

Science and Religion: Friends or Foes?

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ABSTRACT

This paper attempts to describe the core ideas behind science and religion and outlines the differences and common features. Four models describing the relationship between science and religion are briefly outlined. It is proposed that the interaction model is likely to be most beneficial in terms of providing for a healthy and fruitful view of reality.

INTRODUCTION

The two activities that have arguably shaped human culture probably more than any others are science and religion. This view is supported by philosopher and mathematician A N Whitehead as summarised by historian John Hedley Brooke in the following comment: "The models through which the natural world have been analysed and manipulated (science), and the symbols through which humanity has customarily found meaning and purpose in life (religion) are both so powerful that it is essential to determine their relationship" (J H Brooke, 1990, p 763). Science has impacted on just about everything we use in the home and workplace from toothpaste to motor vehicles and has even begun to change the way we view ourselves in the cosmos. Religion has provided a framework for individual and cosmic faith for thousands of years and is still a dynamic force in modern culture according to census statistics. But can these dynamic forces live together as friends in our modern culture and, more importantly, in the

life of an individual? Having been a practicing scientist and Christian for over thirty years now and, in spite of the challenging questions that science and religion ultimately raise from time to time, I have discovered that both contribute to my understanding of reality and ultimate purpose. However, this is not the experience of some of my very well-respected professional colleagues in the universities and industry. They view religion as having arrived at its use-by-date; as having become an anachronism. Science to them speaks to our generation much more authentically than religion.

Science and religion are also often viewed as incompatible particularly in areas of common concern such as the origin of life. The well-known vigorous debates between creationists and evolutionists would suggest that no positive relationship between science and religion could ever be established. However, is it possible that both science and religion could speak authentically about common concerns despite their language

differences? Or is science more authentic in some areas and religion more authentic in others? What is different and common about science and religion? Is it conceivable that I should have an ancient scripture like the Bible sitting next to modern science texts in my library? Is it compatible that I should do science in a laboratory one moment and read scripture and engage in prayer for inspiration the next? Has religion lost its significance in our generation and been replaced by science as some of my colleagues in the scientific field believe? The purpose of this paper is to unravel what science and religion purport to achieve in the scheme of things and to provide a platform for addressing the issue of a possible relationship between the two; whether as friends or foes.

While science and religion are two of the dynamic cultural forces in our society, they are often viewed negatively as well as positively by the public and intelligentsia alike and this has made it difficult to adopt a healthy view of the two or to even take them seriously. Consider, for example, some of the negative images of science.

NEGATIVE IMAGES OF SCIENCE

Science is often associated with environmental pollution such as the contamination of waterways with heavy metals, phosphates and nitrates; the contamination of the atmosphere with nitrogen oxides, sulphur di-

oxide and greenhouse gases; the problems associated with radioactive waste disposal; and the threat of nuclear war. In addition poets and philosophers have questioned the ability of science to reach the heart and soul of humankind. John Keats, in 1819, spoke of science in this way. "Do not all charms fly? At the mere touch of cold philosophy" (J Keats, 1819, p 229). The Czech President, Vaclav Havel, in reviewing the trends of the day had this to say. "Modern thought-based on the premise that the world is objectively knowable and that the knowledge so obtained can be absolutely generalised- has come to a final crisis. This era has created the first technical civilisation, but it has reached the point beyond which the abyss begins" (N Humphrey, 1995, p 8). According to Keats and Havel the scientific way of knowing is severely limited in that it cannot be a platform for passion, purpose and desire – traits essential for a humane society. While religion has often been regarded as the depository of these more humane traits, it too has had negative images associated with it.

