GENERAL SYMPOSIUM ON UNIDENTIFIED FLYING OBJECTS
December 26-27, 1969
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE (AAAS)
134TH MEETING
BOSTON, MASSACHUSETTS

Despite strong protests from scientific conservatives led by Edward U. Condon (Director of the Colorado UFO Project), a special four-man AAAS committee composed of Thornton Page (Wesleyan University), Philip Morrison (MIT), Walter Orr Roberts (Retiring AAAS President), and Carl Sagan (Cornell University) were successful in arranging a UFO symposium at the 134th annual meeting of the American Association for the Advancement of Science.

It was perhaps a significant occasion in the long, troubled, 22-year history of UFO investigation. Such a meeting before the science community was impossible even as recently as a year ago. Although a total of 14 papers were presented during the three sessions by virtually all of the "big guns" in the field, few of the "silent majority" of uninvolved scientists attended. I believe the reasons for the poor attendance and poor press coverage were due to a combination of factors--the generally low level of interest in the UFO subject since the release of the Colorado Report, the foul weather in Boston (the worst storm of the early winter lashed the city on the first day of the symposium), and the location of the hotel which was several blocks away from the center of AAAS activity. Some would add a fourth explanation--the Air Force's announcement of the closing of Project Blue Book just nine days before the AAAS convention. I personally believe the announcement had little effect on scientific opinion since most minds probably were made up following the release of the Condon study last January.

The symposium participants were well selected. They represented the fields of astronomy, physics, radar meteorology, computer science, sociology, psychology, and psychiatry. There seemed to be general agreement among the speakers that no hypothesis yet explains the hard-core UFO sightings.

All three sessions were held in the Sheraton-Plaza Hotel Ballroom.

FIRST SESSION

The first session opened at 2 p.m. Friday, December 26, under the heading, "UFO's and the Public." It was chaired by Walter Orr Roberts, who introduced the subject and the first speaker, Thornton Page. The bearded astronomer with an eye-patch titled his paper, "Introduction: Educational Aspects," and discussed his course on flying saucers at Wesleyan University, Middletown, Connecticut. (Lists of quiz questions, sightings, and several term papers in the course were available to symposium registrants.)

Franklin Roach (University of Hawaii) was the next speaker. His topic was "Astronomers' Views on UFO's." Strangely enough, Roach's paper had very little to do with the subject at hand. He is an expert on airglow and was a principal investigator for the Colorado Project.

William Hartmann (University of Arizona), photographic analyst for the Colorado Project, followed with "Historical Perspectives; Photos of UFO's." He stated that even the very best photographic UFO cases fell apart under close study. Although skeptical, he admitted lack of scientific communication has been a problem in UFO investigation. The young astronomer felt that in order to resolve the UFO problem, one puzzling extraordinary case, meeting rigid criteria, should be found and then presented to the scientific community in a journal such as SCIENCE.

The most thought-provoking and searching paper of the afternoon, in the view of many, was presented by Robert Hall (University of Illinois)--"Sociological Aspects of UFO's." His talk was an excellent examination of the behavior of UFO witnesses and of the reactions of science and society to UFO reports. He said people hold "elaborate systems of belief," and when faced with ambiguous situations (UFO sightings, for example), such beliefs are "likely to be defended vigorously, beyond the point of logic." UFO witnesses first try to explain their sightings in familiar terms, even to the point of what Hall called "hypothesis escalation"--the formulation of increasingly difficult explanations still acceptable within personal and social systems of belief. Finally, in hard-core cases, the witnesses' beliefs are totally jarred.

Scientists, Hall added, have their own systems of belief and tend to resist inconsistent events in several ways: (1) by avoidance or denial of evidence, (2) in illogical arguments by usually precise men, and (3) by passing the buck between physical and behavioral scientists. Galileo's telescopic view of Jupiter's satellites and the history of meteorite falls were cited as examples of science's attitude toward such reports.

In conclusion, Hall urged scientists not to dismiss hard-core UFO cases and stated his belief that "there is clearly a phenomenon of surpassing importance here. It is going to force some of us to make some fundamental changes in our knowledge." Dr. Hall appeared with five other scientists in a Congressional symposium on UFO's on July 29, 1968. All but one of the group participated in the AAAS symposium. (Summaries of the sociologist's paper were available.)

Douglass Price-Williams (Rice University), whose English accent was hard to follow, spoke on "Psychology and Epistemology of UFO Interpretations." The Colorado Report was singled out as having left the UFO problem unresolved. The psychologist outlined his own study of UFO sightings, using Thomas Olsen's coded system (THE REFERENCE FOR OUTSTANDING UFO SIGHTING REPORTS) as a guide. He also gave credit to NICAP, Jacques Vallee, and Aime Michel for initial studies in the field. Philip Klass' plasma hypothesis, incidentally, was cited as having merit insofar as it showed the way to study new phenomena.

The final paper of the day proposed a new psychiatric hypothesis to account for at least some of the UFO sightings. Lester Grinspoon (Harvard Medical School) delivered the paper, titled "Psychiatry and UFO Reports," in behalf of himself and co-worker Allan D.

Persky. Grinspoon and Persky suggest some UFO's are, in effect, "flying breasts and penises," infantile fantasy projections recalled from the nursing period of life and from other periods of gratification. The strong similarities of reported domed and cigar-shaped UFO's to these sexual parts as well as the emotionalism of the witnesses fit the hypothesis, according to Grinspoon. (As if to prove his point, during the brief discussion that followed, a UFO eyewitness came forward from the audience to describe his observation of a "red cigar." This resulted in some humorous remarks but no serious comment on the sighting.)

SECOND SESSION

"UFO Reports" was the general topic of the second session which began at 9 a.m. Saturday, December 27. Chairman Carl Sagan introduced the first speaker, J. Allen Hynek (Northwestern University), whose paper was "21 Years of UFO Reports." The former scientific UFO consultant to the Air Force repeated much of what he has said before except that he devoted more attention to the close-encounter cases, mentioning reported physical effects and alleged occupants. He concluded that UFO reports exist, a large number of them are identifiable, and a small residue are not identifiable. The latter category deserves study, according to Hynek, because (1) the same phenomenon is reported from widely separated locations;(2) the reports come from responsible witnesses; (3) the descriptions are not of known processes; and (4) these reports resist explanation by known processes. Hynek emphasized that so far no hypothesis adequately explains this residue of reports. (The astronomer participated in the Congressional UFO symposium in 1968.)

"Science in Default: 22 Years of Inadequate UFO Investigations" was the title of James E. McDonald's (University of Arizona) talk. McDonald's credentials in the UFO field are impressive. He is a tireless UFO investigator and a prolific writer, having spent three years interviewing over 500 witnesses and lecturing before professional groups across the country. He appeared in the Congressional symposium on UFO's. It has been his contention that UFO's represent "one of the greatest scientific problems of our times."

