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Astronomy, Science Fiction and Popular Culture: 1277 to 2001 (and Beyond)

Guy J. Consolmagno

Stories, myths and tales can make ideas a part of popular culture. Great religious figures have taught with parables; we use fables and fairy tales to teach our children about life; and it has been argued that even the ancient Greek myths might have been deliberate devices for organizing and transmitting information about the natural world to non-scientifically oriented people [1].

Once an idea gets turned into a story, people pay attention long enough to listen. They feel comfortable evaluating the idea by comparing the story against their own lives. And they remember it. One remembers images from Dante more than one remembers the arguments of Aquinas.

With this in mind, we should not be surprised to find a strong interaction between science-fiction stories, the science behind those stories and the popular culture from which those stories spring. In particular, this paper will concentrate on stories involving concepts from astronomy, focusing on three questions:

1. How have advances in astronomy shaped science fiction?
2. How has popular culture influenced science fiction?
3. How does science fiction color the way popular culture views astronomy?

MEDIEVAL INTERACTIONS BETWEEN SCIENCE, PHILOSOPHY AND CULTURE

When Arabic learning (in which classical Greek writings lost to the West had been preserved) was introduced in Europe in the thirteenth century, tensions arose between some Aristotelian ideas—such as that of a universe of immutable laws without beginning or end—and Christian teachings proclaiming the existence of an omnipotent creator God. In 1277 in response to certain philosophers at the University of Paris, the Bishop of Paris, Stephen Tempier, listed 219 philosophical propositions that were not to be taught in his diocese. Among them was the assertion that “God could not have made other worlds.” God is omnipotent, the Bishop reasoned, and so one must admit the possibility of “alternate universes.”

Pierre Duhem saw this event as the birth of modern science [2]; though most historians today would consider that claim to be an exaggeration, David Lindberg has recently noted, “the articles that stressed God’s unlimited creative power gave license to all manner of speculations about possible worlds and imaginary states of affairs that it was evidently within God’s power to create. This led to an avalanche of speculative

or hypothetical natural philosophy in the fourteenth century, in the course of which various principles of Aristotelian natural philosophy were clarified, criticized, or rejected” [3].

However, this avalanche did not include a rise in stories or fables based on such philosophical speculations. In contrast to today’s abundance of science-fiction books, there was rather little philosophy fiction (“phi-fi”) written in the fourteenth century; as a result, those speculations never extended into popular culture. The closest approximation to a popularization of philosophical speculation from the period might be Dante’s *Divine Comedy* (ca. 1330), but even there Dante was poetically describing a vision of what he believed to be essentially true, not a speculation based on an extrapolation of a hypothesis of a philosophical possibility.

By the time of Galileo, the work of John Buriden (ca. 1350) and that of Nicholas Oresme (ca. 1360) on the possibility that the Earth could be moving and spinning was nearly 300 years old. Even Copernicus’s work was nearly 100 years old by then. But the general populace hardly knew about these ideas [4], and when Galileo resurrected them and brought them to the attention of the non-astronomical community, many learned people unfamiliar with astronomy were astonished and outraged. Their reaction fed the Enlightenment (and modern) misconception that the medieval era preceding Galileo must have been a period of religious fundamentalism that resulted in some sort of dark age.

PARALLELS IN THE DEVELOPMENT OF SCIENCE FICTION AND ASTRONOMY

There were a few ancient stories of space travel. In *Scipio’s Dream*, Cicero tells of a dream in which Scipio passes from Earth to heaven through a series of concentric celestial spheres. This voyage is a literary device for looking back and commenting on Earthly events; but these concentric spheres

ABSTRACT

Historically, developments in astronomy and changes in social environments have inspired new styles of science fiction. In return, popular culture has gained from science fiction an understanding of astronomy and of humankind’s place in the universe. However, approaches to plot and character in science-fiction stories color the presentation of astronomical discoveries, altering the way that popular culture views science fiction’s message about the universe and the self in sometimes subtle ways.

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are clearly based on the crystalline-sphere cosmology of the fourth-century-B.C. Greek philosopher Eudoxus. *True History*, by Lucian of Samostat, who wrote in 165 A.D. (coincidentally, only 14 years after Ptolemy's last recorded observations of the planets), describes a voyage of Greek warriors to the Moon, where they fight against the king of the Moon and the king of the Sun and colonize Jupiter. Note that Jupiter, the Moon and the Sun were all thought of as planet-sized places that could be colonized. But, by and large, such stories were rare in classical times [5].

