-1815*. Reed

Salmond, A. 1975 *Hui: A Study of Maori Ceremonial Gatherings*

Patterson, J. 1992. *Exploring Maori Values*. Dunmore Press

Shirres, M. P. 1997. *Te Tangata: the Human Person*. Accent Publishers

SESSION 8. DETERMINISM AND OBJECTIVITY IN PHYSICS

This session will trace the development of modern physics through three stages.

1. Classical physics included concepts of absolute space and time. Mechanistic explanations of natural events concentrated on cause and effect (Descartes), emphasised reductionism and the exclusion of freewill. All ideas of teleology were rigorously

rejected, which left (as Laplace famously pointed out) no need for the God Hypothesis. The formerly influential biblical doctrine of creation was diminished into Deism, or forgotten.

2. The theory of relativity revised the classical view of the nature of space-time, and introduced the idea of gravitation as an expression of the space-time metric, of the curvature in space-time leading to the possibility of an unbounded, uncentred, finite universe.

3. The ideas of modern cosmology include the big-bang theory of creation and the physical evolution of a universe of very different size and form (galactic and star formation, formation of elements, microwave background). The fine tuning of physical constants leads on to the Anthropic Principle. These concepts are compared with the idea of the Logos and the Genesis account of creation. Students will be invited to compare the place of human-kind in the universe as seen in physics and as seen in Judeo-Christian theology. Have we made a passage from the centre of the universe to “no where in particular,” and what does that mean?

Readings

Polkinghorne, J. 1992. *A World We Can Understand and Live In*. Hockerill Lecture.

Barnett, L. 1968. *The Universe and Dr. Einstein*. Bantam, New York

Weinberg, S. 1977. *The First Three Minutes*. Basic Books, New York

Geering, L. 1997. *Relativity - The Key to Human Understanding*. St Andrew's Trust, Wellington

SESSION 9. INDETERMINACY AND SUBJECTIVITY IN PHYSICS.

An introduction to quantum theory, including brief considerations of the nature of matter-energy, waveparticles and complementarity, state of a system expressed as a function of probability, superposition states and Schrodinger's cat. There are many problems of interpretation of quantum dynamics: for example, uncertainty can be seen as an expression of human ignorance, of the nature of world, or of the human mind.

Indeterminacy is not confined only to quantum theory. How are we to understand the physics of complexity, chaos and thermodynamics? What are the implications of the unpredictability and open-endedness of the physical world? Is there only one direction of time? What are the implications of these concepts for the older ideas of determinism and reductionism? Are freedom as seen in physics and freewill as seen in Judeo-Christian theology the same, or different?

Readings

Davies, P. 1987. *The Cosmic Blueprint*. Henemann, London

Polkinghorne, J. 1984. *The Quantum World*. Longmans, London

Polkinghorne, J. 1989. *Science and Providence*. SPCK, London

Coveney, P. and Highfield, R. 1990. *The Arrow of Time*. WH Allen, London

SESSION 10. PHYSICS AND RELIGION - TWO PERSPECTIVES OF A SINGLE REALITY

This session will revisit the central issue of the course, introduced in general terms in sessions 2 and 3, of how we may compare the ways of knowing about the world offered by science and religion. The difference is that, by this stage in the course, it will be possible to make more specific comparisons, using the methods of science as expressed in physics as an example. We will ask what are the implications of the fact that the criteria used for evaluating both physical theories and religious beliefs have a great deal in common - e.g. correspondence to the data, consistency and coherence, simplicity, comprehensiveness, and fruitfulness. In the light of that, we will discuss three particular questions and problems that constantly recur in any discussion of science and religion: creation and freedom; evil and suffering in a world loved by God; and the feasibility of prayer and faith in God's providence.

Readings

Polkinghorne, J. 1989. *Science and Providence*.

