

## **Flying Saucers and Science**

By Stanton Friedman

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320 pages

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According to the back cover:

***Flying Saucers and Science** is a comprehensive look at the scientific data on the flying saucer phenomenon. Nuclear physicist and lecturer Stanton T. Friedman has distilled more than 40 years of research on UFOs, and shares his work on a wide variety of classified advanced nuclear and space systems. He answers a number of physics questions in layman's terms, and establishes that travel to nearby stars is within reach without violating the laws of physics.*

This book contains interesting sections on the author's experiences developing nuclear systems for various cancelled projects to develop nuclear powered vehicles. He provides information on the various nuclear rocket and related programs in the 1950's and 1960's that he worked on or has knowledge of. These sections are probably the strongest parts of the book.

The book has several problems. First, is the book a comprehensive look at the scientific data on the flying saucer phenomenon? The book incorporates by reference several books, reports, and records of Congressional hearings such as the Project Blue Book Special Report #14, the so-called Condon Report, the late J. Allen Hynek's book *The UFO Experience*, and so forth. It is difficult to see this listing of these sources with brief reviews of each as a *comprehensive* look at the scientific data. The author cites the statistical analysis in the Project Blue Book Special Report #14 but performs no similar analysis.

### **Overwhelming Evidence?**

In particular, the author claims in several places that there is "overwhelming evidence" that flying saucers or, more generally, UFOs are extraterrestrial spacecraft, that the US government knows this and

is covering up this fact, and indeed that the aliens are abducting human beings, apparently on a regular basis. For example:

*The evidence that Planet Earth is being visited by intelligently controlled extraterrestrial spacecraft is overwhelming.*

*(Flying Saucers and Science, p. 29)*

Yet, it is difficult to see how the evidence actually presented in the book or incorporated by reference is “overwhelming”. According to the book, Project Blue Book Special Report #14 (1955) classified a total of 689 (21.5%) of the reports studied as UNKNOWNS. The NICAP *The UFO Evidence* report of 1964 classified 746 cases investigated by NICAP as UNKNOWNS. The numbers for Richard Hall’s update, *The UFO Evidence: A Thirty Year Report* published in 2000 are not given. The section on the Congressional Hearings of July 29, 1968 mentions a paper on 41 cases submitted by Jim McDonald. According to the book, the Condon Report studied a whopping total of 117 cases, of which 30% (about 35) could not be identified. J. Allen Hynek’s *The UFO Experience* lists 14 daylight disks, 12 nocturnal lights, 12 radar-visual cases, 14 Close Encounters of the First Kind, 23 Close Encounters of the Second Kind, and 5 Close Encounters of the Third Kind (occupant cases) in *Appendix 1: Description of Sightings Discussed in Text*. These are all sightings with at least two observers. This is a total of 80 cases. The COMETA report actually only lists a small number of cases. Assuming no duplication, this is at least 1,591 so-called unknown cases mostly in the US over at least 30 years, maybe 50 to a few hundred hard to explain cases per year on average. I do not attempt to tabulate the abduction reports incorporated by reference. A few hundred sophisticated hoaxes, unusual psychological episodes, improbable flukes, and/or sightings of classified aircraft per year is not a large number for a nation with as large a population as the United States.

In fact, there are more comprehensive collections of UFO cases than the sources referenced in *Flying Saucers and Science*. Larry Hatch’s **U** database contained 12,100 cases as of 1999 (*source: Time-Series Analysis of a Catalog of UFO Events: Evidence of a Local-Sidereal-Time Modulation, P. A. STURROCK. Journal of Scientific Exploration, Vol. 18, No. 3, pp. 399–419, 2004*). The CUFOS UFOCAT99 electronic catalog reportedly contains 109,000 cases (*source: CUFOS web site, accessed August 5, 2008*). However, even if there are 109,000 hard to explain cases over 60+ years, how significant is this? The most likely conventional explanations for hard to explain cases are hoaxes, some

sort of psychological phenomena, and classified aircraft. It is not easy to find official figures on the rates of crimes such as fraud. Official Department of Justice crime statistics typically report a murder rate in the United States of between 1 and 40 murders per 100,000 persons per year depending on state and other factors. Murder is generally the least common of the different categories of crimes reported by the Department of Justice. Murder has far more severe penalties than hoaxing a UFO and even many highly unethical people would balk at murder for ethical reasons. In fact, in many cases, faking a UFO sighting is not a crime at all. If the incidence rate for sophisticated, meaning difficult or impossible to detect, hoaxes of UFOs were only 1 per 100,000 persons, the United States today would expect around 3000 hard to explain cases per year. Over 60 years, this would give around 1-200,000 cases in the US alone (the UFOCAT99 catalog probably includes cases outside the US).

