Astrotheology

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Astrotheology is a dialogical field of scholarly study at the intersection of religious reflection and natural science. The astrotheologian asks: what are the implications of space exploration and the possibility of discovery of extraterrestrial life, either microbial life within our solar system or intelligent civilizations on exoplanets? At minimum, astrotheologians draw out the religious, social, and ethical implications of astrobiology. At maximum, Muslim, Christian and other religious thinkers engage in doctrinal construction.

Introduction

The sky, especially the night sky speckled with glistening stars, has long stirred religious sensibilities within the human soul. The vault of heaven is high, overwhelming, mysterious, infinite. Something from within us yearns for what is beyond. Plato observed, “Astronomy compels the soul to look upwards and leads us from this world to another.”[1] Astrotheology reflects on astronomy, astrobiology, and all the space sciences in light of these inner stirrings.

The contemporary term, astrotheology, replaces the previous term, exotheology, just as astrobiology replaced exobiology in the mid 1990s. Astrotheology reflects on the religious, social, and ethical implications of astrobiology along with the prospect of encountering extraterrestrial life. According to hybrid astronomer and Methodist theologian, David Wilkinson, “Theologians need to take seriously SETI [Search for Extraterrestrial Intelligence] and to examine some central doctrines of religious belief in light of the possibility of extraterrestrial life, hopefully with a spirit of curiosity.”[2]

Astrotheology has blossomed within the garden of Science and Religion, sometimes called Theology and Science. This garden was first cultivated in 1966 with the publication of Ian Barbour’s book, Issues in Science and Religion.[3] Today scholarly flowers bloom in journals such as Zygon; Theology and Science; Islam and Science; Science and Christian Belief; Science, Religion, and Culture; and publications of ESSSAT (European Society for the Study of Science and Theology) and the Australian Theological Forum (ATF). Although Christian systematic theologians planted the original seeds, today scientists along with religious thinkers are now pruning reflections from Jewish, Islamic, Hindu, and Buddhist traditions as well.

Islamic biochemist and theologian, Muzaffar Iqbal, interprets Qur'an 10:101-- “Ponder on whatever there is in the heavens and on Earth!”-- as an internal religious impetus to ponder the heavens. “The critical word here is whatever. It allows us to extend reflection to ETI, because the insistent Qur’anic exhortation to reflect on the creation of God is not Earth-bound or even Earth-centered.”[4]

The astrotheologian seeks a comprehensive and integrated vision of the totality of reality in light of divine creativity and grace. According to Boston University theologian and ethicist, John Hart, “We living beings are all stardust become material, interrelated, interdependent, and globally and cosmically integrated beings.”[5] With this in mind, Wilkinson admonishes us: “Christian churches need to be active supporters of SETI.”[6]

In what follows we will review briefly the history of astrotheology, making the point that our ancestors for two and a half millennia now have pursued this question: are we on Earth alone or do we share this cosmos with neighbors in space? The more contemporary question asked by today’s astrotheologian is this: if we confirm the existence of extraterrestrial intelligence, what will be the religious, social, and ethical ramifications? To engage this question adequately will require of the astrotheologian a method, a method generated in part by reflection on astrobiology and in part by theology’s own internal speculative and constructive impulses.

Astrobiology and Astrotheology: Definitions

A creative-mutual-interaction (CMI) has developed between theologians and selected fields within science: physics, cosmology, evolutionary biology, genetics, and neuroscience.[7] Other sciences such as chemistry and mathematics are relatively untouched. What interests the astrotheologian are the discoveries and discussions taking place among astronomers, cosmologists, exobiologists, astro-biologists, astroethicists, and those scientists searching for extraterrestrial intelligence (SETI). Astrotheology is at minimum a Theology of Space Science that anticipates the religious, social, a moral implications of future interaction with neighbors in space. At maximum, astrotheology extends our inherited religious vision of creation and redemption to the entire cosmos.[8]
Astrobiology is the science that deals with what is living within the cosmos, on Earth and beyond. According to Chris Impey at the University of Arizona, astrobiology is “the study of the origin, nature, and evolution of life on Earth and beyond.”[9] NASA began using the term, astrobiology, in the 1990s to refer to its work on life in the universe. NASA’s Astrobiology Roadmap of 2003 oriented the field around three fundamental questions: (1) How does life begin and evolve? (2) Does life exist elsewhere in the universe? (3) What is the future of life on Earth and beyond?[10] According to Christopher McKay at NASA Ames Research Center, “Astrobiology has within it three broad questions that have deep philosophical as well as scientific import. These are the origin of life, the search for a second genesis of life, and the expansion of life beyond Earth.”[11] Such deep philosophical as well as scientific implications offer ripe fruit for theological picking.

But, the theologian does more than merely pick scientific fruit. The theologian's hunger to know leads to his or her own recipe. This means we require a more comprehensive definition of the field that includes theology's internal impetus to explore the heavens.

Here is a more comprehensive or maximalist definition. Astrotheology is that branch of theology which provides a critical analysis of the contemporary space sciences combined with an explication of classic doctrines such as creation and Christology for the purpose of constructing a comprehensive and meaningful understanding of our human situation within an astonishingly immense cosmos.[12]

Astrotheology is not a field set off on its own. Rather, it is a branch on the larger systematic theology tree.[13] Astrotheology adds an agenda item to the doctrinal theologian's To-Do List.

**History of Astrotheology**

The science of astrobiology may be new, but astrotheology predates the present era by twenty-four centuries. Philosophers and theologians have been debating the question of extraterrestrial civilizations consistently from the time of Plato to the twenty-first century. Here is a quick historical review.

**History: Ancient Astrotheology**

The subject matter of astrotheology goes back to ancient Athens. In the days of Plato and Aristotle, philosophers asked whether there could be many worlds, or a plurality of worlds (aperoi kosmoi). The many worlds question continued to be asked throughout Western history in Latin (piures mundi), French (pluralité des mondes), German (vielheit der Welten) and in English (plurality of worlds).

Those offering speculative answers can be divided roughly into two teams, the Aristotelians who argue that one world is enough versus the pluralists (originally atomists) who argue for many worlds. Aristotle (384-322 BC) said that there can be only one center and one circumference; therefore there cannot be several worlds or several heavens.[14] Democritus (ca.400-370 BC) and the atomists, to the contrary, said that “there must now be, and always have been, an infinite number of other worlds in various stages of growth and decay.” Epicurus (341-270 BC) followed Democritus, arguing that “there are infinite worlds both like and unlike this world of ours.”[15] Although the Aristotelians have enjoyed the higher score through the subsequent millennia, the pluralists have also scored points.

The debate in ancient Greece over one-versus-many worlds repeated itself in the Christian Church. The Aristotelian geocentrist took the initial lead, arguing forcefully that unity and oneness and centeredness beft both God and the world God has created. The pluralists countered that a sky full of stars would be a waste of the Creator’s potential if the heavenly bodies would go unoccupied. Origin of Alexandria (185-254 AD) sided with the pluralists, affirming many worlds. Origin’s multiple worlds, curiously, were separated by time rather than space. After the destruction of our world “there will be another world, so also we believe that others existed before the present world came into being. And both of these positions will be confirmed by the authority of Holy Scripture.[Isaiah] says “There will be a new heavens, and a new Earth.”[16] Now, most theologians would interpret Isaiah’s prophecy of a new heaven and a new Earth as an eschatological promise for the redemption of this world, not as a postulate about many successive worlds. Be that as it may, the idea of multiple worlds was sufficiently familiar as to become an object of Origen’s deliberation.