SESSIONS 11 AND 12. EVOLUTION - THE PATH, THE MECHANISMS, AND THE ORIGINS OF MORALITY

The idea of evolution did not originate with Darwin, but earlier versions of it, such as the one postulating the inheritance of acquired characters proposed by Lamarck, were faulty. A preliminary comparison between Lamarck and Darwin illustrates the vital distinction between phenotype and genotype, which students must appreciate in order to follow the debate about modern interpretations of Darwinism espoused by most "mainstream" biologists. These include (1) the assertion that evolution is not progressive and not directional (which argues against the concept of the Omega point, proposed by Teilhard de Chardin); (2) that natural selection does not normally work for the good of the group (which argues against a native view of the "goodness" of nature); (3) that natural selection can favour cooperative genotypes even at a cost to the phenotypes that carry them (which allows natural altruism, but only with strings and only under certain conditions); and (4) that the evolutionary origin of intelligence in social animals, especially in primates, was greatly influenced by the advantages to the individual of social manipulation and deception, which increase in effectiveness with memory and computing ability. Secular interpretations of the biological basis of moral systems are divided between (1) those of gene-centred theorists such as Williams, who emphasises evolution as a wasteful, ruthless and cruel process, and human morality as a necessarily un-natural rejection of it, and (2) those of behavioural observers such as de Waal, who emphasises the development of awareness of conflicts of interests and of group identity in our nearest animal relatives, the chimpanzees, and human morality as a natural extension of it.

Readings

Wright, R. 1994. *The Moral Animal*. Vintage, New York

Byrne, R. 1995. *The Thinking Ape*. Oxford University Press, Oxford

Betzig, L. (ed) 1997. *Human Nature, A Critical Reader*. Oxford University Press, New York

SESSION 13. THE GALILEO STORY

The publication in 1543 by Copernicus of a mathematical treatise proposing that the earth should be seen as a planet circling the sun rather than as the centre of the universe had caused rather little comment. It was only when Copernicus' view was taken up by Galileo, and backed by his telescopic observations, his rational arguments and his debating skills, that traditionalists reacted. The argument developed into a full-scale collision between the methods and the ways of thinking of the new Renaissance science, represented by Galileo, and a Church committed to the defence of authority. Galileo's offence was to undermine the satisfying reconciliation of the teaching of Aristotle and Scripture provided by Aquinas (discussed in Session 5). Galileo argued strongly for, and quoted Augustine in defence of the view that, although the truths of nature and of Scripture do not conflict, it is folly to use Scripture to reach conclusions about nature. Others of his time besides Galileo agreed that the Bible is a complex work and often needs interpretation, and to use it to support scientific ideas that later prove false is to risk detracting from the dignity of the Church and the effectiveness of its real message on faith and salvation. But those who disagreed with Galileo prevailed at the time. The class will debate the reasons why this early foreshadowing of many modern discussions turned out the way it did.

Readings

Galilei, G. [1953]. Dialogue concerning the two chief world systems, *Ptolemaic and Copernican*. University of California Press, Berkeley

Shea, W.R. 1986. Galileo and the Church. In *Lindberg and Numbers*, Ch. 4

Gingerich, O. 1982. The Galileo affair. *Scientific American* 247:132-43

SESSION 14. TEILHARD DE CHARDIN

Teilhard is an example of a modern theologian who, like Aquinas, struggled to reconcile the traditional teaching of the Church with the emerging secular science of his age. This session will present a sketch of his life, his work as a Jesuit palaeontologist associated with the Abbe Breuil and the discovery of the Lascaux caves, and his banishment by the Church to China. Then a brief synopsis of his ideas, particularly: the continuum of life from slime to Omega, the step by step progression from phylum to phylum, and the two sorts of energy; the principle of conscience; and Teilhard's interpretation of the theological consequence, the development of the noosphere and the ultimate convergence of all (with Jesus the leading shoot) in God (Omega). Teilhard's understanding of the processes of evolution was necessarily a product of his time, and, though widely

discussed, is now radically outdated. We will compare it with the contemporary view (presented in sessions 11 and 12), and debate the theological implications of both perspectives for our understanding of the nature of God and of sin. What are the similarities and differences between the work, and the impact on religious life, of Teilhard and Aquinas? How far has Teilhard been misinterpreted? (The session leader, a Professor of French, remarks that the necessity to assume that most of the class does not read French is a real handicap, since Teilhard's use of a word like "conscience" involved a double meaning which translation can never adequately render).

Readings

Birx, I-U 1991. *Interpreting Evolution: Darwin and Teilhard de Chardin*. Prometheus, New York

O'Brien, J. F. 1988. Teilhard's view of nature and some implications for environmental ethics. *Environmental Ethics* 10: 329-346

Macquarrie, J. 1961. The natural theology of Teilhard de Chardin. *Expository Times* 72: 335-338

Galleni, L. (1992). Relationships between scientific analysis and the world view of Pierre Teilhard de Chardin. *Zygon* 27: 153-166.

