Relationship between religion and science

The relationship between religion and science has been a focus of the demarcation problem. Somewhat related is the claim that science and religion may pursue knowledge using different methodologies. Whereas the scientific method basically relies on reason and empiricism, religion also seeks (at times, primarily) to acknowledge revelation, faith and sacredness. Some scholars say science and religion are separate, as in John William Draper's conflict thesis and Stephen Jay Gould's non-overlapping magisteria, while others (John Lennox, Thomas Berry, Brian Swimme, Ken Wilber, et al.) propose an interconnection.

Contents



[edit] Perspectives

Medieval artistic illustration of the spherical Earth in a 13th century copy of L'Image du monde (ca. 1246).

The kinds of interactions that might arise between science and religion have been classified using the following typology:[1]

1.Conflict, stating the disciplines contradict and are incompatible with each other. For example, John William Draper and Andrew Dickson White's conflict thesis

2.Independence treating each as quite separate realms of enquiry. For example, Stephen Jay Gould's Non-Overlapping Magisteria (NOMA)

3.Dialogue suggesting that each field has things to say to each other about phenomena in which their interests overlap. For example, William G. Pollard's studies in Physicist and Christian: A dialogue between the communities

4.Integration aiming to unify both fields into a single discourse. For example, Pierre Teilhard de Chardin's Omega Point and Ian Barbour's sympathy towards process philosophy/process theology[2]

This typology is similar to ones found in Ian Barbour[3] and John Haught.[4] More typologies that categorize this relationship can be found among the works of other science and religion scholars such as Arthur Peacocke.[5]

[edit] Conflict

A variety of historical, philosophical, and scientific arguments have been put forth in favor of the idea that science and religion are in conflict. Historical examples of religious individuals or institutions promoting claims that contradict both contemporary and modern scientific consensus include creationism (see level of support for evolution), and more recently, Pope Benedict XVI's 2009 statements claiming that the use of condoms to combat the AIDS epidemic in Africa was ineffective and counterproductive.[6] In the Galileo affair, the acceptance, from 1616 to 1757, of the Greek geocentric model[7] (Ptolemaic system) by the Roman Catholic Church,[8] and its consequent opposition to heliocentrism, was first called into question by the Catholic cleric Copernicus, and subsequently disproved conclusively by Galileo, who was persecuted for his minority view.[9][10][11] Additionally, long held religious claims have been challenged by scientific studies such as STEP,[12] which examined the efficacy of prayer. A number of scientists including Jerry Coyne[13] have made an argument for a philosophical incompatibility between religion and science. An argument for the conflict between religion and science that combines the historical and philosophical approaches has been presented by Neil Degrasse Tyson[14]—Tyson argues that religious scientists, such as Isaac Newton, could have achieved more had they not accepted religious answers to unresolved scientific issues.

[edit] Conflict thesis

Further information: Myth of the Flat Earth

The conflict thesis, which holds that religion and science have been in conflict continuously throughout history, was popularized in the 19th century by John William Draper and Andrew Dickson White. Most

contemporary historians of science now reject the conflict thesis in its original form, arguing instead that it has been superseded by subsequent historical research indicating a more nuanced understanding: [15][16]

Although popular images of controversy continue to exemplify the supposed hostility of Christianity to new scientific theories, studies have shown that Christianity has often nurtured and encouraged scientific endeavour, while at other times the two have co-existed without either tension or attempts at harmonization. If Galileo and the Scopes trial come to mind as examples of conflict, they were the exceptions rather than the rule.

— Gary Ferngren, Science & Religion[17]

Today, much of the scholarship in which the conflict thesis was originally based is considered to be inaccurate. For instance, the claim that people of the Middle Ages widely believed that the Earth was flat was first propagated in the same period that originated the conflict thesis[18] and is still very common in popular culture. Modern scholars regard this claim as mistaken, as the contemporary historians of science David C. Lindberg and Ronald L. Numbers write: "there was scarcely a Christian scholar of the Middle Ages who did not acknowledge [earth's] sphericity and even know its approximate circumference."[18][19]

Other misconceptions such as: "the Church prohibited autopsies and dissections during the Middle Ages," "the rise of Christianity killed off ancient science," and "the medieval Christian church suppressed the growth of the natural sciences," are all reported by Numbers as examples of widely popular myths that still pass as historical truth, even though they are not supported by current historical research. They help maintain the popular image of "the warfare of science and religion."[20]

