Reconciling Theocracy and Science in a Time of Severe Medical Crisis

By Blake L. White

Originally developed and presented at Stanford University in conjunction with *The Plague* graduate seminar in March 2002.

Abstract –

Christian theology and secular science have been at odds throughout most of European history. Although each has its own dogma of fundamentalism and scientism, respectively, they serve as important social belief systems in times of crisis. Modern crises, such as epidemics and the threat of pandemics, illustrate the need for a rational fusion of both schools of thought to address realistic causes and cures of illness and minister to sophisticated, literate, 21st-century people, who by their very nature exist in the dual world of rationalism and faith.

Rationale –

1. Historically, health crises, such as the plague and AIDS, shake the foundations of societies' belief systems. Religion and medical science are challenged and often discredited, leading sufferers and survivors alike to seek comfort and security in new paradigms.

2. Religion and science deal with this challenge is opposite ways. While science learns from the crisis and moves to a more effective level, religion is often too passive and outmoded for the reality at hand; only reluctantly modifying its dogma after it is clearly defeated and increasingly irrelevant.

3. When it was at the height of power, the Church impeded medical progress when its adherents most needed it.

4. Alternatively, at its height of power, science and scientism, rejected the value to the human spirit of faith, emotion, and hope, when it was most needed.

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5. It is clear that modern humanity will reject any non-rational explanation of causes and cures. Likewise, reduction of causes and cures to pure mechanistic explanations is contrary to human experience and will also likely be rejected.

6. A better approach for modern society is the reconciliation of the religious and scientific schools of thought in a manner that recognizes that they are not inconsistent with each other -- in fact they may be complementary – when they restrict their scope and energies to what each school does best.

7. Science should focus on the physical realm of cause, effect, and cure. Religion should focus on the non-physical realm of universal meaning, personal morals, interpersonal relationships, and societal value. Neither should encroach beyond its rational capabilities.

8. In times of severe crisis, such as epidemics and the threat of pandemics, humanity needs the best of both schools to nurse the body and minister to the spirit.

An interdisciplinary approach, drawing from ancient and modern sources in history, scientific non-fiction, journals, film, novels, sermons, lectures, essays, and rhetoric will be used.

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Reconciling Theocracy and Science in a Time of Severe Crisis

By Blake L. White

It is often easier to believe than to think.
-Haki Madhubuti

Christian theology and secular science have been antagonistically and emotionally opposed throughout much of Western history. The conflict between knowledge-based science[1] and belief-based religion confront our intellect, challenge our deeply ingrained value system, and tear our social fabric. Although each has its own dogma of fundamentalism or scientism, respectively, both serve important social roles in times of crisis. This self-imposed conflict between diametrically opposed views of the world has been, and continues to be, a major obstacle to holistic human progress. When society is most distressed, such as when it has been devastated by pandemics, we see the need for both realistic causes and cures of illness, as well as nourishment of the emotional and spiritual needs of sophisticated, literate, 21st-century citizens, who by their very nature exist in the dual world of rationalism and faith.

In much of Western society, overthrowing deeply ingrained belief systems does not occur without intellectual struggle and occasional social violence. However, the massive scope of pandemic health crises, such as the plague, smallpox, and AIDS, shake the foundations of society's belief systems and open up opportunities for fresh ideas. When almost half the population is lost, and it is clear that neither physicians nor priests have effective means to address the situation, even the most

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[1] It is helpful to use Jacob Bronowski's definition and note that science is the body of knowledge obtained by methods based upon observation. Derived from the Latin word *scientia*, which means knowledge, the modern usage employs the German concept of *wisenschaft*, which means systematic organized knowledge. Thus, science implies not mere isolated facts, but knowledge that has been put together in some organized manner (Bronowski). In particular, the science with which we are concerned is a body of knowledge which derives its facts from observation, connects these facts with theories, and then tests or modifies these theories as they succeed of fail in predicting or explaining new observations (Platt).

The modern Western notion of science employs two aspects of Renaissance scientists' work as its foundations: the empirical approach based upon objective, rational observation and the use of a mathematical approach to describe nature. These principles laid the groundwork for modern scientific methods of inquiry and were forcefully argued by the philosopher Rene Descartes and the theologian Francis Bacon. It subsequently became imprinted on the social fabric of Europe as well as modern Western science (Capra 15).

