

THE WORLD VIEW OF THE NATURAL SCIENCES

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1. Introduction

The title of this contribution suggests a synthesis of views that are common to natural scientists. However, the views present here are a reflection of my own view of the subject and may be considered to represent a sceptical and non-theistic one which is by no means common within the disciplinary population of which I am a part. It will be clear from the way in which I have structured this piece, that I have been heavily influenced by the analysis of the relationship between Science and Religion that has been developed by George Ellis of the University of Cape Town - in particular his two articles *Modern Cosmology and the limits of Science* (Ellis, 1995) and *Thinking underlying the new 'scientific' world-views* (Ellis, 1996).

In using the word 'Science', I shall be using the narrow definition that encompasses the natural sciences and mathematics, it is not used in the broader sense of 'scholarship'. Furthermore I intend to analyse world views in an evolutionary context which is a consequence of my training as a biological scientist.

Humans are characterized by the evolution of a brain that is capable of reflecting on the physical and social worlds that individuals inhabit. The 'construction' of, at least, the social world is almost certainly a corollary of these evolutionary processes. In the pre-scientific state¹, individuals inhabited an environment over which they had limited control and had developed technologies that allowed for very limited manipulation/modification of this environment. In these circumstances they developed a series of world views that attempted to explain the origin of the world and the relationships of its biotic and abiotic elements. These constitute broadly what can be described as the creation myths. Underlying many of these attempted explanations is some notion of a God with creative and sometimes capricious power. Allied to these ideas is the development of codes of morality and ethical behaviour that are used to guide social interactions. In all cases these systems receive their authority from some God-like figure who is considered to transcend and govern the material world in which the lives of individual humans are embedded.

These theistic views of the world are often defended on the basis of divine authority and those who offer alternatives to these views can be subjected to extreme social sanction - the interrogation of Galileo and the attacks on Charles Darwin are notable examples of what can be a threatening and confining social environment.

These world views have received a substantial challenge from a developing scientific view of the world which has attempted to give a mechanistic explanation for the material world and has come into direct conflict with those religions with pre-scientific explanations for the material world and its operation via divine intervention.

The conflict is really between a view which was developed with limited explanatory tools vs. one which has a skeptical approach and relies on the use of technologically advanced tools. This skeptical view was substantially accelerated by the philosophical positions of Hume and Kant who realized that the existence or non-existence of God or the nature of the deity cannot be determined by means of human reasoning. This skeptical

¹ The period in hominid evolution in which there was little understanding of the physical nature of natural phenomena and limited ability to manipulate the biotic and abiotic environments in which they lived.

position was reinforced when its adherents realized that if God is not a sufficient explanation for the operation of the material world then one has to seek for the scientific laws that can be used to explain natural phenomena. The development of various technologies, in particular optics made a significant contribution to this newly evolving world view that was based on scientific explanations. It was also driven by a belief that received wisdom should not act as a break or limitation on the exploration of ideas.

The natural sciences are distinctive in that their subject matter is the empirical world and is characterised by the method that is used to interrogate that world. Hence explanations of the material world are based on an understanding of the physical laws that are understood to govern the Universe, and the way in which these laws operate in a hierarchy of increasing complexity from the abiotic to the biotic. The development of this world view has meant that we have a reasonable understanding of the nature of the Universe in which our world is embedded, we think it arose from a 'big bang', we can account for the origin of the solar system. On a much smaller scale the nature of the fundamental entities that constitute matter is much better understood. The details of the origin and evolution of the biological world are being revealed by increasingly detailed empirical investigations. The developments in biotechnology, developmental biology and neurobiology are going to give us profound insights into the operation of organisms and will allow us to mold and modify that operation. Indeed, developments in neurobiology are likely to lead to a much more sophisticated understanding of the operation of the brain and give insights into the origins of consciousness. The next century is likely to be the century of biology in the way that this century was the century of the physical sciences. This level of sophisticated understanding of the material world has the potential to enhance the ability of individuals to contribute to human development and to diminish the power of non-physical explanations of natural phenomena.

