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## Education and the UFO Phenomenon

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At present it is fair to say that the attitude toward UFO's is highly polarized between the conservative views of a small group of senior physical scientists and the vastly more speculative views of a large part of the American public. This book is directed toward a middle group who want to learn more of the facts about the UFO problem, to hear rational discussion of alternative explanations of peculiar sightings, and to go over some of the sociological interpretations of the very widespread UFO phenomenon. (For instance, I hope the sociologists take note of "Page's Law," that the wave of UFO concern moves eastward around the world, completing one full circuit in about seventeen years.) We are convinced that logical discussion of this widely publicized topic will serve a beneficial educational purpose, both among scientists and the general public.

### Educational Aspects

The aim of the symposium, and hence of this book, is to bring the varied facts on UFO's to the attention of scientists and to show enthusiasts the implications of the very much better organized facts in the physical, biological, and social sciences. Two specific educational aspects are important: the possible harm done to science education by pseudoscientific UFO reports, magazines, and books, and the use of student interest in UFO's to benefit the teaching of science.

It is appropriate to begin with a reference to the *Scientific Study of*

*Unidentified Flying Objects* (New York: Bantam Books, 1969) prepared by E. U. Condon and his thirty-six-member staff at the University of Colorado during 1967 and 1968. The symposium was delayed for a year so that the full content of the Condon Report could be read and digested after its publication in January 1969. The paperback edition contains almost 1,000 pages, including case studies, analyses along the lines of several different scientific disciplines, and a twenty-year historical summary. My own experience goes back to the panel convened by H. P. Robertson in 1953, which issued a much shorter report and classified it “secret.” Another panel, which met under the chairmanship of Brian O’Brien in 1966 and included Carl Sagan, made the recommendation which led to the Condon study; the O’Brien report also was not widely read.

The United States Air Force, charged with the responsibility for investigating UFO’s, has come to realize that public education is needed to alleviate the “UFO problem.” About 90 per cent of the 13,000 reports received by USAF Project Bluebook could have been recognized as normal physical phenomena by persons who had studied elementary astronomy in high school or college. Of course, the press and other mass media have influenced public reaction (see Chapter 13), and there is a natural tendency of the average layman to be intrigued by mysterious or unexpected appearances (see Chapter 11). As we all know, public demand helped to build up a large body of published literature, some of it fallacious (or highly speculative) and of special appeal to readers uneducated in science, particularly youngsters of high-school age.

It would be ridiculous to claim that one two-day symposium or one modest book could come up with the “correct” answer to the UFO question. The Condon Report, which involved more than fifty man-years of study, reached a conclusion (disputed by many) that further study is not worthwhile. As a result, the Air Force recently discontinued the Project Bluebook files, which will be moved from Wright-Patterson AFB to the USAF Archives at Maxwell AFB, Montgomery, Alabama (where access will be controlled by the Office of Information, Department of the Air Force, Washington).

Although the Bluebook files were far from perfect, their termination has

disappointed many people, including some of the scientists participating in this symposium. As Condon himself writes (in the Condon Report, Section I, p. 2):

Scientists are no respecters of authority. Our conclusion "that further UFO studies are not worthwhile" will not be uncritically accepted by them. Nor should it be, nor do we wish it to be. For scientists, it is our hope that the detailed analytical presentation of what we were able to do, and of what we were unable to do, will assist them in deciding whether or not they agree with our conclusions.

### The Harmful Effect of UFO Literature

Condon devoted the last half-page of his "Conclusions and Recommendations" to the "miseducation in our schools which arises from the fact that many children are being . . . encouraged to devote their science study time to the reading of UFO books and magazine articles." There can be no doubt that some of the books and articles on UFO's are unsuitable and misleading, just as popular books on science fiction, astrology, drugs, and sex (equally available) may conceivably be harmful to young readers.

A brief review of Lynn Catoe's UFO bibliography <sup>1</sup> shows 71 books, 28 pamphlets, and 73 magazine articles in English that have been available and widely read in the United States since 1947 (the pamphlets and articles mostly since 1961). I have classified these in eight categories (Table 1-1), ranging from "conservative science" and the "Air Force position" through descriptive "historical reports" to speculative treatments of "extraterrestrial visitors," and "contacts" with them. (Since it is unlikely that old magazine articles have much influence today, the pamphlets and articles before 1961 have been omitted from the table.)