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sacred beliefs are opportune targets for change. The 14th-century bubonic plague,[2] or Black Death, devastated Europe by eliminating up to one-third of the population over a brief two and a half years (Ziegler, 232). Variola major, commonly known as smallpox, kills between 10-30 percent of its victims. It has been noted as a scourge on humanity in writings from ancient Egypt to 18th-century America.[3] Smallpox took the lives of commoners and nobles alike.[4] As recently as 1967, between 10-15 million people were infected by smallpox and there were as many as 2 million deaths annually over a range of 43 countries (Tucker, 3). By the early 1990s, the World Health Organization predicted that 25-30 percent of pregnant women in certain African countries tested positive for that modern scourge -- HIV AIDS -- and that 40 million people would be infected by AIDS by 2000, ninety percent of which would be in developing countries, principally among the most impoverished (Kennedy 28). For the most feared diseases, the causes are not visible, the cures are unknown, the physical degradation of the human body is often disgusting, destruction of familial empathy is embarrassing, and the future outlook is bleak. Because historic plagues decimated the aristocracy, clergy, laity, physicians, and peasants similarly, and because no amount of praying, atonement, or adherence to law seemed to slow its spread, religion and medical science of the day are challenged and often discredited,[5] leading sufferers and survivors alike to seek comfort and security in new paradigms.

Throughout much of global literature, one finds a pervasive sense of mystery surrounding disease. "Medieval mysticism meant accepting the rule of invisible forces...within the Good Lord's mysterious blueprint ...rooted in the beyond, over the tangible, everyday experience," according to science historian Thomas Goldstein (Goldstein 138). The medieval belief was that plagues were either the unseen arrows shot directly from the hands of a wrathful God or the mischief of a hateful demon.[6] For example, as far back as Saint Cyprian's writings in the 3rd century A.D., Christians have assumed that the plague was a test from God that must be accepted (Cyprian 206-211). Not limited to Christians, the Spanish importation of smallpox into the Americas so devastated the native Amerindian population, while leaving the Spanish unscathed, that the Aztecs interpreted the selective pestilence as a demonstration of the superior power of the Spanish god (Tucker 10). The pervasive impact of smallpox on human cultures around the globe was reflected in the widespread practice, in

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[2] Plague is found in three forms. Bubonic plague is accompanied by swollen painful buboes. Septicemic plague is a deadly blood disease. Pneumonic plague is a highly contagious respiratory disease. Plague is caused by a flea borne bacillus carried by rats (Koran).

[3] Smallpox outbreaks have been found in 4th-millennia BC Egypt, 2nd-millenia BC India and China, 5th-century BC Greece, 2nd-century Rome, 16th-century Hispaniola and Brazil, 18th-century Iceland, Russia, England, and Revolutionary War-era North America.

[4] Notable deaths due to smallpox include Roman Emperor Marcus Aurelius, Queen Mary II of England, King Louis I of Spain, Russian Tsar Peter II, King Louis XV of France, Inca emperor Atahuallpa, and Aztec general Cuitlahuac, the brother of Montezuma (Tucker, 6-12).

[5] The Black Death destroyed the continuity of the Great Chain of Being, a deeply held medieval worldview that assumed the whole world was a hierarchical pyramid, and that destruction called into question the authority of Church leaders, kings, physicians, and the landowning aristocracy (Steidle).

[6] Andrew White notes that it was common to attribute disease to demons (White 2: 27).

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places like West Africa, Brazil, China, and India, of worshiping gods, goddesses, and the patron saints associated with disease (Tucker 13).

In addition to shock, terror, and fatalism, there is often the opposite reaction of hedonism, a short-term outlook, and a noticeable change in morals among the populous. As far back as the ancient Greece, Thucydides noted that the plague that occurred during the war between Athens and Sparta created a "breakdown of law and order, ...a general deterioration of character throughout the Greek world, ...and an exaltation of profit above justice" (Thucydides 244-245). Boccaccio observed that, "...the townspeople became lax in their ways and neglected their chores as if they expected death that very day" (Herlihy 40). There was also a noticeable change in the accepted social order in favor of immediate gratification.[7] Having a fatalistic outlook, many workers preferred to indulge their appetites while they still had a chance[8] (Herlihy, 40). The fine clothing and food, once restricted to a powerful aristocracy, was adopted by the middle class and sometimes seized by peasants after the death of aristocrats. Once a large portion of the population became aware of the impotence of medieval medicine and the Church, there was no turning back to the old folk medicine or acceptance of the authority of Church and king.[9] Rather, the plague contributed to a newly enlightened urbanized class with a focus on the world of the here-and-now and a taste for the good life.[10]

