

Overcoming the Image of Little Green Men: Astrosociology and SETI

Albert A. Harrison
Department of Psychology
University of California, Davis

(c) 2005 Albert Harrison

Abstract

In 1960, based on calculations showing the feasibility of radio communication over interstellar distances, astronomers began the systematic search for signs of extraterrestrial intelligence. To maintain their credibility with their fellow scientists and their eligibility for funding the scientists who undertook the search were compelled to distance themselves from popular beliefs about UFOs. They achieved this through the leadership of prominent senior scientists, relentless emphasis on scientific methods with special attention to replication and verification, stringent gate keeping, and open identification with prominent skeptics. Early on, these scientists recognized the societal implications of their efforts, and sought to involve scholars from a broad range of social sciences. Research opportunities for sociologists include public attitudes and support, conduct and expansion of the search, message decryption and interpretation, news dissemination and rumor control, the immediate and long-term consequences of detection, and prospective analyses of extraterrestrial civilizations. Sociologists who choose to participate should be aware of the giggle factor and the risks of over-identification with the SETI cause.

For scientists, the prospects for extraterrestrial life rose dramatically during the last years of the 20th Century (Dick, 1996). Increasingly powerful telescopes revealed that the Universe was larger and contained far more stars than astronomers previously believed. New techniques made it possible to find planets outside of our solar system. Well over 100 extrasolar planets have been identified, and of the 50 billion solar-like stars in our Milky Way galaxy perhaps 1.5 billion will host planets, some fraction of which will be Earth-like. Biologists conclude that the initiation of life depends on the self-organizing properties of matter and other reliable processes,

rather than on an all but impossible combination of chance events. Life has been found in environments that were previously considered lethal – deep under the seas, in frozen tundra, in boiling water, and surrounded by radioactive waste (Darling, 2001). For such reasons many scientists have high expectations that we will find simple forms of life elsewhere – single celled organisms, grasses and plants. Fewer scientists are confident that we will find evidence of extraterrestrial intelligence or ETI. According to the “rare Earth hypothesis,” although life may be common, a high order of intelligence depends on a remarkable confluence of events that happened only on Earth (Ward and Brownlee, 2000). Despite its vast size the universe may be precisely big enough to house exactly one technologically advanced civilization, and it is ours (Tipler, 1985).

Astrobiology and SETI are scientific efforts to find evidence of life beyond Earth (Darling, 2001; Ulmschneider, 2004). Astrobiology is the National Aeronautics and Space Administration’s (NASA’s) approach to understanding life in the Universe, and encompasses three thematic questions. “How does life begin and evolve?” “What is life’s future on Earth and beyond?” “Does life exist elsewhere in the universe?” Astrobiology is geared for finding life, as we know it: carbon based, and dependent on metabolic processes similar to those that power plants and animals on Earth. Astrobiologists scan the heavens for promising ecological niches and chemical indicators of life. They assess the prospects for life on other planets including Mars, and send containers into space to sample comet tails and interstellar dust. Within the next ten years, if plans materialize, astrobiologists will have the technology to estimate the number of Earth-sized planets orbiting within a sample of 100,000 stars, and conduct both direct imaging and spectrographic analyses of these planets. Analyses of chemical reactions on distant planets

could reveal signs consistent with biological and industrial activities there, making these planets inviting targets for additional study.

SETI, an acronym for the Search for Extra Terrestrial Intelligence, seeks technologically advanced societies beyond our solar system. Since SETI began in earnest in the 1960s, the dominant search procedure has been using radio telescopes to intercept extraterrestrial radio transmissions. More recently, astronomers began using specially equipped optical telescopes to seek extraterrestrial laser transmissions. Despite coming from many light years away these signals would outshine their suns by a thousand times, at least within a very narrow segment of the optical spectrum. There are other search techniques that are generally rejected as unpromising or simply shunned because they have science fiction overtones. These include using radar to seek evidence of interstellar probes, looking for extraterrestrial artifacts on Earth, the Moon, and Mars, and even hunting for evidence of extraterrestrial intelligence on the Internet. In recent years, passive searches have been joined by active SETI, a controversial approach that involves announcing our presence by launching interstellar probes and sending powerful broadcasts to distant stars.