NEGATIVE IMAGES OF RELIGION

Religion is viewed by many as the breeding ground for fanaticism. The weight of evidence such as the mass suicide in the People's Temple Church at Jonestown in 1978, and the loss of life associated with the activities of the Branch Davidian Cult

at Waco Texas in 1993, would tend to support such a view. Many also point to the fact that many wars and conflicts, such as that between Protestant and Catholic in Northern Ireland since 1969 and between Christian and Muslim on the island of Ambon in 2000, seem to have a religious origin. How can one take seriously the truth claims of religion given its association with such division and conflict? Karl Marx (1818–1883) questioned the truth status of religion and considered it to be only the “opium of the people” (T Honderich, 1995, p 525), and Phillip Adams, journalist and commentator known for his critical comments on religion, declared, “To me, anybody who believes in God, at least, in a God who takes the slightest interest in his or her affairs, is enjoying the misconceptions of the baby. Almost every religion, it seems to me, is a delusion of the cradle, based on a nonsensual notion of one’s importance and centrality. When the human race reaches maturity, if it lives that long, religion will be irrelevant. It’s something we’ll throw from the pram, like a rattle or, more appropriately, a dummy” (P Adams, 1989, p 2,4).

We need, of course, to balance the negative images of science and religion with the positive so that a deeper understanding of their contribution to human culture can be achieved.

POSITIVE IMAGES OF SCIENCE

Consider for a moment the amazing discoveries in space science over the last thirty years. In 1969 there was the unforgettable moon landing made possible by the crew of Armstrong, Aldrin, and Collins. In 1981 the Space Shuttle was launched with a thrust equivalent to 50 Jumbo jets and reaching a speed of 28000 kph in outer space. This was a space vehicle that could carry and deploy satellites in outer space and return intact to earth and be used again for further space flights, something unheard of in space science up to this time. In 1990 the Shuttle carried the Hubble Space Telescope into space so that clearer pictures of the planets and the deeper regions of space could be relayed back to earth.

Amazing discoveries in medicine and molecular science have also contributed to a positive image. In 1928 penicillin was discovered by Sir Alexander Fleming and was further developed as an antibacterial drug in the 1940’s by Howard Florey. The complex molecular structure of penicillin was determined in 1949 by Dorothy Hodgkin using x-ray analysis. Penicillin is obtained from the bluish/green penicillium moulds like those on rotting fruit. It prevents the formation of a cell wall around newly growing bacteria and thus prevents bacterial growth. If this drug had been available in the First World War many lives could have been saved.

The structure of DNA, the molecular basis for all life processes, was determined by Watson and Crick in 1953 and forms the basis of the Human Genome Project. The sequence of bases (A,G,T,C) in DNA determines what kinds of molecules the body makes and the major task of the project is to determine what segment of bases is responsible for different body functions. This will make it easier to prepare specific molecules that will target a disease. It will revolutionise the way we do medicine.

POSITIVE IMAGES OF RELIGION

The theme of many of our greatest artistic and cultural achievements has been religious.

Handel's "Messiah" was first performed in Dublin in 1742 and traces the life of Christ from birth to death and resurrection and "St Matthew's Passion", written by Bach in 1727, portrays the life of Christ according to the gospel of Matthew. Michelangelo completed the world-famous painting of the Creation in the Sistine Chapel in Rome in 1512 and Rembrandt, a 17th century Dutch artist, used religious (biblical) themes for much of his renowned art work.

Many of the great humanitarian causes were instigated by devout religionists. William Wilberforce, a Christian politician and orator, fought the English slave trade for 19 years and was instrumental in

eventually abolishing it in 1807. Martin Luther King, a clergyman, was instrumental in winning civil rights for black Americans in 1968 and Mother Teresa, a Roman Catholic nun, established a home for the dying in India and received the Nobel Peace Prize in 1979.

Having now addressed the negative and positive images of science and religion, we need to address the question of the relationship between these two powerful forces within our culture and what constitutes the core of a scientific way of knowing and a religious way of knowing. To do this I would like to return to the beginnings of modern science in the 17th century, a time when the emerging modern science and religious faith were seen as completely compatible. Such a compatibility was a feature of the life and work of Robert Boyle (1627-1692).

MODERN SCIENCE AND ITS VIEW OF NATURE

Robert Boyle, born in Ireland of wealthy parents and educated largely in England and the Continent, spent most of his life in England and was highly regarded as a Christian Virtuoso- one skilled in the reading and interpretation of Scripture and experimental philosophy. He was a lay Christian theologian and one of the founders of the Royal Society under Charles II. To understand how the modern scientific mindset originated we need to consider a problem

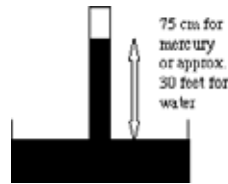
that was being addressed in Boyle's day, namely, why liquid remains suspended in a tube when inverted in a bowl of the same liquid.

