

David A. Weintraub

Religions and Extraterrestrial Life

*How Will We Deal
With It?*



 Springer

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SPRINGER–PRAXIS BOOKS IN POPULAR ASTRONOMY

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To

My California family, the Kennedys and Holberts:

Doris, Janelle, June, Allen, Suzy, David, Juliana, and Greg

Were there men, he was asked, living elsewhere in the universe?
“Other beings, perhaps, but not men,” he answered.
Did science and religion conflict?
Not really, he said, “though it depends, of course, on your religious views.”¹

Albert Einstein
Upon his arrival in San Diego on December 31, 1930

¹ Isaacson, W. (2007). *Einstein*, p. 372. New York: Simon & Schuster and Brian, D. (1996). *Einstein: A Life*, p. 206. New York: John Wiley & Sons, Inc.

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Part I

Discovering Extrasolar Planets

1

Once Upon a Time

*The heavens declare the glory of God, and the firmament
showeth His handiwork.*

Psalm 19

ARE WE ALONE?

Once upon a time, almost two-and-a-half thousand years ago, the great Greek natural philosopher Aristotle offered nearly unassailable arguments that the Earth was the center of the celestial spheres and therefore of the entire universe. Based on the laws of physics he asserted as true, he and all of his intellectual followers knew, absolutely, that no other Earths, no other inhabitable worlds and therefore no other living, god-worshipping beings could exist anywhere in the universe but Earth. In Aristotle's universe, humanity was alone.

While other wise thinkers put forward many ideas over the next two millennia in support of the opposing view, that the universe might be full of other sentient beings living on distant worlds, Aristotle's ideas emerged intact from every intellectual skirmish except the last one. When in 1543 C. E. Copernicus hurled the Earth into orbit around the Sun, the subsequent intellectual revolution smashed Aristotle's celestial spheres to dust, rendered his laws of physics meaningless and swept the discarded remnants of the Aristotelian, geocentric universe into the trash bin of history. The other-worlds pendulum quickly swung away from the we-are-alone-in-the-universe pole and toward the we-have-lots-of-company direction.

Once upon a time, 400 years ago, the wisest scholars in the western world knew, absolutely, that the universe was swarming with inhabited worlds, other Earths. The medieval doctrine of plenitude asserted that all of God's created worlds—the Sun, the Moon,

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the planets, the moons of Jupiter, the rings of Saturn, and all of the stars—must be inhabited. God, these scholars argued, had created these worlds and God always acts with purpose, one that we humans have the ability to understand and explain. As was self-evident to medieval Christian scholars, God's purpose in creating a universe full of worlds was to create a universe full of habitable and necessarily inhabited places. Furthermore, each and every world must be an abode for intelligent life, for creatures who could and would worship God their creator. The doctrine of plenitude even explained why stars exist: God created stars so that they might provide light and warmth for the living beings on the planets in orbit around them. The planets themselves, according to this idea which gained near universal acceptance in the seventeenth century, were created by God for the purpose of sustaining and supporting the lives of the creatures living and worshiping God in those myriad abodes.

Once upon a time, just a few decades ago, astronomer Carl Sagan, the greatest scientific popularizer in modern times of the idea that the universe must teem with life, wrote in his 1973 book *The Cosmic Connection*, "The idea of extraterrestrial life is an idea whose time has come."¹ Sagan's view of life in the universe parallels the expectations and beliefs that reverberate through modern, popular culture. Despite the absence of any scientific evidence for life beyond the Earth, in the popular imagination the universe swarms with life. Our movies, from *The War of the Worlds*; *The Day the Earth Stood Still*; *Invasion of the Body Snatchers*; *Alien*; *Star Trek*; *Star Wars*; *E.T.: The Extra-terrestrial*; *Close Encounters of the Third Kind*; *Cocoon*; *Independence Day*; *Avatar*; and even *Man of Steel* are filled with aliens. Our newspapers and magazines are checkered with reports of UFO sightings, including most famously the supposed UFO crash in Roswell, New Mexico in 1947, the lights seen in the skies above Lubbock, Texas, in 1951 and the crafts seen by pilots aboard Japan Air Lines flight 1628 in 1986. Our websites include detailed reports on alien abductions, including those of Betty and Barney Hill of New Hampshire in 1961, who claim to have been medically examined by their alien abductors, of Betty Andreasson of Massachusetts who reports that she was taken aboard alien spaceships multiple times in the 1960s, of Air Force Sergeant Charles Moody who reports that he was temporarily paralyzed by aliens in 1975 and of Australian Peter Khoury who in 1988 claims that his head was punctured by aliens with a needle. Also, our cartoons and television shows include heroes like Superman (in *Adventures of Superman*) from the planet Krypton, ALF (in *ALF*) from the planet Melmac, Mork (in *Mork & Mindy*) from the planet Ork, Spock (in *Star Trek*) from the planet Vulcan, Uncle Martin (in *My Favorite Martian*) from Mars, Commander Adama (in *Battlestar Galactica*) from the planet Caprica and the Solomon family (in *3rd Rock from the Sun*) from an unnamed planet. If books purchased, television shows watched and magazine articles read are a measure of attitude and belief, large numbers of people believe that Stonehenge was built with the help of alien engineers and that crop circles are messages from extraterrestrial visitors.