UFOs, Astrobiology and SETI

By 1960, when the rationale for interstellar radio communication was sufficiently strong to encourage eminent astronomers to start looking, many people in the Americas and Europe had already concluded that extraterrestrials had already visited Earth. Of the many possible explanations of UFOs, the best known and most favored is the Extraterrestrial Hypotheses (ETH) which states that at least some reported UFOs are intelligently controlled alien spacecraft.

Although the results of public opinion polls have varied over the years, almost everyone has heard of UFOs, about half of those polled believe in the "reality" of UFOs, and about five percent of North Americans have had personal sightings. As of 2005, approximately twenty five percent of the American population believes that extraterrestrials have visited Earth (Musella, 2005). Several works, both scholarly and popular, have detailed the history of the UFO controversy in America (Jacobs, 2001; Peebles, 1994). Around 1960, when SETI was initiated, UFO folklore contended that extraterrestrials had been visiting Earth, perhaps for thousands of years. People known as "contactees" had been approached by "space brothers" who arrived by flying saucer and expressed concern over Earth's future in an age of atomic weapons. The United States government knew more about UFOs than it was willing to reveal; and while undertaking serious investigations, it tried to defuse public interest by debunking the topic. Eventually, UFOlogy would split into three largely separate tracks: UFO sightings, alien abductions, and government cover-ups.

Over sixty years of UFO research has failed to provide acceptable physical evidence that extraterrestrial spacecraft have visited Earth (Sturrock, 1999). Today, most scientists lump UFOs with the paranormal (Goode, 2000). All areas of the paranormal invite deception, but few areas are as dominated by lies, treachery and deceit as UFOs (Hansen, 2001). The challenge besetting UFO buffs, according to Randall Fitzgerald, is to avoid falling for a "continuous dribble of faked UFO photos, bogus alien bodies...fabricated alien artifacts and banal channeled messages" without adopting a rigid mindset that leads to "cynicism and a sniveling disbelief instead of doubt" (Fitzgerald, 1998:2).

UFOs provide a rich and fertile ground for scholars who are interested in psychology,

sociology, anthropology, and folklore. Over the years researchers have related UFO sightings to social marginality, intelligence, mental health, and honesty. Basically, these studies show that UFO sighters are not dumb, crazy, or social outcasts, but they do have somewhat unconventional views of reality. Other researchers have explored the link between UFOs and religions leading to excellent works such as John Lewis's *The Gods Have Landed: New Religions from Other Worlds* (Lewis, 1995), Christopher Partridge's *UFO Religions* (Partridge, 2003), and Susan Palmer's recent *Aliens Adored: Rael's UFO Religion* (Palmer, 2004). Brenda Denzler's *The Lure of the Edge: Scientific Passions, Religious Beliefs and the Pursuit of UFOs* is a powerful but underutilized overview of the entire UFO enterprise. Of particular value is her ethnographic analysis of UFO “believers” that reveals interesting trade-offs between science, religion, and personal beliefs. And, UFOs play prominent roles in discussions of the paranormal, such as that offered by Erich Goode (2000). Still other researchers, largely from psychology, have firmly established that UFO abductees tell us more about psychology and folklore than about extraterrestrial life. UFO abductees, like alleged victims of satanic ritual abuse and people with multiple personality disorders, are products of modern society and misguided psychotherapy. Sleep paralysis, quirks of human memory, social influence processes and well-known cultural scripts account for claims of being abducted by aliens (Randle, Estes and McCone, 1999).

Because UFOs engage public interest in intelligent life beyond Earth, it may seem that UFOlogy would be of great value to astrobiology and SETI, but nothing could be further from the case. At the time of the search's initiation most scientists considered extraterrestrial life the province of science fiction, not science. Whereas scientists had certainly heard of UFOs, most had developed a highly skeptical stance and many were actively involved in debunking the idea

of extraterrestrial visitation. Flying saucers were not available for study, but the people who reported them were, and researchers engaged in their penchant for attributing low-frequency occurrences to psychopathology. One of the biggest challenges for the SETI scientists then and now is to distance themselves from the uncritical, naive and wishful thinking that many of their peers associate with UFOs. This was required for the SETI pioneers to earn legitimacy for their efforts and gain acceptance by their scientific colleagues, to build support from the educated public, and secure funding from government agencies and private foundations. At the heart of their campaign is a relentless emphasis on the scientific stature of SETI:

What all SETI searches share, and what distinguishes SETI from other attempts to find extraterrestrial intelligence, is a steadfast insistence on remaining within the assumptions and methods of science. The bedrock is SETI's insistence on (a) skepticism, verification, peer review, and the scientific method, (b) strict safeguards against hoaxes, self-delusion, and erroneous data, and (c) protocols to avoid premature and immodest claims (Harrison, Billingham et al., 2000, p. 72).