At the very outset of his hard-hitting AAAS talk, he took the scientific community to task for failing to look at the UFO problem. The Colorado Report, he said, was not a thorough investigation, and to illustrate his point, he cited in detail four cases from the report which he regarded as inadequately investigated: (1) the Gulf Coast case, Sept. 19, 1957; (2) Lakenheath, England, Aug. 13-14, 1956; (3) Haneda Air Force Base, Japan, Aug. 5-6, 1952; and (4) Kirtland Air Force Base, New Mexico, Nov. 4, 1957. McDonald also indicated that some important early cases such as Redlands, Cal., and Levelland, Tex., were not included in the Colorado Report. He stated that E.U. Condon's conclusions did not support the contents of the report (some 20 % of the cases were left unexplained). Finally, McDonald conceded that UFO researchers still were trying to convince science there is a UFO problem and until scientists respond, there could be little hope for progress. (Summaries of the paper were available.)

As expected, Donald H. Menzel (Harvard University) provided a

total contrast in viewpoint to the previous speaker. He was not present to deliver his paper (he appeared briefly in the room later). Health reasons were given. Instead, W. O. Roberts read the paper which was entitled, "UFO's: A Modern Myth." Menzel's approach to UFO's has not changed over the years. He still favors various natural phenomena as accounting for UFO cases and reiterated his "hot-air bubble" theory in the AAAS paper. He attacked McDonald and Hynek, claiming to have explained 11 of the latter's best cases. Menzel fully accepted the Colorado Report. One aspect of this paper I found agreement with was Menzel's emphasis on the importance of knowing the eye condition of the witnesses. Such effects as autokinesis, autostasis, afterimages, and internal eye defects have largely been ignored in interviews with UFO witnesses and yet may play a crucial role in the evaluation of some UFO sightings. (McDonald later disputed Menzel's sundog answer for the Salt Lake City case.)

R. M. L. Baker, Jr. (Computer Sciences Corporation) described "Motion Pictures of UFO's." Four short films which he has analyzed were shown. Unfortunately, the first reel which contained both the famed Montana film (1950) and the Utah film (1952) was installed improperly in the projector, and the Montana footage was shown backwards before the strip was rewound. However, the audience was not given a chance to see the 1950 film again. Both Hartmann and Baker agree the images in that film are unexplained although Hartmann, in his analysis for the Colorado Report, does not entirely rule out aircraft.

The Utah film was labeled by Baker as "provisionally anomalistic." (Hartmann concluded the images were birds in the Colorado study.) The remaining two motion pictures shown were called the Illinois film (1967) and the Hawaiian film (1958) and were of such poor quality they were hardly worth projecting, in my opinion.

Baker participated in the Congressional UFO symposium.

The final speaker of the morning was Kenneth R. Hardy (Air Force Cambridge Research Laboratories), and his paper was titled, "Unusual Radar Echoes." Hardy pointed out that the identification of strange radar echoes has required painstaking analysis over the years. It is now known, according to Hardy, that clear-air "angels" on radar screens are caused by (1) anomalous propagation, (2) insects and birds, and (3) fluctuations in atmospheric refractive index (convective thermals and convective cells, breaking gravity waves, and CAT--clear air turbulence). Obviously, these phenomena have important application to radar sightings of UFO's and their interpretation. (Copies of Hardy's paper were available to registrants.)

THIRD SESSION

At 2 p.m. Saturday the symposium reconvened for the third and final session. The afternoon's topic was "Retrospective and Future UFO Studies," chaired by Thornton Page. The first speaker, Carl Sagan, discussed "The Extraterrestrial and Other Hypotheses" (actually only the first hypothesis was referred to). Essentially a repeat of the statement Sagan presented at the Congressional sym-

posium in 1968, the astronomer estimated the number of civilizations (one million) in our galaxy and stressed that the enormous distances between stars would make interstellar travel, perhaps at relativistic speeds, difficult but not impossible. However, he felt the probability of interstellar visitations to earth was "very small." Although he did believe an open mind was necessary regarding the UFO subject since not enough data was available yet, Sagan appeared to take a rather dim view of the extraterrestrial hypothesis (ETH). He cited four reasons for the popularity of ETH: (1) its religious aspect (a visitation by superior beings has appeal in our space age, especially with regard to possible salvation from self-destruction); (2) the charm and novelty of the hypothesis ("it's fun"); (3) military classification which has promoted the notion of a cover-up; and (4) intolerance for ambiguity. In conclusion, Sagan felt the search for extraterrestrial life could be best done through NASA's space probes rather than through study of UFO reports.

Frank Drake (Cornell University) was scheduled to deliver a paper on "Methods and Reliability of Data Collection," but apparently he did not arrive in time for the UFO symposium. (Drake was present for a later AAAS meeting on pulsars.)

Walter Sullivan (The New York Times) spoke on the attitude of the press toward science in general and UFO's in particular ("Influence of the Press and Other Mass Media"). The Times' Science Editor felt that no one should close his mind to something that might be of interest. Although he believed ETH was improbable, Sullivan did think the UFO symposium was of value as a study of the "human condition" (term not exactly defined).

The last speaker was Philip Morrison, who eloquently attempted to summarize the central thoughts and conclusions, if any, under the title, "The Nature of Physical Evidence." The hunchbacked physicist said he found certain of the reported UFO events "puzzling," did not favor ETH or any other hypothesis, and suggested that only a clear example of a UFO incident will demonstrate whatever hypothesis is being tested. He cited Biot's investigation of the French meteorite fall as a classic historical example of the proper testing of evidence. Biot's "independent link-by-link test of multiple chains of evidence" is what Morrison believes must be pursued if scientists are to resolve the UFO problem.

The organizers of this symposium are to be congratulated for assembling such a talented collection of knowledgable scientists whose papers covered a broad spectrum of the UFO field. There were so many papers and they were so lengthy that there was little time for discussion following each of the three sessions. Two important recommendations emerged from the meetings: Dr. Page suggested the symposium proceedings be published (seconded by Mr. Sullivan); and a Dr. Kocher, who is conducting his own UFO study, and Dr. Page urged something be done to save the Project Blue Book files so they could be made available to scientists. Informal discussions about these recommendations as well as other related matters were conducted later among some of the interested parties.

Philip J. Klass, though not a direct participant, distributed a 14-page condemnation of Hynek and McDonald. Ever since McDonald dissected Klass' book, UFO'S--IDENTIFIED, Klass has waged a campaign to discredit the physicist.

An attempt by a Boston area UFO buff, Stephen Putnam of Scituate, to show his slide collection of alleged UFO photographs was foiled after the second slide when Dr. Page politely requested a halt. Earlier Putnam stood up to state his belief that UFO's came from "another dimension." Putnam's antics threatened for a time to disrupt the serious intent of the symposium, but as it turned out, he succeeded only in making a spectacle of himself.

