Promoting the Science-Theology Dialogue

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Abstract

Those working in any academic discipline make extensive use of methods and findings found in other subjects. Interdisciplinary research is now the norm, not the exception. We find, therefore, scientists articulating their theories quantitatively by borrowing mathematical concepts and historians delving into works of literature to get a glimpse of what life was like in the past. Though interdisciplinary research has helped deepen knowledge and understanding, it can occasionally hamper theoretical inquiry if pursued blindly and uncritically. Despite the common mischaracterization of Christian theology as being an insular discipline unaffected by the theoretical breakthroughs brought by science and history, it too has benefited greatly by incorporating what other disciplines have managed to establish. Theology has, for instance, appealed to philosophical concepts and arguments to help buttress its faith in God, providence, and the afterlife. But theology's rapport with other subjects can occasionally become counterproductive, resulting in intellectual quagmires and dead-ends. This is particularly true of its relationship with science. Although science can in principle aid theological inquiry, the relationship between the two disciplines can go astray when theology proceeds in very particular ways. The purpose of this present study is to examine how theology shouldn't relate to science so that a more fruitful and collaborative relationship is possible.

Introduction

One of the defining features of contemporary academia is that academic disciplines don't exist in isolation, untouched by research conducted outside their boundaries. Most disciplines are open to, and willingly embrace, new insights and discoveries from other subjects that have a bearing on the

problems and issues that concern them. Historians commonly examine the latest archeological findings because unearthed potteries and jewelries can shed invaluable light on how people led their everyday lives. And medical science, to mention another example, is affected by advanced research in human physiology because a more thorough understanding of human anatomy can potentially lead to more effective cures. Disciplinary boundaries now are not closed but very open where researchers seek and welcome knowledge established in neighboring fields.

The theoretical growth of many disciplines would be extremely limited had they ignored the research outputs in other fields of inquiry. Educational research in recent years, for example, has gained further insights into students' academic performance by studying sociological works that document how poverty and dysfunctional families tend to corrode the willingness to learn. Thanks to the advancement of genetics, medical science is beginning to identify the particular genes that cause, among other things, neurological disorders and diabetes. By modifying the genetic code in advance, there might be a dramatic reduction in people suffering from Alzheimer's or Parkinson's disease. The painstaking work of geologists has helped unearth countless numbers of fossils which, in turn, have helped evolutionary biologists identify our direct hominid ancestors and the kind of life they led in the plains of Africa. Many sociologists are trying to understand the true nature of social behaviors like altruism and empathy in light of the evolutionary advantages they bring to individuals and social groups. The fruit of intellectual endeavors has relevance and meaning outside the context in which it is discovered. More and more researchers are therefore working collaboratively with experts with a different theoretical background or training to help complement what they know or reexamine the problems they face from a perspective offered by

an altogether different disciplinary matrix.

Interdisciplinary research does not always lead to the productive use of knowledge and understanding that spans disciplinary borders. The appropriation of knowledge established elsewhere can give rise to problems and stalemates. Many novelists like Zola and Maupassant at the turn of the 20th century, for example, sought to improve the quality of art by applying the insights of modern science to literature. Convinced that there was no room for humans to exercise free will in a Newtonian world governed by ironclad laws of force and motion, the characters they depicted were not unlike lifeless machines, passively molded by their environment and genetic makeup. Arguably, their portrayal of human nature lacked both sophistication and depth because it failed to give sufficient account of our ability to transcend fate and determine our own future. Another example that illustrates how research across disciplines can yield unsatisfactory results is the relationship between educational research and behaviorism in psychology. Seeking a pedagogy rooted in the reliable and objective findings of empirical science, many educational researchers appealed to behavioral science as a way of improving teaching practice. Following the decrees of this science, practicing teachers were exhorted to reinforce positive learning behavior with rewards and discard errors and mistakes from the learning process by way of punishments. But as later research demonstrated, rewards tend to severely undermine the learners' interest in learning as they program them to become more obsessed with earning praise and brownie points instead of instilling the thirst for acquiring new content and skills. Cross-disciplinary work in and of itself doesn't ensure fruitful applications and outputs.

Christian theology is often conceived as an isolated discipline that eschews and fails to benefit from serious intellectual engagements with

secular disciplines. Theology is caricatured as tenaciously safeguarding the infallible truths found in both scripture and tradition, and because the truths it upholds are immune from error, there is no need for theologians to search for error or correct doctrinal teaching through cross-disciplinary dialogues. Yet contrary to what many are inclined to think, theology not only engages in dialogues with other disciplines but also accrue many benefits from their joint explorations into truth and understanding. Biblical scholars who seek to learn more about what Jesus was actually like as a human being have gained much knowledge by consulting the works of historians. Such studies have shown that Jesus shared many of the apocalyptic beliefs that were prevalent during his time. He was not only utterly convinced of the imminent end of the world followed by the establishment of God's kingdom, but he also believed that some of his followers would in fact witness the reign of God during the course of their lives. The quest for the historical Jesus has in many ways shown how his beliefs and values were shaped by the socio-cultural environment he was reared in. The cultural conditioning of the beliefs, attitudes, and values Jesus embraced is to be expected, given that he was a man of flesh and blood who experienced pain and joy. As Nineham (1976) explains, "Unless we take an impossibly wooden view of his person…his thoughts and words will have been conditioned by the outlook and perspectives of the first-century Palestinian totality as much as those of his followers" (p. 190). Furthermore, those who engage in apologetics often utilize philosophical concepts and arguments to defend the truth of their faith. The concept of 'contingency' – the notion that everything we find in the world from chairs to buildings owes its existence to a being or source outside itself – is often invoked to show how the universe, in an analogous manner, is ontologically dependent on God who is not an item to be found in the universe. The theological dialogue with Marxism has also led many

to critically reexamine the history of the church. Ever since the emperor Constantine adopted Christianity as the official religion of the Roman Empire, the church has wielded enormous socio-political power and helped maintain the status quo that favors the rich and privileged. Marxist analysis has helped uncover ways in which the church has often stifled the poor and the oppressed by ignoring undemocratic, unjust political systems and by failing to attend seriously to their appallingly dire living conditions. Through its many dialogues with history, philosophy, and sociology, theology has enrichened and expanded its understanding of a wide array of theological matters.

Theology's cross-disciplinary engagement, however, has not always been fruitful and meaningful. Contrary to what the participants sought to achieve, the effect or impact of some of the intellectual conversations with other disciplines has at times been negative. Many theologians have succumbed to the lure of postmodern philosophy and its categorical denial of objective, universal truth. That is, many have unquestioningly accepted this credo so that the "very idea of absolute, objective and universal truth is considered implausible, held in open contempt or not even seriously considered" (Groothuis, 2000, p. 22). Because truth, according to this philosophy, amounts to nothing more than people's subjective preferences, tastes, and commitments, biblical truth, contrary to orthodox teaching, is often presented as simply one among many other possible ways of understanding about ourselves and the world and its veracity is not anchored to objective reality or how the world actually is independent of our whims and predilections. Theology in turn has sometimes exerted a negative effect on how and what people have thought about many issues. Before the rise of feminism, many philosophers accepted without question the inferior status of women on biblical grounds, believing that their

marginal existence was mandated and theologically legitimated by the will of God. And many gays and lesbians were socially ostracized because their sexual preference was thought to contradict what was permitted by scripture.