Why did the liquid remain suspended in the tube?



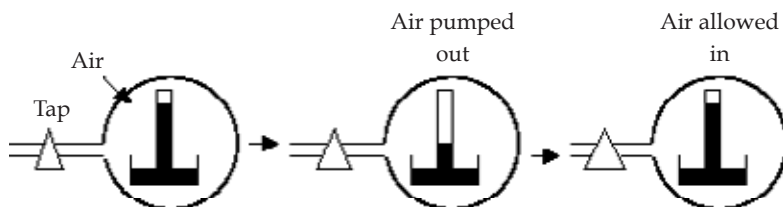
The major philosophy taught in the universities of the day was Aristotelian philosophy. Its reason for this phenomenon was that if the liquid fell, a vacuum would be created in the tube and, since nature abhors a vacuum, the liquid remains suspended. On the other hand, theologians in the church believed that God or the angels were responsible for holding up the liquid in the tube. Boyle argued, however, that attributing this behaviour to divine agency or God's direct intervention was not helpful. He said that such claims distinguish God from his creation and if we could discover the laws by which nature works humankind could be rescued from its diseases and in the process be led to believe in God and his mighty works. If the tube upended in the bowl is long enough the liquid can only be supported to a certain height as shown below.

Torricellian Apparatus



This presented a problem for the Aristotelian view. To try to solve the problem the followers of Aristotle suggested that there were fine invisible threads holding up the liquid so that the space was not really a vacuum. Boyle reasoned that it was the air outside the tube that was holding up the liquid. Aristotle's followers disagreed saying that air, being light, couldn't support such a heavy column of liquid and the churchmen thought that giving an explanation that didn't involve God in the picture would lead to atheism. To illustrate his point Boyle designed an experiment like that shown here.

Air Pump Experiments

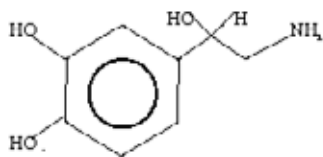


Boyle took the Torricellian Apparatus using mercury as the liquid and placed it inside a large chamber which could be evacuated. As the air in the chamber was pumped out the mercury in the vertical tube descended and as the air was allowed back into the chamber the mercury rose again to its original height. This experiment confirmed that air was responsible for this phenomenon. This also explained why water pumps couldn't lift water more than thirty feet in salt and coal mines. As the air pressure changes the height of suspended liquid changes and so this simple apparatus became the forerunner of the modern barometer for measuring air pressure. In other experiments Boyle also deduced a mathematical relationship between air pressure and air volume commonly known as Boyle's law. In modern terminology this law is stated in the form, $P \times V = \text{constant}$, where P and V are the air pressure and air volume respectively. Boyle believed that such laws would prove helpful to mankind and would lead to the glorification of God. It is interesting to ponder the fact that seculariza-

tion, the tendency to leave God out of the explanations of modern life, really began in earnest at the dawn of modern science and was promoted by scientists who were also Christian with the ultimate view, however, of establishing very good reasons for believing in God. The emphasis in modern science then, was not on nature's purpose (the Aristotelian view) but on nature's description.

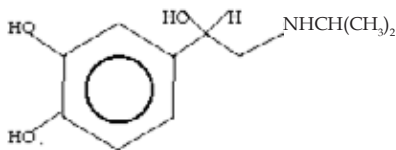
Aristotle viewed air as an element (along with earth, fire, and water) but Boyle believed air consisted of more fundamental entities called corpuscles. Down through the centuries these corpuscles have become known as atoms and molecules. Today we think of matter in terms of atomic and molecular structure and I would like to illustrate how this view has fulfilled Boyle's dream of assisting humankind. Consider the problem of asthma and how a knowledge of molecular structure has helped to find means of alleviating the symptoms. The molecule, noradrenaline, is involved in the transmission of electrical signals from one nerve to the next.