Among those recognized in attendance at the meetings (in addition to the above persons), besides myself and my wife, were Raymond E. Fowler and several members of his NICAP Subcommittee (including my brother) and John E. Hall, brother of one of the speakers.

Walter N. Webb
1/25/70

UFO SIGHTINGS

Summaries Edited By

Dr. Thornton Page

ALASKA, 22 January 1952, 12:10 a.m. RADAR

A strong target appeared on the radarscope, moving in from the northeast, fairly high, at 1500 miles per hour. Three jet fighters took off from an airbase 100 miles to the south and were vectored toward the unknown by ground radar but never saw any visible target. When the ground radar was switched to short range, both unknown and fighter planes disappeared from the screen. Two of the fighters picked up a stationary target on their airborne radars over a period of 10 minutes. (Air Force investigation concluded that these were ground radar returns caused by pecular atmospheric conditions.)

ALBUQUERQUE, NEW MEXICO, 4 November 1957, 10:45 p.m. RADAR

Two men were on dutv alone in the control tower at Kirtland AFB, New Mexico; the tower is slightly over one hundred feet high. One of the controllers looked up to check cloud conditions and noticed a white light traveling east at 200 miles per hour at an altitude of approximately 1500 feet. He called the radar station and asked for an identification of the object. The radar operator reported that the object was on 90-degree heading. It angled across the east end of Runway #26 in a southwesterly direction and began a sharp descent. One witness gave a radio call in an attempt to contact what was believed to be an unknown aircraft that had become confused about a landing pattern. The object was then observed through binoculars, and appeared to have the shape of "an automobile on end," about 15-18 feet high. One white light was observed at the lower side of the object. The object slowed to fifty miles per hour, and disappeared behind a fence one-half mile from control tower. It reappeared, now moving eastward at an altitude of 200-300 feet; it then veered in a south-easterly direction, ascended abruptly at an estimated rate of climb of 45,000 feet per minute, and disappeared.

Although there were scattered clouds with a high overcast, visibility was good. Surface winds were variable at 10-30 knots. Witnesses observed the object for 5 or 6 minutes and approximately half of that time through binoculars.

The Radar Operator stated that the object was first sighted near the east boundary of Kirtland AFB. It reversed course and proceeded to the Kirtland low frequency range station where it began to orbit, then left at a high speed and disappeared 10 miles from the observer. About 20 minutes later an AF C-46 took off to the west. The observer scanned radar to the south and saw the object 4 miles south. It

made an abrupt turn to the west and fell into trail formation with the C-46. The object maintained approximately 1/2 mile separation from the C-46 for approximately 14 miles, then hovered for approximately 1 1/2 minutes, and faded from the scope.

ARTESIA, NEW MEXICO, 16 January 1952, DAYLIGHT DISC

Two members of a balloon project from the General Mills Aeronautical Research Laboratory and four other civilians observed two unidentified aerial objects in the vicinity of the balloon they were observing. The balloon was at an altitude of 112,000 feet and was 110 feet in diameter at the time of the observation.

The objects were observed twice, once from Artesia, and once from the Artesia Airport. In the first instance, one object appeared to remain motionless in the vicinity of, but apparently higher than, the balloon. It had twice the angular diameter of the balloon and its color was a dull white. This observation was made by the two General Mills observers.

A short time later the two observers and four civilian pilots were observing the balloon from the Artesia Airport. Two objects at apparently extremely high altitude were noticed coming toward the balloon from the northwest. They circled the balloon, and flew off to the northeast. The duration of observation was about 40 seconds, and the two objects were the same color and size as the first object observed from Artesia. The two objects were flying side-by-side, and when they appeared to circle the balloon, they temporarily disappeared causing the observers to assume they were disc-shaped and had turned on edge to bank.

COLORADO SPRINGS, COLORADO, 13 May 1967, 3:40 p.m. RADAR

The weather was overcast with scattered rain and sleet showers, and gusty winds. As a Braniff airliner came in for a landing, the ground radar detected a target beyond it at about twice the range. As the plane landed, this target pulled to the east and passed low over the airport (at 200 feet altitude, about 1.5 miles from the control tower). The tower operators, alerted by the radar operation, saw and heard nothing. The pilot of another aircraft, 3 miles behind the Braniff plane, saw nothing when asked to look. (The Condon Report, p. 170, calls this "one of the most puzzling radar cases on record.")

DEADWOOD, SOUTH DAKOTA, 22 September 1966, approximately 3 to 4 a.m., NOCTURNAL LIGHT Clear night, stars all visible, very light breeze

At about 2:40 a.m., Officers A and B were patrolling highway US 14 to the North end of "76" Hill, a mountain extending up out of the canyon at the north end of Deadwood. Officer A stated that as they drove up to the top of the hill, they noticed a large, white, round object in the sky, a little to the Northeast of them. They stopped at a parking area on top of the hill and were facing ENE as they observed the object at about a 50 degree elevation angle, apparently between Deadwood and Sturgis. Officer A radioed to Rapid City on the car's state radio and asked if they could see it. Rapid City replied in the negative. Sturgis then radioed Officer A that they could see the object in the direction of Deadwood, so it apparently was between Deadwood and Sturgis. The radio operators at Spearfish, Belle Fourche and Leed all radioed that they could also see the object. Officer A stated that they watched it hang motionless in the sky for 15 to 20 minutes. On 2 or 3 occasions, he shined the police car spot-light on the object; it would black out, then come back on when the spot-light was turned off. Also, during this period, it turned pale green, then red, then white. It was about the size of a silver dollar held out at arm's length. After about 20 minutes, they noticed a smaller white object, about the size of a pea held at arm's length, streaking in toward the larger object from the Northwest and then stopping. Then another object, the same size, streaked in from the Southeast and stopped close by the larger object. Presently the larger object moved to the right, then down, then to the left, then up again, in a square. As it did this, it would send out occasional blue shafts of light toward the ground. These shafts of light would last only 2 or 3 seconds, then go out. Again Officer A shined his spot-light on the larger object and it would go out, then come back on when the spot was turned off. The radio operators at the above mentioned other locations also radioed that they could see this object manuevering, with the other two remaining motionless in a fixed position. After about 30 minutes, the smaller objects shot off at high speed in the direction from which they had come, taking about 5 seconds. For another 25 minutes or so, the larger object stayed in one spot, shooting out shafts of blue light; then it moved at high speed, stopping, backing up, the moving forward again at high speeds, until finally it too had disappeared into the Southeastern skies. No noise was noticed from any of the objects. No airplanes were heard or observed during the sighting.

