

Thought Experiment

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MAGIC, SCIENCE, AND THE MOON IN *LE VOYAGE DANS LA LUNE*

The Speculative Screencraft series examines how different storytelling themes and techniques have come to be used in science fiction cinema over time.

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There's perhaps no more iconic image from the earliest days of science fiction film than the bullet-like space capsule stuck in the eye of the Man in the Moon from Georges Méliès' 1902 silent film, *Le Voyage dans la Lune* (*A Trip to the Moon*). At the turn of the twentieth century, the Moon had thoroughly captured the imagination of Western cultures. Speculation on what the surface of the Moon was like, and whether it harbored Lunar life, were questions science had raised, but could not yet answer. However, wherever science is found lacking, science fiction excels, and Méliès' understanding of the public's hunger for an answer to this big, existential question about our place in the universe made *A Trip to the Moon* an international sensation.

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The profound sense of wonder evoked from scientific understanding means it carries within it some amount of magic. Méliès' understanding of this can be observed in the opening scene of *A Trip to the Moon*, in which a Scientific Congress is convened at the Astronomic Club, where a crowd of rowdy, bewigged academics in wizard hats and robes passionately debate Dr. Barbenfouillis' proposal to take a trip to the Moon. It's an absurd juxtaposition—the telescopes that, by cinematic magic, become additional seating, the chalkboard on which Barbenfouillis draws a dotted line between a cannon on the Earth to the Moon, the near fisticuffs the proposal inspires—all lead up to Barbenfouillis and his supporters doffing their robes for more gentlemanly attire, and parading off, umbrellas held high.

In *Profiles of the Future* (1973), Arthur C. Clarke famously wrote, “Any sufficiently advanced technology is indistinguishable from magic.” For anyone living during the Victorian Era, this would have been an accurate description of their cultural experience. During their lifetimes, they saw inventions like steam powered engines, photography, electric light bulbs, the telephone, and the film camera turn the Western world into something less rural and agrarian, into something more urban and industrialized, seemingly by magic. Clarke's quote is particularly apt when thinking about what someone who lived in the eras before the Scientific and Industrial Revolutions might think about these inventions, let alone what they might say if they were told how science had fundamentally changed our views on nature and our place in the universe.

For most of our history we answered these questions with culturally idiosyncratic, magical thinking. Animism, thought to be the earliest type of religious thinking among hunter-gatherer societies, is a belief that spirits suffuse everything in the world, and thus those things have wills and motivations of their own. With the rise of agriculture, humans became more stationary and formed increasingly complex communities. Their religious beliefs became correspondingly more complex as well. Cooperation, common ground, and a shared morality were fostered by the development of shared rituals, as well as beliefs that punishments from deities would correct nonconforming behavior, which helped establish long-term societal stability.

It comes as no surprise that astral phenomenon, such as eclipses, comets, and the rotation and phases of the Moon, have found their way into the religious iconography of cultures from around the world. That the phases of the Moon roughly correspond to a woman's menstrual cycle did not go unnoticed, and led to its association in many cultures with the feminine. Lunar Goddesses can be found in the mythology of the Greeks and Romans in the West; the Dinka and Igbo in Africa; in China, Korea, and Indonesia in Asia; and the Lakota, Aztecs, and Mayans in the Americas. The reliably cyclical nature of the phases of the Moon also led different civilizations using the Moon to mark the passage of time, eventually leading to the development of Lunar calendars that helped coordinate work schedules, festivals, and holy days on a societal level.

Despite its central place in the day-to-day life and mythology of these early peoples, the Moon itself was thought to be unremarkable. During the time of Aristotle, in the waning days before the Common Era, it was generally believed that objects in the heavens were more perfect than the Earth, and therefore were perfectly spherical. The Moon's "tarnished" surface also made contributions to mythology, becoming the moon rabbit in East Asian folklore, and the "Man in the Moon" in different European and Christian traditions.

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In the next scenes of the film, Barbenfouillis and his associates go to the rooftop to observe the fabrication of their giant cannon, as towering plumes of steam rise from the casting of the gun's massive barrel. Then it's into the warehouse to watch laborers assemble their bullet-shaped capsule, in which they will fly to the Moon. Once completed, a big to-do is organized, and, taking a moment to first congratulate themselves for their ingenuity, the would-be explorers board the capsule and, to great fanfare, are shot toward the Moon.