After weighing the issue of many worlds carefully, St. Thomas Aquinas (1224-1274) sided with Aristotle. He considered the argument in favor of pluralism: “it is better that there be many worlds than there be one because many good things are better than a few.”[17] Nevertheless, the Angelic Doctor, as Thomas has come to be known, to the contrary, determined that one world is the superior option. “It is necessary that all things should belong to one world.” Why? Because of what Plato and Aristotle had previously said. According to Plato, the oneness of God makes it appropriate for God to create but one world[18] According to Aristotle, perfection is associated with oneness (all things in the world tend to center around a single center) and this implies that one world would better testify to God’s perfection. Two things are notable here. First, Thomas did not appeal to Scripture to trump reason. Second, Thomas registered no shock or revulsion at the question. Rather, he even-handedly debates the matter before drawing a negative conclusion. The result: philosophical and theological geocentrism.

During the generation following Thomas Aquinas at the University of Paris, John Buridan (1295-1358) subjected Aristotle to critical examination; but Buridan drew the opposite conclusion. Aristotle, arguing from nature, had prohibited the creation of multiple worlds, because nature obeys the centering principle. But, rather than appeal to nature, could we by faith assert that God could create other worlds of a different type or different species? Yes, said Buridan. “We hold
In his *Le livre du ciel et du monde*, Nicole Oresme (1325-1382) sought to counter Aristotle's argument on which Thomas' argument depended. Oresme reaffirmed Origin's view on the succession of worlds in time. Then, he speculated about space, about up and down. Another world in space among the stars would have its own center and, hence, its own sense of up and down. This would not conflict with Earth's center and the up-and-down with which we are familiar. Each world would have its own principle of centering. Therefore, Oresme concluded, our omnipotent God could make another world besides this one; and Aristotle cannot prove otherwise. Oresme did not leap to embracing ETI, but he seems quite self-satisfied that he had debunked Aristotle. The result: more many-worldism.

The middle ages gave way to the Renaissance, Reformation, Enlightenment, and the rise of modern science. With the dawn of the Reformation and the Enlightenment, extraterrestrial life became a "doctrine taught in college classrooms, championed by preachers, and celebrated by poets." At least two factors contributed to the rise of interest in the possibility of ETI. The first was an external factor, the gradual acceptance of the heliocentric cosmology proffered by Copernicus, Kepler, Galileo, and Newton. The second was an internal factor: the persistence of the neo-platonic principle of plenitude and the belief that every good potential should become actualized. Accordingly, if God were to create planets with the potential for supporting life, then planets devoid of life would be an inappropriate waste of God's creative energies. To have planets without life would be like setting the table with plates and silverware but not serving food. The potentiality for life seems to require the creation of actual life, so these theologians thought.

Here in the 21st century, this ancient Athenian debate between the disciples of Aristotle and Democritus has still not abated. If SETI scientists would not reject Aristotle in favor of Democritus, they could not justify searching exoplanets for signs of ETI. Philosophical theologian Nancey Murphy sums it up. "Much of modern science can be understood as the development of a variety of scientific research programs that in one way or another embody and spell out the consequences of what was originally a metaphysical theory. It has been the era in which Democritus has triumphed over Aristotle."  

**History: Copernican Astrotheology**

The cornerstones of modern science were laid by Copernicus, Kepler, Galileo, and Newton. Nicholas Copernicus's (1473-1543) book, *De Revolutionibus Orbium Coelestium* (*On the Revolutions of the Celestial Orbs*), was published in Nuremberg by the German Lutherans in 1543. Copernican cosmology was advanced in Germany by Johannes Kepler (1571-1630) and in Italy by Galileo Galilei (1564-1642). The latter used a telescope, whereas Copernicus and Kepler did not.

Kepler believed we Earthlings have extraterrestrial neighbors. In a letter to Galileo, Kepler wrote, "I must point out that there are inhabitants not only on the moon but on Jupiter too." We recall that Copernicus' heliocentrism was not immediately adopted by astronomers or by the wider public. The wheels of the Copernican revolution turned slowly, greased gradually by the subsequent work of Kepler, Galileo, and eventually Isaac Newton. "Throughout the seventeenth century, the public acceptance of the Copernican cosmology was slow, far from unanimous, and based not on proofs but on the persuasion of what was increasingly seen as a coherent system," observes Harvard astronomer Owen Gingerich.

With this historical recollection in mind, we can see that to fault the religious establishment during this period for an alleged recalcitrant geocentrism would be to misread the history. "The classical Reformation figures, including Luther, Calvin, and Melanchthon belong to the period in which there was no compelling reason for accepting the Copernican system." Copernican heliocentrism was slow to catch on among both scientists, and theologians. Renegade Dominican Giordano Bruno (1548-1600) was one of the first theologians to adopt Copernicus' new cosmology. Bruno drew out implications for extraterrestrial life. Copernicus had not actually declared stars and planets to constitute other worlds, but Bruno did. Bruno argued from the principle of plenitude. The *principle of plenitude*, according to Arthur Lovejoy, belongs to the Platonic tradition and says that "no genuine potentiality of being can remain unfulfilled and that the world is the better, the more things it contains."  

Despite the fact that this principle is pre-Copernican, it informed post-Copernican theological speculation. "God, it seemed, *would*, in the phrase of the *Timaeus*, have been 'envious' if he had refused the privilege of actual existence to any logically possible being at any place where such existence was possible." And, this includes off-Earth habitats. If it is possible for life to exist on other worlds, then God would have made it happen.

Like the scholastics who preceded him, Bruno affirmed that the possible and the actual are identical in God. Because God is infinite, it follows that there must exist an infinity of populated worlds. "Why," asks Bruno rhetorically, "should the infinite capacity be frustrated, the possibility of the existence of infinite worlds be cheated, the perfection of the divine image be impaired" without numerous extraterrestrials bearing the *imago Dei* just as we do? "Around these bodies [suns] there may revolve Earths both larger and smaller than our own." These extra-solar Earths are inhabited, just like ours. Each planet, contra Aristotle, would have its own center. And, contra Plato who denied other...
worlds because they undercut unity, Bruno affirmed many worlds all summed up in a grander more inclusive cosmic unity. The one God is God for all that is the universe, its many worlds with many centers included. On February 16, 1600, Giordano Bruno was burned at the stake by the Inquisition. It is not likely that his belief in many worlds is what provoked the Inquisitors. Historian Stephen Dick surmises, “Bruno’s denial of the divinity of Christ headed the list of offenses, followed by his magical view of the world. Still, his Copernicanism and his belief in an infinite number of worlds could not have helped his situation.”[31]

The name, Copernicus, reminds us of the question: what’s in the center? the human being? the Earth? the Sun? God? something else?

An oft repeated misinterpretation of this history includes the trope that the Copernican revolution led to a de-centering of human pride, a sort of humiliation of an arrogant Earth-oriented religion that touted anthropocentrism. But, we ask: did the advances in science actually shatter the geocentrism and anthropocentrism of theology? No, even though the relative size of the Earth and its importance shrunk as the size of the cosmos grew in cultural awareness.

Kepler employed his astro-science to humble us, to be sure; but watch the nuance. Kepler’s humility is derived from our dependence on God in analogy to the Earth’s dependence on the sun. “In the center of the world is the sun, heart of the universe, fountain of light, source of heat, origin of life and cosmic motion. Because man’s house is otherwise, therefore, let him recognize his own wretchedness and the opulence of God. Let him acknowledge that he is not the source and origin of the world’s splendor, but that he is dependent on the true source and origin thereof.”[32] The de-centering by Kepler is not due to a reorientation of Earth to the physical sun but rather our orientation to God. Geocentrism is not replaced by heliocentrism, but rather with theocentrism.