After the birth of the astronomical telescope (1610), this began to change. Galileo engaged in the mass-marketing of astronomy; he wrote science books in Italian, not Latin, and spent much of his time discussing his work and theories at fashionable salons in Rome. He embraced the role of popularizer and could be considered the Carl Sagan of his day. The dialogue format of his later books (four friends discussing new ideas over a period of several days) is, in fact, a fictional style bearing a certain similarity to modern science-fiction novels, such as Arthur C. Clarke's *Rendezvous with Rama* [6], that are long on exposition and short on plot.

Kepler's *Somnium* (written in 1615 but not published until 1634) presented the new astronomy in a narrative form. It depicted a dream voyage to the Moon, incorporating accurate astronomy: the Moon is described as having mountains and a day that is 14 Earth days long, for example. Likewise, in 1638, Bishop John Wilkins produced *A Discourse Concerning a New World*, also predicting what one would really see on a trip to the Moon. And the famous adventure by Cyrano de Bergerac, *Voyages to the Moon and Sun*, was published in 1657. However, as James Gunn [7] points out, all these are tales of wonder or far-traveling, satires or utopias; they convey no conviction that what was being written could really happen. Clearly, they were influenced as much by the post-Columbian world of exploration as they were by advances in astronomy.

In fact, real space-travel fiction begins only in 1863, when Jules Verne published *From the Earth to the Moon*, followed by its sequel, *Around the Moon*, in 1872 [8]. The first book is basically an adventure story; the second, a travelogue. Verne quotes extensively—especially in the second book—from *Der Mond*, a book by W. Beer and J.H. von Mädler published in 1837

[9]. *Der Mond* presented the first trigonometrically accurate study of lunar features, including the positions and heights of over 1,000 mountains [10]. For the first time, the Moon had been mapped as accurately as any piece of the Earth's geography had. No longer merely a heavenly body, the Moon had become a *place*. Clearly, this depiction was an inspiration for Verne's work.

Verne was the first writer to attack the problem of space travel in a realistic way and suggest that it might actually be possible. His propulsion method, a large cannon, had obvious problems, but the book recognized them and did attempt to deal with them. He also introduced the idea of using rockets in space.

In addition, these books discussed the possibility that creatures could be living on the Moon. One of the heroes in *Around the Moon* claims to see evidence of their ruined cities; the others do not, and they argue about whether such aliens could exist and might ever have visited Earth. But the implications of alien life for humanity and its place in the universe are not really explored. Indeed, the attitude seems to be rather matter-of-fact: as if it were not surprising that people would exist elsewhere.

Linear markings on Mars had been observed since the late 1700s and in 1869 Angel Secchi, a Jesuit astronomer at the University of Rome, first referred to these channels using the Italian word *canali*. In the 1870s Schiaparelli publicized these observations in Italian, inspiring other astronomers to make further observations of Mars.

One such astronomer was Percival Lowell, an American. In 1895 he published *Mars* [11], in which he argued that these features were indeed canals in the English sense, produced by a dying race of intelligent beings. Three years later (1898), H.G. Wells came out with *The War of the Worlds*. His race of Martians fleeing a dying planet was clearly inspired by Lowell's suggestion. The first years of the twentieth century saw other pulp-fictional works pick up on this theme, most notably the *Mars* novels by Edgar Rice Burroughs, the first of which was published in 1912 [12]. In these books, John Carter is a Civil War veteran who "thinks" himself to Mars and has a series of adventures involving glorious battles and beautiful women; again, the Mars described is clearly based on Lowell's vision of a dry, dying planet.

The years following World War I saw advances in airplanes, automobiles and,

especially, radio, which fed an increasingly popular enthusiasm for personal technology. In 1926 Hugo Gernsback, a publisher of magazines for radio hobbyists, began the modern style of science-fiction story by establishing a pulp-fiction magazine called *Amazing Stories*.

Most of the stories published in the first couple of years of this magazine were tales of future engineering marvels. But the *Amazing Stories* issue of August 1928 had two important new kinds of stories. The first was a story by Philip Francis Nolan called "Armageddon 2419." In it, a World War I soldier, Anthony Rogers, is trapped in a cave filled with strange gases and emerges, unharmed, 500 years later. In 1929, Tony Rogers's adventures in the twenty-fifth century were made into a comic strip (and later, a movie serial), changing the protagonist's name from Tony to "Buck."