The scientific method eventually grew out of Ancient Greek traditions from Classical Antiquity, then later from the Islamic and Byzantine science of the Middle Ages. Organized scientific thought developed in its complexity, much like religion, as it picked up and integrated new concepts over time. Two foundational ideas came from Aristotle. The first is the inductive-deductive method of reasoning, which holds that general principles should be formed based on evidence from experience and observation, and those principles should be tested using further observations. The second concept is empiricism, which holds that knowledge is derived from our senses. These methods were used by the Arab physicist Ibn al-Haytham in the Middle Ages to write his *Book of Optics* (1021), which upended prior theories that thought we could see objects because of light that comes from our eyes, rather than by light that comes off the objects we're viewing. Theories and ideas such as these were disseminated throughout Europe during the Renaissance and the Age of Discovery, thanks to translations of ancient Greek and Arabic texts. Further refinement of the method occurred during the early Modern Era, folding in ideas like skepticism and experimentation.

The invention and use of optical instruments and lenses led to scientific observations of the Moon that upended traditional, folkloric beliefs about it. Within the first year of the telescope's invention in 1608, Galileo used it to produce a set of six watercolors of the phases of the Moon. These showed that its surface wasn't perfectly smooth, but covered in mountains and craters, much like the Earth. Robert Hooke, an English scientist, who was among the first to use a microscope to look at microorganisms, included his interpretations of lunar geography in his book *Micrographia* (1665). This foundational work was released during the earliest days of the Royal Society of London, whose role was to support and promote science. *Micrographia* demonstrated the power of how lenses could change our understanding of both the heavens and the Earth. As telescopes got into more hands, the steady stream of lunar observations began to feed

speculation over whether there were geological processes on the Moon like there were on Earth that could account for its topography. It was thought, if those processes were the same, then perhaps the Moon supported life as well.

Speculation over the possibility of life existing on other planets dates back at least as far as Greek arguments about it in 610 BCE. This speculation largely disappears in areas where Christian theology came to dominate. Expressing ideas of life on other worlds was enough to tempt the attention of the Inquisition, as sixteenth century cosmologist Giordano Bruno discovered. Bruno extended the then-novel Copernican model, which put the Sun at the center of the Universe and the Earth and other planets in orbit around it, to the idea that other stars could be orbited by life bearing planets. These beliefs led him to be burned at the stake in 1600 on charges of heresy. The idea of “cosmic plurality” came back into vogue during the seventeenth century Enlightenment, finding champions in philosophers like John Locke, and astronomers like William Herschel. However, speculation over what that life might look like became largely the job of science fiction.

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Méliès was an early pioneer of many cinematic camera and editing techniques, many of which were inspired and facilitated by the fact he couldn't move the camera. So, in the iconic scene in which we approach the Moon, the shot was achieved not by moving the camera toward Méliès' models of the Moon, but instead by moving the Moon toward the camera. In this way, we see the tarnished silver orb resolve into the face of the Man in the Moon, which is despoiled as the capsule rams into his left eye.

With all this scientific wonder about the universe and our place in it, it's no surprise voyages to our nearest celestial neighbor became a common subject of works of proto-science fiction. Johannes Kepler's *Somnium*, published in 1634, was the first serious scientific treatise on lunar astronomy. In it, Kepler describes the summoning of a daemon, who describes how humans could be transported to the Moon by other daemons. Kepler used these creatures from myth as a convenient stand-in for a technology that didn't yet exist, allowing him to explore his astronomical theories in a more enjoyable, fictional format.

In the years after *Somnium's* publication, the Lunar Voyage trope flourished. In 1638, Francis Godwin published the utopian novel, *The Man in the Moone*, a philosophical and religious work in which a Spaniard, Domingo Gonsales, flies to the moon in a contraption pulled by trained geese. There he converses with a Christian people living in a utopian paradise before he returns to Earth. This novel would later be satirized in Cyrano de Bergerac's *Voyage dans la Lune* (1657), in which Cyrano himself, after several failed attempts involving things like glass balls that held morning dew, finally travels to the moon with the aid of fireworks. But instead of exploring Christian theology, Cyrano gets thrown out of the Garden of Eden after discussing how humans didn't have souls and how living forever was an impossibility.