How do we correct this common historical misunderstanding? Arthur O. Lovejoy tries to correct the widespread mistaken assumption that pre-Copernican theologians were vulnerable to de-centering. Did geocentrism provide warrant for anthropocentrism? No, says Lovejoy. Why? Because for pre-Copernican Europe the center of the Earth was thought to be hell; the center was not our planet’s surface with its living creatures. “For the centre of the world was not a position of honor; it was rather the place farthest removed from the Empyrean, the bottom of the creation, to which its dregs and baser elements sank. The actual centre, indeed, was Hell.”[33]

In short, medieval theologians were not geocentric; they were diabolocentric. Yes, they were anthropocentric. But what provided the warrant for anthropocentrism was reason, not centeredness. We human beings sit atop the ladder of life because of our intellect, our intelligence. Any challenge coming from the Copernican revolution would come not from de-centering the planet but from the prospect that extraterrestrials might have greater intellectual capacity than we. In his De docta ignorantia of 1440, pre-Copernican bishop Nicholas of Cusa affirmed belief in ETI and—apparently over coming his anthropocentrism—speculated that perhaps extraterrestrials are of higher nobility than we Earthlings, that “the Earth is perhaps inhabited by lesser beings.”[34]

The Copernicus-Kepler-Galileo-Newton revolution provided a new cosmography for theologians to grapple with: (a) our universe may not be bounded but rather infinite; (b) other planets within our solar system may be inhabited by intelligent beings, perhaps even the sun and the moon; (c) the fixed stars may themselves be suns with their own orbiting planets with conscious inhabitants. Or, more precisely, the possible existence of intelligent creatures beloved by God on other planets challenged theologians to connect the drama of salvation in the incarnation on Earth with the history of life on other worlds.

**History: Post-Copernican Transcendentalism**

Another intriguing figure in this history is Emanuel Swedenborg (1688-1772). He is remembered today for his founding of the Church of the New Jerusalem and ancestor to New Age spirituality. He claimed he had “discourse and converse with spirits and angels who are from other Earths.” The planets are inhabited, he said; and these other races are destined as we are to enjoy eternal life with God in heaven. Do they worship God? Yes, indeed. They “are not idolaters” because they “all acknowledge the Lord to be the only God.” Did God incarnate in Jesus Christ become incarnate again on each of these planets? No. “It pleased the Lord to be born, and to assume the Human, on our Earth, and not in any other.”[35] God in Christ appeared on Earth in human form, provided us with scriptural knowledge, and now that saving knowledge of divine incarnation will spread eventually to the other planets. Swedenborg differs from most theologians because he does not base his testimony on behalf of ETI on scientific data or cautious speculation; rather, he bases it on his own alleged experience of communication with extraterrestrial beings.

The Swedenborgian approach crossed the Atlantic Ocean to become absorbed by Ralph Waldo Emerson, Mormons, and Seventh Day Adventists. These American religious voices announced that we share our universe with extraterrestrial worlds. Joseph Smith (1805-1844) and the Church of Jesus Christ of Latter-day Saints (the Mormons) affirm many worlds in their doctrines of creation and redemption. Numerous planets were created by God through Christ; and Christ is the savior of all of them. “And worlds without number have I created,” says God in *The Pearl of Great Price* [33], each one “sav’d by the very same Savior as ours.”[36] Ellen White (1827-1915) reported a vision of an extraterrestrial planet with sinless inhabitants to her Seventh Day Adventist followers: “The Lord has given me a view of other worlds. The inhabitants of the place were of all sizes; they were noble, majestic, and lovely.[living] in strict obedience to the commandments of God, and have not fallen.”[37]
The so-called split between science and theology had not yet occurred during the medieval, Reformation and pre-Enlightenment periods, so the arguments regarding the possibility of ETI were conflated.[38] Theologians as well as scientists found themselves considering, first, that the other planets are similar to Earth; second, nature is fecund, yielding life; third, God who is perfect actualizes what is potential, so the potential for life on other planets should be actualized. What was puzzling to theologians was the soteriological question: would each planet receive its own incarnation or would Earth’s incarnation suffice for the salvation of other worlds as well? The history of astrotheology needs to be understood like all Western theology over against its backdrop in European culture. The backdrop witnessed the crumbling of the Aristotelian edifice and the construction of a new tower of knowing built upon science and reason.

**History: Enlightenment Astrotheology**

Sapere audre! Dare to know! This is the motto of the Enlightenment as the 17th century gave way to the 18th and 19th. Notre Dame’s Michael J. Crowe observes that during the Enlightenment "a major shift occurred regarding the idea of a plurality of worlds, which went from being seen as a somewhat bizarre and dangerous notion to being viewed by many as fully reconcilable with both astronomy and religion."[39]

The advancing frontier of scientific knowledge and expanding awareness of the immensity of our universe served to de-center any residual Earth-centrism we might have formerly embraced. In his article on “Astronomy” in the 1771 edition of the Encyclopedia Britannica, James Ferguson, wrote with eloquence. “Astronomy discovers to us such an inconceivable number of suns, systems, and worlds, dispersed through boundless space, that if our sun, with all the planets, moons, and comets belonging to it, were annihilated, they would be no more missed, by an eye that could take in the whole creation, than a grain of sand from the sear-shore.”[40] William Herschel (1738-1822) was so influenced by Ferguson, that he changed his career from music to astronomy; and he went on to discover Uranus as well as numerous new galaxies. Ferguson thought that “the Almighty, who always acts with infinite wisdom,” had placed inhabitants on extra-solar planets. Herschel added that intelligent inhabitants lived on both the moon and the sun as well. The majesty of outer space and speculations regarding extraterrestrial intelligence wafted through the Enlightenment atmosphere.

According to Immanuel Kant (1724-1804), the Enlightenment (Aufklärung) consisted of a final coming of age, an emancipation of the human consciousness from an immature state of ignorance and error. In his *Kritik der reinen Vernunft, or Critique of Pure Reason*, Kant asserts that “there are inhabitants in other worlds.”[41] Earlier Kant had written a treatise on astronomy and what we would today identify as astrobiology, *Allgemeine Naturgeschichte und Theorie des Himmels, or, Universal Natural History and Theory of the Heavens.* “Most planets are certainly inhabited,” he wrote.[42] The principle of plenitude or fecundity does not require God to create life on every planet, said Kant; so there may be some uninhabited planets as well as inhabited. He further speculates that life develops over time—a pre-Darwinian understanding of evolution—suggesting that now barren planets may receive life at a later time. Kant also graded life forms according to more highly and less highly developed, suggesting that we might find on some planets animals and plants of a “higher and finer kind.”[43]

Kant’s anthropology is curious, perhaps somewhat prescient to the contemporary debate. Kant centered the human race within a Copernican solar system, although in a less than complimentary way. Imagine a ladder of perfection with the human race in the middle. Above is superior and below is inferior. Beings superior to us in rational and other capacities inhabit planets more distant from the sun such as Jupiter and Saturn; but beings inferior to us inhabit Venus and Mercury, which lie closer to the sun. The imago Dei consists of our capacity for reason, assumed Kant just like his medieval forebearers, something we share with both sets of extraterrestrial intelligences. “With what majesty would not God, who depicts himself in all creatures, depict himself in these thinking natures, which as an ocean undisturbed by the storms of passions would quietly receive and reflect his image?”[44]

With the divine image in mind, Kant speculated further: have the extraterrestrials become sinners? Perhaps. Perhaps those closer to the sun have fallen further, and perhaps those further from the sun are less sinful. This leaves Earth and its sister planet, Mars, in the ambiguous middle, capable of both noble virtue and humiliating evil. “Both planets, Earth and Mars, are the middle members of the planetary system; and perhaps not without probability an intermediate physical as well as moral constitution between the two extremes.”[45]

During the Enlightenment, rationalism sprouted like spring tulips. Some skeptics began to see reason as so beautiful that it makes religion ugly. Harvard’s history of ideas scholar, Crane Brinton views it this way. “The rationalist tends to the position that the reasonable is the natural and that there is no supernatural. Rationalism tends then to banish God and the supernatural from the universe.”[46]

Thomas Paine (1737-1809) was willing to exchange ugly religion for beautiful reason. Paine, a Deist who claimed he had a “natural bent” toward science, became sharply critical of the Christian belief system. Paine held that Christian theology required belief in only one world, Earth. And he found this objectionable. “Though it is not a direct article of the Christian system that this world that we inhabit is the whole of the habitable creation,” he admits in his widely read *The Age of Reason*, he still criticizes the Christian religion for its geocentrism. “To believe that God created a plurality of worlds renders the Christian system of faith at once little and ridiculous, and scatters it in the mind like feathers in the air. The two beliefs [Christian faith and other worlds] cannot be held together in the same mind.” He insisted that “the Christian system of faith forms itself upon the idea of only one world,” and then he proceeds to draw out the absurdity of the idea of multiple incarnations. “The Son of God, and sometimes God himself, would have nothing else to do than to travel from world to world, in an endless succession of death, with scarcely a momentary interval of life.”[47]
Despite the opening toward affirming life on other worlds that many previous theologians had exhibited, and despite the acknowledged fact that geocentrism is not a Christian doctrine, Paine leveled what to his mind is a devastating criticism. What we should note here is how the idea of many inhabited worlds in space had become the common coin of intellectual speculation during the Enlightenment, regardless of which stand one took in the debate.