Theology's relationship with science has been extremely complex, defying simplistic, definitive categorizations. At times theology has willingly incorporated the latest fruit of scientific research and has endeavored to integrate it with biblical truth in a comprehensive, coherent manner. Aristotle's worldview which was based partly on empirical findings had a potent effect on theological thinking and many sought to reconcile the enduring truths found in his philosophical system with the revelatory truth contained in scripture and tradition. Theology in turn has had a positive impact on scientific inquiry. Many scientists have viewed their scientific investigations into the underlying causal mechanisms of planetary orbits and radioactive decay as a religious quest inspired and motivated by their zest to learn more about God's creation. For scientists with faith, the world created by God reflects, however dimly and implicitly, his nature and rationality. The secrets nature reveals to scientific investigations are signposts that testify to the glory and majesty of a transcendent God. Many historians, furthermore, argue that modern science was born and bloomed in Western Christendom because the doctrine of creation affirmed by the Christian faith is more hospitable to science. Many nonwestern philosophies and cultures regarded the scientific study of nature as sacrilegious because they idolized nature as divine and holy. Any scientific tinkering with a realm infused with the divine was discouraged. The veneration of nature, from a Christian perspective, is tantamount to idolatry, worshipping God's creation as God or conceiving the finite as infinite. The Christian faith, therefore, lends support to and is conducive to the scientific study of the

book of nature since God's handiwork isn't construed as divine and off-limits to science. As Straine (2014) explains, "Although the world is part of God's pleasing work, it is not itself divine, and so humans are allowed to handle it" (p. 73). Regrettably, the interrelationship between science and theology has also been marked by conflicts and acrimonious disputes. There were occasions when theology dismissed or ignored scientific findings as being erroneous simply because they didn't square with religious dogma. Clinging desperately to outdated scientific cosmologies and critiquing theories buttressed by sound arguments and solid evidence, theology has at times stagnated intellectually and kept science at arm's length. Dialogue between the two disciplines has also been minimal, failing to edify the participants in any meaningful way, when scientists excoriated and ridiculed theology without a thorough understanding of its rich history and tradition. The criticisms often missed the mark and failed to elicit constructive, mutual exchanges because their smattering of theological knowledge displayed their ignorance more than the depth of their observations and admonitions. Both disciplines bear some responsibility for the intellectual impasses.

In order to further promote the science-theology dialogue, both scientists and theologians must become more aware of when and under what conditions the relationship can go awry and learn from the mistakes that have been made. Otherwise the exchange will become more and more sterile and shallow, whereby no one extends his or har intellectual horizon and understanding. Instead of resorting to and relying on overly simplistic and crude caricatures of the Christian faith picked up at Sunday school, scientists interested in partaking in the dialogue must become more well-informed about theological matters by immersing themselves in theology's rich and long intellectual heritage. A shallow, uninspiring, and fruitless conversation can only take place if those who come to the table for

discussion have only a jaundiced and limited understanding of the subject. Scientists must also be willing to listen and learn from what theologians have to say about matters of collateral concern. Theologians have a well-grounded knowledge of many issues that can be applied to help solve and clarify problems. Scripture contains penetrating insights into human nature – our frailty, strength, and potentiality – that many investigating the human psyche can find both relevant and profound. Scientists' willingness to expand their understanding will be severely limited if they dogmatically assume that their field of discipline alone can offer legitimate answers to theoretical questions. Effective and lasting dialogue will be virtually impossible if scientists don't recognize the limits of scientific inquiry, that their method of inquiry cannot resolve every meaningful question.

To ensure the quality of the cross-disciplinary exploration with science, theology too must strive to meet the conditions for meaningful engagement. There are roughly two kinds of conditions that must be met. The first stipulates what theologians must be willing to undertake. Not unlike their counterparts in science, they must keep abreast of the latest advances in scientific knowledge. This requirement is crucial given that research in science often revises and modifies what has been previously taken for granted. Though progress in science is partly cumulative where new theories incorporate the achievements of the past, there is no denying that cutting-edge research can refute what was thought to be true beyond doubt. As Barbour (1974) writes, "In science, all theoretical formulations are tentative and subject to revision…No theory today is immune to modification or replacement" (p. 98). Discussions won't move forward in a constructive manner if their understanding of science is dated and obsolete. Moreover, theologians must at all times articulate their thoughts and ideas in a comprehensible manner. Theological discussion about the trinity, the

atonement, and the resurrection can appear arcane and abstract to those who aren't steeped in the theological literature. But theological biases and partialities cannot be corrected unless their partners in the dialogue can understand what theologians propound. This effort towards clarity doesn't imply that theologians should dumb down the teachings of the church. Rather what seems abstract and complex must be rendered clear by plenty of examples, analogies, and illuminating metaphors. Meaningful critique of any theoretical position presupposes a deep and accurate understanding of what the critic attempts to analyze. Theologians must also be willing to be critiqued by scientists so that flaws in reasoning and dubious contentions can be corrected. Convinced that what faith affirms is true, some don't sense the need to subject theological dogma to criticism. Others are unwilling because they fear that the truths they are committed to might turn out to be false. Theological doctrines and modes of reasoning, however, are not immune from error. Theological assertions and arguments reflect the biases and prejudices that characterize any human undertaking. In so far as theology is pursued by people situated in a very particular socio-historical setting, any exploration of God cannot transcend the ways in which this context impacts what theologians state and how they support what they claim. Their flaws and errors can be identified by paying careful attention to sympathetic critics who seek the truth. Growth in understanding is often achieved by listening to our severest critics. As Pattison (1998) remarks, "Dialogue is only ever dialogue if it is between partners who are genuinely different and irreducible" (p. 113).

The second precondition for advancing the rapport between scientists and theologians is what theology and science shouldn't do or the pitfalls both disciplines should avoid when dialoging. Scientists, for example, mustn't pontificate on theological matters unless they are well acquainted with the

subject. Otherwise what they assert and opine will be intellectually vacuous. Scientists must remain silent and confess their ignorance when they confront areas they are unfamiliar with. Unfortunately, there are scientists with very little theological understanding who engage in a rebarbative critique of religion. Another error that scientists shouldn't commit is to regard the scientific mode of reasoning as the sole arbiter of truth and dismiss claims that are not supported by empirical tests as meaningless. Many are condescending towards and utterly dismissive of theological assertions that are not susceptible to empirical corroboration. Scientists need to adopt a more expansive and broader conception of rationality where the method of rigorous empirical testing is one among many other possible ways of unraveling the mysteries found in the world. How about theology? What have been some of the more common mistakes committed by theologians hampering the process of effective communication with scientists? The purpose of this paper is to answer this question to help remove some of the obstacles that hinder the dialogue between scientists and theologians.

• Critiquing Science

Theology rightly engages in a critical analysis of issues that are within its ambit of concern. Moral problems that beset society are a serious and fundamental concern for theology because it has inherited and seeks to promulgate a very particular moral and spiritual outlook based on the teachings of Christ. Theology views the ethical precepts decreed by Christ to be binding for all ages and people and they constitute a moral compass or yardstick that helps prescribe what course of action we should take. In light of these moral imperatives, theology has questioned the underlying

philosophy of unbridled capitalism for equating human happiness with the possession of material wealth and for its tendency to belittle the plight of low-income workers who are often treated as expendable slaves. Theology has also voiced its concern over the increase in the rate of abortion in many countries where women can go to a clinic and terminate the life of a growing fetus without his or her consent if giving birth doesn't accord with their future plans. The educational establishment has also been faulted for creating a competitive ethos in which students seek to outperform their peers by earning better grades. Preoccupied with academic performance, students' interest in learning atrophies as they progress through schooling.