Religion and science dealt with this challenge is opposite ways. Fundamentally, science is based upon a set of assumptions, including the belief that nature and the physical realm are real, nature is orderly, and nature is, in part, understandable (Fischer 64). It seeks truth but never attains it permanently. According to Thomas Kuhn, "Failure of existing rules is the prelude to a search for new ones" (Kuhn 68). It tries to eliminate ambiguity, yet feeds upon ambiguity. It dissects observations, yet synthesizes them into grand schemes. It is exact, yet relative. It seeks to provide answers, yet reduces questions. Science works toward combining all knowledge into one unifying concept, but human experience continues to lead us away from a single concept. It is this duality in science, as well as of nature, that makes it a human endeavor and makes it part of humanity. It was this enlightened approach that was brought to the process of investigation of causes and cures of contagion. While science learns from the crisis and moves to a more effective level, religion is often too passive and outmoded for the reality at hand; only reluctantly modifying its dogma after it is clearly defeated and increasingly irrelevant. Though the plague of Carthage struck Christians and pagans alike, Cyprian's followers reacted to it submissively. He argued that pain, suffering, infecting others, and humiliation was to be

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[7] The nouveau riche increased the demand for luxury goods (Koran).

[8] Herlihy notes, "Conspicuous consumption by the humble threatened to erase the visible marks of social distinctions and to undermine the social order" (Herlihy 48).

[9] Where the economic system of the medieval world was agrarian, land-based, and stable, the Renaissance of the 15th and 16th centuries was based on capital and it fostered exploration to find new goods and markets. The Renaissance was all about money -- capital, banking, borrowing, interest, using money to make money. New ideas in trade, art, and science cross-fertilized (Steidle).

[10] The power and prominence of cities, rather than the rural farmlands, was evident by the 13th century. For example, independent Italian city-states that expanded to encompass a nation-state composed of powerful urban commercial centers with a solidified commercial middle class (Steidle).

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accepted as divine tests of one's fitness for Heaven (Cyprian 206-211). From a modern perspective, such a test of believers involving sadistic tortures would surely be a perverted philosophy meant to force submission. Random chance or Satan are more convincing explanations for the plague than God's will. Unfortunately, many religious groups have followed the lead of Cyprian, who justified misery and exploited the sufferings of people to build and maintain a fledgling new church organization.

While judging religion and the state of medical knowledge in the hindsight of history is somewhat unfair, it allows one to question whether Christianity's dogma and reliance on faith instead of rational mental faculties slowed the development of the European scientific method, impeded medical progress, and delayed the search for causes and cures when its adherents most needed it. Since ancient times, the educated elites knew the power of Aristotle's reasoning, Hippocrates',[11] Herophilus', and the Galen's[12] observation and experimentation, and it knew that the Muslim scholars of the 9th to 14th-century Spain excelled in medicine and chemistry (White 2: 26-51). In spite of this knowledge, medieval society rejected this early scientific approach in favor of faith. Consider how Cyprian tried to convince his followers that since they could not change the world, they should not even try (Cyprian 218). These beliefs contributed to Christians not seeking prevention nor examining those things in nature that differentiated plague survivors.[13] For hundreds of years, the medieval Church set up a series of obstacles including: attributing disease to demons, sanctioning and profiting from the supposed healing powers of the relics of the Christian martyrs, using the *Apostle's Creed* and its "resurrection of the body" belief to outlaw dissection in medical schools, promoting ideas that abasement adds to the glory of God, that cleanliness was a sign of pride, and that filthiness was a sign of humility. As late as the 18th Century, church leaders were preaching against the 'dangerous and sinful practice' of inoculation[14] (White 2: 27-69).

Throughout European history, schools of thought contrary to Church teachings were seen as blasphemous and appropriate punishment was doled out. In 1270, Thomas Aquinas, writing in his *Summa contra gentiles*, cautioned the faithful not to lift the veil from those ultimate mysteries that are destined to be concealed from the human mind. Thomas Goldstein notes:

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[11] According to Ziegler, "[Hippocrates]... first conceived ill health, not as a series of unrelated and essentially inexplicable catastrophes but as an orderly process calling on each occasion for examination of symptoms, diagnosis of malady, and prescription of cure" (Ziegler 68).