2. Confining the spiritual/religious

The development of scientific world views has undermined those aspects of religious world-views that dealt with the origin and nature of the material world i.e. that which is based on empirical evidence. The latter were essentially allegorical descriptions used to account for natural phenomena for which no better explanation was available at the time.

The conflicts between these two world views have resulted in all of the debates regarding the relationship between Science and Religion. In trying to resolve these conflicts, I share the view of Ellis (1995) that one should define the domain in which each of these views operate appropriately.

Where natural phenomena require explanation, scientific explanations should take priority and the older religious ones should be regarded as superceded. It is clear that our much more advanced technological abilities enable us to understand the operation of this world in a strictly causal fashion that was not possible previously. Mythical and /or allegorical explanations for these same phenomena should be seen as historically interesting, but an attempting to operate in a domain of explanation that is not appropriate. Those who espouse spiritual and religious explanations of the material world should recognize that this is a domain where scientific explanations should take precedence and hence no further conflicts should arise. This is what I call confining the spiritual/religious world views to their appropriate domain and is based not on an *ex cathedra* statement but on the analysis of the available evidence.

3. Confining the scientific

Having dealt rather abruptly and dismissively with religious explanations in the domain of the empirical world, I now wish to turn my attention to what Ellis (1995) has indicated are the limitations of scientific explanations, in order to show that there is a domain in which scientific explanations are not applicable and where religious/spiritual explanations may be appropriate.

Midgley (1985) has indicated that scientists are generally poorly trained in areas of knowledge that fall outside the scientific domain and that hence they are ill at ease in confronting issues that are not amenable to scientific analysis. Let us then explore the areas in which scientific explanations cannot be sought.

When scientists investigate the physical basis of natural phenomena, they do so on the basis of the laws of physics. But as Ellis has pointed out, when we ask question such as : why are there any laws of physics?, what determines their form?, why does anything exist at all?, we are asking questions that cannot be addressed in the same way that natural phenomena are investigated. Furthermore, we cannot answer metaphysical questions about the reasons for the existence of the universe, or whether there is any underlying meaning to existence. For a contrary view see the extreme atheistic views of a natural scientist such as Dawkins (1995).

A further limitation of the natural sciences is that they are unable to adjudicate on ethical issues, the sociobiologists notwithstanding. What is good and bad, what is desirable or undesirable, are socially determined questions. I do not subscribe in this instance to the notion that this lack of applicability is a consequence of the primitive state of scientific development - rather these are issues which are outside the scientific domain since they do not address questions that can be answered by empirical studies.

This means that the natural sciences are not in a position to confirm or disprove religious statements and attempts by scientists to create scientific religions are fatally flawed since they have not appreciated that they are operating outside the domain where scientific explanations have any validity. Dawkin's view in *God's utility function* is that the universe has 'no design, no purpose, no evil, no good, nothing but pitiless indifference'. Such a view is only possible when you do not accept that the domain in which scientific explanations can be expected to give reliable answers is limited. He has not attempted to address the uncertainty raised by Hume and Kant.

In relation to cosmology, when metaphysical questions such as the ultimate question of the origin of the universe are asked, then a scientific answer cannot be given. In these circumstances, some would rely on a theistic explanation, but such an explanation is inherently untestable and is a question faith which may be accepted or rejected depending on ones world view.

In relation to ethical questions, particularly those that arise in relation to the sustainable use of environmental resources, the choices that societies make are essentially metaphysical ones. These are often starkly put as the choice between jobs or conservation - this may be a false dichotomy, but a scientific evaluation of the choices can make some predictions about the consequences of making a particular choice but cannot be used to evaluate the "goodness" or "badness" of any particular choice that is made.

4. Non-theistic view of the relationship between science & religion

The arguments raised in this short essay suggest that science and religion operate in different domains with science dealing with empirical questions and religion operating in the domain of questions that are metaphysical in character. As long as each operates within

its appropriate domain there should be no grounds for conflict and some mutual respect for each's explanatory power with its own ambit should be fostered.

For someone who espouses the non-theistic view, the extreme atheist position of a number of scientists cannot be sustained because of the uncertainty that pertains to the existence of God. This is still an open question since the evidence that is available is not sufficient to provide an unequivocal answer.

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