

## Science and Religion

Course Number: Phil12-220

Institution: Bond University, Australia

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<b>Assessment:</b> 1 x 1500-word Seminar Paper	30%
1 x 2500-word Essay	60%
Weekly Reading Summaries	10%

### Course Description:

This course is concerned with the nature of scientific and religious enterprises and their interaction. In the first half of the course consideration is given to historical aspects of the science-religion relation--the emergence of modern science and the impact of the thought of such figures as Newton, Darwin, and Freud. The second half of the course deals with more current issues--contemporary characterizations of the nature of scientific method and the status of scientific knowledge, along with the implications for religious belief of evolutionary biology, psychology, cosmology, and environmental degradation. Some of the issues to be discussed are:

Can scientific conceptions of nature and of the person be reconciled with religious beliefs?

Are religious ideas responsible for the exploitation of nature?

Can psychology account for religious and moral beliefs?

If human beings have evolved from more simple biological forms, what implications follow for: human knowledge and culture, including the various religious traditions?

What does it mean to say that the universe is "fine tuned" for the emergence of intelligent life?

### **Is big bang cosmology consistent with the idea of a created universe?**

The course will consist of three-hour weekly sessions, with time divided between lectures, tutorials, and seminars.

Weekly Readings: Students are to write a brief summary of the reading for each week, noting questions and comments for class discussion.

Seminars: Student seminars will begin in week 3. Topics for each week are given on p. 12, along with further information about presentation of seminars. Seminar topics are designed to promote specific issues which arise out of the lectures and readings.

### **TEXTS:**

Ian Barbour, Ian G. Barbour, *Religion and Science: Historical and Contemporary Issues*, (New York: Harper Collins, 1997).

John Brooke, *Science and Religion: Some Historical Perspectives* (CUP, 1991).

W. Mark Richardson and Wesley Wildman (eds.), *Religion and Science: History, Method, Dialogue* (New York: Routledge, 1996).

### **WEEKLY TOPICS**

The first listed reference is the reading for the week. All set readings are held on reserve in the library. Other listed references are recommended further reading.

### **PART I: SCIENCE AND RELIGION: HISTORICAL ASPECTS**

The history of the interaction between science and religion is vital to an understanding of the contemporary situation. History bears witness to the complexity of interactions between science and religion, it shows the origins of particular controversies, it provides examples which are illustrative of recurring issues, and highlights the social and political dimensions of both scientific and religious enterprises.

#### **1. Aristotle and Medieval Science**

During the middle ages both religious and scientific knowledge were generally founded in authorities--in the sphere of religion, the Bible, the Fathers, and Councils of the Church; in the sphere of the sciences, from about the twelfth century, various Greek and Latin writers, and pre-eminently, Aristotle. While there were occasional misgivings about the relationship between Aristotelian science and Christian religion, the thirteenth-century Dominican Thomas Aquinas laid down an influential conception of the relation between faith and reason, and in so doing forged a lasting synthesis of science and religion.

Issues for discussion: \*What are the chief sources of knowledge in the middle ages? \*How do these differ from our sources of knowledge? What methods were used to bring competing sources of knowledge--scripture, reason, tradition, etc.-- into harmony? \*Is it desirable to provide a synthesis of science and theology, or ought these spheres be kept

separate? \*Should science subservient to theology, and if so, does this create difficulties for either discipline?

Set Reading: Brooke, Ch. 2.

Further Reading: Edward Grant, *The Foundations of Modern Science in the Middle Ages: their religious, institutional, and intellectual contexts* (Cambridge University Press, 1996), "Science and Theology in the Middle Ages," in David Lindberg and Ronald Numbers (eds.), *God and Nature* (Berkeley: University of California Press, 1986); Amos Funkenstein, *Theology and the Scientific Imagination* (Princeton University Press, 1986); David Lindberg, *The Beginnings of Western Science* (University of Chicago Press, 1992); Peter Biller and A.J. Minnis (eds.), *Medieval theology and the natural body* (Rochester, NY: York Medieval Press, 1997).