While H. Floris Cohen states that most scholars reject crude articulations of the conflict thesis, such as Andrew D. White's, he also states that milder versions of this thesis still hold some sway. This is because "it remains an incontrovertible fact of history that, to say the least, the new science was accorded a less than enthusiastic acclaim by many religious authorities at the time." Cohen therefore considers it paradoxical "that the rise of early modern science was due at least in part to developments in Christian thought—in particular, to certain aspects of Protestantism" (a thesis first developed as what is now sometimes called the Merton thesis).[21] In recent years, Oxford historian Peter Harrison has further developed the idea that the Protestant Reformation had a significant and positive influence on the development of modern science.[22] A review of alternatives to the White/Draper conflict thesis has been composed by Ian G. Barbour.[23][24]

[edit] Independence

A modern view, described by Stephen Jay Gould as "non-overlapping magisteria" (NOMA), is that science and religion deal with fundamentally separate aspects of human experience and so, when each stays within its own domain, they co-exist peacefully.[25] While Gould spoke of independence from the perspective of science, W. T. Stace viewed independence from the perspective of the philosophy of religion. Stace felt that science and religion, when each is viewed in its own domain, are both consistent and complete.[26]

Both science and religion represent distinct ways of approaching experience and these differences are sources of debate.[27] Science is closely tied to mathematics—a very abstract experience, while

religion is more closely tied to the ordinary experience of life.[27] As interpretations of experience, science is descriptive and religion is prescriptive.[27] For science and mathematics to concentrate on what the world ought to be like in the way that religion does can be inappropriate and may lead to improperly ascribing properties to the natural world as happened among the followers of Pythagoras in the sixth century B.C.[27] In contrast, proponents of a normative moral science take issue with the idea that science has no way of guiding "oughts".

The reverse situation, where religion attempts to be descriptive, can also lead to inappropriately assigning properties to the natural world. A notable example is the now defunct belief in the Ptolemy planetary model that held sway until changes in scientific and religious thinking were brought about by Galileo and proponents of his views.[27]

[edit] Parallels in method

Thomas S. Kuhn asserted that science is made up of paradigms that arise from cultural traditions, which is similar to the secular perspective on religion.[28]

Michael Polanyi asserted that it is merely a commitment to universality that protects against subjectivity and has nothing at all to do with personal detachment as found in many conceptions of the scientific method. Polanyi further asserted that all knowledge is personal and therefore the scientist must be performing a very personal if not necessarily subjective role when doing science.[28] Polanyi added that the scientist often merely follows intuitions of "intellectual beauty, symmetry, and 'empirical agreement'".[28] Polanyi held that science requires moral commitments similar to those found in religion.[28]

Two physicists, Charles A. Coulson and Harold K. Schilling, both claimed that "the methods of science and religion have much in common."[28] Schilling asserted that both fields—science and religion—have "a threefold structure—of experience, theoretical interpretation, and practical application."[28] Coulson asserted that science, like religion, "advances by creative imagination" and not by "mere collecting of facts," while stating that religion should and does "involve critical reflection on experience not unlike that which goes on in science."[28] Religious language and scientific language also show parallels (cf. Rhetoric of science).

[edit] Dialogue

Clerks studying astronomy and geometry.
France, early 15th century.
A degree of concord between science and religion can be seen in religious belief and empirical science. The belief that God created the world and therefore humans, can lead to the view that he arranged for humans to know the world. This is underwritten by the doctrine of imago dei. In the words of Thomas Aquinas, "Since human beings are said to be in the image of God in virtue of their having a nature that includes an intellect, such a nature is most in the image of God in virtue of being most able to imitate God".[29]

Many well-known historical figures who influenced Western science considered themselves Christian

such as Copernicus, Galileo, Kepler, and Boyle. The Pew Forum has published data on attitudes about religion and science.[30]

[edit] Concerns over the nature of reality

Science in the Enlightenment and Colonial eras was conceived as ontological investigation which uncovered 'facts' about physical nature. This was often explicitly opposed to Christian Theology and the latter's assertions of truth based on doctrine. This particular perspective on science faded in the early 20th century with the decline of logical empiricism and the rise of linguistic and sociological understandings of science. Modern scientists are less concerned with establishing universal or ontological truth (which is seen, and dismissed, as the pursuit of philosophy), and more inclined towards the creation of pragmatic, functional models of physical systems. Christian Theology—excluding those fundamentalist churches whose aim is to reassert doctrinal truths—has likewise softened many of its ontological claims, due to increased exposure to both scientific insights and the contrasting theological claims of other faiths.[citation needed]