SESSION 15. MODERN CREATIONISM

Modern creationism has nothing whatever to do with the historic biblical doctrine of creation discussed in session 4. Most strands of modern creationism are very recent, and come from North America. They take various forms, but all have in common the aim of upholding biblical authority in general, and scripture as a basis for understanding the geological and biological past in particular. All claim to understand the book of Genesis as a literal account, but they differ widely in their interpretation of what it says, and all have very different attitudes and arguments from those who wrestled to reconcile science and Scripture in the days of Lyell and Darwin (session 11). Some are eager to claim for their subject the status of a scientific discipline which should be given equal time in schools with Darwinism. They have their own research institutes and journals and use many technical terms, but their ways of knowing and thinking are rather different from those of "mainstream" science. We will discuss the conflict between creationists and science teachers in US, and ask: Why do some people follow their views, and others oppose them? What are the political and social correlates of belief in creationism? What about the (at present hypothetical) question of what might be the reactions of class members if modern creationism ever became strong enough to mount a serious challenge to normal science teaching in New Zealand?

Readings

Whitcomb, J. C. and Morris, H. M. 1961. *The Genesis Flood*. Presbyterian & Reformed Publishing Co., Philadelphia

Numbers, R. L. 1986. The creationists. In: *God and Nature* (DC Lindberg and RL Numbers, ed) p.p. 391-423.

Gould, S. J. 1983. A visit to Dayton. In: *Hen's Teeth and Horse's Toes*, Ch. 20. Norton, New York

SESSION 16. SCIENCE AND OTHER RELIGIOUS TRADITIONS, ESPECIALLY ISLAM

A review of religious attitudes towards, and engagement with, science and the scientific endeavour, with special reference to Islam; comparative perspectives on religious cognition and conceptualisation. Issues in the Islamic understanding of science and knowledge.

Readings

Lindberg, D. C. 1992. *The Beginnings of Western Science*, Ch. 8

Pratt, D. 1992. *Religious Concepts of World: Comparative Metaphysical Perspectives*. *Sophia*, 31/3:74-88

Solomon, N. 1992. Judaism and the Environment. Ch. 3 of *Judaism and Ecology*, ed Aubrey, Rose, p.p.19-53. Cassell

Negus, Y. 1992. Science within Islam. Ch. 3 of *Islam and Ecology*, ed F. Khalid and J. O'Brien, p.p. 37-49. Cassell.

al'Alwani, U. 1995. The Islamicization of Knowledge: Yesterday and Today. *The American Journal of Islamic Social Sciences* 12:81-101

al'Alwani U 1995. Some Remarks on the Islamic and the Secular Paradigms of Knowledge. *The American Journal of Islamic Social Sciences* 12:539-544

al Najur, A. M. 1996. Classification of Sciences in Islamic Thought: Between Imitation and Originality. *The American Journal of Islamic Social Sciences* 13:59-87

Gingerich, O. 1992. Islamic astronomy. *Scientific American* 254: 74-83

SESSION 17. THE GAIA HYPOTHESIS: SCIENCE OR RELIGION?

The Gaia hypothesis was first put forward in 1979 by the British atmospheric chemist James Lovelock, who suggested that the earth is a self-regulating, self-sustaining entity capable (within limits) of maintaining the normal homeostatic equilibrium of the atmospheric gases, and of resisting external challenges, such as the long-term rise in global temperature associated with the life cycle of the sun. Gaia is thought of as a super-organism with all its own feed-back controls, which are relatively common in non-biotic systems; but some enthusiastic supporters of the idea have equated homeostatic control with life itself. They have pushed the implications of it much further than Lovelock had in mind, by promoting Gaia almost to a substitute for God. It is certainly true that, as we

become increasingly aware of the impacts of human activity on the life-support systems and sub-systems of the earth, we also become increasingly interested in world models that fuse scientific insight with spiritual awareness, and Gaia is one of the best-known attempts to do this. But to what extent is it valid? We will debate the issues raised by Lovelock and his various supporters and imitators. Is Gaia an example of a normal, if very wide-ranging, scientific hypothesis “taken over” by a generation disillusioned with traditional religion but hungry for scientifically credible spirituality? If not, what explains its popularity? Is it science, or is it religion?