Kepler's daemon, Godwin's gaggle of geese, and Cyrano's fireworks showcase how in the absence of practical technology, the imagination dreams up whatever magical substitute might get the job done. In two different late eighteenth-century tales by writer and con-artist Rudolf Erich Raspe, Baron Munchausen travels to the Moon by way of some fast-growing turkey beans, then again on a ship blown into the air by a storm. These popular Lunar flights of fancy would continue apace into the Victorian Era, with their methods of transport mirroring scientific advances in transportation. A notable example was Edgar Allen Poe's 1835 story, “The Unparalleled Adventure of One Hans Pfaal,” in which the tale of a man's trip to the Moon in a hot air balloon is recounted and later dismissed as a hoax by its readers. Later, Jules Verne would throw public shade at Poe's story in an essay, citing his disappointment that Poe

hadn't studied the scientific aspects of a journey to the Moon more carefully.

Two months after Poe's story was published, the Great Moon Hoax took the world by storm. A series of six articles published in the New York newspaper, *The Sun*, described the discovery of life and civilization on the Moon by the popular astronomer Sir John Herschel, son of William Herschel. The articles claimed the discovery was made using a newly invented and powerful type of telescope built in South Africa, and described unicorns and bat-like humanoids among the menagerie of other fantastical creatures. The articles captured the imaginations of not only New Yorkers, but people around the world, and it took weeks for them to be outed as a hoax meant to increase the paper's circulation. Poe would also complain that the articles ripped-off the ideas in "Hans Pfaal."

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Once upon the Moon, Barbenfouillis and his associates observe the Earth rising, then take a short nap under the watchful gaze of a gallery of celestial gods and goddesses before continuing their exploration. Beneath the surface, they discover a garden of giant mushrooms, and the acrobatic, lobster-like Selenites, a Lunar civilization of people that the humans proceed to misunderstand, then bludgeon using their umbrellas, causing them to die in dramatic puffs of smoke upon contact. The party is pursued back to their capsule, in which they return to Earth, splashing down in the ocean.

The Victorian appetite for the Moon was fed by World's Fair Exhibitions. Following the invention of photography in 1839, the Moon became a popular subject, and a daguerreotype of the Moon was featured at the first World's Fair, London's Great Exhibition in 1851. It also inspired an attraction featured in the Pan-American Exposition of 1901 in Buffalo, New York, called "A Trip to the Moon." In it, riders boarded the spaceship *Luna*, which, once they were inside, would show the Earth flying past its windows until they landed on the Moon. They then exited the ride into a lunar landscape populated with actors in Selenite costumes. The ride later moved to New York City and was permanently installed in Coney Island's Luna Park.

This attraction was partly inspired by Verne's own entry into the fantastic Lunar voyage with his novel, *From the Earth to the Moon* (1865). This opens with a satirical send up of American culture in which the Baltimore Gun Club's President, Barbicane, proposes a method to travel to the moon involving a 90-foot barrel and a room-sized projectile. The projectile would successfully carry Barbicane, his rival, and the French adventurer Ardan into orbit around the Moon. While the book was characteristic of Verne, involving long, technical passages in which he did the math to determine how thick the cannon would have to be, as well as reason through why the launch site had to be in Florida, he left the question of the characters' fate and what they discovered open, resulting in much public clamor. It wouldn't be until 1869 that Verne would publish the novel's sequel, *Around the Moon*, which accounted for the journey around the Moon and their observations of it as a dead, sterile landscape, before they use fireworks to push the capsule out of the Moon's orbit. The capsule then lands in the ocean, delivering the adventurers safely home. Verne's math was so good, in fact, that he correctly anticipated the site of future US space launches from Florida, what a lunar orbit might look like, and splash down landings.