## 2. The Scientific Revolution

The seventeenth century witnessed the demise of the medieval synthesis of Aristotelian science and religion, and saw the emergence of modern science. The hostility of such figures as Bacon and Descartes to the old synthesis have frequently been interpreted as evidence of an intrinsic opposition between religion and science. Galileo's well-known condemnation by the Inquisition has also promoted this view. On the other hand, some historians have argued that religious conceptions actually promoted science--hence, the thesis linking Puritanism with the rise of science. Moreover, many seventeenth century scientists clearly held traditional religious beliefs. In this session we explore some of the complex interactions between early-modern science and religion.

Issues for discussion: \*Was ecclesiastical opposition to Galileo based on genuinely "religious" grounds? \*What religious and scientific issues were at stake in the Galileo controversy? \*What were the typical criticisms of scholastic learning made by Bacon and Descartes? \*Is contemporary science still based on authorities? \*Is there a link between the religious reformation in the sixteenth century and the reformation in learning of the seventeenth? \*What kinds of religious motives might have promoted the scientific revolution? \*Which might have impeded it?

Set Reading: William Shea, "Galileo and the Church," in Lindberg and Numbers.

Further Reading: David Lindberg and Robert Westman, *Reappraisals of the Scientific Revolution* (Cambridge University Press, 1990); Steven Shapin, *A Social History of Truth: Civility and Science in Seventeenth-Century England* (Chicago: University of Chicago Press, 1994); E.A. Burt, *The Metaphysical Foundations of Modern Science* (Atlanta Highlands: Humanities Press, 1980), Introduction; Galileo, "Letter to the Grand Duchess Christina," in Stillman Drake, *Discoveries and Opinions of Galileo* (NY: Anchor, ); Mario Piagioli, *Galileo Courtier* (Chicago, 1993); Bernard Cohen (ed.), *Puritanism and the rise of modern science: the Merton thesis* (New Brunswick, NJ: Rutgers University Press, 1990).

### 3. Newtonian Science and the Mechanical Universe

One of the consequences of late seventeenth-century science was the “disenchantment of nature.” The natural world was increasingly regarded as a purely material entity, governed by immutable laws expressed in mathematical form. Such tendencies, more or less explicit in the natural philosophies of Descartes and Newton, raised new and awkward questions for standard Christian beliefs--belief in providence and miracles, in the soul, in the existence of angels and demons.

Issues for discussion: \*Did modern accounts of gravity (e.g. Descartes, Newton), provide a better explanation for falling bodies than Aristotle? \*If so, in what sense? \*How did proponents of the mechanical philosophy defend their views against accusations of incipient atheism? \*Did scientific explanation displace such traditional notions as providence, and leave no room for the spiritual and miraculous? \*Were Descartes and Newton “religious” individuals? \*How did they accommodate their scientific views and their religious convictions?

Set Reading: Brooke, Ch. 4.

Further Reading: Margaret Jacob, “Christianity and the Newtonian Worldview,” in Lindberg and Numbers; Richard Westfall, *Science and Religion in Seventeenth-Century England* (Ann Arbor: University of Michigan Press, 1973), *The Life of Isaac Newton* (Cambridge University Press, 1994); Frank E. Manuel, *The Religion of Isaac Newton* (Oxford: Clarendon Press, 1974); *Introduction to the mechanical universe*, [videorecording] (Santa Barbara: California Institute of Technology and the Southern California Consortium, 1985); Peter Harrison, “Newtonian Science, Miracles, and the Laws of Nature,” *JHI* 56 (1995) 531-53.

### 4. God in Nature: Natural Theology.

Perhaps the most common religious justification of the new natural philosophy throughout the course of the seventeenth and eighteenth centuries, was that science turned up evidence of design in nature. God was the omnipotent watch-maker who had set the world in motion; he was the master designer who had designed animals and plants such that they were perfectly adapted to their place in nature. The classical “argument from design” seemed to gain increasing support from the natural sciences. Towards the end of the eighteenth century, however, Scottish philosopher David Hume spelt out telling criticisms of this argument. Apparently undeterred by Hume’s arguments, William Paley, in the eighteenth century, strongly restated the case for a divine designer, evident in the structures and workings of nature.