A National Geographic Channel survey of 1,114 persons conducted in 2012 indicated that 30 % of Americans (80 million people) were certain that aliens in UFOs had visited the Earth and 77 % believed some evidence exists that proves that aliens have been here. Only 48 % were not sure, and only 17 % do not believe aliens have ever visited Earth.

¹ Sagan, C. (1979). *The cosmic connection* (p. 198). Dell Publishing.

This study also reported that 79 % of the population thinks the government is withholding information about UFOs from the public (a result that strongly implies that 79 % of Americans think that aliens have been here, conducting business). A similar survey of 1,003 persons by the Scripps Howard News Service and Ohio University, conducted in 2008, found that one-third of adults think that intelligent aliens have visited Earth.² A larger, demographically broader (23,000 persons in 22 countries) Reuters/Ipsos poll taken in 2010 found that 20 % of those surveyed believe in extraterrestrials.³ A survey of 5,886 Americans conducted in 2013 by the consumer research firm *Survata* found a similar result: 37 % of those surveyed “affirmed a belief in the existence of extraterrestrial life” while an additional 42 % were uncertain. Only 21 % denied the possibility that extraterrestrials exist. Of those responding to the survey, 55 % of atheists and 44 % of Muslims agreed with the proposition that extraterrestrial life exists. Slightly less certain were Jewish (37 %) and Hindu (36 %) respondents. Christians (32 %) were least likely to say ‘yes.’ Of the Christians, more than one-third of Eastern Orthodox (41 %), Roman Catholic (37 %), Methodist (37 %) and Lutheran (35 %) people surveyed were believers in extraterrestrial life, while Baptists (29 %) were below the one-third threshold.⁴ Many other opinion polls taken over the last half-century reveal similar results.

Sagan wrote at a time when the theological, philosophical doctrine of plenitude had been replaced with the probabilistic, mathematical certitude of statistics. Sagan based his statistical arguments on numbers gleaned from data obtained with telescopes, in laboratory physics experiments and via space exploration. All such data taken together suggested to many scientists in the late-twentieth century and continue to suggest to a great many twenty-first century scientists that living creatures, and almost certainly intelligent creatures, must populate virtually every part of the universe. Sagan’s modern, statistical, non-theistic vision posits the existence of billions of galaxies, each containing tens or hundreds of billions of stars; most of these trillions of stars likely have ten or more planets, many of which will have robust chemical mixtures as well as temperatures that are warm enough to support liquid water but not so hot as to boil away that water. Given enough time, life almost certainly will come into existence, set down roots in countless locations and evolve toward intelligence, with or without God cooking and stirring the primordial soup.

This view of the suitability of the universe for and propensity to produce life might even be right. Data derived from astrophysical theory and observations, however, can also be used to strongly suggest that we humans might be more alone than most of our forefathers and foremothers had thought. As the great physicist Enrico Fermi reputedly asked in 1950, *Where are they?*⁵

²More than one third of Americans believe aliens have visited Earth. *Christian Science Monitor* (2012, June 28). Retrieved from <http://www.csmonitor.com/Science/2012/0628/More-than-one-third-of-Americans-believe-aliens-have-visited-Earth>

³Do you believe in aliens? Survey says 1 in 5 believe. *Digital Journal* (2010, April 11). Retrieved from <http://digitaljournal.com/article/290378>

⁴survata.com/blog/science-or-sacrilege-atheists-and-agnostics-are-76-more-likely-than-christians-to-believe-in-the-existence-of-extraterrestrial-life.