Scientific and theological perspectives often coexist peacefully. Non-Christian faiths have historically integrated well with scientific ideas, as in the ancient Egyptian technological mastery applied to monotheistic ends, the flourishing of logic and mathematics under Hinduism and Buddhism, and the scientific advances made by Muslim scholars during the Ottoman empire. Even many 19th century Christian communities welcomed scientists who claimed that science was not at all concerned with discovering the ultimate nature of reality.[27]

[edit] Integration

[edit] Bahá'í

Main article: Bahá'í Faith and science

A fundamental principle of the Bahá'í Faith is the harmony of religion and science. Bahá'í scripture asserts that true science and true religion can never be in conflict. `Abdu'l-Bahá, the son of the founder of the religion, stated that religion without science is superstition and that science without religion is materialism. He also admonished that true religion must conform to the conclusions of science.[31][32][33]

[edit] Buddhism

Main article: Buddhism and science

Buddhism and science have increasingly been discussed as compatible.[34] Some philosophic and psychological teachings within Buddhism share commonalities with modern Western scientific and philosophic thought. For example, Buddhism encourages the impartial investigation of nature (an activity referred to as Dhamma-Vicaya in the Pali Canon)—the principal object of study being oneself. A reliance on causality and empiricism are common philosophical principles shared between Buddhism and science. However, Buddhism doesn't focus on materialism.[35][36]

Tenzin Gyatso, the 14th Dalai Lama, spends a lot of time with scientists. In his book, "The Universe in a Single Atom" he wrote, "My confidence in venturing into science lies in my basic belief that as in science, so in Buddhism, understanding the nature of reality is pursued by means of critical

investigation." and "If scientific analysis were conclusively to demonstrate certain claims in Buddhism to be false," he says, "then we must accept the findings of science and abandon those claims."[37][38]

[edit] Christianity

Science and Religion are portrayed to be in harmony in the Tiffany window Education (1890).
Earlier attempts at reconciliation of Christianity with Newtonian mechanics appear quite different from later attempts at reconciliation with the newer scientific ideas of evolution or relativity.[27] Many early interpretations of evolution polarized themselves around a struggle for existence. These ideas were significantly countered by later findings of universal patterns of biological cooperation. According to John Habgood, all man really knows here is that the universe seems to be a mix of good and evil, beauty and pain, and that suffering may somehow be part of the process of creation. Habgood holds that Christians should not be surprised that suffering may be used creatively by God, given their faith in the symbol of the Cross. Habgood states that Christians have for two millennia believed in the love of God because he revealed "Himself as Love in Jesus Christ," not because the physical universe does or does not point to the value of love.[27]

Robert John Russell has examined consonance and dissonance between modern physics, evolutionary biology, and Christian theology.[39][40]

[edit] Reconciliation in Britain in the early 20th century

In Reconciling Science and Religion: The Debate in Early-twentieth-century Britain, historian of biology Peter J. Bowler argues that in contrast to the conflicts between science and religion in the U.S. in the 1920s (most famously the Scopes Trial), during this period Great Britain experienced a concerted effort at reconciliation, championed by intellectually conservative scientists, supported by liberal theologians but opposed by younger scientists and secularists and conservative Christians. These attempts at reconciliation fell apart in the 1930s due to increased social tensions, moves towards neo-orthodox theology and the acceptance of the modern evolutionary synthesis.[41]

[edit] Confucianism and traditional Chinese religion

The historical process of Confucianism has largely been antipathic towards scientific discovery. However the religiophilosophical system itself is more neutral on the subject than such an analysis might suggest. In his writings On Heaven, Xunzi espoused a proto-scientific world view.[42] However during the Han Synthesis the more anti-empirical Mencius was favored and combined with Daoist skepticism regarding the nature of reality. Likewise, during the Medieval period, Zhu Xi argued against technical investigation and specialization proposed by Chen Liang.[43] After contact with the West, scholars such as Wang Fuzhi would rely on Buddhist/Daoist skepticism to denounce all science as a subjective pursuit limited by humanity's fundamental ignorance of the true nature of the world.[44] After the May Fourth Movement, attempts to modernize Confucianism and reconcile it with scientific understanding were attempted by many scholars including Feng Youlan and Xiong Shili. Given the close relationship that Confucianism shares with Buddhism, many of the same arguments used to reconcile Buddhism with science also readily translate to Confucianism. However, modern scholars have also attempted to define the relationship between science and Confucianism on Confucianism's

own terms and the results have usually led to the conclusion that Confucianism and science are fundamentally compatible.[45]