Issues for discussion: \*In what ways were the sciences used to support the view of a designer God. \*How were arguments to the existence of God from nature squared with the existence of natural evils? \*Was the notion that God’s designs are evident in the structures of living things, in the long run, a helpful notion? \*How effective were Hume’s

critiques of the design argument? \*In what sense, if any, does it remain possible to speak of God as a designer?

Set Reading: Brooke, Ch. 6.

Further Reading: "The Teleological Argument," in John Hick (ed.) *The Existence of God* (London: Macmillan, 1964), pp. 99-136; Neal Gillespie, "Natural History, Natural Theology and Social Order" *JHB* 20 (1987) 1-49; Jame Force and Richard Popkin, *Essays on the Context, Nature, and Influence of Isaac Newton's Theology* (Dordrecht: Kluwer, 1990); William Paley, *Natural theology, or, Evidences of the existence and attributes of the Deity* (Edinburgh: Oliver and Boyd, 1813); Peter Harrison, *The Bible, Protestantism and the Rise of Natural Science* (Cambridge University Press, 1998), ch. 5.

## **5. Genesis, Geology, and the Theory of Evolution**

If Hume's philosophical arguments, first articulated in the eighteenth century, seemed not to deter proponents of the argument from design, developments in nineteenth century were more damaging. First, advances in geology suggested the earth was of an immense age, calling into question biblical chronology and universal history. The subsequent development of evolutionary thinking and the impact of Darwin's theory of evolution challenged not only the argument from design, but also called into question the uniqueness of the human being.

Issues for discussion: \*In what ways was the authority of the Bible challenged by nineteenth-century geology and biology? What political issues might have made Darwin's theories more controversial? \*Was the religious reaction to Darwin uniformly negative. \*If not, why not? \*Does Darwinism impugn the dignity of the human being?

Set Reading: Brooke, Ch. 8.

Further Reading: Charles Gillispie, *Genesis and Geology : a study in the relations of scientific thought, natural theology, and social opinion in Great Britain,1790-1850* (Cambridge, Mass.: Harvard University Press, 1996); Adrian Desmond and James Moore, *Darwin* (London: Michael Joseph, 1991); Frederick Gregory, "The Impact of Darwinian Evolution on Protestant Theology" in Lindberg and Numbers; Ted Coslett (ed.) *Science and Religion in the 19th Century* (Cambridge University Press, 1984); Thomas Glick (ed.), *The Comparative Reception of Darwinism* (University of Chicago Press, 1988).

## **6. Science and the Secularization of the West**

During the course of the nineteenth century, there is clear evidence of the waning power of religious institutions. Almost inevitably, this was attributed to the rise of science. Some historians regarded this period as the final phase in a long conflict between science and religion, and one in which science would quite properly be victorious. There began to develop at the same time attempts to explain aspects of human life and society in

scientific terms. Thus there arose scientific and sociological accounts of religious belief, articulated by such figures as Feuerbach, Marx, and Freud. Religious conceptions were accounted for by psychology and the social sciences as illusions necessary only for the infantile, or those in a pre-scientific or economically oppressive societies.

Issues for discussion: \*What is secularization, and is science a cause or consequence of it? \*Do sociological or psychological accounts of religious belief have a bearing on whether or not such beliefs are true? \*Is there any validity to Freudian and Marxian critiques of religion? \*Would seventeenth scientists such as Galileo or Newton have agreed with the thesis of a warfare between science and religion?

