Science, Worldviews and Education: An Introduction

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Abstract This special issue of *Science & Education* deals with the theme of ‘Science, Worldviews and Education’. The theme is of particular importance at the present time as many national and provincial education authorities are requiring that students learn about the Nature of Science (NOS) as well as learning science content knowledge and process skills. NOS topics are being written into national and provincial curricula. Such NOS matters give rise to questions about science and worldviews: What is a worldview? Does science have a worldview? Are there specific ontological, epistemological and ethical prerequisites for the conduct of science? Does science lack a worldview but nevertheless have implications for worldviews? How can scientific worldviews be reconciled with seemingly discordant religious and cultural worldviews? In addition to this major curricular impetus for refining understanding of science and worldviews, there are also pressing cultural and social forces that give prominence to questions about science, worldviews and education. There is something of an avalanche of popular literature on the subject that teachers and students are variously engaged by. Additionally the modernisation and science-based industrialisation of huge non-Western populations whose traditional religions and beliefs are different from those that have been associated with orthodox science, make very pressing the questions of whether, and how, science is committed to particular worldviews. Hugh Gauch Jr. provides a long and extensive lead essay in the volume, and 12 philosophers, educators, scientists and theologians having read his paper, then engage with the theme. Hopefully the special issue will contribute to a more informed understanding of the relationship between science, worldviews and education, and provide assistance to teachers who are routinely engaged with the subject.

1 Introduction

Much of the world is celebrating the 150th anniversary of the publication of Darwin’s *The Origin of Species*. For many, it is not just a very significant *scientific* achievement that is
being commemorated but also the birth of a new worldview. The *Origin* provided not just a novel account of the origin of species by natural selection, but it initiated a transformation of modern worldviews and a new understanding of the place of human beings in the natural world. At a popular level the worldview dimension of Darwinism was captured at the time by the British Prime Minister Benjamin Disraeli who famously proclaimed in 1864 at the Oxford Diocesan Society: ‘Is man an ape or an angel? My Lord, I am on the side of the angels’ (Desmond and Moore 1992, p. 527). One-hundred-and-fifty-years later versions of Darwin’s evolutionary naturalism have become a commonplace modern worldview.

The Oxford Debate has been rekindled by the Spanish Government who introduced legislation in June 2008 to grant a limited number of traditional human rights (life, liberty and freedom from physical and psychological torture) to the great apes (gorillas, chimpanzees, and orangutans).¹ The Spanish Catholic Church has spoken against the legislation saying it erodes the Biblical injunction that gives humans dominion over the earth, and it diminishes the unique and primary place of human beings in the order of things; a uniqueness coming from the possession of an immortal soul that gives intelligibility to the central Christian (and Islamic) doctrines of Redemption, Salvation and Judgement.

Similar worldview and cultural impacts were set in train in late-medieval European society by publication in 1633 of Galileo’s *Dialogues Concerning the Two Chief World Systems* followed fifty years later by Newton’s *Principia Mathematica*. These books established the Copernican heliocentric account of the solar system which removed humans from their religiously and culturally privileged place in the centre of the universe and, concomitantly, introduced a mechanical and lawful account of natural processes.² Going further back, in the ancient world, the ‘science’ of the materialists and atomists-Thales, Anacimenes, Leucippus, Democritus, Epicurus, etc.—was in constant struggle with the mentalist, dualist, teleological worldviews of Platonists and Aristotelians.

The mutual interaction of science with cultural worldviews has been a feature of the history of science.³ The world’s major religions have had an on-going engagement with science, investigating how their own ontological, epistemological and ethical commitments—their worldviews—are to be reconciled with both scientific findings and putative scientific worldviews.

Philosophical systems have likewise been compelled to have an engagement with science.⁴ The towering and influential Kantian programme in metaphysics and epistemology was erected in response to Newton’s science.⁵ The Positivist programme whose foundations were laid down by Ernst Mach was a philosophical reflection upon the achievements of two hundred years of Newtonian science.⁶ The engagement of philosophical systems with science has been especially urgent when the systems have had political and institutional embodiment—such as Marxism within the Soviet state and Thomism within the Catholic Church. In both cases there were educational imperatives for addressing the question of the relationship of science and cultural worldviews.⁷

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¹ The legislation recognised the arguments of the Great Ape Project (www.greatapeproject.org).
² A classic discussion is Dijksterhuis’s *The Mechanization of the World Picture* (1961).
³ A good overview, with references, can be found in Dewitt (2004).
⁴ Texts, and some discussion, can be found in Matthews (1989). See also Gjertsen (1989).
⁵ See Friedman (1992).
⁶ See contributions to Cohen and Seeger (1970).
⁷ For ‘official’ philosophy in the Soviet Union see Graham (1973); for ‘sanctioned’ philosophy in the Catholic Church see McInerny (1966) and Weisheipl (1968).