SETI could not have gained legitimacy without a core of forceful eminent spokespersons (Dick, 1996). A small group of influential scientists sought to recruit other high profile, respected senior scientists to their cause. They surmised that, once these opinion leaders were on board, other scientists would follow. The SETI pioneers had already established their scientific credentials at the time that they became engaged in SETI, and continued their more traditional research to remain front-and-center in the scientific enterprise. SETI scientists are closely identified with the skeptic's cause, and some serve on Paul Kurtz's Committee for the Scientific Investigation of Claims of the Paranormal and write articles for the *Skeptical Inquirer*. Scientist and science educator Carl Sagan, who initially expressed some tolerance for UFOs, became an

outspoken critic of everything paranormal, especially UFOs, as evidenced in one of his last books, *This Demon Haunted World* (Sagan and Druyan, 1996). He was regarded as a gatekeeper who decided "which ideas about extraterrestrial life would be admitted to the annals of science, and which would be left outside, panting on the sidewalk" (Achenbach, 1999). SETI committees, such as those sponsored by the International Academy of Astronautics, explicitly eliminate UFOs from their purview and steer clear of ideas that are linked to flying saucers, except when such ideas are re-invented within science. While SETI distances itself from UFOlogy, the latter tends to embrace SETI because it supports the idea of extraterrestrial life.

From the perspective of astrobiology and SETI, minimizing the UFO taint has been a constant uphill battle. Countless documentaries on "life in the universe" have included both SETI and UFOlogy, without adequately distinguishing between the two. Careful research and wild claims are intermingled. The inherently conservative nature of science places SETI at a disadvantage against an unruly competitor that stresses sensationalistic but unproven ideas. Initially, NASA – Ames Research Center was the home of SETI, but funding was withdrawn in the early 1990s, when an influential senator objected to using government funding to search for "little green men." While today NASA prohibits the use of funds for finding extraterrestrial intelligence, it does support research on the origin and distribution of life in the universe, and following congressional hearings held in 2002 there is a chance that the US government will, once again, fund the search for ET.

Some UFOlogists are competent scientists but most SETI scientists characterize UFOlogy as amateurish and ineffective. In his comparison of SETI and UFOlogy, historian and skeptic Michael Shermer (2000:229) notes "SETI is elitist; UFOs populist; SETI is highbrow, UFOs are

lowbrow... SETI is dominated by Ph.D. astronomers, physicists, and mathematicians [while UFOlogy is] predominantly within the domain of amateurs who lack scientific credentials."

UFOlogy's marginal status severely limits its opportunities to develop quality research. Public funding is not available. Mainstream science has quality control mechanisms to police membership within the field and imposes peer review on published articles. UFOlogy lacks ways to exclude incompetent researchers and, as already pointed out, is highly vulnerable to hoaxes and tricks. Universities stand ready to prepare the next generation of astrobiologists, but there is no recognized path to professional UFOlogy. Mainstream science journals are archived in libraries around the world and made available at special rates to members of professional associations. Few university libraries choose to subscribe to UFO journals, and UFO archives tend to be shuffled from place to place. Scientific UFOlogy can model itself after mainstream science, but since society defines it as a marginal, low status activity, it is hard pressed to match science's practices. Key differences between SETI and UFOlogy are summarized in Table 1.