Set Reading: Richardson and Wildman, pp. 29-40

Further Reading: Owen Chadwick, *The Secularization of the European Mind in the Nineteenth Century* (Cambridge University Press, 1991); John Draper, *History of the conflict between religion & science*, with introduction and notes by Robert Arch. (London: Watts, 1927); Andrew White, *A history of the warfare of science with theology in Christendom* (New York: Dover, 1960); Patrick Masterson, *Atheism and Alienation* (Penguin, 1973); Ludwig Feuerbach, *The Essence of Christianity* (New York: Continuum, 1990); Sigmund Freud, *The Future of an Illusion* (New York: Norton, 1989); R.S. Lee, *Freud and Christianity* (Ringwood: Pelican, 1949); W.W. Meisner, *Psychoanalysis and Religious Experience* (New Haven: Yale UP, 1984).

## **PART II: SCIENCE AND RELIGION: CONTEMPORARY ISSUES**

In the consideration of contemporary issues in the science-religion interaction, we turn not only to new scientific discoveries and their bearing on religious convictions and the religious life, but to twentieth-century attempts to understand the status of scientific claims and methods, and of similarities and differences between structures of knowledge of science and religion.

### **7. The Nature of Science: Historical and Philosophical Perspectives**

Throughout the course of the twentieth century, much attention has been directed towards knowledge claims and their justification. Whereas in the earlier part of the century analytical philosophers attempted to make scientific knowledge the ultimate model to which all other forms of knowledge had to conform, more recently philosophers of science have provided us with quite a different picture. These philosophers have highlighted the problems of induction and naive realism, and many have proposed instrumentalist or pluralist accounts of science. Others have emphasized the social dimensions of all truth claims, again, leading to the deflation of the claims of science to arrive at truth.

Issues for discussion: \*Is scientific knowledge more “certain” than religious knowledge? \*Do moves to relativize scientific knowledge help or hinder attempts to harmonize science and religion? \*Is scientific knowledge too ephemeral to attempt to establish a

relation between science and religion? \*Do scientific practitioners themselves tend to be realists, instrumentalists, or relativists?

Set Reading: Ian Barbour, *Issues in Science and Religion* (NY: Harper, 1971), pp. 137-50.

Further Reading: Alan Chalmers, *What is This Thing Called Science?*, 3rd edn. (Indianapolis: Hackett, 1994); Steven Shapin, *A Social History of Truth*, (University of Chicago Press, 1994); Thomas Kuhn, *The Structure of Scientific Revolutions* (University of Chicago Press, 1970); Paul Feyerabend, *Against method : outline of an anarchistic theory of knowledge* (London: Verso, 1978); Karl R. Popper, *Conjectures and refutations: the growth of scientific knowledge*, 4th edn., (London: Routledge and Kegan Paul, 1972).

## **8. Relating Science and Religion: Structures of knowledge and belief.**

The new philosophies of science, along with more nuanced studies of the structures of scientific knowledge, have led to new attempts to characterize the relationship between science and religion. At the same time, there has been an increased interest in religious language, and in the modes in which religious truths are expressed and lived out. These developments, for the most part, have led to a new, and more positive rapprochement between science and religion.

Issues for discussion: \*Is religion basically about making truth claims, or are religious practices more important? \*Does it make sense to compare *religion* and science, or should attention be directed to *theology* and science? \*Does “faith” play any role in the sciences? \*Does religious faith involve reference to models? \*Does the idea of truth only make sense from within a particular paradigm, or can one make rational choices between competing paradigms? \*Is there genuine progress in either science or theology?

Set Reading: Richardson and Wildman, pp. 95-104.

Further Reading: Ian Barbour, *Myths, Models, and Paradigms* (New York: Harper and Rowe, 1974); Arthur Peacocke, *Theology for a Scientific Age* (Oxford: Blackwell, 1990); John Polkinghorne, *Science and Christian Belief* (London: SPCK, 1994).

## **9. Evolutionary Biology, Genetics, and Human Nature**

To a degree, many of the problems posed for nineteenth-century religious believers by Darwin’s evolutionary theory remain. The traditional notion of divine design seems at odds with the messy machinations of natural selection. The new field of sociobiology similarly casts into doubt a number of traditional religious and moral conceptions of the human person. Such views have a tendency to reduce all aspects of human experience to biology. In this session we examine some of these claims, along with alternative, non-reductive accounts of human experience.