[edit] Hinduism

See also: Hindu views on evolution

In Hinduism, the dividing line between objective sciences and spiritual knowledge (adhyatma vidya) is a linguistic paradox.[46] Hindu scholastic activities and ancient Indian scientific advancements were so interconnected that many Hindu scriptures are also ancient scientific manuals and vice-versa. Hindu sages maintained that logical argument and rational proof using Nyaya is the way to obtain correct knowledge.[46] From a Hindu perspective, modern science is a legitimate, but incomplete, step towards knowing and understanding reality. Hinduism views that science only offers a limited view of reality, but all it offers is right and correct.[47] Not all mentioned in Hindu scriptures are consistent with modern science; however, Hinduism offers methods to correct and transform itself in course of time.

Hindu views on evolution include a range of viewpoints in regards to evolution, creationism, and the origin of life within the traditions of Hinduism.

Samkhya, the oldest school of Hindu philosophy prescribes a particular method to analyze knowledge. According to Samkhya, all knowledge is possible through three pramanas (means of valid knowledge) [48][49] –

1. Pratyakṣa or Dṛṣṭam – direct sense perception,
2. Anumāna – logical inference and
3. Śabda or Āptavacana – verbal testimony.

Nyaya, the Hindu school of logic, accepts all these 3 means and in addition accepts one more - Upamāna (comparison).

The accounts of the emergence of life within the universe vary in description, but classically the deity called Brahma, from a Trimurti of three deities also including Vishnu and Shiva, is described as performing the act of 'creation', or more specifically of 'propagating life within the universe' with the other two deities being responsible for 'preservation' and 'destruction' (of the universe) respectively.[50] In this respect some Hindu schools do not treat the scriptural creation myth literally and often the creation stories themselves do not go into specific detail, thus leaving open the possibility of incorporating at least some theories in support of evolution. Some Hindus find support for, or foreshadowing of evolutionary ideas in scriptures, namely the Vedas.[51]

The incarnations of Vishnu (Dashavatara) is almost identical to the scientific explanation of the sequence of biological evolution of man and animals.[52][53][54][55] The sequence of avatars starts from an aquatic organism (Matsya), to an amphibian (Kurma), to a land-animal (Varaha), to a humanoid (Narasimha), to a dwarf human (Vamana), to 5 forms of well developed human beings (Parashurama, Rama, Balarama/Buddha, Krishna, Kalki) who showcase an increasing form of complexity (Axe-man, King, Plougher/Sage, wise Statesman, mighty Warrior).[52][55] In India, the home country of Hindus; educated Hindus widely accept the theory of biological evolution. In a survey, 77% of respondents in India agreed that enough scientific evidence exists to support Charles Darwin's Theory of Evolution, and 85 per cent of God-believing people said they believe in evolution as well.[56][57] An exception to this acceptance is the International Society for Krishna Consciousness

(ISKCON), which includes several members who actively oppose "Darwinism" and the modern evolutionary synthesis (see Hindu Creationism).

[edit] Islam

Main article: Islam and science

From an Islamic standpoint, science, the study of nature, is considered to be linked to the concept of Tawhid (the Oneness of God), as are all other branches of knowledge.[58] In Islam, nature is not seen as a separate entity, but rather as an integral part of Islam's holistic outlook on God, humanity, and the world. Unlike the other Abrahamic monotheistic religions, Judaism and Christianity, the Islamic view of science and nature is continuous with that of religion and God. This link implies a sacred aspect to the pursuit of scientific knowledge by Muslims, as nature itself is viewed in the Qur'an as a compilation of signs pointing to the Divine.[59] It was with this understanding that science was studied and understood in Islamic civilizations, specifically during the eighth to sixteenth centuries, prior to the colonization of the Muslim world.[60]

According to most historians, the modern scientific method was first developed by Islamic scientists, pioneered by Ibn Al-Haytham, known to the west as "Alhazen".[61] Robert Briffault, in The Making of Humanity, asserts that the very existence of science, as it is understood in the modern sense, is rooted in the scientific thought and knowledge that emerged in Islamic civilizations during this time.[62]

However, the colonizing powers of the western world and their destruction of the Islamic scientific tradition forced the discourse of Islam and Science in to a new period. Institutions that had existed for centuries in the Muslim world were destroyed and replaced by new scientific institutions implemented by the colonizing powers and suiting their economic, political, and military agendas. This drastically changed the practice of science in the Muslim world, as Islamic scientists had to interact with the western approach to scientific learning, which was based on a philosophy of nature completely foreign to them.[58] From the time of this initial upheaval of the Islamic scientific tradition to the present day, Muslim scientists and scholars have developed a spectrum of viewpoints on the place of scientific learning within the context of Islam, none of which are universally accepted or practiced.[63] However, most maintain the view that the acquisition of knowledge and scientific pursuit in general is not in disaccord with Islamic thought and religious belief.[58][63]