⁵Jones, E. M. (1985, March). ‘Where is everybody?’ An account of Fermi’s Question. *LA-10311-MS*.

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Now, suddenly, soon after we have entered the twenty-first century, the debate about life on other worlds is about to change from the realm of thoughtful opinions to the domain of hard science. Astronomers are collecting data that will affect our understanding of and change our conversations about extraterrestrial life forever. In fact, we may soon have a very clear understanding about our place in the universe, as *we are now crossing the boundary from informed speculation to quantitatively-based knowledge as to how many Earth-like planets exist in the universe and whether any of them might harbor recognizable life forms.*

Almost every week, astronomers announce another discovery of planets around other stars. Nearly every discovery announcement is accompanied by a proclamation by a wise astronomer that this planet leads us ever closer to discovering life beyond the Earth. In 2013, a team of astronomers discovered three planets of similar size and mass to the Earth orbiting the star Gliese 667—a star located only twenty-two light years from Earth—whose orbits place them in the region around the star in which liquid water could exist on the surfaces of these planets. Astronomer Guillem Anglada-Escude commented on his team’s discovery that the chance that one of these planets has conditions that can support life is “tremendous.”⁶ Once astronomers have identified millions of such planets where life could exist, how much more time will pass before they determine that life *does* exist?

Are we alone or do we have company out there? Whatever the answer, knowing it will trigger one of the greatest intellectual challenges in human history, not the least of which will be a theological one for terrestrial religions. Science writer Michael Chorost, writing in *The New Yorker* in 2013, asserts that “it would change everything to know that an alien civilization exists somewhere, anywhere, in the cosmos.”⁷ Indeed. *It would change everything.* From a religious perspective, *knowing* that humanity, that life on Earth, is but a tiny part of the cosmos could make us feel insignificant. Alternatively, as the liberal minister Parker Joss says near the end of Sagan’s novel *Cosmos*, proof that we are not alone “also makes God very big.”

English cosmologist and theoretical physicist Paul Davies, who is now a professor at Arizona State University, argues fairly simplistically and with attention only to western religions in his book *Are We Alone?* that our great religions will have to change dramatically, should we discover extraterrestrial beings more technologically advanced than we: “The discovery that mankind did not represent the pinnacle of evolutionary advance would prove a two-edged sword. ... It is hard to see how the world’s great religions could continue in anything like their present form should an alien message be received. ... From the point of view of religion, it might be the case that aliens had discarded theology and religious practice long ago as primitive superstition and would rapidly convince us to do the same. ... If they practiced anything remotely like a religion, we should surely soon wish to abandon our own and be converted to theirs.”⁸ Maybe Davies is right, and maybe he is wrong. Perhaps some religions will handle this knowledge with more flexibility and comfort than

⁶Landau, E. Researchers: Newly found planets might support life. Retrieved from <http://www.cnn.com/2013/06/26/tech/innovation/new-habitable-planets>

⁷Chorost, M. (2013, June 26). “The Seventy-Billion-Mile Telescope,” in *The New Yorker* on-line.

⁸Davies, P. (1995). *Are we alone?* (pp. 54–55). New York: Basic Books.

will others. Undoubtedly, painting all religions with the same broad brush, as did Davies, is unlikely to serve as a satisfactory approach for pursuing a deep understanding of what the future may bring.

The first part of this book will introduce the discoveries in modern astronomy that suggest we are on the cusp of one of the most important intellectual revolutions in history: the discovery of life beyond the Earth. Additional details about many of these discoveries are presented in the Appendix.

I will then present an examination of the histories, scriptures and belief systems of most major religions, in order to discover whether which, if any, of these religions offer clear paths for thinking about how ready we are spiritually, theologically and scripturally for a close encounter with extraterrestrial Others.