This attack on Christian cosmology was repeated a century later by Mark Twain (1835-1910). “How insignificant we are, with our pigmy little world. Did Christ live 33 years in each of the millions and millions of worlds that hold their majestic courses above our heads? Or was our small globe the favored one of all?”[48]

Paine and Twain became history’s bane by promulgating the misleading trope that religion in general, and Christianity in particular, is hopelessly geocentric. The Paine and Twain argument was countered by Thomas Chalmers (1780-1847), a popular preacher in Glasgow, Scotland. On November 21, 1815, he began a series of sermons, *A Series of Discourses on the Christian Revelation Viewed in Connection with the Modern Astronomy.* Is Christian theology inescapably geocentric? By no means. “The assertion is that Christianity is a religion which professes to be designed for the single benefit or our world. Christianity makes no such profession.” Chalmers proceeds to de-center us. “We should learn not to look on our Earth as the universe of God, but as one paltry and insignificant portion of it.” If our Earth would suddenly disappear, the universe at large would suffer as little as a forest would suffer at the fall of a single leaf. Living on the other planets in space are many other intelligent beings who worship the “Supreme Being.” Despite the immensity and splendor of our universe, Psalm 8 teaches us that God can still care for each of us individually, giving “every comfort” we can enjoy.[49] If extraterrestrials have fallen into sin, the Glasgow pastor affirms that Christ’s redemptive work on Earth alone will suffice for the redemption of extraterrestrial sinners.

Back to American transcendentalism. The thought of both Swedenborg and Kant converged on Ralph Waldo Emerson (1803-1882), who believed that the revelations of astronomy force a thoughtful person to reject atheism in favor of belief in a transcendental creator. And, like Paine, the revelations of astronomy force a thoughtful person to reject the basic teachings of Christianity, especially the divinity and redemptive power of Jesus Christ. “An important result of the study of astronomy has been to correct and exalt our views of God, and humble our view of ourselves,” Emerson said in a sermon on May 27, 1832. “It [astronomy] proves the sublime doctrine of One God, whose offspring we all are and whose care we all are.” Then, Emerson sharpened the de-centering spear so that it pierces the heart of atonement. It is “impossible to regard the Earth any longer, as the only object in the care of Providence. I regard it as the irresistible effect of the Copernican astronomy to have made the theological scheme of Redemption absolutely incredible.” In his revised soteriology, Emerson rejected the atoning work of Jesus through the expiation of our sins; and he substituted Jesus-as-teacher who instructs us on how to save ourselves. Jesus instructs us “in the character of God and the true nature of spiritual good; the teacher only saves us, by inducing us to save ourselves.”[50]

**History: Modern Astrotheology**

Modern usage of the term *astrotheology* most likely began in 1714 with the publication of the book, *Astro-Theology, or a Demonstration of the Being and Attributes of God from a Survey of the Heavens.* The author, William Derham (1657-1735), was an Anglican clergyman and chaplain to the future King George II. Derham’s own version of the history of science is broken into three epochs, the Ptolemaic, the Copernican, and now his third post-Copernican system-of-the-universe. Accordingly, said Derham, each star is itself a sun like ours with a family of orbiting planets, also like ours. These planets orbiting fixed stars, he declared “to be habitable worlds; places accommodated for habitation, so stocked with proper inhabitants.”[51] Derham could not prove this. So, he asked for either a direct divine revelation or better scientific instruments to confirm or disconfirm his speculation. The task of astrotheology in Derham’s era was to glorify God by stressing the immensity and magnificence of God’s creation. When we turn to the 21st century, astrotheology’s task has become a bit more modest by asking: just how should theologians assess and interpret the findings of astrophysics and astrobiology? These two tasks have always been allied, to be sure; even if their respective emphases have changed slightly.

When science scores, theology cheers. In the early 19th century the nebular hypothesis was widely discussed by scientists. The most common form of the nebular hypothesis includes the idea that our solar system with planets orbiting the sun formed gradually as a condensation of nebular mass. Some theologians found a conflict between this gradualist hypothesis and the idea that God had created our universe *ex nihilo,* from nothing. The phrase ‘nebular hypothesis’ was coined by an Anglican clergyman and science professor at Cambridge University, William Whewell (1794-1866).

Whewell held one opinion early and then another later. Having been awed by the array of countless stars he could see through the telescope, Whewell concluded in an 1833 publication, *Astronomy and General Physics,* that each star was a sun like ours. And like ours, these suns were surrounded by planets, “the seats of vegetable and animal and rational life.” Belonging to the design school of natural theology—which made Whewell along with William Paley subject to criticism by Charles Darwin—Whewell saw in the systems of suns and planets a sign of the divine. “We shall have some impression of the beneficence and love of the Creator, as manifested in the physical government of his creation.”[52]

Enter Alfred Lord Tennyson (1809-1892), one of Whewell’s students at Cambridge. Tennyson was a young man who became the preeminent poet of the Victorian age. His poem of 1829, *Timbuctoo,* includes these lines.

*And harmony of planet-girded suns*
And moon-enriched planets wheel in wheel,
Arch’d the wan sapphire. Nay—the hum of men,
Or other thing talking in unknown tongues,
And notes of busy life in distant worlds
Beat like a far wave on my anxious ear.

Despite Tennyson’s enthusiasm for extraterrestrial worlds, his former teacher, William Whewell, changed his mind on the matter. In 1853 Whewell anonymously published a refutation of his previous view in Of the Plurality of Worlds: An Essay. The later Whewell offered both a scientific and a theological argument against the existence of extraterrestrial intelligence. Scientifically, he observed that Mars and Jupiter are unlike Earth with regard to atmosphere and living conditions; so we should not expect duplicates of ourselves as residents of these planets. No sufficient reason exists for believing in other worlds than ours; and, even if other planets are inhabited, then they probably support creative beings belonging to lower or more primitive level than Earth’s.