[12] Galen seems to have understood the concept of air borne contagion. He proposed that, "...an inspiration of air infected with a putrid exhalation. The beginning of the putrescence may be a multitude of unburned corpses, as may happen in war; or the exhalations of marshes and ponds in the summer..." (Ziegler 22).

[13] For example, during the Roman plague of 1522, Jews escaped the plague with higher survival rates. Instead of trying to determine if their practices handed down through Jewish lawgivers, such as a superior sanitary system or their abstinence from dangerous foods, may have been the reason, the Christian public assumed that their immunity resulted from protection by Satan (White 2: 72-73).

[14] During the 1721 breakout of smallpox in Boston, even though Zabdiel Boylston's inoculation technique was proven to produce a lower mortality rate than inflicted by the natural disease, it was widely opposed by the medical establishment as unsafe, and by the church as an interference with God's will (Tucker 17-18).

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> "The greatest rational thinker of the Middle Ages, in other words, privy to the most complete scientific knowledge of his time, was warning his own generation and the generations to come not to overestimate the power of rational thought, but to acknowledge the superior scope of mystic intuition and sheer faith as paths toward understanding" (Goldstein 249-250).

Prodded by St. Bernard, conservative theologians from Paris, Orleans, and Laon hounded the masters of Chartres and summoned them to appear before a tribunal to face charges of heresy for teaching a scientific view of the intrinsic creative powers of nature -- a view that threatened the 700-year old view of nature as the passive object of God's creation (Goldstein 69-70). This was the mentality that burned at the stake Giordano Bruno in 1600 for uttering and publishing the heresy that there were other worlds and other beings inhabiting them (Sagan 185). Staunch religious dogma was the reason for the Catholic hierarchy's imprisonment of the aged Galileo Galilei for proclaiming that the Earth moves (Drake 330-351). Johannes Kepler, after whom the laws of planetary motion are named, was excommunicated by the Lutheran Church for his uncompromising individualism on matters of doctrine and because of his writing of The Somnium, in which he imagined a journey to the moon. In addition, Kepler's mother was dragged away in a laundry chest in the middle of the night to be burned as a witch for giving birth to such a heretic and selling herbs (Sagan 50-71). Had it not been for religious ignorance, Europe may not have had to wait another 1500 years after Cyprian to understand the causes and cures of contagion.

In addition to its antagonism against scientific inquiry, the Church lost much of its credibility due to its own actions during the Black Plague. A recurring theme in 14th century plague-era literature is the widespread indictment of the clergy's immoral behavior. Much of this corruption can be traced to a paradox between the professed noble ideals of the Church – piety, modesty, celibacy, truth, honor, fairness, and faith -- in contrast to its all too human behavior, including profiteering, licentiousness, filth, cynicism, and hypocrisy. In much the same way that modern comedians know a good laugh depends on shared audience knowledge of familiar exaggerated caricatures, the writings of medieval poets and authors suggest that a corrupt and depraved clergy was commonplace and accepted as a satirical archetype among storytellers. Boccaccio even notes in his conclusion to The Decameron that, "...even more outrageous stories are to be found in the church's annals than in my own tales" (Boccaccio 144).

Where earlier pre-plague literature depicted the clergy as isolated in a rarefied air of pious devotion, the post-plague medieval Church seemed to tolerate a cadre of practitioners who associated with the common elements of society. Indeed, the Church seemed to have more than its fair share of sinners. For instance, Chaucer's Friar in the Canterbury Tales knew taverns, innkeepers, and barmaids well in every town. In the *Second Story on the First Day* of Boccaccio's The Decameron, Giannotto di Civigni encouraged his Jewish friend, Abraham, to convert to Christianity, but is afraid to allow Abraham to visit Rome and see how wicked the clergy are. Giannotto notes that they are open

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gluttons, drinkers, and sots, who shamelessly participate in lust, including sodomy (Boccaccio 30). In the *Fourth Story of the First Day*, Boccaccio describes the despicable behavior of a monk and his abbot, each of whom had sex with the same village girl and justified it under cloak of secrecy. In addition, it was obvious that cleanliness was not next to godliness. Andrew White notes that in promoting the idea that abasement adds to the glory of God and that cleanliness was a sign of pride, the Church promoted filthiness as a sign of humility (White 2: 69). Boccaccio's concluding remarks in The Decameron insults the friars by saying that, "...they all smell like goats" (Boccaccio 147).