Besides commenting and taking sides on various moral issues, theology has entered into debates that touch on epistemological concerns. One of the many philosophical doctrines that pervades much of contemporary culture is relativism or the belief that there are no objective, universal truths that transcend socio-cultural conventions and personal preferences. Many contend that alleged moral and religious truths – the immorality of slavery, the existence of God, the belief in an afterlife, etc. – are akin to people's taste in music and fashion. They simply register and express a subjective preference for a particular way of life and their viability doesn't hinge on the way things objectively are. Because the saving truth of the gospel is not restricted to a particular historical epoch or group of people, theology has countered various types of relativism, pointing out repeatedly how truth cannot be reduced to our idiosyncratic and private values and tastes. There are, in other words, core values and beliefs – infanticide is wrong, cannibalism is ethically impermissible, love and care for the destitute and poor is morally praiseworthy – that are both binding and true regardless of whether they correspond to our outlook on life. Another prevailing orthodoxy that imbues present secular society is the belief that

the growth of knowledge brought by science and the concomitant decline in superstition and bigotry will help cure the problems we are grappling with today. As one advocate of this philosophy writes, science can be used "to liberate people from custom and tradition, to order social life on the basis of true knowledge rather than superstition" (Edis, 2008, p. 20). The application of scientific knowledge has helped cure diseases, ease transportation, and better our means of communication. Those who champion the core values of the Enlightenment are convinced that problems afflicting people today will be drastically reduced, if not eliminated, as we learn to apply our newly discovered knowledge to more and more areas. Many theologians have questioned this overly optimistic credo. As they never hesitate to remind us, we are self-centered beings who prioritize our personal happiness against that of our neighbors and we strive to better our conditions even if our actions inflict harm and suffering on others. We rarely serve the good of others in selfless love and compassion. Our entire being is tainted by the potent power of sin and greed. As Cottingham (2015) describes the human condition, "We are a deeply flawed species, always ready to talk ourselves out of pursuing the good that is staring us in the face, and to turn away towards the specious but alluring prizes of quick gratification, power, control and self-aggrandizement" (p. 121). This being the case, the knowledge we gain through science can serve destructive and diabolical ends that are not conducive to our well-being. In fact, science has been used to produce weapons of mass destruction and in the field of eugenics, knowledge of our genetic makeup has been used to promote morally outrageous ends such as forcing sterilization on those with genetic defects or requiring those with commendable traits to have children to satisfy the state's twisted racist philosophy. Because the central core of our being is distorted, knowledge can be misused to satisfy distorted ends. Knowledge

alone, however valuable, cannot eradicate the various forms of evil that pervade society.

Theology has also scrutinized science on both moral and epistemological grounds. Science is not a morally neutral enterprise. Scientific research conducted in laboratories may seem far removed from a world riddled with thorny ethical dilemmas but science raises a host of moral questions which it cannot scientifically solve. This is in part because moral conundrums, being non-empirical in nature, cannot be analyzed by the empirical method of science. "Science describes what is but cannot tell us how we ought to act" (Clayton, 2012, p.4). Science can empirically ascertain how many women practiced abortion last year but it cannot conduct laboratory tests to determine whether abortion is morally right or wrong. Theology has concerned itself with moral problems because morality lies within its province. It has, for instance, questioned the ethicality of particular scientific research programs. Some contend that it is morally contentious to spend vast sums of the tax payers' money on experiments in nuclear physics that may help answer the question about the origin of the cosmos when precious resources can be allocated to improve health care or public education. Animal experimentation has also been criticized for subjecting innocent animals to gratuitous pain and suffering so that the shelves in supermarkets can be lined up with products and commodities safe and ready for our use. That is, animals are treated as disposable means to help promote our comfort and health. Besides the kinds of research undertaken by scientists, theology has examined the fruit of scientific research from a moral perspective. We are living in a technocratic society where our lives are becoming more and more dependent on technology to help ease and enrich our lives. Scientific knowledge is used to help create more advanced technologies. But all of this energy and effort spent on manufacturing

more efficient cars, building taller skyscrapers, and inventing cheaper laptop computers is exerting irreparable and catastrophic harm upon our environment. As theologians argue, instead of exercising responsible stewardship over nature by attending carefully to God's creation as his chosen representatives on earth, our insatiable greed to acquire more high-tech items through science is wreaking havoc on nature. Many animals are made extinct because of the destruction of their habitat and harmful toxic waste is dumped into the sea and released into the air, causing irreparable damage to our precious environment.

Theology has also critically explored the epistemological foundations of science. Some atheist scientists vociferously extol science as the paragon of rationality, the sole source of discovering objective truths about the world while characterizing theology as dogmatic, insular, and stagnant, thereby drawing a sharp and unbridgeable gap between the two. Some chide theology for failing to meet the rigors of scientific thinking where beliefs, in order to be accepted, must be supported by empirical evidence. According to critics, because the doctrines theology typically promulgate – the virgin birth, the resurrection of Christ, the atonement of sins, etc. – lack empirical corroboration, they can be dismissed as so much intellectual garbage. In response, theologians informed of the epistemic underpinnings of science have argued that theological inquiry, unlike what atheistically inclined scientists argue, resembles the scientific approach to phenomena in many ways. Both science and theology make extensive use of models and analogies to make sense of what cannot be observed in light of what can be empirically perceived. Thus, theologians have used concepts like 'father,' 'light,' and 'rock' to elucidate however indirectly the nature of God and scientists have shed valuable light on the ways in which electrons orbit the nucleus by comparing their paths to how planets orbit the sun. In addition,

theologians have highlighted the similarities between theology and science by demonstrating how both disciplines use abductive reasoning where the truth of a theory or hypothesis is inferred from its ability to explain a given set of data. Though seemingly counterintuitive, light is construed as both wave and particle because this understanding best explains the dual properties light manifests under different experimental conditions. In a similar vein, Christ is thought to be fully human and divine because the doctrine of incarnation best explains the salvific and transformative power he exerts over his followers alongside the suffering and pain he had to endure during his ministry. By demonstrating how theology resembles scientific inquiry, theologians have corrected the erroneous caricatures and misconceptions that sometimes atheist scientists endorse.