Theologically, Whewell noted how Scripture says nothing about the plurality of worlds; and the history of theology shows no need for such an idea. Both scientists and theologians have speculated about other worlds without empirical evidence. They paid for their extraterrestrial fantasies with incredulous imaginings. Theologically, Whewell attempted to re-center Earth by appeal to rationality, by suggesting that the intelligent beings living on Earth are alone in the vast universe. Why might he argue this? Because of the unsurpassable value of the human mind and soul. With our minds we human creatures think God’s thoughts. With our souls, we receive an immortal dignity. God has no need for more than one intelligent race than ours. “The majesty of God does not reside in planets and stars which are only stone and vapour, a world of mind, must have been better worth creating than thousands and millions of stars and planets,” he wrote. “One soul created never to die outweighs the whole unintelligent creation.”[53]

Star-People versus the Star-Smashers! That’s the division among Whewell’s early disciples and later disciples. Tennyson, among others, was a Star-People who rejected his former teacher’s turn. “It is inconceivable that the whole universe was merely created for us who live in this third-rate planet of a third-rate star.”[54]

Also among the Star-People we find John Henry Cardinal Newman (1801-1890), who affirmed the existence of extraterrestrial planets with intelligent inhabitants in his Grammar of Assent. “In the controversy about the Plurality of worlds, it has been considered, on purely antecedent grounds, as far as I can see, to be so necessary that the Creator should have filled with living beings the luminaries which we see in the sky, and the other cosmical bodies which we imagine there, that it almost amounts to blasphemy to doubt it.”[55]

As the 19th century was closing and Liberal Protestant theology was opening, Germany’s Albrecht Ritschl (1822-1889) announced he was embracing Copernicanism and de-centering our planet. “Thus it is possible that the Earth is not the only scene of the history of created spirits.”[56]

Such an idea was by no means limited to European Christians. The 19th century founder of the Baha’i religion in Iran, Bahá’u’lláh, said in Gleanings, “Know thou that every fixed star hath its own planets, and every planet its own creatures, whose number no man can compute.”[57] At least a minimalist belief in exotic ETI lingered in the atmosphere of the 19th century, inhaled by many a religious thinker.

**Contemporary Astrotheology**

Would confirmed contact with an extraterrestrial civilization lead to the deterioration if not destruction of the world’s religious traditions? Are the traditional religions fragile and vulnerable? No, not at all. The Peters ETI Religious Crisis Survey empirically demonstrates this. Steven Dick who has studied the matter concludes: “In general, for Christians as well as for other religions, indigenous theologians see little problem, while those external to religion proclaim the fatal impact of extraterrestrials on Earth-bound theologies.”[58] In sum, non-religious observers anticipate the demise of religion, while religious believers have no fear.

What seems to be widely acknowledged in contemporary spirituality is the notion that each of us individually is internally connected to all that is, to the entire 13.82 billion years of cosmic history. According to Buddhist Trính Xuan Thuan, “We are all made of stardust. As brothers of the wild beasts and cousins of the flowers in the fields, we all carry the history of the cosmos.”[59] Jewish mystic Daniel Matt declares this cosmic sharing to be divine: “God is the oneness of matter and energy, the process through which one is transformed into the other, the nothingness that embraces both.”[60] Might this cosmic if not mystical oneness include brothers and sisters living on exoplanets?

Speaking from an Islamic context, Muzaffar Iqbal avers that God’s creation includes “yet-unencountered intelligent beings living somewhere other than planet Earth.”[61] Speaking from a Roman Catholic context, Karl Rahner (1904-1984) asks the theologian to take into account “the many histories of freedom which do not only take place on our Earth.”[62] The colorful Hans Küng adds “we must allow for living beings, intelligent—although quite different—living beings, also on other stars of the immense universe.”[63] Notre Dame astrotheologist, Thomas O’Meara, speculates with a hint of glee. “There might be a number of modes of supernatural life with God, a variety of God’s more intimate life shared with intelligent creatures in a billion galaxies.”[64]

We should not ask the Specola Vaticana the Vatican Observatory, to pursue astrotheology. Astronomy, astrophysics,
and astrobiology, yes. Astrotheology, no. Curiously, the Vatican Observatory dedicates its work to science, not theology. Even so, once in a while we hear a theological peep. “The universe sings God’s praises because it is beautiful,” write George Coyne and Alessandro Omizzolo; “it is beautiful because God made it.”[65]

Speaking out of a Protestant context, Paul Tillich (1886-1965) provides a rare example of a contemporary Protestant theologian willing to grapple with the Christological problem posed by many worlds. How should we “understand the meaning of the symbol ‘Christ’ in the light of the immensity of the universe, the heliocentric system of planets, the infinitely small part of the universe which man and his history constitute, and the possibility of other worlds in which divine self-manifestations may appear and be received?” Tillich proceeds to argue that we should expect divine self-manifestations among intelligent species on other planets. He grants that it is necessary for the theologian to speculate here, and then he proceeds to do so. “Incarnation is unique for the special group in which it happens, but it is not unique in the sense that other singular incarnations for other singular worlds are excluded. Man cannot claim to occupy the only possible place for incarnation.” [66]

Whereas Tillich opts for multiple incarnations, one is enough for Wolfhart Pannenberg (1928-2014). After acknowledging the “discovery of nonterrestrial intelligent beings” as a matter of theological concern, the Munich theologian argues that “the Logos who works throughout the universe became a man and thus gave to humanity and its history a key function in giving to all creation its unity and destiny.”[62] The history of salvation on Earth will eventually converge with the history of the entire universe, and the salvific work of Earth’s Christ will be efficacious for the entire cosmos.

Evangelical Protestants show some interest in UFOs but none in the space sciences. The extraterrestrial hypothesis to explain UFOs does not fly among establishment scientists. Astrotheologians align themselves with establishment science, not UFO afficionados. Therefore, for the most part, today’s astrotheologians dodge the extraterrestrial hypothesis associated with Ufology and side primarily with what they deem the more credible sciences of space exploration. Why? Because, as Albert Harrison reports, “Almost sixty years of energetic research has failed to convince scientists that UFO transport visitors from our own future, carry beings from another dimension, or bring us aliens from outer space.”[68] Or, as Wilkinson puts it, “Evidence from UFOs and abductions is not strong enough to believe that they are here.”[69]

Like Jacob and Esau, ufologists and astrobiologists are rival siblings, seldom seen together at the same family barbecue. The split between ufologists and establishment scientists signals to the theologian that he or she must apply a more comprehensive hermeneutic of culture just to understand what the deeper issues are that lie beneath this secular split.

Twentieth century theology accomplished very little, sadly. Historian Steven Dick concludes, “No true astrotheology was developed in the 20th century in the sense that new theological principles were created, or existing ones formally modified to embrace other moral agents in the universe. Systematic astrotheology will probably be developed only when—and if—in-telligence is discovered beyond the Earth.”[70] What about the twenty-first century?

When we turn to twenty-first century theology, astrotheologians such as David Wilkinson at Durham, John Hart at Boston University, and Thomas O’Meara at Notre Dame, along with scholars at Berkeley’s Center for Theology and the Natural Sciences are pioneering the field. Yet, the pioneers are relatively few in number among the crowd of the world’s theologians.

In mainline denominational theology relatively little attention is given to matters of space exploration in general, let alone speculations about ETI in particular. Mainline Christian theologians are occupied with social justice and eco-theology, both healthy endeavors. This also applies in large part to spokespersons for major religious traditions such as Hinduism, Buddhism, the Chinese traditions, and the New Atheism. No antipathy. Simply lack of interest.

Dominant in today’s Protestant and some Roman Catholic circles is constructivist or pluralist theology, in addition to social justice and eco-theology. The constructivist school of thought is driven by an intense commitment to listening to hitherto marginalized voices, to incorporating a plurality of perspectives, to dislodging the hegemony of traditional metanarratives which have intellectually subjugated and distorted local theologies. “Constructivist arguments maintain that difference is an effect of socialization, that is, of nurture. Alterity takes many forms, the most obvious of which include gender, race, and class differences. The message of the gospel transcends an attitude of tolerance to that of a posture of embrace.”[71] This school of thought omits the voice of science, a voice the astrotheologian feels obligated to listen to.

**Astrotheology’s Method: Reflecting on the Space Sciences**

With regard to theological method, astrotheology relies upon the sources identified in the Wesleyan Quadrilateral: scripture, history, reason, and experience. Special attention is given to reason, in this case reason in the form of natural science. Astrotheology gives priority of place to credible science, especially astrobiology and related space sciences. These sciences require direct attention by the astrotheologian, but also indirect attention as the astrotheologian looks at science through the eyes of culture. The Christian astrotheologian is a public theologian, employing a hermeneutic of secular experience. This hermeneutic interprets secular and scientific assumptions in light of faith in God.