The incidence rate for transient psychological phenomena that might cause hard to explain UFO cases is very difficult to estimate. For example, what is the incidence rate of unwitting exposure to powerful psychedelic drugs such as LSD that could cause perceived UFO incidents, including even bizarre abduction experiences? The incidence rate for sightings of classified aircraft is also very difficult to estimate. In one of the many peregrinations of the UFO controversy, Gerald K. Haines of the CIA has claimed that a large fraction of the UFO sightings of the late 1950's and early 1960's were sightings of U-2 and SR-71 spy-planes (*caveat emptor*). Nonetheless it seems clear that the total number of hard to explain UFO reports is not large enough to rule out these conventional explanations *with high probability (for example, even a 95% confidence level) based on the number of unexplained reports alone*.

In fact, nearly all evidence of UFOs consists of eyewitness reports and some physical evidence that in nearly all cases could be produced here on Earth either by natural forces or fraud. To be sure, there are many eyewitness accounts of UFOs that are essentially impossible to explain without either invoking new phenomena or attributing the accounts to fraud, a psychological phenomenon, or an extremely unlikely fluke. This is true of essentially all of the purported abductions, many if not all cases where an occupant is reported, and many close range sightings of metallic disks and other apparently manufactured objects, especially during the day. However, is it correct to call this evidence overwhelming? Certainly not.

In fact, the hypothesis of UFOs as extraterrestrial spacecraft suffers from a lack of strong evidence. What would be strong evidence?

### Strong Evidence

1. A sample or samples of an unusual material that could not be fabricated or found here on Earth, such as an extremely hard material suitable for a spaceship.
2. A working machine that could not be designed or fabricated here on Earth by human beings, such as an antigravity device.
3. A sample or samples of biological material that is not found here on Earth, such as a living organism that did not use DNA, RNA, or something closely related as the mechanism for its genetic code.
4. Highly detailed, high quality, high resolution still or moving film or even digital imagery of a vehicle or occupants that would be difficult to fake due to the high level of detail in the images.

Even such strong evidence would not be conclusive, especially if there is only one or a few instances of the piece of evidence. In particular, even detailed images or video could probably be faked by a highly skilled special effects expert beyond the ability of anyone to unambiguously detect. On the other hand, if numerous such images were collected throughout the world in many different locations, with supporting witnesses and documentation, a fraud would be much less likely. Unusual biological samples, machines, or materials could be attributed to classified programs or some other excuse (and likely would if discovered).

Nonetheless, the point remains that such strong evidence is mostly lacking and *Flying Saucers and Science* fails to present such evidence. The book largely sidesteps the most significant objection to the hypothesis that some UFOs are extraterrestrial spacecraft, namely the almost total lack of strong evidence as defined above, including the remarkable lack of detailed pictures of the putative alien spacecraft after over sixty years of UFO sightings probably numbering in the tens of thousands.

The book appears to contain a single photograph of a purported UFO, with the caption:

*The best of four Trinidad, Brazil UFO pictures, released by the Brazilian president. Courtesy of the author.*

*(Flying Saucers and Science, p. 194)*

In my copy, this picture is printed with dimensions about 8cm in height and 11.5cm in width. The actual UFO appears to be at some distance from the camera. The UFO measures about 1.25 cm in length and about 0.4 cm in height. The UFO is very vague, almost like a cloud. The UFO is not obviously metallic. There is very little detail. It is by no means clear that this is a picture of a machine.

One may compare this lone picture of a UFO with the numerous detailed photographs of nuclear equipment, test nuclear rocket engines, and so forth that the author present in the chapter *You Can Get Here from There*. These show considerable detail. There are numerous pipes and other mechanical components clearly visible. The material looks like metal. The nuclear systems fill the photographs.

This, then, is the problem. Despite over sixty years of UFO sightings including many reported close encounters, there seem to be very few, if any, detailed pictures of these craft, in focus, at close range, in high detail -- despite improving cameras, increasing use of video and still surveillance cameras, and modern digital cameras.