Noradrenaline



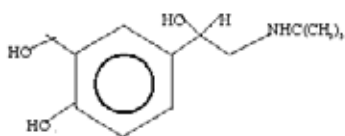
When an incident in our lives leads to fear excess amounts of noradrenaline are produced and the heart rate increases, the bronchioles (lung airways) dilate, and perspiration increases. Could a molecule like noradrenaline be engineered with the desirable dilation of the bronchioles but without the side effects of heart rate increase and perspiration increase? Using noradrenaline as a base small changes are made to the molecule until the desirable properties are achieved. Isoprenaline, similar in structure to noradrenaline but with a small important change on the nitrogen atom, dilates the bronchioles, removes perspiration but still increases heart rate.

Isoprenaline



Further engineering on the molecule finally produced salbutamol which dilates the airways without the undesirable side effects.

Salbutamol



Our understanding of the molecular basis of matter has lead to many similar helpful discoveries.

THE RELIGIOUS VIEW OF LIFE

Having looked at what is involved in doing and thinking modern science from one perspective, we need to ask the question, "What is involved in a religious viewpoint"? Let us return to Boyle who possessed both a religious and scientific mindset and ask the question, "What led to his religious commitment"? Roger Pilkington, a biographer of Boyle, describes the circumstances surrounding Boyle's religious experience this way: "...the matter which stood out above all others was a religious experience ... the experience itself was violent and dramatic and it was finally to provide the motive force for the whole of his life's work as a writer, as a man who preached tolerance in an age of bigotry, and as one who did much to lift scientific knowledge away from the preconceived notions of the scholastics and set it firmly on the sound basis of experiment, observation, and deduction. The experience was the breaking of a violent storm – the moment of religious insight in the calm which followed the storm was his first acquaintance with something

which was to supply the driving force for all the years which were to follow – Piety in the service of God was to be the guiding principle of his work as a scientist” (R Pilkington, 1959, p 44,50). The calm after the violent storm produced in Boyle a deep sense of God’s grace and presence, the recognition of a unity with a reality transcending oneself, and the perception of a purpose at work in the world that carries the assurance that all shall be well. This deep religious experience also led to Boyle’s humanitarian interests and scientific endeavours to find cures for illnesses. He also donated large sums of money for the translation of the Bible into different languages. This has been the experience of other well-known scientists although through different circumstances.

Blaise Pascal (1623–1662) identified the evening of Monday 23rd November 1654 as the date of an important religious experience. At the age of 31 and having just experienced a close brush with death in a driving accident he had a profound encounter with God which changed the course of his life. Whilst reading the 17th chapter of John’s gospel the emptiness of his previous life became filled with the presence of God within – being an experience difficult to describe he coined a few words as follows: Fire, Certitude, Heartfelt joy, Peace, Tears of joy, Total submission to Je-

sus Christ, Everlasting joy in return for one day’s striving on earth. (J M Houston, 1989, p 41,42).

In the case of Clerk Maxwell (1831–1879), Campbell and Garnett, biographers of Maxwell, say, “Maxwell was profoundly moved by the kindness shown him by the Taylor family during his sickness. He referred to it long afterwards as having given him a new perception of the love of God. One of his strongest convictions thence forward was that-love abideth, though knowledge vanish away- And this came to him at the very height of intellectual struggle” (L Campbell and W Garnett, 1969, p 170).

From these examples a religious experience might be described in the following way, although not exclusively so. The experience can be associated with natural events; the reading of scripture, meditation and prayer; human kindness leading to a deep sense of God’s grace and presence; a unity with a reality transcending oneself; and a perception of a purpose at work in the world. Having briefly described how science and religion featured in the lives of some of the early scientists we are now in a position to review some of the similarities and differences between science and religion.

WHAT DISTINGUISHES SCIENCE AND RELIGION?

Firstly, the subject matter is a distinguishing point. A summary is included in the enclosure below.