Natural science provides the astrotheologian with an important source, right along with scripture. To date, astrotheologians have relied solely on establishment science, the kind of science we find at the world’s universities, NASA, SETI, and other space agencies. Some domains are ignored by astrotheologians such as the UFO phenomenon, ancient astronaut theory, and the paranormal. Whether this is good or bad policy remains to be assessed.
Recall that we work with minimalist and maximalist stages in astrotheology: reflection on the space sciences buttressed by internally generated constructive theology. At the minimalist stages, astrobiology and the anthropic principle demand the theologian’s attention.

**Reflecting on Astrobiology**

During the 1970s the term *exotheology* began to appear. It was based on the then extant scientific term, *exobiology*, coined by scientist Joshua Lederberg in 1960. Activities at NASA in the mid 1990’s led to modifications of the research agenda and the emergence of the field of *astrobiology*, “which redefined the boundaries and the concept of exobiology.”[72] Astrobiology continues the search for extraterrestrial life, to be sure; but it does so by relying upon a broader range of sciences.[73] Astrobiology now encompasses genomics, ecology, planetary formation, and all sciences dealing with the origin, history, and distribution of life in the universe. Among its tasks, *Astrotheology* analyzes the assumptions and implications of astrobiology toward the end of enhancing and enriching a worldview centered on God as creator and redeemer.

As just mentioned, among other tasks, astrotheology monitors astrobiology. Astrobiology itself is a controversial science. SETI researchers sometimes joke that they are engaged in a science that has no empirical evidence. Some do not joke. George Gaylord Simpson attacked astrobiology’s predecessor, exobiology, in 1964, saying, “This science has yet to demonstrate that its subject matter exists!” Princeton University’s Christopher Chyba rebuffed Simpson’s attack, comparing the search for extraterrestrial life by biologists with the search for the Higgs Boson by physicists.[74] There is a treasure to be found! Regardless of who wins this debate, new knowledge of the universe combined with even the remote possibility of sharing it with other sentient creatures stirs the astrotheologian’s concern for understanding the scope of God’s immense creation.

**Reflecting on the Anthropic Principle and the Multiverse**

Two related morsels on the astrophysicist’s plate are too delectable for the theologian to pass up: the anthropic principle and the multiverse debate. According to the anthropic principle (AP), the initial conditions at the moment of the Big Bang were such that intelligent life would eventually evolve. It appears that the singularity prior to the Big Bang was fine-tuned so as to prepare physics for evolving biology and biology for evolving intelligence. A strong version of AP (SAP) posits that life would be inevitable. A weak version of AP (WAP) simply says that life would be possible. What is important here is that within the field of astrophysics itself the question of purpose—teleology—arises. How might we answer it? One of three ways. First, chance: the fine-tuning of the universe is due to sheer chance, to happenstance. Second, providence: the universe is designed by God so that the divine will for the creation of conscious creatures could be fulfilled. Third, the multiverse: our universe is only one of many, each with different initial conditions.

Because our universe is so finely-tuned for life, almost no one finds chance to suffice as an explanation. Theologians drift toward providence while unsympathetic scientists embrace the multiverse explanation.

Renowned physical cosmologist George Ellis sides with the theologians. “The symmetries and delicate balances we observe require an extraordinary coherence of conditions and cooperation of laws and effects, suggesting that in some sense they have been purposefully designed, i.e., they give evidence of intention, realized both in the setting of the laws of physics and the choice of boundary conditions for the universe. This is the basic theological view.”[75] Ellis continues by showing how God’s physics readies the universe for God’s loving plan. “The key idea is that the fundamental aim of [God’s] loving action shapes the nature of creation, in particular setting its meaning and limitations.”[76]

Robert John Russell believes divine design underlies nature’s chance. “God chose these values to be precisely what they are, in order that life would arise eventually and by ‘blind chance’ on a planet such as ours.”[77]

Such a providential interpretation of the Big Bang’s initial conditions so mortifies the hard-nosed physicist that he or she wants to say: there must be another explanation? Enter: the multiverse theory, or theory of multiple universes. Baylor physicist Gerald Cleaver provides a definition: “A multiverse is defined as a hypothetical set of possible universes, either finite or infinite in number (including our own observable universe), that together constitute the entirety of space-time, matter, and energy, as well as an underlying set of physical laws or equations.”[78] According to the hypothesis of the multiverse, every potential becomes actualized in one or another universe, eliminating chance, randomness, contingency, freedom, and teleology. Most importantly, the hypothetical multiverse eliminates the need for divine providence to explain the anthropic principle, because our anthropic universe is only one among other universes which are not anthropic.

Royal Society physicist Martin Reese rejects the providential explanation for SAP and turns to the multiverse option to avoid it. “If one doesn’t believe in providential design, but still thinks the fine tuning needs some explanation, there is another perspective. There may be many universes of which ours is just one.”[79] If our cosmos is accelerating and the distant galaxies will forever be beyond our visual horizon, this suggests that there may have been many big bangs in the past. In fact, there might have been a big bang for each possible set of initial conditions. This also means that our particular universe is nothing special, nothing designed, nothing purposeful.
Now, something interesting happens within the multiverse argument. What above we were calling the principle of plenitude in theology becomes in physics the principle of universality. "All that is possible, happens."[80] In other words, every potential universe has become an actual universe. We simply cannot see the others from within our universe. The number of universes is virtually infinite. Our particular universe actualized its potential for evolving life; but many others did not. We happen to live in the one universe that produced life, therefore, the theologically-minded over-interpret the meaning of the physical substrate when they see providential design. The idea of the multiverse provides a secular explanation for the anthropic principle. God is no longer needed to explain SAP.

What is fascinating here is that a theological argument—actually an anti-theological argument—exists right within physics when selecting a preferred scientific theory. The very fact that physical cosmology and even astrobiology from time to time find themselves appealing to theology (or anti-theology) in theory selection should provide sufficient reason for astrotheologians to register interest.

Does belief in a designing God as creator require only one universe directed by SAP? Or would the multiverse also require a divine creator? "Invoking the multiverse just pushes the question regarding cosmic design one step back," notes Helsinki theologian Olli-Pekka Vaino. "Is there perhaps a ‘multiverse generator’?"[81]

Physicist Cleaver believes the multiverse hypothesis better fits theology than SAP. "A multiverse of universes, perhaps as many as $10^{500}$ or more at a time, with an infinite recycling of new and different universes seems far more in tune with the creative nature of a God of the infinities."[82] Whether SAP or multiverse, the astrotheologian's articulation of divine creation dare not sidestep reflection on scientific cosmology.

**Astrotheology's Method: Constructive Doctrinal Theology**

We have noted that the minimalist definition of astrotheology indicates the necessity of the theologian to reflect on the implications of the science. When we turn to the maximalist definition, we will see that the astrotheologian responds to impulses from within religious tradition itself. Here are the doctrinal loci or areas of concern for the astrotheologian: creation, Christology, sin, eschatology, and ethics.

**Creation & Geocentrism**

According to the biblical tradition shared by Jews, Christians, and Muslims, the God of Israel is the creator of all things. This creation includes the galaxies and extraterrestrials. Iqbal speaks for the three religions of the book: "The Quranic doctrine of God reveals Him as being at once Absolute, Infinite, and Perfect, as the Source of all reality and all positive qualities manifested in the cosmic order. Islamic spirituality is nothing other than knowing, loving, and obeying God through the means revealed in the Quran and promulgated and exemplified by the Prophet."[83]

Theologians and other intellectual leaders in each religious tradition need to reflect on the scope of creation and settle the pesky issue of geocentrism.