Does the almost total lack of strong evidence rule out or nearly rule out the extraterrestrial hypothesis for some UFOs? No, not really. If UFOs are aliens, the aliens almost certainly are using advanced technologies to avoid leaving any strong evidence. In particular, they must be able to largely avoid being photographed or imaged at close range in high detail given the almost total lack of such images. Why would they do this? While it is unlikely that we could reverse engineer their power and propulsion technology based on external pictures alone, it is quite possible that high quality pictures in combination with other data could help reverse engineer their technology. This would be particularly true if the actual shape and possibly constitution of the exterior surface of the craft played an important part in the power or propulsion system. A propeller, for example, is an external component of an aircraft that plays a central role in the propulsion system. The precise shapes of both the propeller and the aircraft wing help determine the lift and thrust of an aircraft. The precise shapes of propellers and wings, for example, could be determined from high quality photographs of planes. A solar panel, the main power source of many Earth spacecraft, is an external component that cannot be hidden from view. Even a power source might be integrated into the exterior surface of a UFO.

Several advanced technologies, either separately or more likely in combination, in *widespread* use by the UFOs could account for the near total absence of strong evidence:

1. Tracking mechanisms embedded in materials and equipment that enable the aliens to detect, probably automatically, any sensitive materials accidentally left behind, dropped, broken off, or stolen by humans.
2. Self-destruct mechanisms built into any sensitive components that would reveal their extraterrestrial origins and, perhaps more to the point, might enable humans to reverse engineer the alien technology.
3. Extremely durable materials and/or components that simply never break.
4. Whatever materials are left behind or produced during a crash or system failure must be materials that can be produced on Earth. For example, if the UFOs are constructed of aluminum, debris cannot be recognized as alien.
5. Video cameras and possibly other sensors integrated into the exterior shell of the flying saucer or UFO. The video cameras or other sensors must be small, camouflaged in some way, or tightly integrated into the hull material of the vehicles so that eyewitnesses do not or cannot notice them. Consider the small size of video cameras now appearing in cell phones and laptop computers. These sensors are combined with automatic pattern recognition algorithms that detect humans and especially cameras and other devices that can collect detailed information on the UFOs that would constitute strong evidence. The UFO guidance, navigation, and control system directs the craft to either avoid the field of view of any cameras that are detected entirely or stay at a safe distance where details are lacking.
6. Much higher levels of reliability for the UFO machinery than is typically in human machinery, even very high reliability machinery such as commercial jet airplanes or refrigerators.
7. A high performance, high reliability sterilization or containment system to prevent contamination of Earth with extraterrestrial biological samples (and probably also to protect the aliens from terrestrial life). It is likely this would have to be integrated into the suits that the reported occupants wear or even the bodies of the occupants. For example, a coating or artificial skin might prevent shedding of hair, dead skin, or other biological samples.
8. (OR) The alien biology is astonishingly identical or very similar to Earth biology so that biological samples cannot be identified as extraterrestrial in origin.

A number of these technologies such as tiny and shrinking video cameras already exist on Earth or can reasonably be expected to be developed by the end of the century without any new physics. A combination of video cameras and a pattern recognition system to automatically detect approaching observers and cameras is not far fetched at all. In fact, it is likely that automobiles and other vehicles will incorporate such technologies as safety features within the century. One can easily imagine a computerized automobile guidance system detecting pedestrians and automatically avoiding them with far greater reliability than imperfect human drivers. A logical implication of such a system is that when UFOs are observed or imaged, they are usually well aware they are being watched and are allowing it to happen for some reason.

Consider also the integration of sophisticated radar detectors with the guidance, navigation, and control system of a UFO. If they exist, UFOs are capable of much greater speeds and accelerations than even the highest performance aircraft on Earth today. Consequently, an automatic guidance system could easily change speed and direction very rapidly when a radar beam was detected, making tracking of the UFOs extremely difficult even for the best air defense radar systems. Indeed, even being sure there was a single object to track would be very difficult due to the constantly changing speed and direction of the vehicle.

At least one potential super-hard material is known to materials science, that is materials fabricated as perfect or near perfect crystals without the numerous microscopic defects present in all known macroscopic objects. These defects lead to the weakness of current materials. A hypothetical defect-free material could be fifty to a hundred times harder than steel. Of course, so far all attempts to fabricate defect-free or near defect-free materials in bulk quantities have failed. Defect-free materials are known only as small crystals such as "whiskers" and carbon nanotubes.

The quite plausible explanation above for the lack of high-quality imaging data illustrates a problem that recurs over and over again in scientific controversies. It is usually possible to devise technically sophisticated arguments that can explain apparently contradictory evidence, or in this case a seeming lack of supporting evidence. However, one should be cautious and concerned when one encounters a technically sophisticated argument to explain seemingly grossly contradictory evidence (or lack of evidence).