Table 1
SETI and UFOlogy

1. SETI is Science
 - ! based on a scientific rationale, inference
 - ! conducted by credentialed scientists
 - ! insistence on verifiability/replicability
 - ! peers provide a system of checks and balances

2. UFOlogy is Not Science
 - ! based on popular culture and personal beliefs
 - ! undertaken by untrained observers
 - ! widespread acceptance of unverifiable assertions
 - ! weak system of checks and balances
 - ! many erroneous reports and hoaxes

3. Unless SETI distances itself from UFOlogy it will:
- ! be shunned by mainstream scientists
 - ! lose chances of funding
 - ! lose public support

Research Opportunities for Sociologists

Astrosociology seeks to involve sociologists in the study of space-centered human activities whether these occur on Earth or in space itself (Pass, 2004a, 2005). Perhaps the most obvious opportunities are in human space exploration. Here, social scientists might study social policy and political support, space advocacy groups, private sector businesses and public agencies that have vested interests in space, and groups of people who live on the high frontier. In general, partly for political reasons and partly because of its strong engineering culture (where human factors engineering plays a modest role) NASA has been less than welcoming to social scientists who hope to study the space effort (Harrison, 2005). Yet, as Jim Pass (2004a) also notes, sociologists also have opportunities to conduct studies in the area of astrobiology and SETI. Whether or not extraterrestrial civilizations exist, and whether or not we ever encounter one of these civilizations (if they do exist) there are many interesting research opportunities right here on Earth. At one level, sociologists might be interested in people's increasing fascination with space and efforts to redefine humankind as citizens of the cosmos. Attitudes towards outer space tell us something about inner space (human psychology) and our dreams about life "out there" tell us something about conditions "down here." As social phenomena, astrobiology and SETI are worthy of study in their own right, having thus far avoided the intensive scrutiny that has befallen UFO groups. Most importantly, the conduct and potential consequences of the

search are fraught with psychological, sociological, and cultural implications. Unlike the "hard scientists" who dominate NASA, the physical and biological scientists involved in SETI actively look beyond their home disciplines and solicit the help of social scientists and humanists to understand the social implications of their work.

For forty years SETI scientists have invited the participation of “anthropologists, psychologists, sociologists, historians, philosophers, and others from across the great cultural divide (Finney, 2000, page 151). They have always understood that their efforts would have profound implications for humankind (Baird, 1987; Billingham et al., 1999; Harrison, 1993, 1997; Harrison, Billingham et al., 2000; Harrison, McConnell and Schmidt, 2003). This was first evidenced in a 1961 report prepared by NASA for the US Congress in 1961 (Michael, 1961). A workshop conducted at NASA’s Ames Research Center in the 1970s stressed the urgency of making SETI an interdisciplinary effort (Morrison, Billingham and Wolfe, 1977). A similar recommendation was forthcoming from a 1999 NASA-Ames conference on the Societal Implications of Astrobiology (Harrison, Connell and Schmidt, 2003). Every year, the Congress of the International Academy of Astronautics holds separate workshops on the technical and social aspects of the search. In a position paper initially developed for the SETI Committee of the Academy, Harrison and Billingham et al. (2000) summarized key research areas as follows.

Public Attitudes and Support – Survey research can help searchers understand attitudes toward astrobiology, SETI, and extraterrestrial life. These attitudes have implications for both science and policy.

Conduct and Expansion of the Search – Social scientists may shed light on the cultural, intellectual, and emotional factors that shape the search and move searchers beyond unnecessarily limiting mind-sets. This can result in improved search strategies.

Signal Decryption and Interpretation – Anthropology, including archaeology and linguistics, along with cognitive psychology could be useful for decrypting and interpreting any message that we may intercept. These fields could also be helpful for framing interstellar communications that can be understood in cultures that are radically different from our own.

News Dissemination and Rumor Control – Social scientists can facilitate the orderly dissemination of news to the public. Here, we can benefit from historical precedent and our understanding of the media and mass communications, organizational functioning, social and psychological influences on attitude formation and change, rumor control, and many related topics.

Immediate and Long-Term Consequences of Detection – Social scientists can help forecast, understand and guide human reaction to confirmation of the existence of extraterrestrial life. Near-term research issues include initial reactions to the news, first impressions of the aliens, attitude perseverance and change, rumor, and collective behavior, including possible panic. Here, expertise on demographic and cultural differences, human information processing, social influence processes, and collective behavior will be welcome. Over the long range, confirmation of the existence of extraterrestrial life could affect every sphere of human endeavor. Obvious areas of concern include social change, cultural diffusion, technology and culture, international relations, meta-law, sociology of knowledge, sociology of law, sociology of occupations, social welfare, the history of science and technology, and intergroup relations.