As we saw in the history sections above, a widespread misleading assumption is afoot. Allegedly, pre-Copernican Europeans had relied upon a belief that the planet Earth was in the center of the universe. This geocentrism allegedly supported their *hubris*, their pride-of-place as Earthlings and as human beings, presuming the human race to rank highest among the living creatures. Today, both non-theologians and theologians worry that a geocentric or anthropocentric religion will suffer drastically if a new relationship with extraterrestrials challenges this persistent belief system. What needs emphasis is the recognition that the biblical tradition is not necessarily tied to geocentrism. It is inclusive of the universe no matter how expansive.

The scope of creation for the Abrahamic traditions is inclusive of everything, known and unknown, visible and invisible. When Jews, Muslims, or Christians speak of creation, it includes all of physical reality. The immensity of God surpasses the immensity of the universe. After all, since Anselm we have thought of God as that than which nothing greater can be conceived (*id quo maius cognitari nequit*).

This understanding of God in itself should settle the problem of alleged geocentrism. God is the center, figuratively speaking, not Earth. Wilkinson makes the point forcefully. "Human beings are not the centre of the universe. In fact, it is the human belief that we are the centre of all things that the Bible calls sin. God is the centre of all things, and we are creatures given status by his love."[84]

**Christology: One or Many?**

*Christology* is distinctive to Christianity, to be sure. Does the atoning work of Jesus Christ on Earth suffice for all beings throughout the universe? Or, might we expect God to become incarnate multiple times, once for each spiritually ready species?

The astrotheologian should set the parameters within which the ongoing debates over Christology (Person of Christ) and soteriology (Work of Christ) are carried on.

"God provides multiple incarnations wherever ETI has evolved," argues Robert John Russell at CTNS in Berkeley.[85] Each extraterrestrial civilization would need an incarnation, according to this argument, just to learn about the Creator God. John Polkinghorne at Cambridge similarly affirms species-specific appearances on various planets. "God’s creative
purposes may well include ‘little green men’ as well as humans, and if they need redemption we may well think that the Word would take little green flesh just as we believe the Word took our flesh.”[86]

The contrary position is this: the single divine incarnation of God in Jesus Christ within the history of civilization on Earth has soteriological significance for all places and all times. Multiple incarnations on various planets, therefore, would be unnecessary.

Managing editor of Theology and Science, Joshua Moritz, asserts that one incarnation suffices for the cosmos. Moritz follows the patristic surmise that when the divine took on flesh, all flesh became redeemed. All flesh, not merely what is human. “Does the Messiah—as creator God incarnate—save the animals, the Neanderthals, and ET? The theological logic of redemption found in Early Judaism, the New Testament, and the Early Church would certainly declare: yes.”[87]

Whether an astrotheologian sides with multiple incarnations or a single one, they key is that God’s redemption is cosmic in scope.

**Sin: What Should We Expect?**

The third on our list of the astrotheologian's tasks is Sin. Muslims and Christians seemingly disagree regarding who's responsible for original sin. Whereas Christians hold that we wake up as humans and realize we have inherited a history of sin in our world, Muslims hesitate to pre-date sin on the grounds that this would make it appear that Allah is responsible for what is strictly a human responsibility. Humans sin freely, not because God predestined us to sin. In both the Islamic and Christian cases, however, the theologian will want to ask: would extraterrestrials whom we encounter be fallen like us? Or, might they be so evolutionarily advanced in science, technology, and morality as to bring goodness if not salvation to us on Earth?

For a Muslim, what distinguishes terrestrial humans from the rest of nature is freedom of choice and the moral responsibility that accompanies this freedom. “Qur'an elaborates that all the rest of nature i.e. the sun, moon, stars, mountains, physical phenomenon, plants, even animals and birds unquestioningly obey the Creator's laws. It is only humans who have been given the freedom of choice. But, it points out; they must remember that they will be held accountable for the choices they make. It is not going to be a free ride.”[88] Might a Muslim theologian extrapolate this assessment of the terrestrial human condition to that of morally free extraterrestrials?

For a Muslim, the primary creaturely sin is against God. “The greatest sin that man can commit is the denial of this divine Oneness or of accepting a partner (shirk) for God—hence the odium which surrounds every form of polytheism (shirk), which implies exoterically the formal acceptance of another divinity besides God and esoterically the acceptance of any force or power, whether it be within the soul of man or in the outside world, as being independent of God. At the heart of all Islamic spirituality stands the doctrine of God's Oneness and its implications for and ramifications within the human soul.”[89] The astrotheologian must ask: will ETI know God, honor God, and obey God? This question cannot be answered until we terrestrials meet them.

Our awareness of human sin leads to an additional question: should we Earthlings prepare to protect ourselves from alien aggression? The late Stephen Hawking certainly thought so. The world renowned physicist worried that an alien spacecraft might make its way to Earth on an expedition, seeking to strip-mine our home planet for its natural resources. In the process, the more advanced extraterrestrials would subjugate if not enslave the human race. In the 2016 television program Stephen Hawking's Favourite Places, he advised against METI, against sending messages to distant exoplanets. Rather, we should hide electronically, so as to remain invisible and thereby protected from alien invasion.[90]

Hawking, the physicist and atheist, presupposed the doctrine of sin; and he applied it to unmet ETI. What is realistic? Robert John Russell submits the ambiguity hypothesis. “I predict that when we finally make contact with life in the universe, it will be neither the insipidly angelic E.T. variety nor the unmitigated demonic alien that Independence Day portrays. Instead, I predict that it will be a lot like us: seeking the good, beset by failures, and open to the grace of forgiveness and new life that God offers all God's creatures, here or way out there.”[91] Until we actually meet our space neighbors, perhaps Russell’s position is the most reasonable among the options.

The astrotheologian should expect that alien intelligences will be fallen, living ambiguous lives with the potential for great virtue yet with the temptation to avarice and malice.

Theologian Noreen Herzfeld reminds us that, whether ET is sinful or not, we still need to look to our own terrestrial responsibilities. “Should the skies remain silent, then we must either grow up rather quickly as a species or accept that transience is a part of life, not just for individuals, but for civilizations, for species, even, perhaps, for life itself.”[92]

**Redemption & the ETI Myth**

The fourth locus on the astrotheologian's task list is Eschatology. God has promised redemption and renewal. “Islamic eschatology presents a grand scenario of a sudden and decisive moment when all existents will reach their end—an absolute annihilation, uniformly encompassing the tiniest atom and the vast galaxies, leaving nothing but the face of the Lord. If there are beings on planets other than Earth, they would be included in this universal return to the Creator.”[93] In parallel fashion, Christian Keith Ward foresees God’s eschatological future as “the uniting of all things—
The astrotheologian must acknowledge dissonance here. Scientific cosmology is not consonant with biblical eschatology. With the prognostications of physical cosmologists regarding the demise of our sun and the eventual heat death of the universe, how should we handle the biblical symbols of “new creation” and “eternal life”? Scientific cosmology does not look anything like biblical eschatology, according to which God promises cosmic transformation and renewal. This will be especially challenging to the Abrahamic traditions: Judaism, Christianity, and Islam. When it comes to placing our hope for a renewed and redeemed creation, we will have to rely solely on God’s promise, not science.

Even so, another problem requires the attention of the astrotheologian, namely, the ETI myth. The myth says this: science saves, and superior extraterrestrial science will save Earth. This myth has arisen within the heart of science; and it requires demythologization if not demythicization. We are talking about the myth of salvation coming to Earth from a more advanced extraterrestrial science.

Physicist and astrobiologist Paul Davies articulates the myth by speculating on the technological and moral superiority of extraterrestrial superintelligences. “There will be communities of beings who may have reached our stage of development millions of years ago. Those beings are likely to be far ahead of us not only scientifically and technologically, but ethically too. Quite possibly they will have used genetic engineering to eliminate grossly criminal or antisocial behaviour. By our standards they would be truly saintly.” Will alien saintly science bless us on Earth with technological and moral transformation? If so, who needs God’s grace?