## Roswell and the Classified Trump Card

The book also cites the mysterious Roswell case. Roswell, of course, has turned into a cultural icon and cottage industry complete with appearances in the *X-Files*, *Independence Day*, a *Roswell* TV show, dozens of books, web sites, and so on. The author, by his account, played a central role in the emergence of the Roswell story in the late 1970's. Indeed, Roswell is so well known today that many people do not realize it was almost never mentioned in relation to UFO's before 1978. The now discarded Air Force weather balloon explanation was widely accepted and the incident largely forgotten. The late 1970's and 1980's saw several participants or possible participants in the original incident such as Jesse Marcel make claims of witnessing something truly remarkable, quite possibly a crashed alien spacecraft if the reports are true. It includes counter-claims from other participants, changing stories, allegations of fraud, and all the frequent smoke and mirrors of extremely strange UFO cases.

Roswell also features a curious change in the government's story, a seeming discarding of the original weather balloon story, and a non-denial denial, a theory that a classified *Mogul* balloon used to detect radiation from atomic bomb tests was recovered. This theory was presented both by the Air Force and later by skeptics in such a way as to sound like a proven fact, although a close reading of the government report shows no eyewitnesses willing to testify on record and that all documents such as an after-incident report are missing, supposedly destroyed in routine document destruction (not an impossible excuse).

In Roswell, there is indeed evidence of something and evidence of some sort of government cover up. Actually, the government appears to have admitted a cover up (of the then classified *Mogul* program). This might be called the classified trump card of the UFO controversy, always available to skeptics so long as the government plays along (or always available to the government so long as the skeptics play along). Almost certainly, some UFO reports are classified aircraft. The government may very well cover up UFO cases that are classified incidents and may, in some cases, have good reason to do so. One may even encounter unusual materials, equipment, or even biological specimens (in the case of a classified biological weapons program) in a classified incident. If all else fails, one can explain, with great scorn and disdain aimed at the foolish witnesses and UFO researchers who failed to recognize a secret classified aircraft for what it was, that the

UFO was actually super-secret program XYZ. Any idiot should have known that and what is all the fuss about?

Roswell is evidence of something. But what? It may have been a crashed alien spacecraft as some participants have claimed. But is it "overwhelming evidence"? Without a piece of the wreckage that could not be fabricated on Earth or similar physical evidence, Roswell is not overwhelming evidence either.

## **Majestic-12**

One of the pieces of evidence that the book cites is the so-called Majestic-12 documents which supposedly document the creation of a secret government committee known as Majestic-12 or MJ-12 to oversee dealing with the alien problem in 1947 following the purported UFO crash in Roswell, New Mexico. The author published an entire book *TOP SECRET/MAJIC* on these documents several years ago.

The problem is that the Majestic documents are not originals but purported photographs of the documents:

*Just 10 years after the 1984 receipt of a roll of exposed 35mm film by Jaime Shandera at his Burbank, California, home and his efforts with William Moore and myself to evaluate them, a new roll of film showed up in the mailbox of aviation and science writer (and long time ufologist) Don Berliner.*

*(Flying Saucers and Science, p. 258)*

It is essentially impossible to authenticate documents or manuscripts without the original. Crude cutting and pasting can be hidden in a photograph. There is no way to date the paper or ink. Even originals may be faked in some cases with sufficient expertise and resources. The author authenticates the documents only by comparing them to known documents and official records. Others have claimed to find inconsistencies between the Majestic documents and documents of the same vintage. Whatever the truth, it is not possible to authenticate documents of this type without the originals, an issue that the author largely ignores in *Flying Saucers and Science* and his previous book.

## **The Abductions**

The book endorses the claims of alien abductions, citing Budd Hopkins and Dr. David Jacobs favorably by name. The author also refers

favorably to the Hill abduction case. The author is a co-author of *Captured*, a recent book on the Hill case. *Flying Saucers and Science* also attacks Susan Clancy's recent critical book about abductions (*Abducted: How people Come to Believe They Were Kidnapped by Aliens*, Harvard University Press 2005) which reaches the predictable mainstream science conclusion that it is all in the abductee's heads. However, very little of *Flying Saucers and Science* addresses the specific content of the abduction cases and the so-called abduction research. Perhaps intentionally, since many of the abduction claims are truly bizarre.