Issues for discussion: \*Are the apparently random and wasteful processes of natural selection consistent with the idea of a loving divine creator? \*If human morality is to be explained in terms of our evolutionary history, does this mean that concepts of right and wrong are without foundation? \*Can one have a kind of religious commitment to a scientific theory? \*If human perceptions and cognitions are the end products of evolution, why should we have any confidence that we can know the truth about anything?

Set Reading: Richardson and Wildman, pp. 345-50.

Further Reading: \*Dawkins, Richard, *The Selfish Gene* (Oxford: OUP, 1976); *The Blind Watchmaker* (New York: Norton, 1987); Michael Ruse, *Taking Darwin Seriously* (Oxford: Blackwell, 1986); Alan Olding, *Modern Biology and Natural Theology* (London; New York: Routledge, 1991); Mary Midgley, *Evolution as a religion: strange hopes and stranger fears* (London: New York: Methuen, 1985); Ian Plimer, *Telling Lies for God: reason vs creationism* (New York: Random House, 1994).

## 10. Determinism and the Mechanical Mind

In the last decades of the twentieth century there has been an increasing interest, on the part of philosophers and neurologists, in the nature of the human mind and its relation to the brain. The dualistic view, championed by Descartes, that the mind or soul is a non-material entity which closely interacts with the physical brain, has been almost universally rejected. Contemporary theories of mind, allied with the neurosciences, thus throw up new problems for such first-person experiences as personal identity and moral freedom. Religious experience too, in its various manifestations, has been subjected to scientific explanations. There remain, however, alternative viewpoints which, for example, regard consciousness as an emergent property of matter. Some explanations of the functioning of the mind, moreover, stress the importance of holistic rather than reductionist approaches. These latter theories seem better able to accommodate “common sense” psychologies, as well as religious conceptions of the person.

Issues for discussion: \*What is “top down” explanation? \*Is a materialist theory of mind consistent with the idea of an immortal soul? What does it mean to say that consciousness is an “emergent” property of matter? \*Do chaos theory or quantum indeterminacy have any bearing on such issues as free-will or religious states of consciousness? \*Are mystical experiences or experiences of the sacred amenable to scientific investigation?

Set Readings: Richardson and Wildman, pp. 351-71

Further Reading: John Puddefoot, *God and the mind machine: computers, artificial intelligence and the human soul* (London: SPCK, 1996); Ian Barbour, *Religion in an Age of Science* (San Francisco: Harper and Row, 1990), ch. 7; Donald Mackay, *Brains, Machines, and Persons* (London: Collins, 1980); M.A. Persinger, *Neurophysiological Bases of God Beliefs* (New York: Praeger, 1987); E.G. d’Aquili, “Religious and Mystical States: Towards a neurological model,” *Zygon* 28 (1993) 177-200.



## 11. Cosmology and Creation

“Why is there anything, and not nothing?” Leibniz asked in the seventeenth century. In answering this question he invoked a metaphysical principle and concluded to the existence of God. Contemporary cosmologists have posed the same question, and if they have resisted Leibniz’s conclusion, for all that, they find themselves in the rarefied realm of metaphysics. Big bang cosmology, it has been claimed, can mesh neatly with classical cosmological and teleological arguments for God’s existence, or at least it throws up the kinds of questions which those traditional arguments answered. If the biological sciences seem to provide a hostile environment for religious conceptions, the physical sciences appear to be more hospitable.

Issues for discussion: \*How might the more traditional cosmological argument and the “argument from design” be reformulated in terms of new cosmological speculations?  
\*What is the “anthropic principle” and how does it relate to the idea of God as creator?  
\*What does it mean to say that the physical constants of the universe are “fine tuned”?  
\*Do cosmological speculations about the origins of the universe go beyond what might reasonably be called “science”?