The theological examination of the moral reverberations and philosophical presuppositions of science is an invaluable endeavor for it unveils the complex ethical problems science raises and corrects many overly simplistic philosophical characterizations scientists make about theology. Yet the theological critique of science sometimes extends beyond what it can competently address. It occasionally critiques the content of science, not on scientific or philosophical grounds but on religious grounds. That is, theology questions the truth of a scientific theory or hypothesis because it fails to correspond to theological dogma. Theology can certainly question the content of science by showing either scientifically or philosophically how a theory isn't supported by enough evidence or how it assumes theoretically dubious assumptions or how it contains a flaw in reasoning or how it contradicts a different well-corroborated theory. Criticizing a scientific theory, however, by invoking scripture or doctrinal teachings is an ineffective mode of criticism that doesn't undermine what it finds questionable. Scripture is not a textbook on advanced physics or biology,

filled with scientific insights into how galaxies form and how species evolve. Scripture consists of a series of texts written by people who were unacquainted with the discoveries of modern science. The biblical worldview supposes a prescientific cosmology where a relatively small universe with the earth at its center was created four to five thousand years ago. Passing references to nature and space we find in scripture are rooted in outdated science. The sheer magnitude of the ever-expanding universe and its fourteen billion years of history after the Big Bang were simply not part of the common lore shared by people living during the time scripture was written and collated. The world portrayed in the bible is filled with evil spirits and angels that tempt us to do wrong or aid us to do good and earthquakes and eclipses are construed as harbingers of unpleasant events that will unfold in the future. The eternal flames of hell were thought to lie underneath our flat earth and heaven, a sacred and spiritual abode for those who practiced virtue and avoided evildoing, was believed to exist beyond the starry heavens. This mythological worldview is not consistent with what modern science has uncovered about the universe. Furthermore, trying to disprove a scientific theory by referring to passages in the bible is analogous to discrediting the viability of an educational theory by appealing to the works of Shakespeare. Rigorous experiments, not scripture, help unveil the mysteries nature has in store. If one wants to learn about stars and galaxies, the Hubble telescope will be more revealing than the Book of Revelation. If wanting to obtain reliable knowledge about atoms and protons, one must refer to the periodic table, not the Book of Isiah. The best way to learn about the life cycle of a tulip is to go out into the fields and make careful observations, not by consulting the Nicene Creed or the works by Aquinas. Besides misconstruing the genre of scripture, another problem with this type of criticism is that it has failed to achieve its aim of

questioning scientific theories in the past. Historically theologians appealed to scripture to refute the findings of science but subsequent developments in science showed that their arguments were off the mark. The heliocentric model of the solar system first propounded by Copernicus was criticized for being unbiblical. Because humans were thought to be the apex of God's creation, we had to inhabit earth situated at the very center of the solar system. Or as Fleming (2016) writes, it was assumed that "earth was the center of the created order because mankind was God's crowning glory" (p. 128). Dethroned and dislocated from the center, our existence on one among many planets orbiting the sun seemed to undermine our status as beings shaped and created in God's very own image. There are also biblical passages in the Old Testament where prophets ordered the sun to remain still for a period of time, thereby implying that the sun orbited around earth. But subsequent scientific research has demonstrated the truth of Copernicus's model of the solar system. Furthermore, the theory of evolution was also criticized for not squaring with the first book of the Old Testament because a literal reading of Genesis seemed to suggest that species are not only immutable but they also don't originate from a common biological source millions of years ago. But contrary to scripture, fossil records and DNA studies have shown beyond reasonable doubt that currently exiting species all trace their origin to a common biological ancestor and they have all undergone gradual physiological change spanning billions of years while competing with other creatures to secure scarce resources. Theology must learn from these past encounters with science so that similar errors won't be committed in the future. Theology mustn't appeal to scripture to refute the claims of science. Scripture is imbued with rich and enduring spiritual truths, not incontestable scientific theories. It is an invaluable source for spiritual guidance, not for learning

science. As Galileo reminded his contemporaries, scripture teaches us how to go to heaven, not how the heaven goes. Theology can question the truth of scientific claims on empirical or philosophical grounds but it cannot use the premodern science found in scripture to cast doubt on what science affirms as true.

・Idolizing Science

Science is revered in most developed countries and this is partly due to its staggering and impressive history of success. Previously incurable diseases and illnesses can now be treated effectively at hospitals and clinics because of the progress made in medical science. Our hominid ancestors hunted with crude sticks and stones but now satellites orbit the earth and rockets visit distant planets due to advances made in astrophysics. From eclipses and comets to earthquakes and tides, phenomena that baffled the minds of the greatest philosophers and sages are now being understood by science and what mystifies us now will be explicated by scientific research in the future. Furthermore, the technologies made possible by science have greatly eased our everyday lives. Time-consuming and physically taxing work is becoming rarer and rarer as it is now being managed and handled by machines and robots.

Having replaced God and the state as the object of veneration, science is the new sacred cow that is worshipped by many. This almost unconditional faith in the power of science is evident in many areas. If we are sick, we see a trained doctor, not a witchdoctor. If we suffer from depression or schizophrenia, we visit a psychologist, not a priest. If we yearn for meaning and value in life, we consult a self-help book, not the bible. Instead of approaching a fortune teller, we rely on satellite

images sent from space if we want to know what the weather will be like tomorrow. For the most part we don't invoke God or metaphysical entities when we encounter puzzling phenomena but seek scientific explanations to deepen our understanding instead. Floods are not brought by God as a fitting punishment for human sin but occur because of natural causes. And we place our faith and trust in science, not political leaders or God, believing that it alone can help deliver us from famines and draughts and floods. And societies and communities untouched by science are regarded as primitive, premodern, and downtrodden, in desperate need of enlightenment.

This deference to science is apparent in the world of academia. More and more disciplines are aping the methods of science in order to yield objective, reliable knowledge. Unlike the past when psychology was dependent on crude introspection and much speculation, psychologists now conduct rigorous, controlled experiments to learn about how the mind works. In the field of education, pedagogy was more or less founded upon speculative theories that lacked empirical support. To help build pedagogy on firm empirical foundations, researchers can be seen inside classroom doors making meticulous observations and drawing valuable inferences from the data they collect. Philosophy's infatuation with science is also apparent. Many philosophers working in the area of metaphysics unquestioningly accept a materialist view of the mind and the world because science, they believe, hasn't established the existence of a nonmaterial realm alongside the world of space and atoms. Philosophical speculation accepts as a given the findings of science and metaphysical musings and reflections that don't comport with the worldview of science are treated with skepticism. In addition, the nonscientific disciplines like art, music, and literature lead a marginalized existence in many places of learning because they don't make predictions, test their claims empirically, and manifest cumulative growth

by incorporating the truths and insights of previous works of art. This overall trend of emulating the scientific method and paying homage to the knowledge it helps engender will not recede but grow in the ivory tower.

Theologians who collaborate with scientists must respect the scientific enterprise for expanding beyond imagination our knowledge of the starry heavens above and the drives and aspirations that are within us. Theologians are forever in their debt for demystifying the world that was once haunted by demons and spirits and replacing blind ignorance with wisdom and truth. Having said that, theology mustn't kowtow to the altar of science and absolutize it as an omnipotent idol. The idolizing of science can take four different forms and they will be explored below.

"The manifest success of the sciences has tended to distort our grasp of the variety of ways in which we apprehend truth" (Louth, 1983, p. 43). As a result, the method of science can be and often is regarded as the sole source of objective knowledge, thereby questioning other avenues to truth that don't depend on the process of subjecting hypotheses to empirical tests. Given this criterion, putative truth-claims that are not in principle susceptible to empirical corroboration are either meaningless or unscientific, subjective claims that don't deserve serious attention. Metaphysics as a discipline becomes deeply suspect because arguments for and against the infinite and the absolute cannot be subject to empirical investigation. Aesthetics will suffer the same fate since the beauty and sublimity of paintings and sculptures cannot be determined by experiments in the laboratory. Alongside metaphysics and aesthetics, theological knowledge will inevitably fall into disrepute because the central articles of the Christian faith cannot be ascertained empirically because they are believed to have been revealed by God. Divine revelation is an indispensable means of learning about God's nature and will. The content of revelation cannot