Alien abduction claims have been around at least since the 1950's. Prior to around 1980, abduction claims were relatively rare. The early abduction claims sometimes included strange sexual or religious/mystical elements similar or identical to the elements that now abound. The abduction stories were often presented in books as chance encounters or one-time events, perhaps someone taking a walk or drive in a sparsely populated area who blundered into the aliens during one of their mysterious missions. In some cases, the abductees claimed full conscious recall of the event. In a number of cases such as the Hills, the event was mostly recovered during hypnosis. Since about 1980, the number and strangeness of the abduction claims seems to have skyrocketed, closely associated with a small number of abduction researchers (the late Dr. John Mack, Budd Hopkins, Dr. David Jacobs, and others) who have published numerous books on the topic and appear to run support groups for the abductees.

The modern abduction claims include:

1. The aliens are repeatedly abducting certain people, often starting in childhood.
2. The abductions run in families, with the children and parents of abductees either likely or certain to be or have been abducted.
3. The aliens perform some sort of medical examination on the abductees, including stripping the abductees naked, inserting painful probes, taking tissue samples without an anaesthetic, and sometimes performing other apparently sadistic operations.
4. The aliens are creating hybrid human-aliens.
5. Female abductees are impregnated in some way and carry these hybrid children in their wombs for a few months.
6. The hybrid children are removed after a few months during an abduction and carried to full development in some sort of artificial womb.

7. The abductees are shown the hybrid children and asked to hug them or perform other parental acts.
8. The abductees are frequently shown some sort of message, for example urging the world to make peace, abandon nuclear weapons, or predicting environmental catastrophe unless the human race changes direction.
9. The aliens are able to abduct people not only from isolated country roads, but even from bedrooms and sometimes from populated suburbs and regions, all without detection by anyone other than the abductee in the vast majority of cases.
10. In most cases, the aliens remove conscious recall of the abduction event other than occasional sightings of an approaching UFO, "missing time", and some other anomalies.
11. The alien memory erasure is imperfect and can be overcome by hypnosis.
12. The aliens communicate with the abductees by telepathy.
13. The aliens have some sort of mind control or something similar that enables them to control the abductees in some way.
14. The abductees sometimes develop psychic powers or have other paranormal experiences.
15. Some abductees develop strange interests or obsessions.
16. The abductees are implanted with some sort of tracking, monitoring, or control device that is undetectable during medical examinations or appears only as unusual scar tissue or something similar that cannot be clearly identified as an alien device.

Numerous truly strange accounts, supposedly recovered from often unidentified patients during hypnosis, can be found in books by Budd Hopkins, John Mack and others. It is worth noting that some of the researchers and abductees either believe or entertain the possibility that the aliens are not extraterrestrials but some other unknown phenomenon such as psychic or supernatural forces.

Is it possible that genuine aliens are doing this? Certainly the kind of advanced stealth technologies outlined above, which in many cases are plausible and do not require new physics, *might* well enable aliens to carry out such an elaborate and mysterious program with little or no hard evidence falling into human hands. A common objection to the physical reality of the abduction experiences is the question how hundreds or thousands of people could be exposed to the aliens on board their craft for hours at a time without ever returning with even a single alien artifact. However, a high reliability tracking device embedded in every piece of equipment that could be removed by the

abductee could explain this. Tracking technologies of this type are plausible and are already in use here on Earth.

However, one must wonder a great deal especially given the appearance of strange sexual and religious/mystical elements in many of the stories, not to mention the heavy use of hypnosis to recover the memories. If the abduction stories in part or in whole are the result of deliberate or accidental misuse of hypnosis and other psychological techniques on people, very serious harm may be being done by the so-called abduction research. *Flying Saucers and Science* certainly has little to address these concerns. A "comprehensive look at the scientific data" would certainly need to say much more.

### **Interstellar Travel**

One of the arguments against UFOs as extraterrestrial spacecraft is that interstellar travel is impossible, at least based on current physics. This argument is trotted out from time to time by various skeptics. The book devotes a chapter *You Can Get Here from There* to countering these arguments. Some of the discussion and pictures of various nuclear rocket engines and other nuclear gadgets from the 1950's and 1960's is fascinating. The chapter does not mention the estimates for the top speeds and flight durations for interstellar missions using hypothetical nuclear fission rockets, nuclear fusion rockets, and antimatter powered rockets. These serious scientific estimates are not encouraging.