Can we draw reasonable conclusions as to how Judaism, Roman Catholicism, Orthodox Christianity, the Church of England, mainline Protestant Christianity, fundamentalist and evangelical Christianity, Mormonism, Islam, Hinduism, Buddhism, Sikhism, Jainism, the Bahá'í Faith and a handful of other deeply-rooted religions might handle the coming intellectual revolution? Yes, we can.

For some major religions, the very concept of extraterrestrial life is built into their histories and/or scriptures; for others, ideas about extraterrestrial life are clearly irrelevant to their belief systems. For at least a few religions, evidence for the existence of extraterrestrial life would require making some adjustments, ones that can be made when the time comes, but those adjustments would not come at great theological cost; for other religious groups, important and deeply held beliefs would be fundamentally undercut by proof that extraterrestrial beings exist. In all cases, we can ask whether the beliefs and practices of each religion are human-centric and earth-centric, as this knowledge can help us understand whether a particular set of religious practices limit that religion to the Earth or if that religion could be practiced in other parts of the universe.

Might a great spiritual awakening and revolution lie just ahead of us?

2

Pluralism Through Western History

Astronomy, like the Christian religion, if you will allow me the comparison, has a much greater influence on our knowledge in general, and perhaps on our manners too, than is commonly imagined (Rittenhouse, D. (1775, February 24). An oration delivered February 24, 1775, before the American Philosophical Society, Philadelphia (p. 7). Philadelphia: John Dunlap).

David Rittenhouse, 1775 C. E.

IS THE EARTH THE ONLY LOCATION IN THE UNIVERSE WHERE LIFE EXISTS OR CAN EXIST?

In western thought over the last several thousand years, ideas pro and con have been put forward in attempts to answer this question. Without any scientific evidence, the only strong consensus that emerged was that Aristotle's physics seemed to be right, and Aristotle's physics seemed to tie our hands in the sense that other worlds could not exist if Aristotle were right, unless of course God simply chose otherwise. This chapter offers a look at what some of our intellectual forefathers had to say on this topic, from ancient times until very recent times.

Ancient peoples likely spent very little time contemplating the existence or non-existence of other worlds, let alone whether those other worlds might be inhabited. In the west, that changed in the sixth century B. C. E. with the birth of rational science in the form of metaphysics and philosophy. In about 350 B. C. E., in his books *Physics* and *On the Heavens*, Aristotle (384–322 B. C. E.) summed up the accumulated wisdom of several centuries of Greek philosophical thought with his description of the physics at work in the universe, as understood in his time. Properly understood, the laws of physics according to Aristotle lead directly to an unequivocal answer as to whether humanity is alone in the universe: no other worlds exist and therefore humanity is alone in the universe.

The following logic explains how Aristotle reaches his conclusion. In an Aristotelian universe, four simple bodies—earth, water, air and fire—exist on Earth and in the Earth's atmosphere, a region that Aristotle calls the terrestrial realm. A fifth element, aether, exists only far above Earth's atmosphere, in the celestial realm. Bowls, flowers, emeralds, cows and all other real-world objects are composites made from varying proportions of the four basic building blocks of matter available in the terrestrial realm. The stars and planets, including the Sun and Moon, are made entirely of aether. Built into the very nature of each of the five elements is a purpose, and each purpose is a kind of motion.

One of the great powers of Aristotelian thinking is that Aristotle's conclusions appear to be based on observations that each and every person can and does make in his or her every-day experiences. Consequently, people can use their own senses each and every day to verify that Aristotle is right. To Aristotelians, the purpose for both earth and water is for those elements to seek their natural place at the center of the universe, that center being located at the center of the Earth. To achieve that purpose, earth and water naturally move downwards toward the center of Aristotle's universe. Indeed, in everyone's everyday experiences, objects made principally of earthy substances, like rocks and leaves and nuts, are heavy; they all fall downwards. Even if they are hurled upwards, in a direction that would be an unnatural motion for these objects, they naturally turn around and move as far downwards as they can. Likewise, fire and air seek to find their natural places as far as possible from the center of the universe, that is, as far as possible from the center of the Earth. These motions are also observable by ordinary people in their everyday experiences, as objects that one might imagine being made of fire and air are buoyant; light a fire and the sparks of fire and the hot air rise. Neither needs to be pushed upwards, as those motions are natural to those elements. Thus, both of these elements naturally move upwards, which is defined by Aristotle to be away from the center of the universe. Aether, Aristotle's fifth element, does not exist on or near the surface of the Earth. Aether only exists far above the Earth, beyond the edge of the terrestrial realm, above the sphere of fire which surrounds the sphere of air which encircles the spheres of water and earth. Beyond those four spheres that together are known as the terrestrial realm lies the realm of the aether, which fills the celestial realm. Out there, everything is made of aether, or so said Aristotle. The element aether is perfect, eternal, unchangeable and immutable; furthermore, circles have no beginnings or ends. As a result, according to Aristotle motion along the circumference of a circle is ceaseless and eternal and unchangeable and is the most natural and appropriate movement for objects made of aether. Consequently, the natural motion of anything made of aether is to move in a circle around the center of the universe (i.e., around the Earth), which is the reason objects in the heavens appear to move in circles around the Earth. Aristotle's laws of physics thus explain, naturally, why the Sun, the Moon, the planets and the stars all appear to circle the Earth.