Harvard sociobiologist E.O. Wilson anticipates contact with more highly evolved aliens who have surpassed us Earthlings and attained utopian existence. “Perhaps the extraterrestrials just grew up. Perhaps they found out that the immense problems of their evolving civilizations could not be solved by competition among religious faiths, or ideologies, or warrior nations. They discovered that great problems demand great solutions, rationally achieved by cooperation among whatever factions divided them. There was no need to colonize other star systems. It would be enough to settle down and explore the limitless possibilities for fulfillment on the home planet.”

A constellation of ideas has converged to produce this ETI myth: evolution, progress, deep time, confidence in science to solve problems, and the belief that technological advance is accompanied by moral advance. “Today, ancient myths are reemerging with a scientific spin and cloaked in space-age garb,” writes Harrison. “Thus, rather than subject to God’s scrutiny, we are watched by naturally evolved entities whose level of intelligence is beyond our ken. We are visited by humanoids that drive advanced spacecraft and wear shiny spacesuits.” The ETI Myth is found among both astrobiologists and the UFO believers, unfriendly siblings though they may be.

Theologian James Herrick uses the term “Myth of the Extraterrestrials” to refer to “the idea that intelligent extraterrestrials exist and that interaction with them will inaugurate a new era in human existence.” Spiritually deprived modern culture is thirsting for superior entities in space who can save our planet and, according to Herrick, this is a poor substitute for the classic God of theism and its genuine promise of redemption. Herrick fears that the ETI Myth—replete with the alleged evolutionary promise that we can employ science and technology to achieve our own redemption and that our more highly evolved ETI neighbors are already where we are going—will replace the Christian faith, not augment it. “The biblical message is that transforming grace rather than an evolving human race is the means of discovering our spiritual destiny. Salvation is the liberating gift, not of benevolent aliens, but of a preexistent, creating and redeeming God.”

On behalf of biblical eschatology, the astrotheologian should penetrate the ETI myth with the tools of demythologizing or even demythicizing. The astrotheologian should offer a critique when scientists try to practice theology without a license.

**Astroethics**

The fifth item on the astrotheologian's task list is Ethics or, more specifically, Astroethics. What are the quandary issues rising from space exploration and related matters? What direction should public policy take? This indicates that astrotheologists will need to ally with space scientists and all persons of good will to set public policy. It indicates the need for a new field: astroethics.

Theologians and religious intellectuals should cooperate with leaders of multiple religious traditions and scientists to set public policy regarding space exploration ethics as well as prepare the public for the eventuality of extraterrestrial contact.

Astroethics must assess two domains: space exploration within the solar system and the search for extraterrestrial intelligence on exoplanets. Within the solar commons, the astroethicist should ask the following twelve questions: (1) does planetary protection from alien contamination apply to Earth alone, or are we Earthlings responsible for protecting off-Earth biospheres? (2) does extraterrestrial microbial life have intrinsic value, warranting our protection? (3) should space explorers invoke the Precautionary Principle when planning invasions of off-Earth biospheres? (4) how should we manage moral responsibility for cleaning up the 22,000 tons of space junk Earthlings have already left in Earth’s orbit? (5) should satellite surveillance be permitted and controlled? (6) should nations weaponize space? (7) which gets priority to off-Earth sites: scientific research or making a profit? (8) should we Earthlings terraform Mars? (9) should we Earthlings colonize Mars? (10) how should we protect Earth from extraterrestrial threats such as asteroids?
Astrobiologists have already concluded that no intelligent life lives anywhere within our solar system other than on Earth. The only local life to which we may owe moral responsibility will be non-human life, most likely microbial. Astrobiologists might be misleading if it turns out that all life, even microbial life, is intelligent.

Be that as it may, to find intelligent life we must extend our search beyond the solar ghetto into the wider Milky Way metropolis. Beyond the Milky Way the distances between galaxies and stars is so vast that we have no conceivable prospect of inter-galactic communication. It is reasonable, however, for astrotheologians to think of the Milky Way as a galactic commons.

Within the Milky Way commons, the likelihood of discovering intelligent life seems to be rising with each new discovery of exoplanets in the habitable zone. Even though we have not yet met them, our moral quandary might suggest dividing intelligent aliens into three preliminary categories: extraterrestrial creatures less intelligent than Homo sapiens; equal in intelligence to us; or superior in intelligence. If we add these three to our list of a dozen, we now have fifteen quandaries. (13) In the event that ETI are somewhat intelligent but less intelligent than we are, might our existing moral responsibility toward animals provide a reservoir of moral precedents? (14) In the event that ETI are equally intelligent, might our existing commitment to dignity, equality, and rights contribute to formulating our moral responsibility? (15) In the event that ETI are intellectually superior to us, might we appeal to our own history of caste and servitude if not slavery? We combat slavery on our planet only because we have come to believe in equality and dignity regardless of one's status at birth. If we Homo sapiens find ourselves objectively inferior to superior aliens, how might this previous experience of slavery with liberation apply off-Earth?

No one can predict with precision exactly what is coming. If the day of extraterrestrial contact arrives, re-thinking our terrestrial worldviews should follow. This is likely to be complex, not simple. Harrison observes, "we cannot simply incorporate extraterrestrial ideas without thinking them through, because our systems (supranational, societal, and organismic) have highly interrelated parts, so changes in one arena yield changes in another." [109]

Religion is one of those parts, perhaps even foundational for revised worldview construction. Hart foresees that "the collaboration of scientists, ethicists, and theologians will enhance both reflection on Contact, and terrestrial-extraterrestrial interaction when Contact occurs." [104] Cooperation and collaboration are the watchwords.

**Conclusion**

As a form of public theology, astrotheology is a dialogical field of scholarly study at the intersection of religious reflection and natural science. The astrotheologian asks: what are the implications of space exploration and the possibility of discovery of extraterrestrial life, either microbial life within our solar system or intelligent civilizations on exoplanets? At minimum, astrotheologians draw out the religious, social, and ethical implications of astrobiology. At maximum, Muslim, Christian and other religious thinkers engage in doctrinal construction on loci such as creation, Christology, sin, eschatology, and astrotheology.

**References**


[22] Ibid., 35


[28] Ibid., 111.


[34] Cited by Lovejoy, ibid., 115.


[40] Ibid., 172.


[43] Ibid.

[44] Ibid.

[45] Ibid.


[48] Ibid., 463.

[49] Ibid., 240-259.

[50] Ibid., 319-323.

[51] Cited by Crowe, *Extraterrestrial Life Debate*; 125

[52] Ibid., 304-305.

[53] Ibid., 352.

[54] Ibid., 365.


The term astrobiology comes from the Greek: αστρο, astro, "constellation"; βίος, bios, "life"; and λόγος, logos, "knowledge." It is the interdisciplinary study of life in the universe combining aspects of astronomy, biology, and geology. It is focused primarily on the study of the origin, distribution and evolution of life. Given the influx of new information about planetary systems around other stars, its mandate has expanded beyond the study of exobiology, from the Greek: έξω, exo, "outside." See the University of Arizona project, “Astrobiology and the Sacred: Implications of Life Beyond Earth,” http://scienceandreligion.arizona.edu/project.html.


Ibid., 386, Ellis' italics.


Cleaver, "Multiverse," 94.


Russell, Robert John, “Many Incarnations or One?” Astrotheology, 303-316, at 303.


Iqbal, "Islamic Theology Meets ETI," 225.


This ethical quandary is one of the most important, because it requires a moral commitment that extends beyond anthropocentric interest. "Respect the extraterrestrial ecosystem and do not substantively or irreparably alter it (or its evolutionary trajectory)." Margaret S. Race and Richard O. Randolph, “The Need for Operating Guidelines and a Decision Making Framework Applicable to the Discovery of Non-Intelligent Extraterrestrial Life,” *Advances in Space Research*, 30:6 (2002):1583-91, [http://www.seti.org/pdfs/m_race_guidelines.pdf](http://www.seti.org/pdfs/m_race_guidelines.pdf).


**Keywords**

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