Here are some numbers for sending a hypothetical 1000 ton interstellar spacecraft to Alpha Centauri, the nearest star which is 4.3 light years from Earth.

<b>Propulsion</b>	<b>Top Speed</b>	<b>Flight Duration</b>
Chemical Rocket	175 km/sec	7700 years
Nuclear Fission Rocket	2% speed of light	215 years
Nuclear Fusion Rocket	10% speed of light	43 years
Antimatter Rocket	90% speed of light	5 years

*(Source: Entering Space: Creating a Spacefaring Civilization)*

*by Robert Zubrin, Tarcher, 2000. Note that this is a very positive book about the prospects for space travel.)*

The technical challenges are enormous, but interstellar travel *may* be possible within the physics that we know. Of course, if UFOs are aliens, it is more likely that they are using physics that we do not know and have yet to discover.

## **SETI and Alien Worship**

The author devotes a significant amount of space including a chapter titled *The Cult of SETI* to attacking SETI (Search for Extraterrestrial Intelligence) and especially Dr. Seth Shostak, with some potshots at SETI leaders Dr. Jill Tarter (incorrectly spelled Tartar in my copy of the book) and Dr. Frank Drake.

SETI is a curious scientific field and program. The SETI Institute, which is almost synonymous with SETI in the US, is a NASA contractor closely associated with NASA Ames Research Center (Moffett Field, CA). SETI Institute contractors are involved in or comprise a variety of NASA programs many of which have some relationship to the origin and evolution of life, looking for aliens, and other exotic areas. For example, the SETI Institute is involved in data analysis for the Kepler project to locate possible Earth-like worlds orbiting other stars. Kepler is a \$600 million program to launch a probe into solar orbit that will look for decreases in light from stars caused by planets transiting in front of the star. It is possible the technology could also be used to look for dark objects within the solar system as they pass in front of stars.

Congress has prohibited NASA from funding the searches for alien radio signals. Microsoft billionaire Paul Allen provided funding to the SETI Institute for the Allen Telescope Array to conduct such a search. Funding for actual SETI is entirely private, which may also place the activity entirely outside of government reporting requirements. To be blunt, the SETI Institute engages in many programs that would probably have a highly classified element if the government knew about and was covering up aliens visiting the Earth. The author actually suggests in one paragraph that Frank Drake may have replaced the late UFO skeptic Donald Menzel on the alleged secret government Majestic-12 committee.

*I have been asked my opinion as to who might have taken Menzel's place [on the Majestic-12 committee].... A better bet to my mind might be Frank Drake, now of the SETI Institute in California.*

*(Flying Saucers and Science, p. 136-137)*

SETI has suffered from what space enthusiasts call the "giggle factor", the credibility problem that space activities sometimes suffer due to an association with strange subjects such as UFOs and science fiction such as *Star Trek*. The late Senator William Proxmire targeted SETI with his Golden Fleece award until the late Carl Sagan convinced him to relent. SETI was attacked with considerable ridicule in Congress, specifically linking it to tabloid headlines about alien abductions and so forth, leading to the ban on funding of radio searches for aliens. SETI is rarely attacked on the record by scientists, but I suspect there is considerable skepticism about the program among scientists. NASA gadfly Dr. Jeff Bell, conveniently retired in Hawaii, has criticized SETI on the record, perhaps expressing common doubts discussed in private by scientists. Seth Shostak of the SETI Institute, in particular, has attacked UFOs on several occasions and debated Stanton Friedman. One may need look no further than the "giggle factor" for the SETI antipathy to UFOs. No government cover up may be required.

Both in the middle of the book and especially in the concluding chapter, the author raises the possibility that the UFOs represent an advanced enlightened extraterrestrial civilization that has triumphed over war, in part out of necessity due to the presumed power of the alien's weapons making war into certain self-destruction. Hence, study of the UFOs or contact with them may lead us to world peace. This notion has been associated with flying saucers at least since the famous classic flying saucer movie *The Day the Earth Stood Still*. This notion of advanced, enlightened, even godlike aliens was present in most of the flying saucer contactee cults of the 1950s. It also recurs in the context of the abductions mentioned above, despite the alarming nature of many of the abduction accounts.