[edit] Current scholarship

The modern dialogue between religion and science is rooted in Ian Barbour's 1966 book Issues in Science and Religion.[64] Since that time it has grown in to a serious academic field, with academic chairs in the subject area, and two dedicated academic journals, Zygon: Journal of Religion & Science and Theology and Science.[64] Articles are also sometimes found in mainstream science journals such as American Journal of Physics[65] and Science.[66][67]

Recently philosopher Alvin Plantinga has argued that there is superficial conflict but deep concord between science and religion, and that there is superficial concord but deep conflict between science and naturalism.[68]

[edit] Influence of a biblical world view on early modern science

H. Floris Cohen argued for a biblical[69] influence on the early development of modern science.[70]

Cohen presented Dutch historian R. Hooykaas' argument that a biblical world-view holds all the necessary antidotes for the hubris of Greek rationalism: a respect for manual labour, leading to experimentation and a greater level of empiricism and a supreme God that left nature "de-deified" and open to emulation and manipulation.[70] This argument gives support to the idea that the rise of early modern science was due to a unique combination of Greek and biblical thought.[71] Cohen summarised Hooykaas' conclusion as attributing the rise of modern science to the combination of the "Greek powers of abstract reasoning and of thinking up idealized constructions" in combination with "the biblical humility toward accepting the facts of nature as they are, combined with a view of man as fitted out by God with the power to take nature on".[72] Cohen also noted that Richard S. Westfall "brought out the ultimate paradox" in stating: "Despite the natural piety of the virtuosi [English 17th-century scientists], the skepticism of the Enlightenment was already present in embryo among them. To be sure, their piety kept it in check, but they were unable to banish it. ... They wrote to refute atheism, but where were the atheists? The virtuosi nourished the atheists within their own minds."

Oxford historian Peter Harrison is another who has argued that a biblical worldview was significant for the development of modern science. Harrison contends that Protestant approaches to the book of scripture had significant, if largely unintended, consequences for the interpretation of the book of nature.[73] Harrison has also suggested that literal readings of the Genesis narratives of the Creation and Fall motivated and legitimated scientific activity in seventeenth-century England. For many of its seventeenth-century practitioners, science was imagined to be a means of restoring a human dominion over nature that had been lost as a consequence of the Fall.[74]

Historian and professor of religion Eugene M. Klaaren holds that "a belief in divine creation" was central to an emergence of science in seventeenth-century England. The philosopher Michael Foster has published analytical philosophy connecting Christian doctrines of creation with empiricism. Historian William B. Ashworth has argued against the historical notion of distinctive mind-sets and the idea of Catholic and Protestant sciences.[75] Historians James R. Jacob and Margaret C. Jacob have argued for a linkage between seventeenth century Anglican intellectual transformations and influential English scientists (e.g., Robert Boyle and Isaac Newton).[76] John Dillenberger and Christopher B. Kaiser have written theological surveys, which also cover additional interactions occurring in the 18th, 19th, and 20th centuries.[77][78]

Oxford University historian and theologian John Hedley Brooke wrote that "when natural philosophers referred to laws of nature, they were not glibly choosing that metaphor. Laws were the result of legislation by an intelligent deity. Thus the philosopher Rene Descartes (1596-1650) insisted that he was discovering the "laws that God has put into nature." Later Newton would declare that the regulation of the solar system presupposed the "counsel and dominion of an intelligent and powerful Being."[79] Historian Ronald L. Numbers stated that this thesis "received a boost" from mathematician and philosopher Alfred North Whitehead's Science and the Modern World (1925). Numbers has also argued, "Despite the manifest shortcomings of the claim that Christianity gave birth to science—most glaringly, it ignores or minimizes the contributions of ancient Greeks and medieval Muslims—it too, refuses to succumb to the death it deserves."[80] The sociologist Rodney Stark of Baylor University, a Southern Baptist institution, argued in contrast that "Christian theology was essential for the rise of science."[81]

