



Unidentified Flying Objects

Carl Sagan

To cite this article: Carl Sagan (1967) Unidentified Flying Objects, Bulletin of the Atomic Scientists, 23:6, 43-44, DOI: [10.1080/00963402.1967.11455092](https://doi.org/10.1080/00963402.1967.11455092)

To link to this article: <https://doi.org/10.1080/00963402.1967.11455092>



Published online: 15 Sep 2015.



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Unidentified Flying Objects

Carl Sagan, *Smithsonian Institution Astrophysical Laboratory, Cambridge, Massachusetts*, prepared the following report for the *Encyclopedia Americana*. Reprinted here with permission of the publishers, *Grolier, Inc., New York (1967)*.

In the United States, popular interest in unidentified flying objects began on June 24, 1947, when a group of rapidly moving, glistening objects was observed from the air in daytime, near Mount Rainier, Washington. The observer, a Seattle resident, dubbed them "flying saucers." The sighting received extensive publicity. Somewhat similar sightings have been reported ever since. The differences among these observations, however, are as striking as the observations themselves.

Investigations: Because of its national defense responsibility, the U.S. Air Force investigates reports of unidentified flying objects over the United States. The number of sightings investigated by the Air Force in the period 1947-1965 varied greatly from year to year.

UFO SIGHTINGS INVESTIGATED BY U.S. AIR FORCE

1947-1950	577	1956-1960	3,350
1951-1955	2,880	1961-1965	2,912

Source: L. J. Tacker, *Flying Saucers and the U.S. Air Force* (Princeton, 1960) and Library of Congress, *Facts About Unidentified Flying Objects* (Washington, 1966).

Evaluation of these reports is difficult. Observations frequently are sketchy, and different reports of the same phenomenon are often dissimilar, or even irreconcilable. Observers tend to exaggerate. Deliberate hoaxes, some involving double-exposure photography, have been perpetrated.

Most UFOs have been identified as belonging to one of the following categories; unconventional aircraft; aircraft under uncommon weather conditions; aircraft with unusual external light patterns; meteorological and other high-altitude balloons; artificial earth satellites; flocks of birds; reflections of searchlights or headlights off clouds; reflection of sunlight from shiny surfaces; luminescent organisms (including one case of a firefly lodged between two adjacent panes of glass in an airplane cockpit window); optical mirages and looming (a mirage in which images of objects below the horizon appear distorted); lenticular formations; ball lightning; sun dogs; meteors, including green fireballs; planets, especially Venus; bright stars; and the aurora borealis.

Radar detection of unidentified flying objects has also occurred occasionally. Many of these sightings have been explained as radar reflections from temperature inversion layers in the atmosphere and other sources of radar "angels."

Considering the difficulties involved in tracking down

visual and radar sightings, it is remarkable that all but a few per cent of the reported UFOs have been identified as naturally occurring—if sometimes unusual—phenomena. It is of some interest that the UFOs which are unidentified do not fall into uniform categories such as motion, color, and lighting, but rather run through the same range of these variables as the identified UFOs. In October 1957, Sputnik I, the first earth-orbiting artificial satellite, was launched. Of 1,178 UFO sightings in that year, 701 occurred between October and December. The clear implication is that Sputnik and its attendant publicity was responsible for many UFO sightings.

Earlier, in July 1952, a set of visual and radar observations of unidentified flying objects over Washington, D.C., caused substantial public concern. Government concern was reflected in the creation in November of that year of a special panel to evaluate these reports. The panel was established by the Office of Scientific Intelligence of the Central Intelligence Agency, and was headed by H. P. Robertson of the California Institute of Technology. The Robertson panel, after a thorough investigation of the UFO reports to that date, concluded that all were probably natural phenomena, wrongly interpreted.

The most reliable testimony is that of the professional astronomer. Jesse L. Greenstein of Mount Wilson and Palomar observatories pointed out that a vehicle 100 feet (30.5 meters) in diameter, at an altitude of 50 miles (80.5 km), would leave a broad track on photographic plates of the sky taken with large telescopes. This track could be differentiated easily from those of ordinary astronomical objects, such as stars, meteors, and comets. Nevertheless, it appears that such tracks or unambiguous visual observations of classical UFOs have never been made by professional astronomers.

In the Harvard Meteor Project performed in New Mexico during the period 1954-1958, extensive photographic observations were made by Super-Schmidt cameras, with a 60° field of view. In all, a surface of about 3,000 square miles (7,700 sq km) was observed to a height of about 50 miles (80 km) for a total of some 3,000 hours. Visual and photographic observations were made which could detect objects almost as faint as the faintest objects visible to the naked eye. These observations by professional astronomers were made in a locale and period characterized by extensive reports of unidentified flying objects. No unexplained objects were detected, despite the fact that rapidly moving objects were being sought in a study of meteors. Similar negative results, obtained by large numbers of astronomers, help to explain the general skepticism of astronomers toward flying saucer reports.