The author accuses SETI of not discussing that advanced aliens might have solved the problem of war at one point in the book:

*SETI people don't seem to want to discuss the simple notion that technologically advanced civilizations must learn to live at relative peace with other civilizations or be destroyed by that advanced technology.*

*(Flying Saucers and Science, p. 151)*

In fact, SETI has been closely associated with this concept of advanced alien civilizations for years. A common SETI idea is that the aliens might send a message by radio containing some sort of digitized enlightenment. Here is a clear statement of this sort from a SETI book:

*When the opportunity for contact arises it will be costly, in both money and time. Yet we will seize the opportunity, for reasons that will be compelling at that time. I do not know what the reasons will be, but here are suggestions. Peace may continue to elude human grasp, despite sincere effort, to the point where information about the social organization of an outside planet will be highly valued.*

*(Ronald Bracewell, The Galactic Club, W.H. Freeman and Company, San Francisco, 1974, p. 128)*

In his biography of the astronomer and science popularizer Carl Sagan, Keay Davidson devotes several pages to claims of this sort by Sagan and other SETI leaders:

*Carl Sagan, too, believed in superior beings in space, creatures so intelligent, so powerful as to resemble gods. They are superior partly because their civilizations are millions of years old and have developed technologies unimaginable to us. They have evolved far enough to outgrow their warlike ways. And they are benevolent, they will even share the secrets of the cosmos with us, if we'll simply tune in to their radio transmissions. In short, they are all powerful, all-knowing, all-loving. Is it any wonder that Sagan's first son, science writer Dorion Sagan, scoffs that "the search for extraterrestrial intelligence is a replacement for religion in a secular age."*

*(Carl Sagan: A Life, Keay Davidson, John Wiley and Sons, New York, 1999, p. 237)*

Davidson cites many quotes by Sagan and other SETI leaders similar to Professor Bracewell's quote above. This SETI quasi-religion is evident in the SETI movie *Contact* (based on Carl Sagan's novel) with its curious, ambiguous ending. It is precisely this salvation from the stars notion that raises skepticism of both SETI and UFOs (or SETI and UFO enthusiasts) in many circles. The SETI community may well have toned down or avoided such rhetoric in recent years due to public or private criticism or a strong "suggestion" from NASA.

Curiously, the author accepts the abductions with their frequently harrowing accounts of alien activities. Yet, he concludes the book with the hopeful notion of an enlightened, peaceful alien civilization that may perhaps lead us to a better world. This is most clearly stated in this paragraph:

*In addition to the visitors' advanced technology, it appears they must have at least some advanced sociology as well. They haven't caused wholesale destruction on our planet...yet. They don't knock down every aircraft that gets a radar lock on them and comes chasing them. As far as we know, they haven't given ultimatums to earthling governments to do certain things – or else. We haven't been told to throw out our religion, or to destroy certain groups because the aliens don't approve of them. As far as can be told, they haven't offered new and better weapons to this or that group to help them with this or that project. They haven't enslaved us. They don't seem to have intervened in any large way. That would seem to show forbearance. I must say, the fact they are being observed all over the planet does spread the message that we are neither alone nor the big-shots in the neighborhood – a big message indeed.*

*(Flying Saucers and Science, p. 298-299)*

Well, maybe. It is a common notion in popular science and science fiction, epitomized by the original *Star Trek*, that technological and political/moral progress go hand in hand. Certainly, human history does not clearly support this. One can make a strong case that several of the technologically backward "barbarian" civilizations that battled the Roman Empire were actually politically and morally ahead of Rome (perhaps not a difficult feat after the fall of the Roman Republic). The Scottish tribes that defeated the second century Roman invasion of Scotland lived under democratic governments and seem positively humane compared to the invading Romans who took pride in slaughtering entire villages. Josephus' pro-Roman *The Jewish Wars* describes the slaughter of around one-million Jews by the more advanced Roman civilization. The Visigoths who ultimately overthrew Rome do not sound particularly barbaric compared to their Roman oppressors. The *Pax Romana* was extremely violent. *Pax Alien. Caveat emptor.*

*If some UFOs are aliens, there are scenarios other than benevolent, pacifist superbeings that can explain their seemingly non-aggressive behavior. For example, if we could rapidly duplicate their power and*

propulsion technology using tools, machinery, and technology widely available to us now, they might behave exactly as they do. For example, some present-day fusion devices can be fabricated for a few thousand dollars using widely available tools. These devices consume more energy than they generate, but a breakthrough could change this dramatically.

*(See for example: Nuclear Ambitions: Amateur Scientists Get a Reaction from Fusion, by Sam Schechner, Wall Street Journal, August 18, 2008, page A1)*

An open attack or display (landing on the White House lawn) might provoke us to develop the technology that they do not want us to have and, in the case of an attack, defeat them despite the seemingly long odds. A massive genocidal preemptive attack from space could probably wipe out our nuclear weapons facilities and labs as well as most of the population, but it might not be able to wipe out our machine shops and other facilities.