[edit] Perspectives of religious communities

[edit] Historical Judeo-Christian-Islamic view

Science, and particularly geometry and astronomy, was linked directly to the divine for most medieval scholars. The compass in this 13th century manuscript is a symbol of creation.
Most sources of knowledge available to early Christians were connected to pagan world-views. There were various opinions on how Christianity should regard pagan learning, which included its ideas about nature. For instance, among early Christian teachers, Tertullian (c. 160–220) held a generally negative opinion of Greek philosophy, while Origen (c. 185–254) regarded it much more favorably and required his students to read nearly every work available to them.[82]

In the Middle Ages some leading thinkers in Judaism, Christianity and Islam attempted synthesis between religion, philosophy, and natural sciences. For example, the Islamic philosopher Averroes,[83] the Jewish philosopher Maimonides, and the Christian philosopher Augustine of Hippo (354-430) held that if religious teachings were found to contradict certain direct observations about the natural world, then it would be obligatory to re-evaluate either the interpretation of the scientific facts or the understanding of the scriptures. The best knowledge of the cosmos was seen as an important part of arriving at a better understanding of the Bible, but not yet equal with the authority of the Bible.[citation needed]

The synthesizing approach has continued down to the present day; the Scot Henry Drummond, for example, wrote many articles, some of which drew on scientific knowledge to tease out and illustrate Christian ideas.[citation needed]

From the 11th century, however, scientific methods were being applied by both Muslim scientists and Christian scientists to domains such as optics and planetary orbits, with results which threatened some of the Church's doctrines. Christianity asserted religious certainty at the expense of scientific knowledge, by giving more explicit sanction to officially endorsed orthodox views of nature and scripture. Similar developments occurred in other religions. This approach, while it tended to temporarily stabilize doctrine, was also inclined toward making philosophical and scientific orthodoxy less open to correction, as accepted philosophy became the religiously sanctioned science. Observation and theory became subordinate to dogma. In Europe, scientists and scholars of the Enlightenment responded to such restrictions with increasing skepticism.[citation needed]

[edit] Non-fundamentalist religious views

In between these positions lie the views of non-fundamentalist religious believers. Large numbers of Christians and Jews still accept some or many traditional religious beliefs taught in their respective faith communities, but they no longer accept their tradition's teachings as unquestionable and infallible. Liberal religious believers do believe in God, and believe that in some way God revealed divine will to humanity. They differ from religious fundamentalists in that they accept that even if their religious texts were divinely inspired, they are also human documents which reflect the cultural and historic limitations and biases of their authors. Many support allegorical interpretations of Genesis. Such believers are often comfortable with the findings of archaeological and linguistic research and historical-critical study. They will often make use of literary and historical analysis of religious texts to understand how they developed, and to see how they might apply in our own day. This approach developed among Protestant scholars in the 18th and 19th centuries, and is now found among other Christians, Liberal Jewish communities and others.[citation needed]

Some religious approaches acknowledge the historical relationship between modern science and ancient doctrines. For example, John Paul II, leader of the Roman Catholic Church, in 1981 spoke of the relationship this way: "The Bible itself speaks to us of the origin of the universe and its make-up, not in order to provide us with a scientific treatise, but in order to state the correct relationships of man with God and with the universe. Sacred Scripture wishes simply to declare that the world was created by God, and in order to teach this truth it expresses itself in the terms of the cosmology in use at the time of the writer".[84] This statement would reflect the views of many non-Catholic Christians as well. An example of this kind of thinking is theistic evolution.

This understanding of the role of scripture in relation to science is captured by the phrase: "The intention of the Holy Spirit is to teach us how to go to heaven, not how the heavens go."[85] Thomas Jay Oord said: "The Bible tells us how to find abundant life, not the details of how life became abundant."

[edit] Scientific community's perspective

[edit] History

Further information: List of atheists (science and technology) and List of Christian thinkers in science

In the 17th century, founders of the Royal Society largely held conventional and orthodox religious views, and a number of them were prominent Churchmen.[86] While theological issues that had the potential to be divisive were typically excluded from formal discussions of the early Society, many of its fellows nonetheless believed that their scientific activities provided support for traditional religious belief.[87] Clerical involvement in the Royal Society remained high until the mid-nineteenth century, when science became more professionalised.[88]

Albert Einstein supported the compatibility of some interpretations of religion with science. In an article originally appearing in the New York Times Magazine in 1930, he wrote:

Accordingly, a religious person is devout in the sense that he has no doubt of the significance and loftiness of those superpersonal objects and goals which neither require nor are capable of rational foundation. They exist with the same necessity and matter-of-factness as he himself. In this sense religion is the age-old endeavor of mankind to become clearly and completely conscious of these values and goals and constantly to strengthen and extend their effect. If one conceives of religion and science according to these definitions then a conflict between them appears impossible. For science can only ascertain what is, but not what should be, and outside of its domain value judgments of all kinds remain necessary. Religion, on the other hand, deals only with evaluations of human thought and action: it cannot justifiably speak of facts and relationships between facts. According to this interpretation the well-known conflicts between religion and science in the past must all be ascribed to a misapprehension of the situation which has been described.[89]

Einstein thus expresses views of ethical non-naturalism (contrasted to ethical naturalism).