GRAVOIS, FRANCE, 22 September 1967, about 8:30 p.m.
NOCTURNAL LIGHT

A Catholic Priest writes: "I was the last person in the world to imagine that I had seen a UFO because I have been very skeptical ... I was coming south from Versailles, about 3 miles outside of Gravois, when I noticed this light about the size of a big grapefruit. Because this light was so clear and bright and low lying, I suspected that it was a reflection from some light from the ground reflected in the window, so I turned the window down. The light was still there, so I pulled the car into the side of the road. It appeared not too far away, and I watched it for 15 minutes. There was a constant stream of traffic going toward the lake. It amazed me that no one else got out of their cars, but kept on going. I was standing there on the side of the road looking up. It was dusky. After a while the object seemed to move off, but it didn't move in a uniform motion. It made kind of a round swing and eventually it seemed to head off toward the northwest and then it swung a little to the north and then it seemed to go towards the northeast.

"I was about a mile from another gentlemen, who was equally skeptical, and I told him what I had seen. He and his son had seen the same thing. I saw it definitely stationary for about 15 minutes. I timed it. It seemed to me to be going far faster than an airplane; it couldn't have been an airplane. It was a bright yellow, and had no definite shape except for a while I thought it was kind of flat with a dome shape on top."

HANEDA AFB, TOKYO, JAPAN, 5 August 1952, 11:30 p.m. - 12:30 a.m.
NOCTURNAL LIGHT AND RADAR

In the clear night sky, several ground observers saw a bright round light low in the NE, and one incoming pilot after radio query said it looked like a bright star. The ground radar could at first find no target. At about 11:50 a fighter plane was vectored in on a bogie, made contact with airborne radar, but the pilot saw nothing visually and lost the radar contact in 90 seconds; its estimated speed was very high. (The Condon Report, p. 126, identifies the visual sighting as a star.)

LAKENHEATH, ENGLAND, 13 August 1956, 11:00 p.m. - 3:30 a.m.
RADAR, NOCTURNAL LIGHTS

Two RAF ground radar stations detected several objects moving at high speed on a clear moonlit night. One was tracked

by the first radar going at about 3,000 miles per hour westward at 4,000 feet altitude; simultaneously, tower operators reported a bright light passing overhead toward the west and the pilot of a C-47 aircraft at 4,000 feet over the airfield saw the bright light streak westward underneath him. The second radar station, alerted by the first, detected a stationary target at about 20,000 feet altitude that suddenly went north at 600 mph. It made several sudden stops and turns. After 30 minutes an R.A.F. fighter was called in and made airborne-radar contacts with the object over Bedford (just north of Cambridge, England). Suddenly the object moved around behind the fighter plane both being tracked by ground radar. The fighter pilot could not "shake" the object. A second plane was called in but never made contact and all radar contacts were lost. Several other radar targets were tracked in the same area and several other small moving lights were seen; all disappeared at 3:30 a.m. by which time a few clouds appeared in the sky.

METHUEN, MASSACHUSETTS, 20 January 1967, after dark,
CLOSE ENCOUNTER

Three people were driving Northeast on a street which runs through a lonely area bordered by woods, field and a few houses. Reaching the top of the hill they suddenly came upon a straight string of bright glowing red lights moving NE along the roadside to the North. They appeared to be at an altitude of 500-600 feet and just off the road at a point estimated to be about 400-500 feet away from them. Witnesses immediately slowed the car and proceeded toward the lights. When almost broadside to the lights which now seemed to be hovering, the object to which they were apparently attached swung around in a smooth side-ways turn revealing a new light configuration and color. Four distinct lights formed a perfect trapezoid. Two red lights formed the top and two white lights formed the base. One witness was certain she saw a dimmer white light just above the two red lights. All were impressed by the large size of the individual lights and the apparent size of the object that they must have been attached to. The red lights were compared to the color and brightness of a hot electric stove burner. A reflecting metal was seen about the lights. The center of the trapezoid seemed to be dark and nonreflecting. The driver pulled over to the side of the road directly broadside to the object which seemed to be lower and only 100-300 feet away. The witnesses decided it would be best to stay in the car which was idling with lights and radio on. Then abruptly the engine, lights, and radio failed completely except for the generator light which just barely lit up and was pulsating off and on. The driver immediately tried to start the car but the engine would only "moan"

and would not start. Thinking that the lights and radio switch being on might be overloading the battery, the driver tried to start the car again after switching them off but was unsuccessful. The driver had opened the side-window. The others were afraid to put down the larger windows. No noise was heard. Then the object began moving slowly and then shot away at great speed in a SW direction. The driver was then able to start the car and the lights worked perfectly as did the radio later on when they turned it on.

A SMALL TOWN IN MINNESOTA, June 1958, 6:30 p.m. DAYLIGHT DISC

My wife and I had just finished supper. I went out and started the garden hose. The sun had dropped below the horizon but the western sky was quite golden after the rain shower. There was a large thunderhead cloud in the southwest sky. I heard a sort of whining noise and I thought that one of my neighbors about a block away might be running a saw.

The sound became stronger and a steady whine, and seemed to be coming from the southwestern part of the sky, not like what I had heard of jets. I turned around and looked up toward the thunderhead from where the sound now seemed to be coming. As I looked I saw this thing come out from behind the thunderhead. My wife just saw the last part of it as it went back behind the thunderhead.

I remarked to her that this was something new in flying machines -- probably some new government test.

There was no mention of anything in our local paper, but later I realized that in town with trees in the streets, the object probably had not been visible. I made a pencil sketch of it; it was near enough so that I got a good view in several positions. It sort of spiraled and glided and was silvery with what appeared to be portholes showing dark as interiors would. I would judge it to be about 150 feet in diameter. I don't know what height thunderheads usually are but the distance could be judged from that.

MISSOURI, 6 March 1966, 11:00 a.m. CLOSE ENCOUNTER

The sky was clear and the sun was behind the observer, who was driving with her dog, a St. Bernard, sleeping in the back seat. The dog started acting very strangely, barking and seemingly quite upset. The dog jumped up on the front seat with the hair standing up on the back of his neck. Suddenly he acted as though someone had whipped him and tried

to get down under the seat. He was whimpering and very scared. The observer then saw a beam of light on the road ahead of the car. The light beam extended about one foot over each side of the road, which has a 24' pavement, and the beam was blue-white in color and bright enough so that the observer could see what appeared to be dust particles in the beam. As the observer looked through the beam the road beyond seemed distorted as though by heat waves. As the car entered the beam it slowed from 50 miles per hour to about 10 miles per hour. As the car began to slow, the observer looked out and up through the windshield and saw a disc-shaped object hovering over the road. She estimated it to be some 1,000 feet high; it appeared larger than a dime held at arm's length, to be metal with a raised or domed area at the top. Witness could see no detail, lights on the object, or seams. The light beam narrowed to a small area in the lower center of the disc. The object appeared to be stable; it did not wobble. The surface seemed to be very smooth. The light beam was very bright and witness had to close her eyes partially to look at the object. Witness stated that her eyes bothered her for 3 days following the sighting. When the car slowed to about 10 miles per hour, she pushed the accelerator to the floor, but the car would not respond. After passing through the beam the automobile ran smoothly again. She then drove straight home and did not look at the object. The total duration of the sighting was about 10 seconds.