The statistics in Table 1-1 are interesting in themselves: the books show a much wider range in "speculativeness" than the pamphlets and magazine articles. About 10 per cent of the books are extremely conservative, and 20 per cent highly speculative, whereas the pamphlets and magazine articles are mostly of the liberal scientific or historical type, eminently suitable for student reading. If books like Adamski's *Inside the Space Ships* (New York: Abelard-Schuman, 1955) are discounted as

Table 1-1. General publications on UFO's in English, 1948–1969

Category	General books						Pamphlets		Magazine articles	
	1948–59		1960–69		Total		1961–69		1961–69*	
	No.	%	No.	%	No.	%	No.	%	No.	%
Conservative science	1	4	3	6	4	6	1	4	1	1
USAF position	0		3	6	3	4	0		1	1
Liberal science	1	4	5	11	6	8	8	29	35	48
Psychology	0		2	4	2	3	1	4	3	4
Historical report	8	33	7	15	15	21	13	46	17	23
Extraterrestrial speculation	7	29	13	28	20	28	2	7	15	20
Speculation on secrecy	2	8	5	11	7	10	0		0	
Stories of contacts	5	21	9	19	14	20	3	11	1	1
Totals (100%)	24		47		71		28		73	

\* Magazines in English devoted entirely to UFO's are *APRO Bulletin* (formerly *Newsletter*), U.S. bimonthly started in 1952; *BUFORA Journal*, British quarterly started in 1965; *Fate*, U.S. monthly started in 1948; *Flying Saucer Review*, U.S. bimonthly started in 1954; *Flying Saucers*, U.S. monthly started in 1957; *Saucer News*, British quarterly started in 1953; *UFO Investigator*, U.S. monthly started in 1958.

Articles also appeared in *America*, *Argosy Bluebook*, *Giant Comic Book*, *Macleans*, *New Republic*, *Life*, *Look*, *Newsweek*, *New Yorker*, *Playboy*, *Saga*, *Spectator*, *Nation*, *Saturday Evening Post*, *Saturday Review*, *Time*, *True*, *U.S. News and World Report*; and (less available) in *Aero Digest*, *Airline Pilot*, *Airman*, *Bioscience*, *Bulletin of the Atomic Scientists*, *Journal of the Optical Society of America*, *Journal of the British Interplanetary Society*, *Library Journal*, *Physics Bulletin*, *Physics Today*, *Popular Mechanics*, *Popular Science*, *Public Opinion Quarterly*, *Science*, *Science Digest*, *Science and Mechanics*, *Yale Scientific Magazine*.

science fiction, even the speculative books can be used by an experienced science teacher as “interest rousers.” As any teacher knows, student interest in a topic—even if it derives from misconceptions—is better than no interest at all.

### Using UFO's in the Teaching of Science

The reader may be intrigued by how I tested this technique at Wesleyan University in an undergraduate elective course (“Science 101”), designed to interest non-science majors who would otherwise have had no science courses whatsoever. Not all my colleagues on the

faculty were enthusiastic over my offering “Flying Saucers” in the fall semester, 1967, even when it was oversubscribed and offered again in the spring of 1968 by student demand.

Along with many other science teachers, I had become frustrated with the diminishing undergraduate interest in physical science (Table 1–2) at a time when space exploration, electronic computers, and nu-

*Table 1-2.* Undergraduate majors at Wesleyan (in per cent graduating in each field)

Year	Physical sciences	Biological sciences	Social sciences	Humanities and the arts
1960	16	10	50	24
1961	15	8	55	22
1962	13	11	50	26
1963	13	11	51	25
1964	12	16	48	24
1965	11	10	44	35
1966	10	6	59	25
1967	9	7	53	31
1968	8	6	58	28
1969	7	4	59	30

clear physics seem to me to offer more and more exciting work. The lack of interest (even hostility) has been traced to poor teaching of mathematics and physics in grade schools and high schools, but this scarcely helps to solve the problem of what we should do about a generation of college students who want nothing to do with physical science at a time when more young physicists, engineers, and astronomers are needed.

Briefly, the one-semester course consisted of two lectures and a discussion session each week, with a two-week reading (and writing) period near the end. We started with a review of UFO reports, then spent five weeks on elementary astronomy—because planets, bright stars, and meteors are so often reported as UFO’s. The importance of celestial coordinates and time was stressed for proper reporting of UFO’s, and students were interested (or villainous) enough to phone me late in the evening at home to report celestial objects that looked like UFO’s. One of my most active evenings was in November 1967, when there was a

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bright “moondog” (ring around the moon) reported to me by every one of the fifty students in the class.