be derived from studying history or nature but must be disclosed by God himself. The truth of what God decides to unveil is beyond the scope of science. That Christ died on the cross is part of history but that he died to expiate our sins is revelatory truth. That Christ was fully human can be easily inferred from the New Testament but his divinity cannot be attested empirically. Death is one of the indubitable facts of life but the sharing of eternal life with God after death cannot be verified by science. To make theology scientifically respectable and credible, some theologians have actually embraced science as the sole means of attaining knowledge and have questioned revelation as a legitimate source for learning about God. True to their empiricist epistemology, they have dismissed doctrinal teachings that are not subject to empirical corroboration. If, however, the creed is restricted to what can be affirmed by the canons of scientific reasoning, the richness and depth of the Christian faith will be greatly impoverished. It will amount to nothing more than a watered down veneration of a dead, charismatic prophet who preached a number of moral maxims that may still be relevant today. Unless they want to impair the fundamentals of faith, theologians must endorse revelation as an invaluable road to truth and pronounce science's monopoly of knowledge as partisan and too exclusive of other nonscientific forms of knowledge. It is also questionable whether any theology that denies revelation can be called Christian. The tenets that characterize the Christian faith – God as a personal being who created the world, the divinity of Christ who committed no sin, the existence of the Holy Spirit that guides the church, etc. – were revealed from God and their truth was not established by human reason alone. A theology that jettisons revelation must thereby question the truth behind what God imparted. But because the content revealed by God forms the foundation and pillar of what Christians affirm, it is doubtful whether

theologies that discard the central creeds are being true to faith. Any theology that idolizes science and discards revelation as an avenue to truth will not markedly differ from various types of humanistic philosophies that question what cannot be discovered by human reason alone. In a thoroughly secularized form of Christianity that does not make any reference to a transcendent reality, we become the measure of everything, defining and creating what is good, beautiful, meaningful, and true. This is contrary to orthodox teaching which assumes that moral virtue, epistemic truth, and the meaning of history are all determined by God. If theology doesn't want to depart radically from its roots, it mustn't worship science as ultimate. As Polkinghorne (2007) writes, "We are to take what science tells us with great seriousness, but we are not to assign it an absolute superiority over other forms of knowledge so that they are neglected, relegated to the status of mere opinion" (p. 31).

Secondly, science can be idolized if it becomes the sole arbiter of what can and cannot exist. Existence, according to this view, is limited and restricted to what is within the province of science to determine empirically. Particles and entities and beings that cannot in principle be verified by science simply don't exist. Witches and fairies and goblins don't have ontological status because their existence cannot be verified by science. It is hard to deny that if science becomes the criterion for adjudicating whether something exists or not, God's existence becomes extremely questionable to say the least. This is because God is not an item that can be found in the universe alongside quarks, electrons, and galaxies. God's presence cannot be verified by a Geiger counter or an electron microscope. He is by definition a transcendent being who exists beyond space and time. Being the creator of the universe, he doesn't ontologically exist in what he creates. If science becomes the benchmark of what exists, God becomes nothing more than

a figment of our imagination, since his existence cannot be confirmed empirically. Because God is the fundamental and central tenet of faith, it is hard to imagine how people can continue their lives as orthodox Christians if science is accepted as the Archimedean point of reference that decides what exists. To be sure, God can be reinterpreted in ways that deny his transcendence. He can be construed as an ethical ideal that inspires self-less commitment or as the entire universe itself or as a powerful yet finite force that guides the process of evolution and history. When the meaning of God is revised along any of these ways, it is salutary to remember that it departs significantly from what the Christian tradition has always meant by God. He invariably becomes another finite human construct that is made in our image so that he can fit into our science-based ontology.

Thirdly, scientific theories or findings can be idolized when theology accepts them as indubitable truths, impervious to error or correction. Scientific theories are not incorrigible matters of fact but are open to falsification and revision. As the history of science reveals, theories once thought to be immune from doubt have been refuted or modified in light of new evidence. Aristotle's physics that dominated our understanding for centuries presupposed the eternity of the universe although this contention was subsequently discredited by modern cosmology when it was found that receding galaxies have their origin in a primordial source of incredible mass and density. And Newtonian physics, which was the accepted paradigm for doing scientific research for many years, ran into serious difficulties when its principles were applied to objects approaching the speed of light and to the subatomic world of protons and neutrons. Despite the fallible nature of science, theology has at times built its theological edifice by incorporating the findings of science and became very defensive when countervailing evidence and arguments that questioned their viability

were found. Galileo, for example, made two important discoveries with his telescope that undermined the scientific worldview the church embraced as infallible. His observations showed that Jupiter had moons and the sun had sunspots. Both discoveries were not welcomed by the church. Because the church accepted the geocentric model of the solar system and much of Aristotle's physics, any data suggesting celestial objects not orbiting the earth was dismissed and the existence of sunspots was denied because it didn't accord with one of the fundamental tenets of Aristotle's metaphysical system, namely that the celestial realm beyond the moon had to be free of imperfections. Instead of abandoning false science and embracing the truth revealed by science, the church dogmatically adhered to an outdated and erroneous theory it had mistakenly absolutized as flawless, thereby creating and promulgating the unfortunate impression of being closed to new discoveries. This problem would not have arisen had the church truly understood the fallible nature of science. Christian theology must not unconditionally commit itself to the truth of any given theory in science. Because of their fallible nature, theology must always accept the theories of science with a pinch of salt.

Science can also be idolatrized when it is thought to be capable of transforming our self-centered existence into a life devoted to the good and well-being of our neighbors. Because science has eased and facilitated our lives in so many ways, it becomes tempting to assume that it has the power to rectify the inner flaws and contradictions that characterize our whole existence. If science has prolonged our life expectancy, split the atom, and sent people to the moon, shouldn't it be capable of making us more loving and caring, enabling us to lead a life that is in concert with God's will? Some within the theological community have faith in psychology, believing that our dark and corrupt nature can be corrected by counselling and psychotherapy.

But the very attempt to improve our nature by self-directed effort by means of psychology is the root of the problem. According to biblical faith, no matter how hard we try, we cannot save ourselves from our plight. Unless we allow the power and grace of God to enter our lives and radically transform our being, we will forever be driven by greed, lust, and hate. Psychology may assist in our path to self-recovery or may help us overcome past traumas but all the sessions with a psychiatrist won't help erase the fundamental flaw of human nature, namely the sin of pride and the sin of self-aggrandizement. We can only free ourselves from the shackles that lock us into our ego-centered world if we realize that we are not self-sufficient, autonomous creatures who can live and direct our lives without God. The road to curing the state of our soul starts when we realize that anything all too human – our science, our technology, our effort – cannot deliver us from the human condition.