MONTGOMERY, ALABAMA, 24 July 1948, 2:45 a.m. NOCTURNAL LIGHT

Pilot C. S. Chiles and co-pilot J. B. Whitted in the cockpit of an Eastern Airlines DC-3 at 5000 feet altitude enroute from Houston to Boston saw a dull-red object approaching on a collision course. During the next 10 seconds, it veered slightly to the right, passed the plane on the right at high speed, then seemed to pull up, and disappeared in the clouds overhead. One passenger on the right side of the plane glimpsed the bright light as it flashed by. There was no disturbance of the DC-3, although the pilots described the object as cigar-shaped, about 100 feet long, with two rows of lighted windows, a dark blue glow underneath, and a red-orange jet flame about 50 feet long behind it. They estimated the closest approach to be less than a mile. (Both Hynek and Menzel identify this as a meteor much farther away.)

NEWTON, ILLINOIS, 10 October 1966, 5:20 p.m. CST. DAYLIGHT DISC

A woman and five children witnessed the slow passage of a metallic object past their farm home. Observing conditions were excellent with clear, dry weather. The object was first seen by the children, ages 4 through 9 years. The mother responded to the children's call and joined them in the yard, walking parallel with the object's motion. The object moved slowly and uniformly in a westerly direction, at walking speed, approximately 50 feet above the ground. The object disappeared by abruptly turning nose up and moving upward extremely rapidly, disappearing from sight in one or two seconds. An analysis of sighting and landmark positions and angular clues suggests a prolate spheroid approximately 20 feet long and 8 feet in diameter. The surface was metallic, like aluminum; the witness was near enough to observe longitudinal seams. The object had a small dorsal fin at the rear and a rectangular black aperture near the front. A brownish-gold design was observed on the lower rear portion. The whole object was at all times surrounded by a bluish haze of about 5 feet thickness. The haze had a noticeable optical thickness. It also contained luminous bubbles or sparks. No sound was heard from the object except for an unusual vibrating noise perceived for a few seconds when the object was nearest. No electrical effects were noted by the observers.

Regarding the credibility of the witness, all indications are that she is reporting as accurately as possible an inexplicable occurrence. The children were asked to sketch the object the evening of the sighting; the results are remarkable. Individual judgments of color obtained by means of a Nickerson color fan produced consistent results.

Seventy minutes after this observation, under dark sky conditions, an elliptical blue light of the same color and axial ratio was seen moving in the same general direction, at low elevation angle, by a witness seven miles from the location of the first sighting. These two sightings were the first ever reported from this area.

SALT LAKE CITY, UTAH, 2 October 1961, 12:05 p.m. DAYLIGHT DISC

A civilian pilot, taking off from the Utah Central Airport noticed a bright silvery disc ahead of his plane. A few minutes later he saw that the object was pencil-shaped and still in the same position. He radioed the control tower where the operator saw the same object directly under

the sun apparently hovering over Provo, 40 miles to the south. The pilot flew toward the object which seemed to be at about 7000 feet altitude and rocking gently. When he got to about 5 miles from it, the object suddenly shot up and retreated rapidly southward soundlessly and with no vapor trail. After a few seconds, while it diminished in size, the object vanished at an estimated speed of several thousand miles per hour. Ground observers at the airport saw the object, but others at Provo, alerted by radio, did not. The sky was slightly hazy (and Menzel identifies the "object" as a sun dog produced by scattering of sunlight in cirrus clouds).

SOUTH CENTRAL U.S., Autumn, 1957, Early Morning

A U.S.A.F. B-47 specially equipped with electronic-countermeasures equipment, and carrying a crew of 6, returned from a test mission over the Gulf of Mexico and was headed north flying at about 30,000 feet. The weather was clear and all crew members monitoring their equipment. One special radar, at 2,800-megacycle frequency, detected a strong target overtaking the B-47, and shortly later the pilot and co-pilot saw a bright white light moving ahead of them. This object veered across the B-47 course toward the east at a speed much higher than any aircraft. It seemed to be "as large as a barn" and was picked up by the 2,800-megacycle radar on the right side of the B-47. The object was flying at the same speed even though the pilot changed the air speed of the B-47. Groundbased radar confirmed the presence of the object about 10 miles east of the B-47. The object then moved to a position ahead of the B-47 and was seen as a large red glow. It stopped and as the B-47 flew over, it disappeared. At this time a radar target also disappeared. As the B-47 circled to reapproach the last position, the object reappeared, stationary on both radar at 15,000 feet altitude. As the B-47 approached it, it disappeared again at range 5 miles.

WHITE SANDS MISSILE RANGE, NEW MEXICO, 2 March 1967, 12:25 - 11:32 p.m. RADAR

A driver on Highway 70 near the Apache Summit at 9,000 feet elevation reported silvery specks passing overhead from north to south. Two ground radars at Holloman AFB searched the region near Apache Summit, found nothing moving from north to south but got intermittant targets. Lighter aircraft searched the area with no visual or radar targets. (The ground-radar targets are explained in the Condon Report, p. 151, as ground targets and a possible drifting balloon.)

892

'69

9/29/68

Dear Ed:

We NEED you. How can you do all that good work and then claim it is a waste of time to present it? The opposition is to have a voice. Why not? Their case is weak, weak, but it is a case much believed in. Is not the AAAS task to represent science at its best before public? Surely that is not by censorship. Evidence is what we have, and what you can produce. Please?

best to all, espec Emily.
yours
Phil Morrison

6-308
MIT

POST CARD

BOSTON. MASS. 5 PM

10c U.S. AIR MAIL

Dr E U Condon
761 Cascade Ave

Boulder COLO
80302

AIR!

Ceremonial vessel of the type *fang-i*. Chinese, Chou Dynasty, 11th century B.C. Bronze casting, 13⅝" x 9⅜" x 8⅛".
30.54 Freer Gallery of Art, Washington 25, D. C.

cc Roberts

Dear Phil:

Thanks for the beautiful postcard. I do not think that the AAAS (or anyone else) can possibly put on a sober or balanced UFO picture, especially with the help of some of those (that are being) invited. I have had more (than enough) association with them already and I expect you will feel that way too after the event. I do not think it would be 'censorship' to call the thing off. I see censorship in Science' rejection of a paper sent in by Menzel a year ago, and in the fact that Science has not published a review of the book. (Now I hope that they never do) for I would expect them to have it reviewed by one of the true believers. (Read the Jastrow book, you will enjoy it.