Having established laws of physics that defined the natural, unforced motions of all objects as toward, away from or around the center of the universe, and having established from these laws of physics that the center of the Earth is identically the center of the universe, Aristotle, writing in his *On the Heavens*, pondered how earth, water, air and fire would move if another world existed. If, out there, somewhere far from the Earth, another world existed that was also made of earth and water, surely those elements would do what those elements naturally do. They would move toward the center of the universe, which is

the Earth, which also means they would move upwards rather than downwards in their own worlds. In addition, particles of air and fire in this other world would move away from the Earth, away from the center of the universe and thus downwards in their own worlds. "It must be natural therefore," Aristotle wrote, "for the particles of earth in another world to move towards the centre of this one also, and for the fire in that world to move towards the circumference of this."¹

This combination of movements, however, makes no sense, because those particles of earth in that other world also define a center of the universe, and so the universe would have two centers. Objects made of earth in our world would have to simultaneously move toward the center of the earth and toward the other center of the universe. "This is impossible," Aristotle continues, "for if it were to happen the earth would have to move upwards in its own world and the fire to the centre; and similarly earth away from the centre, as it made its way to the centre of the other, owing to the assumed situation of the worlds relatively to each other." Such a situation is self-contradictory. Something must be wrong. "Either, in fact, we must deny that the simple bodies of the several worlds have the same natures," he writes, "or if we admit it we must, as I have said, make the centre and the circumference one for all; and this means that there cannot be more worlds than one."

Since the parts of Aristotle's logic that are consistent on both the Earth and this hypothetical other world are the purposes, that is the natural motions, of the elements, the logical flaw in this scenario is that another world could exist. Therefore, Aristotle's logic demands that no other worlds, no other Earths, can exist and therefore only one habitable planet can exist in the entire universe. Such are the constraints of the laws of physics, as understood and explained by Aristotle and his followers. According to his arguments, life cannot exist anywhere other than Earth since the laws of physics preclude the existence of another abode for life anywhere else in the universe.

Although Aristotle's arguments dominated western thought from the fourth century B. C. E. until the sixteenth century C. E., other thinkers did place competing ideas into the intellectual marketplace. Epicurus (341–270 B. C. E.), who lived shortly after Aristotle and believed that the fundamental particles of the universe were atoms, argued that other worlds, full of living creatures, must exist: "Moreover, there is an infinite number of worlds, some like this world, others unlike it. For the atoms being infinite in number, as has just been proved, are borne ever further in their course. For the atoms out of which a world might arise, or by which a world might be formed, have not all been expended on one world or a finite number of worlds, whether like or unlike this one. Hence there will be nothing to hinder an infinity of worlds ... nobody can prove that in one sort of world there might not be contained ... the seeds out of which animals and plants arise and all the rest of the things we see."²

Unfortunately for Epicurus, his ideas about physics were less powerful than those of Aristotle and so his ideas in favor of the existence of other worlds were less convincing than Aristotle's arguments against the existence of those worlds. Nevertheless, the idea

¹ Aristotle. (1986). *On the heavens*, Book I, Part VIII (p. 73) (W. K. C. Guthrie, Trans.). Cambridge: Harvard University Press.

² Epicurus. *Letter to Herodotus*. Retrieved from <http://www.epicurus.net/en/herodotus.html>