But, besides the first Buck Rogers tale, there was another story in this issue worth noting. It never did get made into a movie and is not nearly as famous. But every serious science-fiction reader has probably heard of E.E. "Doc" Smith. August 1928 marks the date of the first installment of his first novel, written 10 years earlier but unpublished until the pulp magazines came along. It was called *The Skylark of Space* [13].

Let there be no mistake. This book is dreadful. (It has been suggested by some that my assessment of *Skylark* is a bit harsh. However, judging the original serial published in the magazine and not the extensively rewritten version that came out in paperback in 1947, I stand by my assessment!) It has every stereotype of bad 1920s pulp fiction: the handsome young inventor; the millionaire's beautiful daughter, whose sole function is to be kidnapped by the evil villain; a chirpy best friend; endless chases; stolen formulas; secret ingredients and a climactic scene in which good triumphs over evil in a fistfight.

It is also the first popular book to present heroes who travel, not to the planets of our solar system, but to planets around other stars.

A later set of books by Doc Smith, the Lensman series (the first was serialized in 1938), is even more grandiose. It posits Earth and Earth people as pawns in a grand interstellar battle between two warring alien races, one good, one evil. Aliens are given character and personality, although it is a hero from Earth, Kimball Kennison, who eventually saves the day. The Lens is a symbol worn by

the good guys of all alien strains; it signifies their common citizenship in a community that encompasses the entire lens-shaped Milky Way Galaxy. (The 1920s and 1930s, of course, were the time of the great debates by Shapley, Hubble, Eddington and others on the size, shape and nature of our Galaxy.)

Why is this important? Why does Doc Smith matter? His books are crude space operas. They read like popcorn; you could finish them all in a week. (I did.) But they are important precisely because they are classic space opera. They invented the genre. As a result of Doc Smith's books, not just planets but stars became places where people had adventures.

One early imitator of Doc Smith was John Campbell. In the late 1930s he became the editor of a rival of *Amazing Stories* called *Astounding Stories* and fundamentally changed the style of science fiction. As an editor, he made the crucial decision that travelogues or panoramas of technological marvels were not good enough. His magazine had to have real, plotted stories of human protagonists who develop, interact with the marvels, solve problems and change as a result. Under his guidance, such writers as Robert Heinlein and Isaac Asimov were nurtured and developed into popular science-fiction novelists.

After World War II, the view of alien races in science fiction had long progressed past the evil-invaders-from-Mars stereotype. For one thing, that was old hat; doing it again made for boring stories. Instead, it was realized that aliens might just be misunderstood, as they were in the film *The Day The Earth Stood Still* [14]. Heinlein's book *Double Star* [15] and Cordwainer Smith's haunting series of Underpeople stories [16]—which were based on the style and themes of ancient Chinese folk tales—both dealt with the struggle of non-human races for equal status in a universe dominated by human beings. Note the obvious connection with the nascent Civil Rights movement of the 1950s and 1960s.

In the 1960s there was a wave of "new wave" stories; they were about grand ideas or attempted experimental narrative styles. But, unlike the stories fostered by Campbell, they were not about people and, ultimately, they were never very popular except among an intellectual elite. By contrast, television shows such as "The Twilight Zone" and "Outer Limits" offered traditional ghost stories (actually, they covered everything from

horror to fantasy), bringing into the living room the chance for ordinary people to see themselves as a part of a larger universe.

Note the irony. The medieval age had spirits—angels and devils—coexisting with people; but Enlightenment science had taken them away, making human beings the only inhabitants of the universe. Now fantasy and science fiction brought back the old angels and devils in a more scientifically correct guise.

Indeed, the whole field of fantasy grew very rapidly in the 1960s, fueled by imitators of J. R. R. Tolkien's *Lord of the Rings* [17] (first published in the United States in 1965). By the 1970s the genre had developed its own set of rules and clichés. The general setting of a modern fantasy novel was usually a medieval world of courtly love, with knights and fair maidens, dragons and elves and trolls and dwarves, minstrels and merchants and thieves . . . the Middle Ages, as one fan put it, the way they should have been. Unlike the male-dominated roster of pulp science-fiction writers of the 1930s, 1940s and 1950s, the fantasy writers were often women. Since they were not bound by historical accuracy, they could explore alternate social structures or retell old myths with modern sensibilities, as did Zenna Henderson, P. C. Hodgell, Katherine Kurtz, Tanith Lee, Elizabeth Lynn, Patricia McKillip and Sherri Tepper, to name but a few of these writers. In many cases, such as the books of Marion Zimmer Bradley, the fair maidens *were* the knights. Fantasy became a way for women writers to come to grips with the still-unsettled demands of feminism and modern society.