Best regards

Sincerely

I base this on the eagerness with which they sent Boffey out to explore the sewers of Boulder to sensationalize some personnel troubles we had in the spring of 1968.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, 134th MEETING

Subject	Science in Default: 22 Years of Inadequate UFO Investigations
Author	James E. McDonald, Professor of Atmospheric Sciences
Address	The University of Arizona, Tucson, Arizona, 85721
Time	9:00 a.m., December 27, 1969
Place	Sheraton Plaza Ballroom
Program	General Symposium, Unidentified Flying Objects
Convention Address	Sheraton Plaza Hotel

RELEASE TIME
A.M.'s December 28

No scientifically adequate investigation of the UFO problem has been carried out during the entire 22 years that have now passed since the first extensive wave of sightings of unidentified aerial objects in the summer of 1947. Despite continued public interest, and despite frequent expressions of public concern, only quite superficial examinations of the steadily growing body of unexplained UFO reports from credible witnesses have been conducted in this country or abroad. The latter point is highly relevant, since all evidence now points to the fact that UFO sightings exhibit similar characteristics throughout the world.

Charging inadequacy of all past UFO investigations, I speak not only from a background of close study of the past investigations, but also from a background of three years of rather detailed personal research, involving interviews with over five hundred witnesses in selected UFO cases, chiefly in the U. S. In my opinion, the UFO problem, far from being the nonsense problem that it has often been labeled by many scientists, constitutes a problem of extraordinary scientific interest.

The grave difficulty with essentially all past UFO studies has been that they were either devoid of any substantial scientific content, or else have lost their way amidst the relatively large noise-content that tends to obscure the real signal in the

UFO reports. The presence of a percentually large number of reports of misidentified natural or technological phenomena (planets, meteors, and aircraft, above all) is not surprising, given all the circumstances surrounding the UFO problem. Yet such understandable and usually easily recognized instances of misidentification have all too often been seized upon as a sufficient explanation for all UFO reports, while the residue of far more significant reports (numbering now of order one thousand) are ignored. I believe science is in default for having failed to mount any truly adequate studies of this problem, a problem that has aroused such strong and widespread public concern during the past two decades. Unfortunately, the present climate of thinking, above all since release of the latest of a long series of inadequate studies, namely, that conducted under the direction of Dr. E. U. Condon at the University of Colorado, will make it very difficult to secure any new and more thorough investigations, yet my own examination of the problem forces me to call for just such new studies. I am enough of a realist to sense that, unless the present AAAS UFO Symposium succeeds in making the scientific community aware of the seriousness of the UFO problem, little immediate response to any call for new investigation is likely to appear.

In fact, the over-all public and scientific response to the UFO phenomena is itself a matter of substantial scientific interest, above all in its social-psychological aspects. Prior to my own investigations, I would never have imagined the widespread reluctance to report an unusual and seemingly inexplicable event, yet that reluctance, and the attendant reluctance of scientists to exhibit serious interest in the phenomena in question, are quite general. One regrettable result is the fact that the most credible of UFO witnesses are often those most reluctant to come forward with a report of the event they have witnessed. A second regrettable result is that only a very small number of scientists have taken the time and trouble to search out the really puzzling reports that tend to be diluted out by the much larger number of trivial and non-significant UFO reports. The

net result is that there still exists no general scientific recognition of the scope and nature of the UFO problem.

* * *

Within the federal government, official responsibility for UFO investigations has rested with the Air Force since early 1948. Unidentified aerial objects quite naturally fall within the area of Air Force concern, so this assignment of responsibility was basically reasonable. However, once it became clear (early 1949) that UFO reports did not seem to involve advanced aircraft of some hostile foreign power, Air Force interest subsided to relatively low levels, marked, however, by occasional temporary resurgence of interest following large waves of UFO reports, such as that of 1952, or 1957, or 1965.

A most unfortunate pattern of press reporting developed by about 1953, in which the Air Force would assert that they had found no evidence of anything "defying explanation in terms of present-day science and technology" in their growing files of UFO reports. These statements to the public would have done little harm had they not been coupled systematically to press statements asserting that "the best scientific facilities available to the U. S. Air Force" had been and were being brought to bear on the UFO question. The assurances that substantial scientific competence was involved in Air Force UFO investigations have, I submit, had seriously deleterious scientific effects. Scientists who might otherwise have done enough checking to see that a substantial scientific puzzle lay in the UFO area were misled by these assurances into thinking that capable scientists had already done adequate study and found nothing. My own extensive checks have revealed so slight a total amount of scientific competence in two decades of Air Force-supported investigations that I can only regard the repeated asseverations of solid scientific study of the UFO problem as the single most serious obstacle that the Air Force has put in the way of progress towards elucidation of the matter.

I do not believe, let me stress, that this has been part of

some top-secret coverup of extensive investigations by Air Force or security agencies; I have found no substantial basis for accepting that theory of why the Air Force has so long failed to respond appropriately to the many significant and scientifically intriguing UFO reports coming from within its own ranks. Briefly, I see grand foulup but not grand coverup. Although numerous instances could be cited wherein Air Force spokesmen failed to release anything like complete details of UFO reports, and although this has had the regrettable consequence of denying scientists at large even a dim notion of the almost incredible nature of some of the more impressive Air Force-related UFO reports, I still feel that the most grievous fault of 22 years of Air Force handling of the UFO problem has consisted of their repeated public assertions that they had substantial scientific competence on the job.

Close examination of the level of investigation and the level of scientific analysis involved in Project Sign (1948-9), Project Grudge (1949-52), and Project Bluebook (1953 to date), reveals that these were, viewed scientifically, almost meaningless investigations. Even during occasional periods (*e.g.*, 1952) characterized by fairly active investigation of UFO cases, there was still such slight scientific expertise involved that there was never any real chance that the puzzling phenomena encountered in the most significant UFO cases would be elucidated. Furthermore, the panels, consultants, contractual studies, etc., that the Air Force has had working on the UFO problem over the past 22 years have, with essentially no exception, brought almost negligible scientific scrutiny into the picture. Illustrative examples will be given.

The Condon Report, released in January, 1968, after about two years of Air Force-supported study is, in my opinion, quite inadequate. The sheer bulk of the Report, and the inclusion of much that can only be viewed as "scientific padding", cannot conceal from anyone who studies it closely the salient point that it represents an examination of only a tiny fraction of the most puzzling UFO reports of the past two decades, and that its level of scientific argumentation is wholly unsatisfactory. Furthermore,

of the roughly 90 cases that it specifically confronts, over 30 are conceded to be unexplained. With so large a fraction of unexplained cases (out of a sample that is by no means limited only to the truly puzzling cases, but includes an objectionably large number of obviously trivial cases), it is far from clear how Dr. Condon felt justified in concluding that the study indicated "that further extensive study of UFOs probably cannot be justified in the expectation that science will be advanced thereby."