Subject Matter

<i>Science</i>	<i>Religion</i>
What is the universe like?	What is my place in the universe?
Speaks the language of mathematics	Speaks the language of experience
Focuses on space, matter, energy	Focuses on encounter

That is, science and religion approach reality with different questions and use different tools and materials. Galileo was certainly of this opinion as was the Vatican librarian at the time who suggested that the Bible was a book that instructed us on how to get to heaven-not on how the heavens go. Robert Boyle was also cautious about using Scripture to arrive at the truths of nature. The purpose of Scripture was to primarily encourage us in the way of love and devotion,

whereas, the purpose of science (or natural philosophy as it was then known) was to discover the laws of nature. Love, devotion, and purpose focus on encounter and speak the language of experience. Natural science focuses on space, matter, and energy and describes them using the language of mathematics.

Secondly, science and religion view reality from different standpoints. These are summarised in the enclosure below.

Standpoints

<i>Science</i>	<i>Religion</i>
Individual transcends the object of study	Individual is transcended by the object of study
Emphasis on testing, prediction, and knowledge growth	Emphasis on trusting, encounter, and experience

One of the reasons why science seems to be more successful than religion is that, because the scientist transcends his object of study, that

is, an experiment can be designed to yield consistent answers from nature, knowledge can grow at an enormous rate. In religion where

the individual is transcended by the divine it is sometimes difficult to know what questions are relevant or irrelevant and answers often do not seem consistent. Probing the divine mind presents far more difficulties than probing the mind of nature. The questions we wrestle with in religion are the same questions that were being addressed thousands of years ago. Knowledge, while important in science, is not, however, the focus of religion. The strength of religion lies in a trusting experience and encounter, although knowledge has an important moderating influence. Individuals will differ, of course, in the extent to which they rely on knowledge and encounter in religious experience. To some the kind of religious experiences described in relation to Boyle, Pascal, and Maxwell could be quite foreign. Also, some prefer a religious practice that relies more on a knowledge of a sacred text than on abstract experience. The resulting variety in religious practice and affiliation should not, therefore, surprise us. However, scientific practice, given its different standpoint, is much more uniform. Given the different levels of dependency on knowledge within religious traditions I think it is still fair to say that it is the role of encounter with a divine mind more or less that distinguishes religion from science. The differences discussed here do not preclude, however, the existence of common elements between science and religion.

WHAT DO SCIENCE AND RELIGION HAVE IN COMMON?

1. **Both seek an understanding of reality.** On occasions scientists and churchmen have been guilty of suggesting that their particular way of viewing reality was the only authentic way of doing such. Sir Peter Medawar, Noble prize winner for Immunology in 1960, considered that, "There is no quicker way for a scientist to bring discredit upon himself and upon his profession than roundly to declare that science knows or soon will know the answers to all questions worth asking, and that questions which do not admit a scientific answer are in some way nonquestions or pseudoquestions that only simpletons ask and only the gullible profess to be able to answer" (J Polkinghorne, 1986, p 61). Similarly, religion does not have the exclusive rights to truth. Seventeenth century scientists who also professed a Christian faith identified both the book of revelation and the book of nature as revealing aspects of reality, albeit in different ways. The main point to emphasize, however, is that both books attempt to reveal aspects of the way things are. Both books however need interpretation which leads us on to the second point.
2. **Both depend upon tradition, reason, and the accumulation of evidence.** Tradition leads to an

accumulated body of data such as scientific journals and holy writings. That is, both science and religion have their sacred texts as it were which have received public recognition amongst the relevant community of scholars. Articles in scientific journals must pass through a review process by respected scholars before publication and sacred texts like the Bible have had to pass through a canonization process and theological review before acceptance by the community of faith. Reason is used in interpreting and manipulating data through the laws of mathematics and logic in science and through interpretative texts in religion. The accumulation of evidence occurs via observation and experiment in science and religious events such as miracles and new manuscript discoveries like the Dead Sea scrolls in religion. While the nature of the data in science differs from that in religion, both, however, contain broad themes of a similar kind.