Readings

Lovelock, J. E. 1979. *Gaia: A New Look at Life on Earth*. Oxford University Press

Lovelock, J. E. 1991. *Gaia: A Way of Knowing*. In Cayley D (Ed) *The Age of Ecology*, p.p. 163-68.

Joseph, L. E. 1990. *Gaia: The Growth of an Idea*. St Martins Press, New York

Reuther, R. R. 1993. *Gaia and God: An Ecofeminist Theology of Earth Healing*. SCM, London

SESSION 18. CONSERVATION SCIENCE AND THE HISTORY OF NEW ZEALAND WILDLIFE. ENVIRONMENTALISM AS AN ALTERNATIVE TO RELIGION

The history of New Zealand wildlife is one of independent evolution of many unique species in secure isolation, followed by waves of disruption and extinction associated with the arrival of two separate races of humans. Contemporary conservation science in New Zealand is complicated by cultural differences in attitudes and priorities, due largely to historic differences between the two main cultural groups in their attitudes to knowledge, to authority, and to the definition of national identity, which developed for reasons explored in Sessions 5 and 6. There is a spectrum of opinions on how we should manage our natural environment, ranging from inviolate preservation through conservation-for-use to outright exploitation. Along this spectrum, four main cultural groups can be identified, whose basic philosophies can be loosely labeled idealistic, traditional, pragmatic and commercial; each may include members of any racial background. They differ in their values and their understanding of the natural world and of humanity's place in it, and consequently in their attitudes to many specific such as the management of exotic species, the harvesting of game and traditional foods, and the development of hydro power. We will debate the issues of the origins of these different values, and of whether conservation, which tries to make objective scientific decisions but ultimately deals in non-objective values, can be a science at all. At one end of the scale, what are the interrelationships between science, economics and cultural history/perceptions when important decisions about resource management are being made? At the other, has environmentalism become a substitute for traditional religion?

Readings

King, C. M. 1996. Changing values and conflicting cultural attitudes towards plants and

animals in New Zealand In: Biodiversity. Papers from the Seminar Series on Biodiversity, hosted by Science and Research Division, Department of Conservation, Wellington, pp 69-88

Lawton, J. E. 1997. *The Science and Non-Science of Conservation*. Oikos 79: 3-5

Attfield, R. and Dell, K. eds 1996. *Values, Conflict and the Environment*, 2d ed. Avebury, Aldershot

SESSIONS 19, 20. TRADITIONAL KNOWLEDGE AND SCIENCE. THE SCIENCE AND RELIGION OF RESOURCE MANAGEMENT. CUSTOMARY USE UNDER THE TREATY OF WAITANGI

Traditional Maori knowledge about native species and their behaviour, and about the wider environment, is extensive but usually specific to local tribal areas and not structured in ways compatible with conventional western science. However, the value of traditional knowledge is increasingly being recognised, as well as the need to involve Maori in management decisions whilst also protecting their intellectual and cultural property rights. The issues involved in integrating these two forms of knowledge are matters of wide public debate in New Zealand. For example, the current European ethic of protecting wild natural resources for their own sake is a relatively recent (<200 years) reaction to over-exploitation and damage, and has gained widespread support only since the 1960s. It is entirely different from the long-standing traditional Maori ethic of tribal responsibility for, and controlled use of, the native plants and animals that are important to maintain Maori culture and identity. We will debate questions such as: how can Maori and European forms of knowledge be integrated? should legislation giving absolute protection to species that were formerly important items of cultural harvest be imposed on the Maori by the European majority? Should Maori be able to patent their traditional knowledge and genetic resources? Should they be able to contest decisions made by science-based resource management authorities?

Readings

NZ Conservation Authority 1997. Maori customary use of native plants, birds and other traditional materials. NZCA Wellington

Moller, H. 1996. Customary use of indigenous wildlife - towards a bicultural approach to conserving New Zealand's biodiversity. In: *Biodiversity. Papers from the Seminar Series on Biodiversity*, hosted by Science and Research Division, Department of Conservation, Wellington, p.p. 89-125

Best, E. 1942. *Forest Lore of the Maori*. Government Printer, Wellington

Orbell, M. 1985. *The Natural World of the Maori*. Collins, Auckland Paia, S. 1989. Protection and cultural use: Maori concepts of the relationship between Maori people and nature. In Towns, D. R. et al eds. *Ecological Restoration of New Zealand Islands*. Department of Conservation, Wellington.