Analyses of Extraterrestrial Organisms and Civilizations. The most challenging topic, and one that is avoided by most wise scientists, is forecasting the likely nature of extraterrestrial organisms and societies. Here, of course, anthropomorphism can run rampant, and science fiction themes of angels, devils, and emotionally sterile robots dominate purely imaginative scenarios. Another tact, reverse engineering, is to identify the requirements for interstellar communication and then work backwards to identify the behavioral and societal prerequisites. A certain level of interest in the universe around them and the ability to launch interstellar probes or, more likely, initiate interstellar broadcasts are prerequisites for them to make their presence known to us. Thomas Aquinas, no less, pioneered this strategy to identify the pre-requisites for other human-like races (George, 2005). Another strategy is to seek principles of behavior that are “universal” or “deep” in the sense that they hold true across species, cultures, and historical epochs (Harrison, 1993, 1997; Harrison and Dick, 2000). Our knowledge of biosocial entities on Earth gives us a good starting place for organizing our thinking about life everywhere.

Some of the common assumptions that enter into discussions of what ET must be “like” are listed in Table 2.

Table 2
Common Assumptions About ET

- Extraterrestrials will be more intelligent than humans, and for this reason alone they will be difficult to understand. In comparison to extraterrestrial intelligence, human intelligence is mediocre.
- Extraterrestrial civilization will be old, stable, and technologically advanced. To achieve their great age, they will have already solved the problems that put our own

civilization at risk: nuclear war, environmental decline, pandemic, and asteroid or comet impacts.

- Extraterrestrial civilization will be prosperous. This will reflect their advanced technology and ability to tap the resources of space.
- Extraterrestrial civilizations will have an outward orientation that allows them to detect potential dangers (such as astronomical hazards and war-like societies), satisfy their curiosity, and form collaborative relationships.
- Extraterrestrial civilization will be peaceful and willing to share information with Earth.

A brief summary of selected sociological research issues appears in Table 3. If we eliminate from consideration those researchers that are interested in UFOs and abductions, the number of behavioral and social scientists that have a continuing involvement in studying such issues is very small. Anthropologists – less than a dozen – predominate, aided by an event smaller handful of psychologists and sociologists, and an occasional political scientist. Conspicuous among sociologists are David Swift, who wrote an excellent book on SETI pioneers (Swift, 1990), and Donald E. Tarter who has been actively engaged in SETI social science for at least 15 years (e.g. Tarter, 1998).

Table 3

Selected Research Topics: Sociology and SETI

01. Attitudes and Public Opinion
02. Collective Behavior
03. Organizational Dynamics
04. Social Networks
05. Disaster Planning
06. Mass Media

07. Deviance and Social Control
08. Intergroup Communication
and Relations
09. Sociology of Knowledge
10. Sociology of Law
11. Sociology of Politics
12. Sociology of Religion
13. Policy Analysis and
Development

Conclusion

Recognizing that contemporary human efforts in space are best viewed as the tip of an iceberg and as possible precursors of grander future efforts, astrosociology proposes to move sociology into the space age (Pass, 2004b, 2005). Astrosociology deals with the broad, societal contexts of activity pertaining to space, as well as actual space exploration including human space exploration and the search for extraterrestrial life.

Astrobiology and SETI have many opportunities for increased involvement by sociologists, and sociological expertise is sorely needed. Sociological issues will be discussed with or without sociologists' involvement, and in the latter case the results will not meet with sociologists' professional approval. The very bright astronomers engaged in the search have some grounding in biology and are quite comfortable with Darwinian notions, but are not conversant with higher-level analyses. Some discussions are tainted by popular misconceptions regarding collective behavior and disaster management (Orson Wells' "War of the Worlds" broadcast).

As an emerging research field, astrosociology, especially in the area of SETI, will lack many of the mechanisms that support established fields (Harrison, Billingham et al, 2000).

Disciplinary biases that define some areas as "hot" are likely to discourage some sociologists from entering the field. Be prepared for "the giggle factor." Unless they carefully explain their work, sociologists whose activities can be linked to "little green men" risk ridicule and professional censure. For all intents and purposes, you will have no peer group. Although much has been published on life on other worlds, very little of this has been published by professional sociologists and their allies. Thus, expect a spotty and tangential literature base. Perhaps needless to say, there is little or no opportunity for funding. Other risks, especially for those are willing to contemplate the nature of unknown civilizations that are radically different from our own, include an inability to move beyond anthropocentric, ethnocentric ideas. Finally, there is always the risk of "going native." Even as the student of scientology may eventually drop his or her professional calling and become a scientologist. Social scientists involved in SETI run the risk of relinquishing professional detachment as they gain growing enthusiasm for the search itself.