Set Reading: Richardson and Wildman, pp. 183-224.

Further Reading: Paul Davies, *The Mind of God* (Ringwood: Penguin, 1992); John Leslie, *Universes* (London, Routledge, 1989); Michael Corey, *The Natural History of Creation: Biblical evolutionism and the return of natural theology* (Lanham, MD : University Press of America, 1995); Peter Forrest, *God without the supernatural: a defense of scientific theism* (Ithaca: Cornell University Press, 1996).

## 12. Science, Religion, and the Environment

In the 1960s, historian Lynn White Jr. made the controversial claim that the Christian tradition was partly responsible for the despoiling of the environment. Such theological ideas as a transcendent God who is totally separate from nature, along with the view that nature was created solely for human use, were identified as the kinds of doctrines which led to an exploitative attitude towards the natural world. White further suggested that the solution to our environmental woes was also religious. In this session we examine White’s thesis, and the possible link between religious ideas and attitudes to nature.

Issues for discussion: \*Is Christianity responsible for the degradation of the environment?  
\*Is science likely to help or hinder in the quest for an ecologically-sensitive ethic? \*Are religious traditions other than Christianity more environmentally responsible? \*Is revision of the Christian doctrine of a transcendental Creator called for, in light of the environmental crisis?

Set Reading: Lynn White Jr., “The Historical Roots of Our Ecological Crisis,” in Barbour (ed.), *Western Man and Environmental Ethics*.

Further Reading: Peter Harrison, "Subduing the Earth: Genesis 1, Early Modern Science, and the Exploitation of Nature," *Journal of Religion* 79 (1999), 86-109; Ian Barbour, *Western Man and Environmental Ethics* (Reading, Mass., Addison Wesley, 1973); Thomas Berry, *The Dream of the Earth* (San Francisco: Sierra Club Books, 1996); James Nash, *Loving Nature, Ecological Integrity and Christian Responsibility* (Nashville: Abingdon, 1991); Dieter Hessel (ed.), *After Nature's Revolt: Eco-justice and Theology* (Minneapolis: Fortress, 1992).

## Seminar Topics

- | <b>WEEK</b> | <b>TOPIC</b>  |
|-------------|---|
| 3.          | Does a scientific approach to the world leave room for miracles?  |
| 4.          | "Hume's criticisms of the teleological argument forever laid to rest the idea that nature exhibits evidence of a divine designer." Comment. |
| 5.          | Which aspects of traditional Christian belief, if any, are most threatened by a theory of evolution by natural selection?                   |
| 6.          | "The myth of a conflict between science and religion arose only with the triumph of evolutionary theory." Discuss.                          |
| 7.          | "The pursuit of both scientific and religious enterprises requires a commitment to realism." Comment.                                       |
| 8.          | "There are more differences between religious and scientific modes of knowing than there are similarities." Discuss.                        |
| 9.          | "Most conflicts between science and religion arise out of a kind of fundamentalism on both sides." Discuss.                                 |
| 10.         | Can religious experiences be explained away by psychology?  |
| 11.         | "Our universe seems remarkable fine-tuned for the emergence of intelligent life." Discuss.  |
| 12.         | Have Christian ideas contributed to environmental degradation? Are other religious traditions more ecologically responsible?                |

## Notes on Seminar Presentations

Seminar topics will be chosen in the second week.

Oral Presentations should be 15-20 minutes long.

Draft papers should be submitted the day before the presentation date.

Only one paper will be offered each week. If more than one student is working on the same topic, one will present, the others will have the opportunity to give first responses to the paper.

Final written-up seminar papers should be submitted one week after presentation.

#### Final Essay Topics

1. Is there genuine conflict between science and religion?
2. "Physics and cosmology are more hospitable to religious belief than are the life sciences." Critically discuss.
3. "Science provides us with a better account of the meaning of human life than does religion." Comment
4. Is it still possible to claim that the universe shows evidence of intelligent design?
5. Treat one of the seminar topics in more depth.