How did fantasy get associated with science fiction? To begin with, both shared the same audience; but there is a more direct connection. The revolutionary advances in physics during the twentieth century had blurred the differences between possible and impossible science or technology, at least in the popular conception: "a sufficiently advanced technology is indistinguishable from magic," to quote Arthur C. Clarke. Furthermore, with the assumed multiplicity of habitable planets, one no longer had to look to the future for such advances. Fantasy no longer meant "an impossible world that never was" but rather a possible world that just happens to be "a long time ago in a galaxy far, far away"—to quote the beginning of the *Star Wars* movies.

Many fantasies explicitly stated that they were set on other planets. One of

the first, E. D. Eddison's *The Worm Ouroboros* [18], is supposedly set on Mercury. Modern writers place their planets around other stars and often have their characters make oblique references to a mythical place called "Earth." Ursula K. LeGuin's novel *The Left Hand of Darkness* [19] is a story with many fantasy plot devices that explores a possible alternate social structure and is set firmly on a realistic, scientifically plausible distant planet. Anne McCaffrey's Pern novels, starting with *Dragonflight* [20], depict a medieval society whose heroes ride telepathic dragons; but these books, by any definition, are really science fiction rather than fantasy: the people are descendants of Earth colonists, a scientific rationale is given for how and why these dragons were genetically engineered and the main plot revolves around the celestial mechanics of a neighboring rogue planet. McCaffrey's books have also been immensely popular; they were among the first science-fiction novels to break into the mainstream *New York Times* best-seller list, a sign that, by the 1970s, science fiction had become an established part of popular culture.

“STAR TREK” VERSUS 2001: A SPACE ODYSSEY—A CONTRAST IN MYTH-MAKING

The 1968 film *2001: A Space Odyssey* was a modern example of deliberate myth-making. The director, Stanley Kubrick, took a very timely interest in our first steps off the planet and tried to illustrate just what it would mean when we first encountered another intelligence.

It was consciously intellectual. From its sound track to its visual style, it announced its serious intentions in capital letters. But consider the matter-of-fact depiction of the hero traveling to the Moon—flying Pan Am, calling long distance on a Bell telephone. The future, we were told, would be just like today. (Ironically, neither Pan Am nor the old Bell system has survived today, much less to the year 2001.) All this homeliness was intended to serve as a contrast to the mind-expanding final half-hour when the alien encounter was experienced. But the final half-hour was deliberately vague. Any attempt to depict such an encounter literally in the highly charged atmosphere of the film would have looked out of place; it would have been an attempt to depict the ineffable. What we were given, instead, was not much more than a "groovy" 1960s light show.

As a result, though much of the audience was entertained, many more were confused or merely bored.

The message of the film was that Space is bigger than we can understand. The realistic images in the earlier scenes of the film may have inspired some young people to pursue a career in astronomy, but for many others, the hopeless sense of incomprehensibility at the end of the film left only one question: why bother trying? With only visual clues and a meager story line, we were encouraged to read into it what we wanted to see; and so all we saw was what we brought with us to the movie. Ultimately, the movie did not change us.

By contrast, consider the "Star Trek" phenomenon. Every week on television (every night in the form of reruns) we saw a story of people living in the universe, having adventures on planets and around stars and actually dealing with—and being affected by—the strange things the astronomers were finding out there. Like any production wedded to a rigid weekly schedule, it was littered with clichés, easy answers and shallow characterizations. But a few of the shows were pretty good; they were enough to keep us watching. And the characters were fun. They became old friends with whom one could look forward to visiting, week after week. Slowly, without noticing it, the audience absorbed little nuggets of information (or misinformation) about what astronomers had to tell us about the universe. Planets became places where people we knew had adventures.

Unlike the image-laden *2001*, "Star Trek" was a writer's show, firmly based in the popular culture of pulp science-fiction stories. Indeed, some of the show's best script ideas and most famous lines first appeared in a 1952 novel by Robert Heinlein, *The Rolling Stones* [21]. Screenplay writers such as Robert Bloch, Frederic Brown, Richard Matheson, Jerry Sohl, Norman Spinrad and Theodore Sturgeon were, for the most part, people who had made their living for years by writing for science-fiction magazines.