3. Both contain consonant themes.

Such themes include an emphasis on the fruitfulness and coherency of ideas rather than absolute proof, the existence of paradoxical ideas which appear unresolvable, the inclusion of ideas that are not pictureable, and an agreement as to the fundamental importance of holism and relationship. It may be surprising to the reader to discov-

er that sacred texts like the Bible never attempt to give an absolute proof for God's existence for example. The text simply assumes it. In mathematics, the language of natural science, axioms which do not have an absolute proof are required if new ideas and laws are to be developed. Kurt Godel in 1931 showed that "in any mathematical system sufficiently complex to include arithmetic there are propositions which are capable of being stated but not capable of being either proved or disproved" (J. Polkinghorne, 1986). In fact, truth is more treasured in both science and religion than is absolute proof. And it would appear that truth is more likely to be present when ideas are fruitful and coherent.

The paradox of the wave/particle duality of matter and the paradox of the trinitarian view of the Godhead are difficult to resolve from a common sense point of view but they present fruitful and coherent ideas in science and religion. The bending and reflection of light can only be adequately explained using a wave model of light but when light is used to produce electricity the particle or photon model of light is more adequate. So it becomes more fruitful and coherent to consider light as having a dual nature, wave/particle, than in trying to resolve why it behaves as a wave in one situation but as a particle in another.

The trinitarian unity of the Godhead (God as Father, Son, Spirit) likewise, assists in understanding the relationship between the divine and human aspects of God's nature.

As science and religion attempt to deal with their subject matter, both need to refer to ideas which are difficult to picture adequately. Imagine the difficulty in drawing an adequate picture of an electron and God as Spirit. While religion might be more adequately described through relationship than pictures, it turns out that relationship might also be fundamental to the properties of matter. Quantum mechanics suggests, for example, that electrons once associated with opposite spins retain this relationship even when separated in time and space. When associated, if electron A had a spin value of $+1/2$ then electron B would have a spin value of $-1/2$. If electron A is now separated from electron B and the spin of electron A is measured to be $+1/2$ then electron B has a spin of $-1/2$ even though they are not now associated. Conversely if the spin of electron A was measured to be $-1/2$ then electron B would have a spin of $+1/2$. It appears that a measurement made at A affects the measurement at B. The experiments referred to here were developed partly by Einstein in an attempt to undermine the Bohr interpretation of quantum phenomena by showing that an observation far removed in time and space from an interaction could not affect the

interaction. Paradoxically, the opposite seemed to be the case. Religion explores relationship in terms that appeal more to the human psyche.

MODELS FOR THINKING ABOUT SCIENCE AND RELIGION

Because of the enormous success that science has achieved in helping us understand nature one could be tempted to deny religion any place in the modern scheme of things. Like Philip Adams one could envisage a time when religion would be a relic of the past. However it would appear that religious phenomena are as real as the gas laws governing the behaviour of air and if I am to reach some compliance with reality there is a need to use the tools of religion as well as science. At least this perspective helps me personally to be faithful to all the dimensions of reality as I know it. If this is the case how then might one think productively about science and religion? Here are some models that might help us answer this question.

1. The Separation Model. This model considers religion to have no relationship to the physical world and to concern only the human psyche. Science relates only to the physical world and objective reality. This means basically that the two dominant forces attempting to achieve an understanding of reality might enlighten each other only on rare occasions. There is some virtue

in this model in that historically one had to remove religion from science when it came to reaching a productive understanding of nature. However with the advances of science over the last one hundred years it may be time to bring science and religion closer to each other again to shed light on some of the current issues in science such as the question of origins, purpose and ethics in the new biology just to take a few examples.

2. **The Integration Model.** In its extreme form this model views nature as part of God's essence. It was differentiation, however, that enabled science to succeed and religion to take its most powerful place. In the middle ages it was believed that nature's function was primarily to teach morality and that the lessons of scripture could be seen inscribed in nature. Even though more integration than we currently have may be required as suggested in the previous model it is doubtful if a return to a fully integrated model as existed in the middle ages would be fruitful given the advance science made as a result of differentiation.
3. **The Conflict Model.** This model views science and religion more from a conflict perspective where each views the other with suspicion. In an atmosphere where some religionists view modern

science as the creation of the Devil and some scientists view religion as a fanatical misguided relic of the past there is bound to be vigorous conflict of a personal nature. This has often been the case in the creation-evolution issue. As someone has said the only outcome of such a situation is much heat instead of light. If science and religion are legitimate attempts at understanding reality a conflict model would not provide a situation where each could enlighten the other. If one were convinced that either science or religion were superior to the other in all attempts at understanding reality then a conflict model would most likely reflect the relationship between the two.