The Church also allowed hypocrisy to become rampant. Chaucer's Pardoner sees no reason not to "have advancement by hypocrisy." While he recognizes a contradiction between his motive and message, he admits his hypocrisy, "Thus I spit out my venom under color of holiness, while seeming holy and sincere" (Chaucer 348-351). Chaucer's Friar found that it held no profit to lower himself to do undignified work with the poor. He preferred, "...to deal with ...the rich and sellers of food, and anywhere profit might appear" (Chaucer 16). Boccaccio tells how a monk and an abbot often had a young village girl brought back into the monastery again for sex, and how the abbot justified breaking his vow of celibacy with witticisms like, "...a sin that's hidden is half forgiven" and "I believe it is a sign of great intelligence for a man to profit from what God sends others" (Boccaccio 36).

The Church sanctioned and profited from the supposed healing powers of the relics of the Christian martyrs (White 2: 26). It allowed this profit to further corrupt its messengers and devalue its message. One finds in literature caricatures, such as Chaucer's Friar that gave penance "wherever he knew he'd have a good remuneration" (Chaucer 15). Chaucer's Pardoner is openly larcenous, and yet operates with the full authority of a Papal Bull. In the *Prologue* to The Canterbury Tales, the Pardoner is described as having a pillowcase said to be Our Lady's veil, a small piece of sail supposedly from Saint Peter's boat, and pig's bones said to be those of a saint (Chaucer 44-45). This seller of relics is an "entirely viscous man" who has no interest in the message of Christianity, other than how it is used to profit him (Chaucer 348). The Pardoner admits, "For my intention is only for profit, and not at all for correction of sin" (Chaucer 348). Through the sale of benefices, Boccaccio describes the clergy in Rome as, "... having carried on more trade and had more brokers than there were engaged in the textile or other business in Paris" (Boccaccio 30). The general exposure of Catholic frauds, inquisitions, and massacres further accelerated the decline in the Church's credibility.

Though the modern church has its fair share of child molesters and fraudulent schemes, it also has intellectual dishonesty. Religion seems to historically abhor the use of the analytical left-brain that science so dearly cherishes. Zealots always seem to be lurking to limit our knowledge to an "approved list." Consider the case of Creationism, a view that if we were to subscribe to it would significantly stunt our understanding of how biological organisms evolve, including those that mutate into serious agents of disease.[15] As a simplification let's revisit what fundamentalists and scientists are quarreling

[15] Microbes have evolved diverse ways of spreading from animals to people and from one person to another. Many human symptoms of disease are actually ways in which a microbe modifies our bodies or our behavior such that we become enlisted to

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about. Charles Darwin explained his theory as one in which all living things show slight variations that are inherited and this sets up a fierce struggle for existence, so that a very slight variation in strength, cunning, or camouflage will give its possessor an advantage and determine its survival. Over very long periods of time these successful variations have produced the vast differences between living plants and animals that we now know (Raven 207). From the early days of the theory's teaching, men like William Jennings Bryan sought to protect religious dogma, not to seek the truth. Bryan was the spokesman for the antievolutionist movement of the 1920's and as such by the end of the decade more than 20 state legislatures debated evolution laws and at least five, including Oklahoma, Florida, Tennessee, Mississippi, and Arkansas, passed restrictive legislation[16] (Numbers 538-544). More recently, in the 1980s, fundamentalist U.S. theologians tried to teach Creationism as science. They wanted teach that all creation took place very recently. They also sought scientific evidence to show that the fossil beds and fossil bearing strata were nearly all laid down during a flood in the historic past, with life forms being separated and arranged into sequential layers by the water's turbulent action (Elliot 7-9). It is intellectually dishonest that Creationists tried to legitimize their beliefs by using select pieces of science in a manner that further defeats their cause. The idea that religion is a body of belief, immune to criticism, fixed forever by some founder is a prescription for the long-term decay of that religion, especially in light of new discoveries.