I shall cite a number of specific examples of cases from the Condon Report which I regard as entirely inadequately investigated and reported. One at Kirtland AFB, November 4, 1957, involved observations of a wingless egg-shaped object that was observed hovering about a minute over the field prior to departure at a climb rate which was described to me as faster than that of any known jets, then or now. The principal witnesses in this case were precisely the type of witnesses whose accounts warrant closest attention, since they were CAA tower observers who watched the UFO from the CAA tower with binoculars. Yet, when I located these two men in the course of my own check of cases from the Condon Report, I found that neither of them had even been contacted by members of the University of Colorado project! Both men were fully satisfied that they had been viewing a device with performance characteristics well beyond anything in present or foreseeable aeronautical technology. The two men gave me descriptions that were mutually consistent and that fit closely the testimony given on Nov. 6, 1957, when they were interrogated by an Air Force investigator. The Condon Report attempts to explain this case as a light-aircraft that lost its way, came into the field area, and then left. This kind of explanation runs through the whole Condon Report, yet is wholly incapable of explaining the details of sightings such as that of the Kirtland AFB incident. Other illustrative instances in which the investigations summarized in the Condon Report exhibit glaring deficiencies will be cited. I suggest that there are enough significant unexplainable UFO reports

just within the Condon Report itself to document the need for a greatly increased level of scientific study of UFOs.

That a panel of the National Academy of Sciences could endorse this study is to me disturbing. I find no evidence that the Academy panel did any independent checking of its own; and none of that 11-man panel had any significant prior investigative experience in this area, to my knowledge. I believe that this sort of Academy endorsement must be criticized; it hurts science in the long run, and I fear that this particular instance will ultimately prove an embarrassment to the National Academy of Sciences.

The Condon Report and its Academy endorsement have exerted a highly negative influence on clarification of the long-standing UFO problem; so much, in fact, that it seems almost pointless to now call for new and more extensive UFO investigations. Yet the latter are precisely what are needed to bring out into full light of scientific inquiry a phenomenon that could well constitute one of the greatest scientific problems of our times.

* * *

Some examples of UFO cases conceded to be unexplainable in the Condon Report and containing features of particularly strong scientific interest: Utica, N.Y., 6/23/55; Lakenheath, England, 8/13/56; Jackson, Ala., 11/14/56; Norfolk, Va., 8/30/57; RB-47 case, 9/19/57; Beverly Mass., 4/22/66; Donnybrook, N.D., 8/19/66; Haynesville, La., 12/30/66; Joplin, Mo., 1/13/67; Colorado Springs, Colo., 5/13/67.

Some examples of UFO cases considered explained in the Condon Report for which I would take strong exception to the argumentation presented and would regard as both unexplained and of strong scientific interest: Flagstaff, Ariz., 5/20/50; Washington, D. C., 7/19/52; Bellefontaine, O., 8/1/52; Haneda AFB, Japan, 8/5/52; Gulf of Mexico, 12/6/52; Odessa, Wash., 12/10/52; Continental Divide, N.M., 1/26/53; Seven Isles, Quebec, 6/29/54; Niagara Falls, N.Y., 7/25/57; Kirtland AFB, N.M., 11/4/57; Gulf of Mexico, 11/5/57; Peru, 12/30/66; Holloman AFB, 3/2/67; Kincheloe AFB, 9/11/67; Vandenberg AFB, 10/6/67; Milledgeville, Ga., 10/20/67.

SCIENCE IN DEFAULT: 22 YEARS OF INADEQUATE UFO INVESTIGATIONS

James E. McDonald, Institute of Atmospheric Physics
University of Arizona, Tucson

(Material presented at the Symposium on UFOs,
134th Meeting, AAAS, Boston, Dec. 27, 1969)

* * *

ILLUSTRATIVE CASES

The following treats in detail the four principal UFO cases referred to in my Symposium talk. They are presented as specific illustrations of what I regard as serious shortcomings of case-investigations in the Condon Report and in the 1947-69 Air Force UFO program. The four cases used as illustrations are the following:

1. RB-47 case, Gulf Coast area, Sept. 19, 1957
2. Lakenheath RAF Station, England, August 13-14, 1956
3. Haneda AFB, Japan, August 5-6, 1952
4. Kirtland AFB, New Mexico, Nov. 4, 1957

My principal conclusions are that scientific inadequacies in past years of UFO investigations by Air Force Project Bluebook have not been remedied through publication of the Condon Report, and that there remain scientifically very important unsolved problems with respect to UFOs. The investigative and evaluative deficiencies illustrated in the four cases examined in detail are paralleled by equally serious shortcomings in many other cases in the sample of about 90 UFO cases treated in the Condon Report. Endorsement of the conclusions of the Condon Report by the National Academy of Sciences appears to have been based on entirely superficial examination of the Report and the cases treated therein. Further study, conducted on a much more sound scientific level are needed.

SOME ILLUSTRATIVE UFO CASES - J. E. McDonald
(AAAS UFO Symposium, Boston, Dec. 27, 1969.)

Case 1. USAF RB-47, Gulf Coast area, September 19-20, 1957.

Brief summary: An Air Force RB-47, equipped with ECM (Electronic Countermeasures) gear, manned by six officers, was followed over a total distance in excess of 600 miles and for a time period of more than an hour, as it flew from near Gulfport, Miss., through Louisiana and Texas, and into southern Oklahoma. The unidentified object was, at various times, seen visually by the cockpit crew (as an intense white or red light), followed by ground-radar, and detected on ECM monitoring gear aboard the RB-47. Simultaneous appearances and disappearances on all three of those physically distinct "channels" mark this UFO case as especially intriguing from a scientific viewpoint. The incident is described as Case 5 in the Condon Report and is conceded to be unexplained. The full details, however, are not presented in that Report.

1. Summary of the Case:

The case is long and involved and filled with well-attested phenomena that defy easy explanation in terms of present-day science and technology. The RB-47 was flying out of Forbes AFB, Topeka, on a composite mission including gunnery exercises over the Texas-Gulf area, navigation exercises over the open Gulf, and ECM exercises in the return trip across the south-central U.S. This was an RB-47 carrying a six-man crew, of whom three were electronic warfare officers manning ECM (Electronic counter-measures) gear in the aft portion of the aircraft. One of the extremely interesting aspects of this case is that electromagnetic signals of distinctly radar-like character appeared definitely to be emitted by the UFO, yet it exhibited performance characteristics that seem to rule out categorically its having been any conventional or secret aircraft.