SESSION 21. POSTMODERNISM

The postmodernist critique of the rationalist world-view is based on a rejection of science-based positivism as a way of knowing the world. It regards the supposed objectivity of science as a myth. We will discuss these challenges to western science, and their implications for the scientific enterprise. Post-modernists are equally sceptical of the notion of a transcendent reality, so there are also interesting parallels and contrasts between the post-modernist criticisms of science and of Christianity. There are even similarities between the post-modernist critique of contemporary social ethics and the Old Testament prophetic traditions.

Readings

Griffin, D. R. 1989. *God and Religion in the Post-Modern World*. State University of New York Press.

Blackwell 1997. *The Postmodern God: A Theological Reader*. Blackwell, Malden Mass.

Newman, F. 1997. *The End of Knowing*. Routledge, London

McCallum, D. 1990. *The Death of Truth*.

SESSION 22. CONTEMPORARY DEVELOPMENTS IN CHRISTIAN SPIRITUALITY

Fowler's concept of the stages of spiritual growth can be taken as a model for faith in a post-modern world, which allows for "knowing" in the face of contradiction and mystery. We will discuss the model, and to what extent it is useful in understanding current trends in the Church, for example the rise of Pentecostalism, with its emphasis on personal experience, and the emergence of "post-evangelical" ideas emphasising a less-dogmatic, more pluralistic approach to belief. To what extent do these ideas help, or hinder, the Science-religion debate?

Readings

Peck, M. S. 1993. *Further along the Road Less Travelled: the Unending Journey towards Spiritual Growth*

Geering, L. 1994. *Tomorrow's God*. Williams, Wellington

Renault, M. 1970. *Fire from Heaven*. Longmans

SESSION 23. THE GLOBAL ENVIRONMENTAL CRISIS: A PROBLEM FOR SCIENCE OR RELIGION?

Most aspects of the human environment which are at risk (forests, ozone, biodiversity, fisheries, clean water etc) are common property. The legal and social problems of organising just and equitable collective action to manage common property, especially in a large modern society run under free-market economics, are well known. The usual outcome is that vital group-level issues such as the capacity of an ecosystem to sustain life, or the network of personal relationships within a human community, are

insufficiently accounted for. One of the functions of religion has always been to forge a link between how things are (an explanation of reality) and which things matter (perception of the sacred and a consequential system of moral behaviour). In contemporary times, the breakdown of the link between the prevailing religious myth and the world as described by the sciences has decoupled reality from morality. At the same time, the parallel breakdown of community has weakened the old systems of reciprocal altruism. The combined effect has been to diminish both religion and community spirit, and to allow free-market economics to dictate the direction of development of society according to its own supposedly neutral but actually destructive values. Religious organisations (in New Zealand, the Church) have sources of strength and meaning supplied from outside the assumptions of freemarket economics, and a rational, updated and culturally aware Church would be in a good position to offer meaning and leadership to a society in crisis - but only if it is able to re-think its theology to meet the challenge of contemporary science, at least as effectively as Aquinas did. What do these facts mean for the future of Christianity, and of humankind? What chances do we have of averting predicted future environmental problems, and what are the potential contributions of science and religion in achieving that aim?

Readings

Ambler, R. 1990. *Global Theology: The Meaning of Faith in the Present World Crisis*. SCM London.

Rue, L. 1989. *Amythia: Crisis in the Natural History of Western Culture*. University of Alabama Press

Rasmussen, L. L. 1996. *Earth Community, Earth Ethics*. World Council of Churches, Geneva

SESSION 24. CONCLUSION: WAYS OF RELATING SCIENCE AND RELIGION IN CONTEMPORARY NEW ZEALAND

To begin this final session we will revisit Barbour's four "ways of relating science and religion" (conflict, independence, dialogue and integration) and debate the extent to which they apply in New Zealand. We will summarise what we have learned from each other during the course, in those terms and any others that arise, and what we see as "where to go from here." The session is likely to lead in unpredictable directions, but each student will be encouraged to make their own summary statement.