However, the scientific community is not innocent of the charge of tyranny either. Western science has traditionally rejected the value to the human spirit of faith, emotion, and hope when it was most needed. Scientists have throughout the ages ignored and ridiculed approaches that involved insight, intuition, hunches, and general the use of the emotional right brain. There has been a mechanistic claim among scientists that living organisms are nothing more than very complex physico-chemical systems (Hempel 101). This led to a view among scientists that scientific theories could be applied to social phenomena and they should be described, analyzed, and explained in terms of the situations of the individual agents involved in them and by reference to the laws and theories concerning individual human behavior (Hempel 110). This view has also been called *scientism*.

Scientism is not science. It is the affirmation that there is no other realm than matter and energy, no knowledge other than scientific knowledge, and no areas of investigation including

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spread microbes. For example, malaria, plague, typhus, and sleeping sickness come from microbes that hitchhike in the saliva of insects that bite animals and humans. Syphilis, rubella, and AIDS pass from a woman to her fetus, infecting the child before birth. Influenza and pertussis induce the victim to cough, spreading the microbes through the air. The cholera bacterium induces massive diarrhea that delivers the bacteria into the water supply of potential new victims. The rabies virus gets into the saliva of a dog and also drives the dog mad, so that its frenzy of biting further infects new victims. Some microbes, such as the AIDS virus, evolve new antigens that fool human antibodies as it lives within its victim (Diamond 195-205).

[16] In 1925 John Thomas Scopes, a high school teacher in the small town of Dayton, Tennessee, confessed and was found guilty of having violated the state law banning the teaching of human evolution in public schools. His trial was the center of international attention with the press treating the antievolutionists with disdain for their illogical defense of creationism (Numbers 538-544).

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philosophy, humanities, and social sciences that should be spared scientific scruting (Fischer 68). Spinoza and Einstein believed that God was the sum total of all the physical laws which describe the universe. When Pierre Simon, the Marquis de Laplace, presented a copy of his work on the mathematics of physical laws to Napoleon in 1798, the Emperor asked as to the mention of God in the text. Laplace's response was an arrogant, "Sire, I have no need for that hypothesis" (Henahan 9). Francis Bacon proclaimed science as the religion of modern emancipated man (Durant 47). Robert Jastrow, the founder of NASA's Goddard Institute observes:

> "Scientists cannot bear the thought of a natural phenomenon which cannot be explained, even with unlimited time and money. There is a kind of religion in science; it is the religion of a person who believes there is order and harmony in the universe. Every event can be explained in a rational way as the product of some previous event; every event must have its cause" (Jastrow 113).

Because we have adopted a faith in science, it is clear that modern humanity will reject any non-rational explanation of causes and cures. Will and Ariel Durant argue that the replacement of Christian with secular institutions is the culmination and critical result of the Industrial Revolution, which replaced agriculture and its faith in annual rebirth and the mystery of growth with the humming daily litany of machines and its resulting mechanistic outlook on life (Durant 47-48). Also, from a modern philosophical perspective, truth can only be proven -- never disproved -- and, as such, the truth needs no defense other than itself, and certainly needs no fear tactics. Where religion traditionally opposes questions, science is based upon questions. Science is knowledge gained through testing questions and by observing nature. Religion might be considered an accumulation of folk wisdom, but it is not objective knowledge. Rather, it is a belief system and, as such, has no demonstrable test. It requires faith. Science postulates the process and does not mind being questioned. Religion gives an answer and demands silence. Doubts must be allowed and answered by churches with more than the standard blind faith retort or face serious erosion of confidence in religious doctrine. Likewise, scientific reduction of causes and cures to pure mechanistic explanations is contrary to human experience and will also likely be rejected. "The [doctrine] that certain characteristics of living systems, such as their adaptive and self-regulating features, cannot be explained by physical and chemical principles alone, but have to be accounted for by reference to new factors of a kind not known to the physical science, namely entelchies or vital forces," cites philosopher of science Carl Hempel (Hempel 101). Scientism's assignment of an omnipotent role to science, of solving all problems and clarifying all things, and of deifying nature while secularizing religion can lead to what Robert Fischer refers to as, "...an ideology, like other ideologies, tends to be systematic, authoritarian, and to be held tenaciously" (Fischer 68).