A series of puzzling and well-publicized flying saucer sightings in the mid-1960s again led to the appointment of a government investigating panel, this time under the aegis of the Air Force Scientific Advisory Board. It is significant that this panel was convened not at the request of the operational or intelligence arms of the Air Force, but in response to a request by the Air Force public relations office. The panel, under the chairmanship of Brian O'Brien, a member of the board, met in February 1966 and restated the general conclusions of the Robertson panel. It recommended that the Air Force make a more thoroughgoing effort to investigate selected UFO reports of particular interest, although the probability of acquiring significant scientific information (other than psychological) seemed small. The O'Brien panel suggested that the Air Force establish a group of teams at various points within the United States in order to respond rapidly to UFO reports. Each team would consist of (1) a physical scientist familiar with upper atmospheric and astronomical phenomena, (2) a clinical psychologist, and (3) a trained investigator. In October 1966 the University of Colorado was selected by the Air Force Office of Scientific Research to manage this program and to prepare a thorough analysis of the UFO problem. The National Academy of Sciences agreed to appoint a panel to review the Colorado report.

Hypotheses of extraterrestrial origin: Repeated sightings of UFOs and the persistence of the Air Force and the responsible scientific community in explaining away the sightings have suggested to some that a conspiracy exists to conceal from the public the true nature of the UFOs. Might not at least a small fraction of the unexplained few per cent of the sightings be space vehicles of intelligent extraterrestrial beings observing the earth and its inhabitants?

It now seems probable that the earth is not the only inhabited planet in the universe. There is evidence that many of the stars in the sky have planetary systems. Furthermore, research concerning the origin of life on earth suggests that the physical and chemical processes leading to the origin of life occur rapidly in the early history of the majority of planets. From the point of view of natural selection, the advantages of intelligence and technical civilization are obvious, and some scientists believe that a large number of planets within our Milky Way galaxy—perhaps as many as a million—are inhabited by technical civilizations in advance of our own.

Interstellar space flight is far beyond our present technical capabilities, but there seem to be no fundamental objections to it. It would be rash to preclude, from our present vantage point, the possibility of its development by other civilizations. But if each of, say, a million advanced technical civilizations in our galaxy launched at random an interstellar spacecraft each year (and even for an advanced civilization, such a launching

would not be a trivial undertaking), and even if all of them could reach our solar system with equal facility, our solar system would, on the average, be visited only once every 100,000 years.

UFO enthusiasts have sometimes castigated the skeptic for his anthropocentrism. Actually, the assumption that earth is visited daily by interstellar spacecraft is far more anthropocentric—attaching as it does some overriding significance to our small planet. If our views on the frequency of intelligence in the galaxy are correct, there is no reason why the earth should be singled out for interstellar visits. A greater frequency of visits could be expected if there were another planet populated by a technical civilization within our solar system, but at the present time there is no evidence for the existence of one.

Related to the interstellar observer idea are the “contact” tales—contemporary reports of the landing of extraterrestrial space vehicles on earth. Unlike the UFO reports, these tales display a striking uniformity. The extraterrestrials are described as humanoid, differing from man only in some minor characteristic such as teeth, speech, or dress. The aliens—so the “contactees” report—have been observing earth and its inhabitants for many years, and express concern at “the present grave political situation.” The visitors are fearful that, left to our own devices, we will destroy our civilization. The contactee is then selected as their “chosen intermediary” with the governments and inhabitants of earth, but somehow the promised political or social intervention never materializes.

Psychological factors: The psychologist Carl Jung has pointed out that the frequency and persistence of these contact tales—not one of which has been confirmed by the slightest objective evidence—must be of substantial psychological significance. What need is fulfilled by a belief that unidentified flying objects are of extraterrestrial origin? It is noteworthy that in the contact tales, the spacecraft and their crews are rarely pictured as hostile. It would be very satisfying if a race of advanced and benign creatures were devoted to our welfare.

The interest in unidentified flying objects derives, perhaps, not so much from scientific curiosity as from unfulfilled religious needs. Flying saucers serve, for some, to replace the gods that science has deposed. With their distant and exotic worlds and their pseudo-scientific overlay, the contact accounts are acceptable to many people who reject the older religious frameworks. But precisely because people desire so intensely that unidentified flying objects be of benign, intelligent, and extraterrestrial origin, honesty requires that, in evaluating the observations, we accept only the most rigorous logic and the most convincing evidence. At the present time, there is no evidence that unambiguously connects the various flying saucer sightings and contact tales with extraterrestrial intelligence.