Prominent modern scientists who are atheists include evolutionary biologist Richard Dawkins and Nobel prize winning physicist Stephen Weinberg. Prominent scientists advocating religious belief include Nobel prize winning physicist Charles Townes, Francis Collins, director of the National

Institutes of Health and past head of the Human Genome Project, and climatologist John T. Houghton.[66]

[edit] Studies of scientists' belief in God

Many studies have been conducted in the United States and have generally found that scientists are less likely to believe in God than are the rest of the population. Precise definitions and statistics vary, but generally about 1/3 are atheists, 1/3 agnostic, and 1/3 have some belief in God (although some might be deistic, for example).[66][90][91] This is in contrast to the more than roughly 3/4 of the general population that believe in some God in the United States. Belief also varies by field: psychologists, physicists and engineers are less likely to believe in God than mathematicians, biologists and chemists.[92][93] Doctors in the United States are much more likely to believe in God (76%).[94]

Some of the most recent research into scientists' self reported belief in God is discussed by Professor Elaine Howard Ecklund. Some of her most interesting findings were that scientist-believers generally considered themselves "religious liberals" (not fundamentalists), and that their religion did not change the way they did science, but rather the way they reflected on its implications. Ecklund also discusses how there is a stigma against belief in God in the professional science community, which may have contributed to underrepresentation of religious voices in the field.[95]

[edit] List of studies

Among contemporary scientists—physicists and biologists—about 40% held strong religious beliefs in 1997, which closely matched those of a similar 1916 poll.[66][90]

According to a 1996 survey of United States scientists in the fields of biology, mathematics, and physics/astronomy, belief in a god that is "in intellectual and affective communication with humankind" was most popular among mathematicians (about 45%) and least popular among physicists (about 22%). In total, about 60% of United States scientists in these fields expressed disbelief or agnosticism toward a personal god who answers prayer and personal immortality.[92] This compared with 58% in 1914 and 67% in 1933.

Among members of the National Academy of Sciences, 7.0% expressed personal belief, while 72.2% expressed disbelief and another 20.8% were agnostic concerning the existence of a personal god who answers prayer.[96]

A survey conducted between 2005 and 2007 by Elaine Howard Ecklund of University at Buffalo, The State University of New York and funded by the Templeton Foundation found that over 60% of natural and social science professors at 21 elite US research universities are atheists or agnostics. When asked whether they believed in God, nearly 34% answered "I do not believe in God" and about 30% answering "I do not know if there is a God and there is no way to find out."[91] According to the same survey, "[m]any scientists see themselves as having a spirituality not attached to a particular religious tradition."[97] In further analysis, published in 2007, Ecklund and Christopher Scheitle conclude that "the assumption that becoming a scientist necessarily leads to loss of religion is untenable" and that "[i]t appears that those from non-religious backgrounds disproportionately self-select into scientific professions. This may reflect the fact that there is tension between the religious tenets of some groups and the theories and methods of particular sciences and it contributes to the large number of non-religious scientists."[98]

An explanation has been offered by Farr Curlin, a University of Chicago Instructor in Medicine and a member of the MacLean Center for Clinical Medical Ethics, that science-minded religious people instead elect to study medicine. He helped author a study that "found that 76 percent of doctors believe in God and 59 percent believe in some sort of afterlife." and "90 percent of doctors in the United States attend religious services at least occasionally, compared to 81 percent of all adults." He reasoned, "The responsibility to care for those who are suffering and the rewards of helping those in need resonate throughout most religious traditions."[94]

Another study conducted by the Pew Research Center found that "just over half of scientists (51%) believe in some form of deity or higher power; specifically, 33% of scientists say they believe in God, while 18% believe in a universal spirit or higher power."[99] 48% say they have a religious affiliation, equal to the number who say they are not affiliated with any religious tradition. The survey also found younger scientists to be "substantially more likely than their older counterparts to say they believe in God". Among the surveyed fields, chemists were the most likely to say they believe in God.[93]