The survivors would be highly motivated to replicate, if possible surpass, the alien technology and retaliate. Every "kooky" idea from cold fusion to zero point energy would be dusted off and seriously investigated by everyone from surviving top scientists to town welders. Major technological advances usually require many years of trial and error no matter how intelligent the inventor or discoverer is. Trial and error plays a major role. But in the case of a massive global attack, the many trials might be performed in parallel by large numbers of the survivors of the attack. What other hope for survival would exist? Any alien weapons or spacecraft that malfunctioned during the attack and fell into human hands could also contribute to replicating the alien technology; there would probably be more chances for a rare malfunction of the high reliability alien technology during a massive attack than during a limited reconnaissance operation.

In this scenario, even extremely malevolent aliens might conclude that overtly aggressive behavior would be unwise. A more subtle approach would be better. During reconnaissance operations, it would be extremely important to exercise great caution to avoid giving us clues or a working example that would enable us to replicate their key technologies.

A final comment on cults may be in order. People build cults and engage in cult-like behavior around real things. One encounters

groups and behavior that resemble cults in open-source and free software. People have constructed cults such as Ayn Rand's Objectivist movement around business or "free market" economics. There are space activist groups that exhibit various features of cults. Well-funded and successful groups are rarely publicly labeled cults even if they exhibit the characteristics of a cult and may be so identified or criticized in private by people familiar with the group. The existence of UFO or SETI cults, or irrational alien worship, does not tell us whether UFOs or aliens are real or imaginary.

### **What Would Make *Flying Saucers and Science* Better?**

The book would have been better with a modern statistical study of UFO reports to date along the lines of the statistical study in Project Blue Book Special Report #14. Statistical software embodying modern methods such as R, SAS, and so forth could be applied today. This would not settle anything, but would provide a more rigorous picture of the alleged phenomena.

The unwarranted term "overwhelming evidence" should be discarded, as it is not justified and undermines the credibility of the book. Similarly the limits of authentication of the Majestic documents should be disclosed in the text. Something more convincing should be said about the alleged abductions for the reasons outlined above. Should anyone, even implicitly, endorse hypnotic regression, a poorly understood process, sometimes by unqualified practitioners, in cases of possible alien encounters, when the interaction of hypnosis with the effects of the possible alien forces is clearly beyond our knowledge?

### **Conclusion**

*Flying Saucers and Science* contains an interesting discussion of the now cancelled attempts to build nuclear airplanes, rockets, and other vehicles in the 1950's and 1960's. Indeed, we may one day build such vehicles, travel to other planets in the solar system, and even reach out to other solar systems, although it seems likely something beyond nuclear fission would be needed to reach even Alpha Centauri, the nearest star. The author takes on, probably correctly, questionable arguments that interstellar travel must be impossible, hence no aliens could be visiting Earth today (or ever). In this area, the book seems on relatively firm ground and indeed this is the author's area of technical expertise prior to becoming a prominent ufologist. Nonetheless the prospects for interstellar travel are not as positive as the book implies.

While there seems to be a continuing stream of eyewitness reports sometimes supported by some physical evidence that defy conventional explanation except by invoking fraud or a psychological phenomenon, this evidence is certainly not “overwhelming”. The marked absence of high quality photographic and imaging data is not addressed, nor the absence of other strong evidence. Several thousand unexplained cases may seem like a large number, but considering that this is spread over 60+ years (since 1947) and considering the population of the world, this is not an unreasonable number for sophisticated hoaxes, psychological phenomena, improbable flukes, and sightings of classified aircraft or spaceships. Similarly there are some odd things that suggest a government cover up in some cases, but this may be due to classified programs unrelated to extraterrestrial visitors.

One conclusion is clear, *if* some UFOs are extraterrestrial spacecraft, it is extremely likely that the aliens are using advanced technology to hide their presence and probably prevent us from reverse engineering their technology. *If* UFOs are aliens, it is highly likely that the lack of high quality, detailed photographic evidence is due to deliberate measures by the aliens. The elusive nature of the phenomenon is due to the UFOs themselves, and not principally any government cover up. *If* UFOs are aliens, it is likely that proving their existence would require a technological advance, a way to circumvent their evasive “stealth” technologies.

### **About the Reviewer**

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