・Doing Science

Ever since the dawn of human consciousness, we have always been interested in learning about the natural causes that give rise to a wide spectrum of phenomena ranging from the trajectories of stars and the hibernation of animals to earthquakes and eclipses. And science has been one of the most reliable tools for investigating the natural world. There are many reasons that account for the tremendous success of science in unlocking many of nature's secrets. First and foremost, science would not have evolved to its present state unless our forebears were intellectually aroused by what they couldn't understand. If their ignorance didn't spur them to delve further into studying the empirical world, our understanding of its underlying mechanisms would be very rudimentary. As Bancewicz

(2015) writes, “In the real world of science, a certain kind of ignorance drives forward the process of investigation” (p. 30). Scientists’ deep yearning for truth and knowledge drove many to explore unknown territories in cosmology and biology and sustained their interest and curiosity amidst constant failures and difficulties. The scientific mode of investigating nature has contributed to its enormously successful quest for understanding the universe. Instead of resorting to philosophical speculation, intuition, or a priori reasoning, hypotheses susceptible to empirical tests are proposed to give an account of or make sense of a particular phenomenon. If they withstand the tests, they are tentatively accepted by the community of scientists until their inherent errors and faults are revealed through further experimentation. The scientific mode of inquiry is built upon a robust tradition of critically exposing conjectures to rigorous testing to further understanding. In more recent years technological inventions have greatly aided the rise of science. The telescope has to this very day advanced our understanding of the birth and death of galaxies and stars and the electron microscope has been instrumental in unraveling the structure of atoms and molecules. There are severe limits to what can be learned about the world with our naked eyes and the far reaches of space would have remained unexplored without satellites and telescopes. The spectacular growth of science is also due to the fact that the world is governed by regular, repetitive patterns that can be discerned by human observations and experiments. Had the world been haphazard and devoid of regularities, science would not have been possible. Causal laws and principles cannot be derived from a close study of the empirical world if objects suddenly for no rhyme or reason defy the law of gravity or if planets suddenly deviate from their regular trajectories or if material objects unexpectedly disintegrate or disappear. And because we believe the world to manifest order and

rationality, we believe the regularities underlying empirical phenomena can be understood scientifically. As Torrance (1980) rightly argues, "It is precisely because we hold unshakably that there is order in the universe that we refuse to believe that there is ultimately anything irrational" (p. 132). In addition, one cannot discount the contribution of mathematics in the development of modern science. Scientific theories can be expressed quantitatively using the language of mathematics. Because the language of mathematics is clear, scientific theories can make very precise predictions which can help corroborate or question their truth.

Science has been successful in two ways. First, it has given us a wealth of reliable information about the world that has withstood the test of time. The troves of scientific knowledge that fill countless volumes are the result of many years of painstaking observations, calculations, and theorizing. Scientific knowledge is characterized by its objectivity, for its truth is anchored to reality and unlike fads and fashions, it doesn't undergo radical change. Careful, meticulous observations of the heavens have established the exact orbits of planets and moons, enabling precise estimates of their future locations. Data gathered from forests and deserts has advanced our understanding of animals and plants and our habitat. Psychological studies have uncovered many interesting facts about ourselves. We are gaining a clearer picture of what fosters and stifles human motivation and what aids the mind to retain new information. Though there are many areas we are ignorant of, what we currently know is a vast improvement in the scientific knowledge shared by our distant forebears.

Besides amassing factual knowledge, science has throughout the years proposed many explanatory theories that have provided coherent and reliable accounts of why things are the way they are. By identifying the causal mechanisms that underlie and give rise to particular phenomena,

these theories have shed invaluable light on what was previously veiled in mystery. Explanatory theories are akin to a torchlight we use when we find ourselves in a dark room for they illuminate what was obscure and complex. In the past, people viewed earthquakes as the manifestation of divine wrath and sacrifices were made and prayers were offered to appease the demigods. In light of plate tectonics we now understand that they occur when plates found underground rub against each other. Before the advent of medical science, the causes of illnesses were largely unknown, inviting all types of bizarre, unsound speculations. The germ theory of disease put an end to such wild conjectures by identifying microorganisms as the cause behind many of our physical ailments. In the field of psychology, the theory of unconsciousness has uncovered how are conscious lives are deeply affected by suppressed drives, thoughts, and experiences hidden and trapped in the subconscious world. In physics, quantum theory has replaced the crude atomism of Greek philosophy, explaining the subtle and counterintuitive behavior and nature of subatomic particles and the theory of relativity has in an analogous manner illuminated the nature of space and time by showing how time is observed differently depending on one's point of reference and how massive objects cause space to curve and bend. Although further experiments and theorizing will in the future revise and correct the scientific theories that are accepted today, there is no denying that they have helped us better understand about the world and ourselves.

Throughout its long and impressive history of building knowledge, science has continuously encountered problems and anomalies that have been resistant to clear solutions. The problems faced by science have taken multifarious forms. Sometimes scientists gathered data or facts that didn't square with an accepted theory such as when the orbits of planets, contrary to what the heliocentric model of the solar system assumed, didn't follow

a circular path. Furthermore, to help protect a theory from countervailing evidence, parts of it would be modified in countless ways, thereby turning a simple and elegant theory into something that is complex. The geocentric model of the solar system suffered this fate and lost its initial appeal as more and more epicycles had to be introduced to help explain the behavior of the planets. Another recurring problem scientists had to face was when there was only a paucity of evidence to support the theory they were committed to. Before the receding of galaxies was empirically confirmed by the Hubble telescope, the Big Bang theory, though theoretically plausible, lacked empirical support for many years.

It goes without saying that problems within the province of science must, if they are to be solved, be approached scientifically by, say, collecting more data or restating the hypothesis in a more cogent and clearer manner or revising parts of the theory that don't accord with the given facts or conducting a different kind of experiment. Scientific problems should be subject to scientific studies and analyses and nonscientific approaches, if they are attempted, will for the most part not yield satisfactory results. But theology has in the past entered the domain of science, attempting to provide theological answers to what were strictly scientific anomalies. To be specific, whenever there were problems that science couldn't fully explicate, theology would fill that hole or gap in scientific understanding with God, convinced that this would resolve the mystery once and for all. God, in other words, was invoked to provide what theology thought to be a viable and satisfactory answer to unanswered scientific questions. For example, before Darwin proposed his theory of evolution, scientists didn't fully understand why species were so well-adapted to their habitat. Giraffes had long necks that enabled them to reach for leaves growing in high places and many birds were equipped with strong beaks that allowed them

to crack open nuts. In response to this problem, many theologians wedged God into the gaps and argued that only an omniscient and omnipotent God can create such a marvelous and rich handiwork that displays such adaptability and sophistication. Just as the structural complexity of a watch bears witness to a conscious intelligence that brought it into being, the anatomical and physiological intricacy of sentient organisms can only have been created by a being of supreme intelligence, not by blind forces of chance. Instead of appealing to natural causes that could be discerned empirically, a non-natural, transcendent agent was inserted into the causal nexus to give an account of biological phenomena. Contemporary theology too invokes God to explain what science doesn't understand. In the world of cosmology, for example, scientists now know that the universe came into being approximately 14 billion years ago when an infinitely dense ball of mass and energy exploded giving rise to billions of galaxies each containing billions of stars. Though scientists have established the forces and particles that came into being right after the explosion, they still don't know what actually triggered the cosmic burst of matter and energy. What ultimately started the universe remains a mystery and though scientists can speculate about the ultimate origins of space and time, there is very little evidence to confirm what they say. Many theologians resort to God as the causal agent responsible for igniting the primordial ball, bringing forth everything there is in the universe. The answer to a mindboggling scientific mystery that defies present science is thought to lie in the hands of a transcendent creator that exists outside the space-time matrix. Another gap in scientific understanding concerns the origin of life on earth. Before the arrival of unicellular organisms, the world consisted of lifeless matter and different types of gasses. Scientists still do not fully understand how inanimate matter gave rise to sentient beings capable of reproducing and responding

to their environment. In response, some theologians argue that God intervened into the causal network and conferred life to matter, starting the very process of evolution. Again, God is invoked to help solve a question that should be solved empirically by practicing scientists.