4. **The Interaction Model.** This model allows science and religion their independent existence but believes they interact at key points to illuminate the human condition. Each remains open to the other to inform human experience and to describe the way things are. While faith can provide a passion for science, science can protect faith from fanaticism. In my view the interaction model is more likely to be the most helpful as it has the potential to lead to a coherent and fruitful view of reality. Some key points of interaction might occur as follows.

(a) *The origin of all things.*

Robert Adair (1987, p 368) of the Brookhaven National Laboratory observes that, "If the universe was born in a quantum fluctuation, the inherent randomness revealed in quantum mechanics may eliminate the possibility of extrapolation before that incident. Before the beginning of the universe and after the end may be beyond the reach of rationality. Perhaps physicists must leave the Cause with theologians and philosophers". Genesis 1:1 of the Hebrew scriptures declares that, "In the beginning God created the heavens and the earth". In relation to the origin of all things, then, it would appear that science and religion can interact in such a way that provides for a fruitful, coherent outcome-science confirming that the universe had a beginning and religion telling us that God created that beginning.

(b) *The nature of nature.*

Stars are held together by gravity and lose energy by radiating light. If there was a relative change of as much as one part in 10^{40} in either gravity or the electromagnetic force stars like our sun could not exist. Stars would be either blue giants or red dwarfs. This fine-tuning in nature has received international attention through the work of scientists such as Paul Davies and Fred Hoyle. Davies' book, *God and the*

New Physics, gives many other examples of this phenomenon. (P Davies, 1983). While Davies does not believe in a personal God like that represented in the Hebrew Scriptures but prefers to think about God as a universal principle behind nature, believers in the Hebrew God can now read Psalm 19:1 with some conviction and substance. "The heavens declare the glory of God and the firmament shows His handiwork".

(c) *Our future.*

The Greeks believed that matter was eternal. It never had a beginning and would never have an end. Modern science tells us that the sun will eventually exhaust its fuel and die and so will all life in the solar system. Revelation 21 of the Christian Bible records the vision of John the revelator in relation to the end of all things. "I saw a new heaven and a new earth, for the first heaven and the first earth had passed away and there was no longer any sea ... God will live with them and they shall be his people". This interaction tells us something about the nature of our solar system and at the same time something about the hopes and relationships of the future.

(d) *The human condition*

A scientific description of the human condition views humanity as creatures of chance and necessity

which can lead at the personal level to tragedy, loneliness, and disease. The Christian religion declares that God entered human experience in the form of Jesus Christ to grant hope in this condition. The writer to the Hebrews in Hebrews 2:18 says that, "Because he himself suffered when he was put to the test, he is able to help those who are being put to the test". Belief in God does not shield us from tragedy in this life but it offers us the companionship of a suffering God and ultimate triumph.

The interactions discussed above are of such a nature that when science reaches the limits of its descriptive power religion adds its dimensions to the situation and when religion reaches the limits of its descriptive power science adds its dimensions to the issue at hand.

CONCLUSION

In my experience an understanding of the totality of existence has demanded a scientific and religious perspective to life. That is why my Bible coexists with my science texts and why my laboratory coexists with my prayer chamber. I have gained great strength from the words of Isaiah 40: 28-31. "Do you not know? Have you not heard? The Lord is the everlasting God, The creator of the ends of the earth, He will not grow tired or weary and His understanding no one can fathom, He gives strength to the

weary and increases the power of the weak, Even youths grow tired and weary and young men stumble and fall, but those who hope in the Lord will renew their strength, They will soar on wings like eagles, They will run and not grow weary, They will walk and not be faint".

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SOME QUESTIONS TO CONSIDER

1. In learning to understand nature the early scientists, many of whom were Christians, had to remove God from the explanations given of nature. Give some examples where this has benefited science.
2. Under what circumstances do you think it might be productive and helpful to bring God back into the picture of nature?
3. Can the Bible or other sacred texts teach us about nature?
4. Can science teach us about religion?

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