Verne's immensely popular diptych would get a callback in H.G. Wells' own foray into the form, *The First Men in the Moon* (1901). In it, the eccentric inventor Professor Cavor and his entrepreneurial-minded neighbor Mr. Bedford use Cavorite, a substance invented by Cavor that can repel gravity, to assemble a capsule with Cavorite-coated window shutters, in which the protagonists fly to the Moon. There, they find a landscape that comes to life in the sunlight, and an insect-like race of subterranean Selenites. Wells, like Poe, was never overly concerned with scientific

mechanisms in his fiction. While Verne was overly concerned with questions of what we could do, Wells was always more concerned with what we should do. Thus, Cavorite joined the ranks of other handwavium methods of lunar transport in science fiction's young history. Once the protagonists were on the Moon, Wells explored his ideas of colonialism in the behavior of Cavor and Bedford toward the Selenites, and eugenics in the organization of the Selenite society.

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After Méliès' adventurers return to Earth, a parade is organized to celebrate. There is much cheering and hand-shaking and self-congratulating before they trot out a captured Selenite and prod it into performing tricks for the assembled audience. The final shot is of a statue constructed to the glory of Science (and Barbenfouillis), with its wizard-robed figure standing victorious, pointing toward the sky, with one foot resting on the face of the subjugated Man in the Moon.

Méliès, born in 1861 in Paris, grew up on the fiction of Poe and Verne, and as a young man in London representing his parents' shoe manufacturing business he became enamored with stage magic and pantomimes. Upon returning home to Paris, he taught himself magic, and soon bought the Théâtre Robert-Houdin in 1888. This came set up with all the requisite trapdoors, pulleys and other technological devices required for staging magic acts and fantasy pantomime spectacles, also known as *féeries*, which he would manage, design sets, and invent tricks for, as well as perform in. In 1895 Méliès was among the earliest people to see the Lumière brothers' first public film screening at the Grand Café in Paris, and, recognizing they had a sensational technology on their hands, got a camera of his own.

Early film was concerned primarily with realist documentation—film of a train coming into a station, or people leaving a factory—which was enough to amaze Victorian audiences. This style, known as the “cinema of attractions,” had the goal of inspiring awe first and foremost. But by the time Méliès had half acquired/half built his own camera and begun making films, the popularity of the realist style had started to wane, leading many to speculate film was a passing fad (including the Lumières' own father). But Méliès knew he had a winner on his hands, and he would go on to establish the first permanent film studio at his family's home in the Parisian suburb of Montreuil. Between 1896 and 1912 he made five hundred films and established many editing techniques that later became commonplace in cinematic productions.

The kinds of tricks he developed came from both his understanding of how stage illusions work, as well as the ins and outs of the technology in his stationary camera. Notable special effects he pioneered include the use of pyrotechnics and miniature models. Notable visual effects included substitution splicing, in which one thing suddenly becomes another (which he claimed to have discovered when the camera jammed one day during filming), and extensive use of multiple exposures that could achieve ghost-like transparent effects, dissolve shots, and replicate multiples of the same actor within one shot. His films, including *A Trip to the Moon*, became instantly popular with attendees of the festivals and theaters to which he sold his films.

A Trip to the Moon pulled its story heavily from Verne's work, in its use of a cannon to launch its protagonists to the moon, but also brought in its own special blend of Méliès' stage magic and a satirical Wellsian angle in his send up of colonialism during a time of unprecedented French imperial expansion. The public at the time fostered seemingly contradictory passions for both nostalgia for simpler, pre-technological times, and strong beliefs in technology's ability to shape their lives for the better. Méliès used his tacit understanding of this dichotomy, as well as his understanding of how he could use film to achieve the right blend of magic and science, to achieve the desired reaction of awe from this audience. Ultimately, he was left behind by the very industry he helped to create, becoming destitute due to rampant

piracy of his films (including by Thomas Edison in the United States), new practices of mass production, which his one-man-studio couldn't keep pace with, and the evolving taste of movie-going audiences for more narrative elements in their spectacles. His studio went out of business in 1912.

Yet, Méliès lived to see his contribution to film history rediscovered by the Surrealist movement in the 1920s, and publicly acknowledged by the larger film community before his death in 1938. His practices set the standards for visual effects, which became a defining characteristic of science fiction cinema. The first flight around the Moon, à la Verne, wouldn't happen until thirty years after Méliès' death, with the Apollo 8 mission in 1968, and the first foray onto the lunar surface, à la Wells, wouldn't happen until the year after. Verne would prove right in the end, though, that the surface of the Moon is a cold, dead place. But, as Wells anticipated, that didn't stop us from planting a flag in it to claim the Moon for all humankind.