"Star Trek" began in September 1966 and ran until 1969, when it was finally canceled (due to low ratings!) 2 months before the first moon landing. But "Star Trek" lives on in reruns, novels, animation, feature films and three spin-off shows (to date) that have become far more popular than the original. It had, and has, a strong, devoted fan following; people watched favorite episodes over

and over (which advertisers found appealing). As of June 1994, in the "Star Trek" universe there were 331 television episodes, six feature films and over 100 novels, with more of each in the works. In addition came the "fanzines"—some 5,000 fan-written, fan-produced, photocopied magazines publishing stories, novels, articles and reviews, all involving the "Star Trek" universe and characters. It has become a billion-dollar industry. (Information on "Star Trek" and its spin-offs can be found on the electronic bulletin board/digest moderated by Saul Jaffe [22].)

The message of the show? Wonder, optimism, a tolerance for others. The "Prime Directive"—that we should not interfere with alien races developing their own culture—was an important plot device, though it was violated more often than not . . . because that made for good stories.

With more than 10 million households tuned in every week, probably more people today learn more about modern astronomy from this show than from any other single source.

In "Star Trek," for the first time science fiction attracted a sizeable female audience. In turn, by the 1970s a significant number of science-fiction stories were being written by women. Furthermore, during this time the proportion of women entering the fields of science and engineering also increased rapidly: at the Massachusetts Institute of Technology (MIT), for example, the number of women in the incoming freshman classes more than doubled from 1970 to 1974. Obviously, many developments in society at that time led to this increase, however, many of these young women mentioned "Star Trek" as a factor in their career choices.

Note the contrast between the messages, the audience and the effects of *2001* and "Star Trek." The film *2001* reached much of the 1960s intellectual audience who had been unfamiliar with science fiction and confirmed, in many ways, their prejudice that space was unapproachably alien. The television show "Star Trek" reached a much larger audience, lapping several generations, with a message that the universe beyond Earth was approachable, interesting and fun.

Today, much of *2001*'s message seems as dated as its once-avant-garde special effects. "Star Trek," a much more modest television show, still thrives. In our postmodern world, where the lines be-

tween high culture and popular culture blur, the "Star Trek" vision ultimately prevails.

SCIENCE FICTION AND THE POPULAR CONCEPTION OF VALUES IN ASTRONOMY

As illustrated by the contrast between *2001* and "Star Trek," a science-fiction setting that depicts astronomical phenomena also communicates a set of values and attitudes. These attitudes and value contents can become associated in the popular mind with the people actively involved in the science in question. And if the young people who enjoy "Star Trek" become the next generation of astronomers, then they will carry with them the show's values as they practice astronomy, and the "Star Trek" vision of astronomers will become a self-fulfilling prophecy.

Thus, it is important to see exactly what sort of values wind up being communicated by popular science fiction.

Consider a breakthrough novel of the 1960s, Frank Herbert's *Dune* [23]. *Dune* has often been hailed as a prophetic book of the environmental movement. For the first time, a planet itself became a hero. The planet was seen as a complex ecological system, and understanding its ecology became, for the human protagonists, a source of power—personal, political and military. Like many of the fantasy/science-fiction novels described above, it too was a story mixing a medieval society and elements of hard-core science fiction. (As one of its plot threads, it supposes that spacecraft pilots need a drug from a primitive desert planet to navigate through other dimensions.) In keeping with the times it was written in, *Dune* had plenty of sex and drugs and a rebellious young mystic out to topple a corrupt establishment. But in fact, the plot is basically an old-fashioned fairy tale: the hero is a prince of noble blood fighting to regain a kingdom rightfully his by birth. And its execution is that of a classic war novel, as we follow the strategy he uses to win against all odds.

We find the same contrast in Robert Heinlein. *Stranger in a Strange Land* [24] describes a universe where every philosophy is true, and love (or at least sex) is all you need—this, written 5 years before the hippie movement. However, his *Starship Troopers* [25], which appeared just 2 years earlier, is a paean to the glories of warfare. Most of Heinlein's books, including

Stranger, strongly affirm the rugged individualist fighting a misguided, muddling State. (In *Stranger*, the State is headed by a befuddled president whose wife regularly consults an astrologer. . . .)

So how can one classify the values communicated in these books? Were Herbert or Heinlein proto-hippies or right-wing reactionaries?