Sociological research on astrobiology and SETI is an important contribution that would be welcomed by the physical and biological scientists that spearhead the search for extraterrestrial life, and it should be welcome by policy makers and the public. An effective multidisciplinary approach requires close coordination between the scientists who conduct the search and those who can shed light on the social implications, who can, in effect, help minimize the problems of cultural lag. A satisfactory overall research program would be broad, structured in such a way as to permit meaningful quantitative comparisons, and enable cogent explanations of the findings. Thoughtful and effective collaboration among physical, biological and social

scientists may break down the barriers that separate different intellectual fields and move us towards the unification of knowledge.

References

- Achenbach, Joel (1999). *Captured by Aliens*. New York: Simon and Schuster.
- Baird, John (1987). *The Inner Limits of Outer Space*. Hanover, N.H.: University Press of New England.
- Billingham, John, Roger Heyns, David Milne et al (1999). *Social Implications of the Detection of an Extraterrestrial Civilization*. Mountain View, Calif.: The SETI Institute.
- Darling, David. (2001). *Life Everywhere: The Maverick Science of Astrobiology*. New York: Basic Books.
- Denzler, Brenda (2001). *The Lure of the Edge: Scientific Passions, Religious Beliefs, and the Pursuit of UFOs*. Berkeley, Calif.: University of California Press.
- Dick, Steven J. (1996). *The Biological Universe: The Twentieth Century Extraterrestrial Life Debate and the Limits of Science*. Cambridge: Cambridge University Press.
- Dick, Steven J. (2000). "Cultural Aspects of Astrobiology." Pages 145-152 in *If SETI Succeeds: The Impact of High Information Contact*, edited by Allen Tough. Bellevue, Wash.: Foundation for the Future.
- Finney, Ben (2000). "SETI, Consilience and the Unity of Knowledge." Pages 139-144 in *If SETI Succeeds: The Impact of High Information Contact*, edited by Allen Tough. Bellevue, Wash.: Foundation for the Future.
- Fitzgerald, Randall (1998). *Cosmic Test Tube: Extraterrestrial Contact, Theories and Evidence*. Los Angeles: Moonlake Media.
- George, Marie I. (2005). *Christianity and Extraterrestrials: A Catholic Perspective*. New York: iUniverse, Inc..
- Goode, Erich (2000). *Paranormal Beliefs*. Prospect Heights, Ill.: Waveland Press.
- Hansen, George P. (2001). *The Trickster and the Paranormal*. Ex Libris.

- Harrison, Albert A. (1993). "Thinking Intelligently about Extraterrestrial Communication: An Application of Living Systems Theory." *Behavioral Science*, 38: 189-217.
- Harrison, Albert A. (1997). *After Contact: The Human Response to Extraterrestrial Life*. New York: Plenum.
- Harrison, Albert A. (2001). "Our Future Beyond Earth." *Space Times*, July/August, 4-9.
- Harrison, Albert A. (2003). "Confirmation of ETI: Initial Organizational Response." *Acta Astronautica*, 53: 229-236.
- Harrison, Albert A. (Ed.) (2005). "New Directions in Spaceflight Behavioral Health: A Workshop Integrating Research and Application." *Aviation, Space and Environmental Medicine*, 76 (6), Section II, Supplement, B1-B223.
- Harrison, Albert .A., John Billingham, Steven J. Dick, Ben Finney, Michael A. G. Michaud, Donald E. Tarter, Allen Tough, and Douglas A. Vakoch (2000). "The Role of the Social Sciences in SETI." Pages 105-119 in *If SETI Succeeds: The Impact of High Information Contact*, edited by Allen Tough. Bellevue, WA.: Foundation for the Future.
- Harrison, Albert A., Kathleen Connell and Gregory K. Schmidt (2002). "Rethinking our Place in the Universe: Exploring the Societal Implications of NASA's Astrobiology Program." *Space Times*, January-February, 4-9.
- Harrison, Albert. A., and Steven J. Dick (2000). "Contact: Long-Term Implications for Humanity." Pages 35-60 in *If SETI Succeeds: The Impact of High Information Contact*, edited by Allen Tough. Bellevue, WA.: Foundation for the Future.
- Jacobs, David M. (Ed.) (2000). *UFOs and Abductions: Challenging the Borders of Knowledge*. Lawrence, Kansas: University of Kansas Press.
- Lewis, James R. (Ed.) (1995). *The Gods Have Landed: New Religions from Other Worlds*. Albany, NY: State University of New York Press.
- Michael, Donald N. (1961). *Proposed Studies on the Implications of Peaceful Space Activities for Human Affairs*. Washington, DC: Brookings Institute.
- Morrison, Philip, John Billingham, and John Wolfe (Eds.) (1977). *The Search for Extraterrestrial Intelligence: SETI*. NASA SP-419. Washington, D.C.: National Aeronautics and Space Administration.
- Musella, David Park (2005). "Gallup Poll Shows that Americans' Belief in the Paranormal Persists." *Skeptical Inquirer*, September/October, 5.