Science cannot ever hope to realistically answer the big questions facing humanity. Being based upon observation and testing, science is at an impasse when it comes to things that cannot be observed, measured, tested, and predicted. Social problems transcend mathematical description and

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involve emotions that cannot be touched, measured, or manipulated successfully. Numerous problems, such as naturally mutating microbes, the nuclear arms precipice, and global economic inequity, have no easy technical solution. Worse still, technical solutions often only address changes in technique that might relieve the symptoms, but do not demand changes in human values or morality which ultimately affect many underlying causes. Faith in technology as the ultimate solution to all problems can divert our attention and prevent us from taking effective action to solve it (Meadows 155-159).

Alternatively, religion appeals to the imagination, provides hope, consoles and brightens lives in times of hardship. Cyprian, the Bishop of Carthage, developed a powerful sermon that addressed the critical issues raised by early Christians under siege by the plague. Writing in the middle of the 3rd century, he offered solid theological arguments on prophecy, life after death, why God's people suffer, and how Christians believe they have superior moral strength (Cyprian 195-221). His sermon comforted the grieving, soothed the terror that accompanied the plague, and reinforced a set of organizing principles of the early Church. Religion is also necessary to morality and is crucial to maintenance of social order. Durant notes that, "There is no significant example in history, before our time, of a society successfully maintaining moral life without the aid of religion" (Durant 50-51).

Religion also appeals to non-scientific common sense that tells one that complex life doesn't just happen. There must be some process, even if one believes that God initiated the process. As best shown by Antonius Block, the protagonist of Ingmar Bergman's classic 1957 film The Seventh Seal, life without meaning is unthinkable. Block is willing to die if he can obtain true knowledge of God and of the meaning of life, but he delays death if it means he will die with noting more than faith (Bergman). Modern society is much like Block in that we want spirituality based on actual knowledge, but knowledge is limited to the space and time that we physically grasp. However, we are not willing to waste precious time on unproven ritual and faith alone.

A definitive answer is not likely to be forthcoming from either school of thought alone, but consider what could happen if they cooperated. Religion could tell us where to look and science could determine how the process occurred. A workable approach for modern society is the reconciliation of the religious and scientific schools of thought in a manner that recognizes that they are not inconsistent with each other -- in fact they may be complementary -- when they restrict their scope and energies to what each school does best. Science should focus on the physical realm of cause, effect, and cure of disease. The scientific values of truth, objectivity, dissent, independence, respect, and supranationality could solve many of our most pressing problems. Religion should focus on the non-physical realm of universal meaning, personal morals, interpersonal relationships, and societal value, which often break down during massive epidemics. Religion can provide a generally accepted view of our place in the universe, if it can avoid mutual confrontations with differing religions and with science, which only serve to erode the adherence of many people to religious belief and practice (Sagan 289). Since our future needs will be closely linked to science, religion has some real challenges ahead. However, neither should encroach beyond its natural and rational capabilities.

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Now is when we need both schools of thought; or both faiths if you prefer. As we encounter the stresses and complexities of high-tech society, we will become more intense in our search for religious meaning and spiritual well being. In their report on emerging microbial threats, Lederberg, Shope, and Oaks observe that, "Like other living organisms, infectious agents are subject to genetic change and evolution. This includes their ability to infect new hosts and alterations in their susceptibility to antimicrobial drugs. It is unrealistic to expect that humankind will win a complete victory over the multitude of existing microbial diseases, or over those that will emerge in the future" (Lederberg 1,32). So, as we face the specter of new forms of devastatingly dangerous mutant microbes, we will search out and value our relationships to people and to God. On issues such as genetic engineering, technical complexities will need to be balanced by human values, which churches and families can help preserve. When dealing with the creation or modification of life forms, we are actually reformulating our morals. We cannot trust science to do this alone; religion can guide us, but only if it coexists in concert with the high-tech society. Like it or not, religions that remain irrelevant to the current and future needs of people are doomed.