The value system underpinning these books is not really right-wing; rather, it is Libertarian. Libertarianism, a political philosophy in North America, champions the individual's rights over society's needs to an extreme. Europeans might recognize Libertarians as being the polar opposites of the "Greens"—hence the irony of finding Herbert and his ecology novel *Dune* in the Libertarian camp.) Many current popular writers, including Larry Niven, Jerry Pournelle and Joe Haldeman, appear to be on this side of the political spectrum. In fact, even the most radical expressions in contemporary science fiction, cyberpunk stories of rebels who live inside computer networks, display an anarchist attitude that is really just radical libertarianism.

Thus the conception of science fiction as pro-Libertarian has become well established. And though most science-fiction fans and writers are not Libertarians, even writers today who overtly reject this philosophy—such as Kim Stanley Robinson or Orson Scott Card—nevertheless create stories and heroes that reflect many of its ideals.

The reason may arise from the nature of storytelling itself. A good story is ultimately about a person, an individual; that person must be engaged in a conflict, thus implying a bad guy. The modern science-fiction novel, from its conception, sees the universe in a good guy/bad guy frame of mind. Next, if Nazis, Communists or invading aliens have been ruled out as bad guys, then the handiest bad guy left—one that readers can easily root against—is the faceless bureaucratic state. (Orson Scott Card's masterpiece novel *Enders Game* [26] really does have faceless evil alien invaders; but they are not nearly as bad as the system that prepares his hero to fight against them!) Finally, setting the story in a military milieu—be it the Star Fleet of "Star Trek," the rebel army of Star Wars or any sort of exploration ship (which can almost always be read as a branch of the Navy)—gives ready-made opportunities for both the conflict and the hardware to carry on that conflict. Even out of uniform, heroes are often

military veterans. If the hero is female, all the better from a feminist point of view to make her a warrior. Among the most popular books of the 1990s (having won three Hugo awards) are the modern space operas by Lois McMaster Bujold [27]; her hero is a physically handicapped son of nobility who leads his own interstellar mercenary corps, which includes women, hermaphrodites and a variety of genetically altered humans.

It is not surprising that today's science fiction often carries, even unintentionally, a world view that can be seen as militaristic, right-wing or Libertarian. What has gone unnoticed is that, in the popular-culture mindset, the connection between science fiction and astronomy has meant that astronomy can get painted in the same colors, and by the same brush, as science fiction. An odd chain operates. Popular science fiction is enthusiastic and optimistic about the future, full of wonder and the love of wonder. Astronomy, tied to science fiction both by its subject matter and its love of wonder, is thus also viewed as optimistic—even though there is no obvious reason why astronomy by itself ought to be "optimistic" or "pessimistic." Science fiction is a medium that, for the sake of plot, often propagates a Libertarian world view. By association, then, astronomy is also colored as being individualistic and libertarian, militaristic or right-wing—much to the chagrin of many astronomers. But most bizarre of all is that the circle gets completed: to be full of the wonder and optimism, the "Star Trek" vision has somehow also come to be thought of as being right-wing.

Politics aside, another message of the science fiction–astronomy connection—one that, again, comes as much from the needs of a good plot as from any scientific or philosophical principle—is the sense that the universe is strange but ultimately knowable. The 2001 vision is rejected, because it makes for boring stories. This is not a sense that "anything is possible." Science has its rules, and so does science fiction. But the multiplicity of planets that science fiction assumes must exist in the universe—and that astronomy at least does not deny—does suggest that (in the words of Merlin, from T.H. White's retelling [28] of the Arthurian legend, *The Once and Future King*) "anything not forbidden is compulsory." If it is possible, you must assume that somewhere in this huge universe it actually happens.

A final irony also arises from the plot needs of science fiction. Many science-

fiction writers—from Doc Smith in the 1930s to David Brin today—have depicted humans and alien races interacting; but in virtually all cases, the human race is depicted as somehow special, different and better than the others. Consider even one seeming exception to this pattern, Rebecca Ore's *Becoming Alien* [29]. The book follows a single human carried off to another planet where all the other characters have truly alien physiologies and cultures. The theme of the story concerns how the human being comes to understand that, to their eyes, he is the alien. The overt message of the book is a rejection of anthropocentrism. Yet, simply because the author needs a reader to speak to and a protagonist that the reader can identify with, the main character is, in fact, human. The ultimate myth of science fiction that is tagged onto our astronomy turns out to be that, even with all those alien races, human beings are the central characters in the story of the universe.

It is as if the Copernican Revolution never happened.

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