When dialoguing with scientists, theologians mustn't invoke God to answer unsolved scientific problems. Though there have always been countless unanswered problems that have kept researchers awake at night in the lab, science has made dramatic progress over the years answering many challenging questions by identifying natural causes and corroborating theories with empirical data. Given the progress of science made possible by careful experiments and rigorous theorizing, it is entirely reasonable to assume that the problems scientists face today will eventually be solved in the future. Scientists still don't understand how neurons give rise to human consciousness. Nor do they know for sure whether evolution follows a slow, incremental process or whether it is punctuated with sudden, dramatic changes in species. It seems highly unlikely, however, that science will come up against a brick wall in which problems remain endlessly insoluble regardless of the tireless effort and time scientists expend in solving them. Invoking God to solve problems that science cannot answer is a counterproductive theological approach to science because given more time they will eventually be solved, squeezing God out of the picture and making him irrelevant. Science will discover intellectually sound and satisfying answers which invoke no divine being, discrediting God as an unnecessary, redundant hypothesis that has no bearing on science. Or as Jeeves and Berry (1998) write, "God is left with a steadily dwindling territory, shrinking with every new scientific discovery" (p. 79). As God gets pushed out of the scientific domain in this way, he will come to resemble other outdated entities like the ether and the celestial spheres that were once posited

to explain natural phenomena. Theology will only further sideline God in our secular society if he is made redundant in the realm of science. An additional problem is that when God is used to explain what is scientifically inexplicable, he is treated as an empirical item or being that can be found in the universe. If God is inserted into a gap existing in the causal network, he becomes another finite and identifiable being indistinguishable from atoms and quasars and electromagnetic radiation that are ultimately confined and bound by space and time. But God is not a being among many other beings that can be detected with an advanced telescope. God is, by definition, the transcendent creator of the universe who exists outside the world he is creating. As Macquarrie (1984) writes, "To turn God into an object or to develop a natural theology which treated him as an object would be the most thorough perversion imaginable of the knowledge of God" (p. 186). The divine artist who molded the world to express his being cannot be located on his canvass. Inserting God into gaps and holes is also theologically suspect because it implies that God is actively present in the universe only when scientists appeal to God to help address problems that they cannot adequately handle. God remains on the margins and is not in any way involved in sustaining the universe in so far as science can continue explicating the problems they face. This understanding of divine reality resembles the God of deism who after creating the universe stands back and watches the universe unfold by itself and intervenes only when something goes wrong with what he created. But the biblical God affirmed by faith is not an absentee landlord who watches the goings-on of the world as a distant bystander. Rather he is continuously present in the world, creating and sustaining the whole universe at every single moment, and because the world is utterly dependent on God, it would vanish without a trace if God were to withdraw his support. As Stannard (1999) expounds

this view, "God is involved in absolutely everything that goes on in the world. It is not that God performs this miracle and that miracle, but is otherwise not involved – when nature is running smoothly. Rather, it is the case that nothing at all happens without his direct involvement" (p. 37). An additional problem with appealing to God to answer scientific questions is that unlike what is expected in science it cannot, given the nature of God, give an explanation that is scientifically acceptable. In order for explanations to count as satisfactory in science, they must help illuminate what was previously unclear or they must enable us to make more sense of what remained a puzzle. Invoking God doesn't meet this epistemological requirement. Because he is by definition ineffable and utterly mysterious, a reality that forever eludes human understanding, God will not be able to shed any light on scientific problems. What is beyond human conception cannot solve problems that must be susceptible to solutions that can be conceived by human thought. A problem in science is not solved by referring to what is beyond the confines of human thought but to what is within the limits of what we can think and understand.

・Limiting Science

When theology engaged in cross-disciplinary research, it sometimes placed boundaries which it expected researchers from other fields of inquiry not to trespass. If researchers violated this imposed rule and investigated this forbidden area, their work was devalued, ignored, or criticized by the theological community. The engagement with philosophers was sometimes characterized by such boundary conditions. Theologians sometimes dissuaded philosophers to use logic and reason to critically analyze the revealed truths bestowed by God because their truth was thought to be

beyond human rationality. Though revelatory truth doesn't contradict the canons of legitimate reasoning, its viability cannot be ascertained by our rational faculty. Though the possibility of eternal life cannot be demonstrated by the rules of logic alone, it cannot be refuted by critical thought. Others discouraged the philosophical analysis of revelation because they conceived the skeptical approach to the fundamental tenets of faith as sacrilegious. Questioning the divinity of Christ or his status as the Son of God was tantamount to heresy. The truth God revealed must be accepted unconditionally and preserved and safeguarded by the church instead of subjecting it to critical examination. Besides philosophy, theologians also set limits when dialoguing with historians. Many were cautious and leery of the critical study of scripture adopted by some historians. Being a sacred book bearing witness to the mighty acts of God, they thought it shouldn't be treated like any other book on history or science by scrutinizing its content in search for any biases. Another reason for their discomfort was that the bible was thought to lose its status as a divinely inspired book if a close study of it revealed various textual inconsistences and contradictions, unquestioned cultural biases, or potent religious influences from cults and religions that existed during the time it was written. That is, a critical study of the bible was thought to have a corrosive effect on faith if the main source of religious teachings was not immune to the kind of errors found in works on science and philosophy.

Even among theologians who partake in studies with scientists in search of deeper understanding and truth, some are overly protective of what they consider to be their legitimate theological domain, wanting science to remain outside this area. They fear science encroaching into their sacred turf, disrupting the alleged harmony and coherence that can be found within. The scientific study on the efficacy of prayer is an illustration

of this point. Undoubtedly prayer is the epitome of the Christian faith, where the believer establishes a personal relationship with God by focusing her whole mind and heart to the rich and ineffable nature of divine reality. People pray for different reasons. Many kneel down in front of the altar to ask for forgiveness, to express gratitude, and seek spiritual guidance. Intercessionary prayer is also prominent where people pray on behalf of others and ask God to intercede and cure a malignant tumor or a severe neurological disorder. There have been many scientific studies done on whether prayers offered to those suffering from illnesses are effective. There are some within the theological community who are critical of such studies because they see them as putting God to the test, testing whether God really does have the power to restore people's health. Testing the efficacy of prayer is by nature impious, opponents argue, because we are supposed to obey and trust God, not to question his fidelity or scrutinize his concern for our well-being. Science has gone beyond what can be theologically permitted as viable and appropriate scientific research when God's power to cure is questioned as one questions the effectiveness of a particular drug or a doctor's competence.

Another example that illustrates theology drawing barriers that discourage scientific entry is the question concerning how we should live our lives. For centuries theology has endeavored to articulate and spread a vision of the good life that is primarily founded upon the life and teachings of Christ. Because it has been engaged in ethical reflection for an extended period of time, theology regards the art of living a moral life to be primarily a theological concern. In recent years, however, science has been grappling with the question of how we can lead meaningful lives, trying to shed light on this perennial problem by the methods of empirical inquiry. Theology has a tendency to devalue the insights science can provide on

this issue because it is convinced that questions concerning meaning, value, and purpose are beyond the limits of what science can competently address. That is, because moral issues concerning how one ought to live or which value we should pursue are not empirical questions that can be corroborated by the methods of science, the contribution science can make to this debate is thought to be limited. Science, it is argued, cannot determine whether hedonism is a more viable philosophy of life than a life centered on God or whether a licentious life is preferable to a monastic life. Theologians are never hesitant to remind scientists that there are questions that cannot be answered by scientific research. By placing a limit to what science can achieve, theology hopes to create and preserve a space that cannot be intruded by science.