At this point we shifted to atmospheric physics, and discussed ball lightning, refraction, and aurorae for a week or two. Then we returned to astronomy for discussion of the extraterrestrial hypothesis. The students learned that conditions on other planets of the solar system are perhaps not conducive to intelligent life, and discussed theories of the origin of the solar system and the origin of life (a very popular topic). They learned how stellar distances are measured by parallax, discussed the probability of life on planets of other stars, and recognized the difficult problems of interstellar travel (long distance, and impact with interstellar material at high speed <sup>2</sup>).

Each student spent the two-week reading period writing a term paper on a topic selected from the following list:

### The Celestial Sphere

- Coordinates in the Sky

- The Constellations

- The Ptolemaic System

- Distances to Planets, Stars, and Galaxies

### The Earth's Atmosphere

- Aurorae and Luminous Clouds

- Meteors and their Trails

- The Ionosphere, Radio, and Radar

- Effects of the Solar Wind

### Celestial Mechanics

- History of Planetary Motions

- Evidence for Motions of the Earth

- Complete Description of an Orbit

- Newton vs Einstein

- Travel between Stars

### Space Probes

- History since 1930

- Launch and Guidance into Orbit

- Design of a Modern Space Probe

- Orbits and Times for Interplanetary Flight

- Purpose of NASA Programs

**Moon and Planets****Surfaces of the Moon and Mars****Theories of Crater Formation****Living Conditions on Moon and Planets****Solar System****Differences between Planets, Comets, and Meteoroids****Solar Flares and the Solar Wind****Origin of the Solar System****Evidence for Life on Other Worlds****Flying Saucers****History****Survey of Significant Reports****Sociological Implications****Physical Peculiarities****Reliable Identifications**

When the papers were turned in, each was passed to a different student assigned the job of writing a critique. In all but a few cases, these critiques revealed a good grasp of the astronomy and physics involved. The three best papers were published in pamphlet form, and sold well (at 25 cents) in the college bookstore. These three authors appeared on a half-hour television show to explain their views on UFO's, and thus gained firsthand experience of the publicity aspects of this topic. Earlier in the semester, two outside speakers widely recognized for their UFO studies (J. Allen Hynek and Donald H. Menzel) had lectured to the class, and told a little about the publicity difficulties.

I am convinced that the students learned a good deal of astronomy, physics, and biology in the "Flying Saucer" course, although I admit that such a course is not suitable as a standard part of the curriculum and that possibly it might lose its appeal after the novelty wore off. For "lab work," the students learned constellations, spotted an earth-orbiting spacecraft, and looked at bright planets through a small telescope. Several searched for UFO evidence on films taken by one of the sixty-four cameras of the Prairie Network,<sup>3</sup> after a session in which we decided that the astronomical telescopes in use have almost no chance of photographing a UFO passing through the telescope field.<sup>4</sup> On the other hand, the Prairie Network has about 65 per cent coverage of the sky for

bright objects over 440,000 square miles in the Midwest—about 0.22 per cent of the earth's surface. A similar Canadian network and the earlier Czech network raise this area coverage to about 0.5 per cent. The network results (negative for UFO's, positive for meteors) are discussed later in the book.

## Conclusions

The general advancement of science depends heavily on public education in science. Most of the significant research today depends on public support (university, foundation, or government financing). It is therefore obvious that students (and older citizens) must be given enough education in science to recognize worthwhile scientific effort. For a number of reasons, many students as well as the general public are interested in UFO's. Teachers should capitalize on this interest in teaching courses of broad appeal; scientists in general should take advantage of public interest in UFO's to correct public misconceptions about science.

## NOTES

1. Lynn E. Catoe, *UFO's and Related Subjects: An Annotated Bibliography*, Library of Congress, AFOSR 68-1656 (Washington, D.C.: U.S. Government Printing Office, 1969).
2. Freeman Dyson, "Interstellar Transport," *Physics Today*, Oct. 1968.
3. R. E. McCrosky and H. Boeschstein, *The Prairie Meteorite Network*, Smithsonian Astrophysical Observatory Special Report No. 173 (Cambridge, Mass.: 1965).
4. Thornton Page, "Photographic Sky Coverage for the Detection of UFO's," *Science* 160 (1968): 1258.