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## Before SETI

### The Age of Pluralism

Lost in time, beyond knowledge, is that moment when a human creature first looked at the heavens, saw the lights of the sky, and asked if other beings lived in worlds above. We will never know when and where a human first asked that question. We will never know if a *Homo erectus* first asked that question, or if a Neanderthal man or a Cro-Magnon of later eras did the asking.

We know that people of early historic times believed in gods, mighty beings who played a role in human affairs. The ancient Mesopotamians (in today's Iraq) identified their gods with the planets to which they ascribed great power over humans. Other ancient peoples believed their gods lived in the heavens. Ra of the ancient Egyptians, Zeus of the Greeks, and Odin of the Germanic tribes all lived in the sky, ignoring humans but when bored showing a keen interest in humanity. Although extraterrestrials of sorts, the gods of antiquity were too much part of this world. They are not the extraterrestrials of today, distant and probably ignorant of our existence.

#### Greek Pluralism

The idea that other worlds exist beyond Earth and may contain intelligent creatures is known as pluralism. The classical Greeks, who had an opinion on nearly everything, probably invented it. Although their

speculations on extraterrestrial life could be whimsical, some of the Greeks realized the greater use of pluralism. Extraterrestrials could serve as an allegory to comment on humanity. Although no one cared to flatter the human race by imagining inferior, villainous extraterrestrials, the possibility of using superior extraterrestrials to deflate swollen human egos was irresistible. The Pythagoreans of the fifth century B.C., best known for their belief in the centrality of numbers, claimed the moon supported creatures of great size and beauty, a life so advanced that it did not produce excrement.

Also agenda-driven were the atomists, the best known of the Greek pluralists, who flourished from roughly 480 to 280 B.C. The atomists theorized that all matter reduced to indestructible atoms, perpetually and randomly in motion. When atoms combine, they make up the stuff of Earth. When they combine beyond Earth, they create other inhabited worlds. For the atomists, extraterrestrials were part of a vision of life that encompassed the entire universe. Yet pluralism was secondary to a social agenda. The atomists preached hedonism, holding that the random motion of atoms destroyed purpose in life and as a result people should live only for the moment. Besides, death and the possible punishments of the afterlife were not to be feared, because there was no immortality. The random motion of atoms saw to that.<sup>1</sup>

The atomic theory had a modern ring. The atomists made a case for extraterrestrials similar to the SETI community's in that they argued that Earth's physical laws were universal and led to the same results. If life appeared on Earth, it should appear elsewhere. In addition, like many moderns who reject traditional faiths, the atomists could not accept an empty universe. Although they posited a random system of matter, they gave a purpose to the rest of the universe by endowing it with life.

The atomists did not represent the classical mainstream. That honor belonged to the polymath Aristotle (384–322 B.C.), whose common sense often gave him great insight into a host of subjects. In one instance, though, Aristotle's common sense failed him. He believed the sun moved over a stationary Earth. After all, unless one is in love, one does not feel Earth move. The ever-practical Aristotle went a step further and assumed that Earth is the center of all motion. A cosmos with

only one center implies the nonexistence of other worlds. If they did exist, they would be sucked into the center, which is Earth.

### Medieval and Early Modern Pluralism

Aristotle was the premier savant of the ancient world, and his prestige persisted during the Middle Ages (roughly 500 to 1400 A.D.). The Catholic Church liked his rejection of pluralism, since pluralism implied that humanity was not the center of creation. Besides, extraterrestrials were irrelevant for salvation. There was a flaw, though, to Aristotle's geocentrism; it implied limits to God's power. Hence, Thomas Aquinas (1225–74) and William of Ockham (1288–1348), both leading philosophers, declared other worlds possible, although probably nonexistent.<sup>2</sup>

The possible became certain when the Polish astronomer Nicolaus Copernicus (1473–1543) forever changed our view of the heavens. By holding that the sun was at the center of the cosmos and that Earth moved instead of the sun, Copernicus created a new astronomical theory with astounding implications: he unwittingly questioned humanity's special place in the universe. The belief in human uniqueness gradually lost ground.<sup>3</sup>

Although Copernicus did not mention pluralism, he implied it. The seventeenth and eighteenth centuries would be its golden age. Scholars throughout Europe debated whether other worlds were inhabited and, if so, whether extraterrestrials professed Christianity, another religion, or none. Another pressing matter of discussion was the intelligence and ethics of extraterrestrials. To prick human egos, pluralists often posited superior extraterrestrials.<sup>4</sup>

During pluralism's golden age, astronomical information depended on primitive telescopes. By today's standards, much was unknown, giving much leeway to metaphysical speculation, often involving analogical and teleological reasoning. According to the argument from analogy, if two objects share many properties, that is, if they share properties A, B, C, and D, then if the first object contains E, chances are very good that the second object also contains E. The astronomer Johannes Kepler (1571–1630) used this reasoning to populate the moon. Since both Earth and the moon contained craters and mountains, Kepler deduced that

the moon also contained living creatures. According to the principle of teleology, matter and life has a purpose, making a lifeless universe meaningless. Pluralists concluded that other worlds contained life.<sup>5</sup>

Besides sowing doubts about Christianity, pluralism also served another agenda: comparing humans to their extraterrestrial counterparts. These comparisons call to mind utopian writers such as Thomas More (1478–1535), who compared ordinary humans to idealized humans,<sup>6</sup> or cynics such as Jonathan Swift (1667–1745), whose *Gulliver's Travels* unfavorably compared humans to horses. Also coming to mind is the practice of pointing to the alleged failings of civilized society through the “other”—for example, the “noble savage” of Jean-Jacques Rousseau (1712–78) or the sexually liberated Samoans of Margaret Mead (1901–78). Although third-world natives were not noble, nor Samoans free of sexual anxieties, claiming otherwise embarrassed the “civilized.” In the age of pluralism, extraterrestrials often served as a counterpoint to shame humanity, and they have continued to play this role in modern science fiction and occasionally in SETI itself.