Furthermore, when dialoguing with scientists, many theologians argue that science cannot either prove or disprove the existence of God because the transcendent creator of the entire universe is not an empirical object that can be verified by the methods of science. Scientific research can only determine the existence of objects found within space and time and because God cannot be found in the universe he has been creating, his existence is beyond the ambit of science. Thus, when scientists refer to data or evidence which supports the existence of God, many theologians remind their counterparts that they are pronouncing on matters that lie well beyond what science can establish empirically. Just as theological studies alone cannot establish the truth of quantum theory or Newtonian physics, science alone cannot verify the existence of a spiritual reality.

Theologians must be more cautious when they set limits to the kinds of questions science can address. This is in part because what was thought to be beyond the purview of science in the past is now subject to scientific studies that have unearthed many valuable findings about ourselves and the

world. The examination of the nature and function of our mental apparatus, for example, was strictly a philosophical undertaking and the very thought that disciplines outside philosophy could make significant contributions to the study of the mind was greeted with skepticism. Despite the subject of intense philosophical speculation, our understanding of the cognitive faculty remained superficial and tentative. A body of solid knowledge that earned the approval of practicing philosophers was virtually nonexistent. This scenery underwent significant change with the emergence of cognitive science. As the tools and methods of scientific analysis are applied to the brain, we are extending our understanding of how the mind functions beyond what our forebears could have dreamt of. Though much work needs to be done to fully understand the mind, we know what cognitive roles different parts of the brain fulfill and we are learning more about how the mind is molded by both physiological and sociological factors. Furthermore, the nature of happiness and how to achieve it was another theme that was thought to be within the province of theology or philosophy. Again, both philosophers and theologians engaged in heated discussions to unravel the mystery of happiness without reaching a consensus acceptable to those with different philosophical commitments. While hedonists espoused physical pleasure as the essence of happiness, others sought happiness in selfless devotion to God. Recent work in psychology, however, has helped us better understand how people attain lasting happiness. Through countless experiments, psychologists are beginning to realize that people sense true joy when immersed in meaningful and challenging activities that require effort and concentration and they experience life as more meaningful when they have long-term goals that give direction and purpose to what they do. Moral behavior like love, altruism, and compassion has also been subject to scientific analysis in recent years, though it was thought to be an area

that could only be explored by philosophers. Evolutionary psychology, for example, has sought to illuminate what we do and experience in evolutionary terms. We are, according to this school of thought, born with very particular innate abilities and dispositions that influence what we think and do in very subtle ways. As Stannard (2017) explains, "All of us, from the moment we are born, come into the world with minds that are not blank; they already have a structure of sorts to them, leading us automatically to think and feel along certain well-defined lines" (p. 44). And we are genetically hardwired or have the innate capacity to experience pain, sense sexual gratification, and feel compassion because each endowment had survival value, enabling our ancestors to survive in a harsh environment surrounded by dangers of every imaginable kind and pass on their genes to their children. We wouldn't be here if our ancestors couldn't experience pain, enabling them to avoid harm and danger, or if they were not sexually aroused by the opposite sex. Science is forever expanding its field of competence, revealing new secrets by applying its method of inquiry to new areas. Imposing limits to what science can achieve is bound to be premature, given how science is expanding our understanding in areas that were once considered off-limit.

Another problem with barring science from studying a given phenomenon is that it violates one of the underlying assumptions of cross-disciplinary research which is that any theme, issue, or subject can be understood from multiple disciplines. Human beings, for example, have been the subject of studies conducted by a panoply of disciplines. From the point of view of physics, we are made up of billions of atoms and molecules that obey the laws of physics. Researchers in chemistry understand our humanity in terms of chemical reactions between chemical compounds. Biology offers us another pair of theoretical lens through which we can understand more

about ourselves. From a biological perspective, the traits that distinguish us from other species – our intelligence, our ability to use language, our ability to walk on two legs, etc. – were acquired because they helped us compete against other animals in a harsh and competitive struggle for survival. Many psychologists focus their attention on our unconsciousness and how the thoughts and experiences buried in this realm affect our everyday conscious lives. Each discipline has unique and invaluable insights to offer about what makes us truly human. Our knowledge about ourselves would have been limited had any particular discipline been precluded from analyzing our nature. Theology should value the irreplaceable insights each discipline offers because they all contribute towards furthering our knowledge about ourselves and the world. The theoretical approach any discipline takes and the kind of findings it can establish are bound to be partial and limited. In order to fully understand any given phenomenon, we need to complement what each field of inquiry can offer with contributions from other disciplines, thereby painting a richer, fuller, and more complete picture. A sociological study of education without reference to what philosophers and historians have to say about learning is bound to be incomplete, reflecting only what can be seen through the prism of sociology alone. Though school learning is influenced by the social environment, what takes place inside classroom doors – the quality of teaching and the kind of activities students do – cannot be fully addressed by sociology. As McGrath (2016) rightly points out, "We all need a greater narrative to make sense of the world and our lives, naturally weaving together multiple narratives and multiple maps to give us the greatest possible traction on reality. Reality is just too complex to be engaged and inhabited using only one tradition of investigation" (p. 21).

Although theology as a general rule shouldn't set limits to what science

can pursue, there are three common cases when it can counsel science to be more cautious in its approach. Science is not omnipotent. There are inbuilt limits to the types of questions it can address. Science qua science cannot, for example, determine the aesthetic merit of artwork. It cannot empirically determine whether the paintings of Monet have more value than that of Picasso or if the novels by George Eliot are superior to that of George Gissing. When scientists use science to solve problems beyond what it can legitimately do, theologians must point out the limits to what science can achieve and how its alleged findings are bound to be misleading or erroneous. Theology should also discourage science to undertake studies that are morally dubious. Alongside studies that cause irreparable harm to the environment, experiments that can inflict unnecessary harm on humans and animals should not be carried out. Sometimes the moral price that has to be paid for pursuing research is too costly. Knowledge gained by means that have harmful consequences is not worthwhile. And theology must forever remind scientists to impose moral constraints upon themselves so that what they do don't breach the moral law mandated by God. This role is important, for scientists too are prone to sin by plagiarizing the work done by others or deliberately distorting data so that it fits their preconceived assumptions.

Conclusion

The historical relationship between science and Christian theology defies simple, definitive characterizations. There have been both fruitful and ineffective exchanges between the two disciplines. Both science and theology have been responsible for thwarting the path to meaningful and constructive dialogue. Scientists, both past and present, have misconstrued

science as inherently atheistic and have stereotyped theology as a dogmatic endeavor bound by tradition. Theologians too bear some of the responsibility for hampering the process of meaningful exchange. This present study focused on four particular ways theology shouldn't relate to science. It was argued that theology must not critique the content of science on theological grounds and it shouldn't idolize science by embracing it as the sole arbiter of what can be known and what can exist. In addition, theology must practice theology and shouldn't engage in science by inserting God into any gap in our scientific understanding. And though there are exceptions, theology shouldn't set limits to scientific inquiry. Rather, it must encourage science to expand its domain of inquiry and learn from what it has to say about this world we live in. By bearing in mind the errors theology can commit when dialoguing with science, a more sustained and fruitful engagement between the two disciplines can in principle ensue. Put differently, a path to a more constructive dialogue lies in part on theology's willingness to rectify the mistakes it committed in the past. And learning from past errors is paramount in any intellectual endeavor because, as historians often profess, those who are unwilling to learn from the past are inclined to repeat the same mistakes.

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