Religious beliefs of US professors, many in scientific fields, were recently examined using a nationally representative sample of more than 1400, published in Sociology of Religion. The researchers reported that "Contrary to the view that religious skepticism predominates in the academy, we find that the majority of professors, even at elite research institutions, are religious believers" (p. 101).[100] Beliefs varied across disciplines, and "the most religious fields are applied ones outside the traditional liberal arts core, whose instructors may come closer to resembling the general population in terms of attitudes and values.... At the other extreme, psychology and mechanical engineering have the highest proportion of atheists [50 and 44 percent], while 60.8 percent of biologists are either atheists or agnostics" (p. 115).[100] The researchers concluded that among US professors, "less than a quarter could be classified as complete nonbelievers.... even at elite schools, there are more professors who are religious than who are nonbelievers, which suggests that in academe—as in American society more generally—secularization has entailed more the privatization of religious belief... than its elimination" (p. 124).[100]

Ecklund and Sheitle's 2005-2007 survey also compared differences between natural and social scientists at the 21 elite US research universities that they surveyed. Analyses of the more than 1600 responses indicated that "differences in religiosity between natural and social scientists are simply no longer a meaningful descriptor of the place of religion in the academy. For the most part, there is little difference between these larger fields [social versus natural science] or between the specific disciplines themselves. The differences that do exist are seen among chemists and political scientists who are more likely to be religious, according to traditional indicators, when compared to physicists"[101] (p. 299).

[edit] Scientific study of religion

See also: Religious studies, Psychology of Religion, Handbook of Religion and Health, and Faith and Health: Psychological Perspectives

Scientific studies have been done on religiosity as a social or psychological phenomenon. These include studies on the correlation between religiosity and intelligence (often IQ, but also other factors). A recent study on serotonin receptors and religiosity[102] suggests a correlation between low density of serotonin receptors and intense religious experiences. Also of popular interest are the studies regarding prayer and medicine, in particular whether there is any causal or correlative link between spiritual supplication and improvement of health. Surveys by Gallup, the National Opinion Research Centre and the Pew Organisation conclude that spiritually committed people are twice as likely to report being

"very happy" than the least religiously committed people.[103] An analysis of over 200 social studies that "high religiousness predicts a rather lower risk of depression and drug abuse and fewer suicide attempts, and more reports of satisfaction with life and a sense of well-being."[104] A review of 498 studies published in peer-reviewed journals concluded that a large majority of these studies showed a positive correlation between religious commitment and higher levels of perceived well-being and self-esteem, and lower levels of hypertension, depression and clinical delinquency.[105][106] Surveys suggest a strong link between faith and altruism.[107] Studies by Keith Ward show that overall religion is a positive contributor to mental health.[108] Michael Argyle and others claim that there is little or no evidence that religion ever causes mental disorders.[109]

Other studies have shown that certain mental disorders, such as schizophrenia and obsessive-compulsive disorder, are also associated with high levels of religiosity.[110] In addition, anti-psychotic medication, which is mainly aimed to block dopamine receptors, typically reduces religious behaviour and religious delusions.[111]

Some historians, philosophers and scientists hope that the theory of memetics, reminiscent of the theory of genetics, will allow the modeling of the evolution of human culture, including the evolutionary origin of religions. Daniel Dennett's book Breaking the Spell (2006) attempts to begin such an analysis of modern religions. The idea that evolutionary processes are involved in the development of human culture and religion is not particularly controversial among natural scientists, although other approaches based on social sciences such as anthropology, psychology, sociology and economics are more prevalent in academic use.

[edit] Perspectives of other groups in society

A survey of a national sample of US college students examined whether these students viewed the science / religion relationship as reflecting primarily conflict, collaboration, or independence.[112] The study reported that

despite the seeming predominance of a conflict-oriented narrative, the majority of undergraduates do not view the relationship between these two institutions as one of conflict. Undergraduate students are also more likely to move away from a conflict perspective than to adopt one during their college years. [112]:175

[edit] Religion and science community

The religion and science community consists of those scholars who involve themselves with what has been called the "religion-and-science dialogue" or the "religion-and-science field."[113][114] The community belongs to neither the scientific nor the religious community, but is said to be a third overlapping community of interested and involved scientists, priests, clergymen, theologians, and engaged non-professionals.[114][not in citation given] Institutions interested in the intersection between science and religion include the Center for Theology and the Natural Sciences, the Institute on Religion in an Age of Science, the Ian Ramsey Centre,[115] and the Faraday Institute. Journals addressing the relationship between science and religion include Theology and Science and Zygon: Journal of Religion & Science.