### Pluralism in the Nineteenth Century

With many scholars believing in extraterrestrials, the public's credulity is not surprising. When the *New York Sun* claimed in 1835 that English astronomer Sir John Herschel (1792–1871) had seen moon people with his new telescope, many readers believed the hoax, showing how deeply the idea of extraterrestrial life had penetrated the popular consciousness. Not for the first time would fantastic stories of contact take in the public.

Several scientists suggested signaling extraterrestrials of our existence. In the 1820s, the mathematician Karl Friedrich Gauss (1777–1855) proposed clear-cutting large parts of the Siberian pine forest to illustrate the Pythagorean theorem, thereby demonstrating to the moon's inhabitants that Earthlings were intelligent. Joseph Johann von Littrow (1781–1840), director of the Vienna Observatory, also proposed a system of mathematical signaling. He suggested digging huge geometric trenches in the Sahara Desert, filling them with kerosene, and setting them alight, in the hope that other races in the solar system would

notice. The French physicist Charles Cros (1842–88) proposed a system of mirrors to reflect sunlight toward Mars.

By the mid-nineteenth century, metaphysical pluralism was facing sharp criticism. William Whewell (1794–1866), in his *Of the Plurality of Worlds* (1853), examined the argument from analogy and found no hard evidence and concluded that humanity is unique. In a way, Whewell foreshadowed today's SETI deniers who believe humanity unique in the universe. John Stuart Mill (1806–73) also objected to the argument from analogy, noting that whenever two phenomena have more dissimilarities than similarities, the unknown aspects are less likely similar. His example was alleged moon life. In Mills's opinion, without more astronomical knowledge, analogical reasoning was invalid for pluralism.<sup>7</sup>

In the second half of the nineteenth century, pluralism had the good fortune of three great scientific advances: the nebular hypothesis, spectrum analysis, and the theory of biological evolution. The nebular hypothesis was a new view of the solar system's origins.<sup>8</sup> According to this hypothesis, the solar system was formed when a huge cloud of gas and dust, called a nebula, collapsed and was pulled in by gravitational forces. The nebular hypothesis boosted pluralism because it implied that the same process formed other stars and planets.<sup>9</sup>

Spectrum analysis began with the discovery that the spectrum (or light frequency) of each chemical element produces an emission line with a unique pattern. Using this method, scientists soon discerned Earth's elements on the solar system's planets and moons. Spectrum analysis also revealed that stars contained the same elements as the sun. In other words, stars, no matter how distant from our solar system, even trillions of light-years, are simply other suns. Like our sun, they too may be surrounded by orbiting planets (since the 1990s a proven fact).

All that remained was to explain extraterrestrial life without referring to a deity. The theory of biological evolution did this. Proposed by Charles Darwin (1809–82) and Alfred Wallace (1823–1913), evolutionary theory made the development of terrestrial life a natural process. Survival of the fittest, or fortunate, was the key; it forced species to adapt to changing environments or perish. According to Darwin,

a species surviving over the millennia, if not millions of years, might change physically and eventually become a new species.<sup>10</sup>

Darwin's evolutionary theory had a staggering implication for pluralism. If life arose on Earth and developed from lower to higher forms, the same natural process could take place elsewhere, especially since the universe contained the same elements throughout. Evolution now replaced teleology in the pluralist schema. No longer were extraterrestrials necessary to give other worlds a purpose. As on Earth, local conditions determined life's emergence.

### The Strange Career of Percival Lowell

In 1877, the Italian astronomer Giovanni Schiaparelli (1835–1910) announced that the Martian surface had straight features, which he called “canali.” Unfortunately, this Italian word, which means “channels,” was mistranslated as “canals,” feeding the imagination of a generation prepared by pluralistic thought and recent science to believe in extraterrestrial life.<sup>11</sup>

The best-known canal chauvinist was Percival Lowell (1855–1916), who claimed that his telescope revealed canals on Mars. Scientific in approach and the author of scholarly papers, Lowell could not be dismissed as a quack. Although knowledgeable, Lowell was wrong nonetheless. His career shows how agendas can twist the faculties of even the intelligent and honest.

Lowell was an old-money, proper Bostonian who could have quietly enjoyed life and its privileges. Instead, Lowell was fearful and alienated. He worried over the relative decline of Boston and its elite, eclipsed by the crass new money of the industrial and oil barons who preferred to live in New York City. Lowell also worried over dangers from below. The lower classes were increasingly assertive and, along with the ever-increasing “immigrant horde,” threatened to swamp the WASP elite. Proper men were not even safe from the distaff side. The emerging feminist movement threatened the sexual hierarchy he took for granted.<sup>12</sup> Lowell convinced himself that his Martian observations validated his social and political views.

Like his Puritan forebears who believed themselves chosen by God,