- Palmer, Susan J. (2004). *Aliens Adored: Rael's UFO Religion*. New Brunswick, NJ: Rutgers University Press.
- Pass, Jim (2004a). *Inaugural Essay: The Definition of Astrosociology in the Twenty-First Century (Part One: Definition, Theory, and Scope)*. *Astrosociology.com*; retrieved from <http://www.astrosociology.com/iessay.html>.
- Pass, Jim (2004b). *Inaugural Essay: The Definition of Astrosociology in the Twenty-First Century (Part Two: Relevance of Astrosociology as a New Subfield of Sociology)*. *Astrosociology.com*; retrieved from <http://www.astrosociology.com/iessay.html>.
- Pass, Jim (2004c). *Space: Sociology's Forsaken Frontier*. *Astrosociology.com*; retrieved from <http://www.astrosociology.com/vlibrary.html>.
- Pass, Jim (2005). *Invitation to Astrosociology: Why the Sociologist-Space Enthusiast Should Consider It*. *Astrosociology.com*; retrieved from <http://www.astrosociology.com/vlibrary.html>.
- Peebles, Curtis (1994). *Watch the Skies! A Chronicle of the Flying Saucer Myth*.
- Partridge, Christopher (Ed.) (2003). *UFO Religions*. London: Routledge.
- Peters, Ted. (1995). "Exotheology: Speculations on Extraterrestrial Life." Pages 186-206 in *The Gods Have Landed: New Religions from Other Worlds*, edited by James R. Lewis. Albany: State University of New York Press.
- Randle, Kevin D., Russ Estes, and William P. McCone (1999). *The Abduction Enigma: The Truth Behind the Mass Alien Abductions of the Late Twentieth Century*. New York: Forge Books.
- Sagan, Carl, and Ann Druyan (1997). *This Demon Haunted World: Science as a Candle in the Dark*. New York: Ballantine Books.
- Shermer, Michael (2000). *The Borderlands of Science: Where Sense Meets Nonsense*. New York: Oxford University Press.
- Snow, C. P. (1959). *The Two Cultures and the Scientific Revolution*. Cambridge: Cambridge University Press.
- Sturrock, Peter A. (1999). *The UFO Enigma: A New Review of the Physical Evidence*. New York: Warner Books.
- Swift, David (1990). *SETI Pioneers*. Tempe, Arizona.: University of Arizona Press.

Tarter, Donald E. (1998). "Reply Policy and Signal Type." *Acta Astronautica*, 42: 685-689.

Tipler, Frank J. (1985). "Extraterrestrial Beings do not Exist." Pages 133-160 in *Extraterrestrials: Science and Alien Intelligence*, edited by Edward Regis, Jr.. Cambridge: Cambridge University Press.

Ulmschneider, Peter (2003). *Intelligent Life in the Universe: From Common Origins to the Future of Humanity*. New York: Springer Verlag.

Ward, Peter D., and Donald Brownlee (2000). *Rare Earth: Why Complex Life is Uncommon in the Universe*. New York: Copernicus Books.

White, Frank (1990). *The SETI Factor*. New York: Walker and Company.