Likewise, scientists need to recognize that religion is also an evolving endeavor that is fraught with human aspirations and frailties, but nonetheless crucial to the spirit. Alfred North Whitehead observed that, like science, "...religion [has] been in a state of continual development ...arising from an aspect of conflict between its own proper ideas" (Whitehead 228-229). Christianity's message has shown an amazing ability to thrive in spite of scandalous behavior by the leaders and agents of the Church. While post-plague medieval literature is critical of the clergy's morals, it also gives an indication that their immorality did not necessarily damage their positional power. For example, in spite of being a vicious profiteer, Chaucer describes the Pardoner as a noble ecclesiastic; one that can and does tell a moral tale (Chaucer 45, 351). He also describes the Friar as wanton, yet a noble pillar within his order (Chaucer 14). Perhaps it was the first instance of a delineation of the person delivering the message from the message itself. Maybe the medieval authors recognized that, after the very real and human experience of the plague, there is no such thing as an infallible clergy. Just as we can admire what religious leaders and politicians accomplish without admiring aspects of their personal lives, Chaucer gave us early signals of a more humanistic, less idealized, more democratically secular, and less serious view of religion and those practitioners of it.

In times of severe crisis, such as epidemics and the threat of pandemics, humanity needs the fusion of science to nurse the body and religion to minister to the spirit. This is not a new 21st-century concept. The 12th-century masters of the School of Chartres asserted that the laws of nature were worthy subjects of investigation by the human mind, since both are encompassed within the divine universe and its design (Goldstein 69-70). In the 13th-century, Thomas Aquinas gave a sound philosophical argument that scientific rationalism and empiricism are perfectly compatible with mystic and religious concepts of the world, as long as rationalism remains aware of its metaphysical limitations (Goldstein 70). Daniel Defoe gives us perhaps the first significant literary vision of a peaceful

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coexistence between religious faith and scientific reasoning. In the process, Defoe demystifies the beliefs in supernatural causes of the plague and modernizes our concept of God's creation.

Writing in 1720 as the narrator and reporter in A Journal of the Plague Year, the Presbyterian Defoe graphically describes the 1665 London plague to an audience that fears its return. As one standing on the cusp of the Enlightenment and in the midst of a century of tremendous religious reformation, Defoe applies logic to the medieval idea that plagues are either the unseen arrows shot directly from the hands of a wrathful God or the mischief of a hateful demon. Defoe's narrator, H.F., flatly states that the plague is a natural phenomenon. He says, "I am speaking of the Plague, as a Distemper arising from natural Causes...that go on in the ordinary Course of natural Causes." He is in a search for how the plague spreads, not what God's plan is for the plague. His observation about the spread of the plague is within the context of his own rational faculties and is constrained by an approach to science that is about the physical world. Defoe wisely sidesteps the argument of God's existence and whether the plague was sent by God as punishment for human sin. To Defoe, the divine nature and God's intent are independent of the search for a natural cause and effect. Defoe does not see an inconsistency between an interventionist deity's actions and natural causes. He acknowledges to his 18th century audience that since everything was created by God, "...for the divine Power has form'd the whole Scheme of Nature, and maintains Nature in its Course," then the search for the 'how' of the plague is consistent with knowing God's creation. Just as the modern philosopher of science, Jacob Bronowski, sees scientific thinking as describing the machinery of nature and its fundamental processes, Defoe would agree that when one observes an act of nature, one is practicing science; but we are also acknowledging God's creation as we observe (Bronowski). Like the actual pioneer of census statistics, John Graunt[17] (1620-1674), who studied London's Bills of Mortality during the plague years, Defoe's H.F., through his treatment of observation and scientific thinking as not in conflict with religion, but in concert with God's will, demonstrated a new age of complementary thinking styles based on harmony between science and religion, tangible and intangible, fact and faith.

Since phenomena outside of our physical realm of experience are, by definition, foreign to science and native to religion, the right brain's feeling, intuition, and connectedness can certainly assist in answering complex questions. When scientists start listening to theologians and mystics, and this latter group starts, not only listening, but understanding and practicing science, we may be on our way to viewing these ultimate questions with our collective brains and in a holistic fashion. Just imagine a concept of creation that took place anciently, in the beginning, with the process being started by the loving, all-powerful God. The physical laws with which we are well familiar are mere representations of a multifaceted being of which we are an integral part. Genesis then becomes allegorical, and we would be continually in a process of biological and mental evolution to become more closely associated with God, who is revealed in the harmony of all creatures and not in the trivialities of the actions of individuals.

[17] (Boorstin 667-675)

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Suppose science and religion could agree upon a scenario like this one. How fascinating! How wonderful!

God is behind all things, but all things conceal God.

-- Victor Hugo

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