I have discussed the incident with all six officers of the crew:

Lewis D. Chase, pilot, Spokane, Wash.
James H. McCoid, copilot, Offutt AFB
Thomas H. Hanley, navigator, Vandenberg AFB
John J. Provenzano, No. 1 monitor, Wichita
Frank B. McClure, No. 2 monitor, Offutt AFB
Walter A. Tuchscherer, No. 3 monitor, Topeka

Chase was a Major at the time; I failed to ask for information on 1957 ranks of the others. McClure and Hanley are currently Majors, so might have been Captains or Lieutenants in 1957. All were experienced men at the time. Condon Project investigators only talked with Chase, McCoid, and McClure, I ascertained. In my checking it proved necessary to telephone several of them more than once to pin down key points; nevertheless the total case is so complex that I would assume that there are still salient points not clarified either by the Colorado investigators or by myself. Unfortunately, there appears to be no way, at present to locate the personnel involved in ground-radar observations that are a very important part of the whole case. I shall discuss that point below.

This flight occurred in September, 1957, just prior to the crew's reassignment to a European base. On questioning by Colorado investigators, flight logs were consulted, and based on the recollection that this flight was within a short time of departure from Forbes to Germany, (plus the requirement that the date match a flight of the known type and geography) the 9/19/57 date seems to have emerged. The uncertainty as to whether it was early on the 19th or early on the 20th, cited above is a point of confusion I had not noted until preparing the present notes. Hence I am unable to add any clarification, at the moment, in this matter of the date confusion found in Thayer's discussion of the case (1, pp. 136-138). I shall try to check that in the near future. For the present, it does not vitiate case-discussion in any significant way.

The incident is most inadequately described in the Condon Report. The reader is left with the general notion that the important parts occurred near Ft. Worth, an impression strengthened by the fact that both Crow and Thayer discuss meterological data only for that area. One is also left with no clear impression of the duration, which was actually over an hour. The incident involved an unknown airborne object that stayed with the RB-47 for over 600 miles. In case after case in the Condon Report, close checking reveals that quite significant features of the cases have been glossed over, or omitted, or in some instances seriously misrepresented. I submit that to fail to inform the reader that this particular case spans a total distance-range of some 600 miles and lasted well over an hour is an omission difficult to justify.

From my nine separate interviews with the six crew members, I assembled a picture of the events that makes it even more puzzling than it seems on reading the Condon Report -- and even the latter account is puzzling enough.

Just as the aircraft crossed the Mississippi coast near Gulfport, McClure, manning the #2 monitor, detected a signal near their 5 o'clock position (aft of the starboard beam). It looked to him like a legitimate ground-radar signal, but corresponded to a position out in the Gulf. This is the actual beginning of the complete incident; but before proceeding with details it is necessary to make quite clear what kind of equipment we shall be talking about as we follow McClure's successive observations.

Under conditions of war, bombing aircraft entering hostile territory can be assisted in their penetrations if any of a variety of electronic countermeasures (ECM techniques as they are collectively termed) are brought into action against ground-based enemy radar units. The initial step in all ECM operations is, necessarily, that of detecting the enemy radar and quantitatively identifying a number of relevant features of the radar system (carrier frequency, pulse repetition frequency, scan rate, pulse width) and, above all, its bearing relative to the aircraft heading. The latter task is particularly simple in principle, calling only for direction-finding antennas which pick up the enemy signal and display on a monitor-scope inside the reconnaissance aircraft a blip or lobe that paints in the relative bearing from which the signal is coming.

The ECM gear used in RB-47's in 1957 is not now classified; the #2 monitor that McClure was on, he and the others pointed out, involved an ALA-6 direction-finder with back-to-back antennas in a housing on the undersurface of the RB-47 near the rear, spun at either 150 or 300 rpm as it scanned in azimuth. Inside the aircraft, its signals were processed in an APR-9 radar receiver and an ALA-5 pulse analyser. All later references to the #2 monitor imply that system. The #1 monitor employed

an APD-4 direction finding system, with a pair of antennas permanently mounted on either wing tip. Provenzano was on the #1 monitor. Tuchscherer was on the #3 monitor, whose specifications I did not ascertain because I could find no indication that it was involved in the observations.

Returning now to the initial features of the UFO episode, McClure at first thought he had 180-degree ambiguity in his scope, i.e., that the signal whose lobe painted at his 5 o'clock position was actually coming in from the 11 o'clock position perhaps from some ground radar in Louisiana. This suspicion, he told me, was temporarily strengthened as he became aware that the lobe was moving upscope. (It is important here and in features of the case cited below to understand how a fixed ground-radar paints on the ECM monitor scope as the reconnaissance aircraft flies toward its general direction: Suppose the ground radar is, at some instant, located at the 1 o'clock position relative to the moving aircraft, i.e., slightly off the starboard bow. As the aircraft flies along, the relative bearing steadily changes, so that the fixed ground unit is *"seen"* successively at the 2 o'clock, the 3 o'clock, and the 4 o'clock positions, etc. The lobe paints on the monitor scope at these successive relative azimuths, the 12 o'clock position being at the top of the scope, 3 o'clock at the right, etc. Thus any legitimate signal from a fixed ground radar must move downscope, excluding the special cases in which the radar is dead ahead or dead astern. Note carefully that we deal here only with direction finding gear. Range is unknown; we are not here speaking of an airborne radar set, just a radar-frequency direction-finder. In practice, range is obtained by triangulation computations based on successive fixes and known aircraft speed.)

As the lobe continued moving upscope, McClure said the strength of the incoming signal and its pulse characteristics all tended to confirm that this was some ground unit being painted with 180-degree ambiguity for some unknown electronic reason. It was at 2800 megacycles, a common frequency for S-band search radars.

However, after the lobe swung dead ahead, his earlier hypothesis had to be abandoned for it continued swinging over to the 11 o'clock position and continued downscope on the port side. Clearly, no 180-degree ambiguity was capable of accounting for this. Curiously, however, this was so anomalous that McClure did not take it very seriously and did not at that juncture mention it to the cockpit crew nor to his colleagues on the other two monitors. This upscope-downscope *"orbit"* of the unknown was seen only on the ALA-6, as far as I could establish. Had nothing else occurred, this first and very significant portion of the whole episode would lalmost certainly have been forgotten by McClure.

The signal faded as the RB-47 headed northward to the scheduled turning point over Jackson, Miss. The mission called for simulated detection and ECM operations against Air Force ground radar units all along this part of the flight plan, but other developments intervened. Shortly after making their turn westward over Jackson, Miss., Chase noted what he thought at first were the landing lights of some other jet coming in from near his 11 o'clock position, at roughly the RB-47's altitude. But no running lights were discernible and it was a single very bright white light, closing fast. He had just alerted the rest of the crew to be ready for sudden evasive maneuvers, when he and McCoid saw the light almost instantaneously change directions and rush across from left to right at an angular velocity that Chase told me he'd never seen matched in all of his flight experience. The light went from their 11 o'clock to their 2 o'clock position with great rapidity, and then blinked out.

Immediately after that, Chase and McCoid began talking about it on the interphone and McClure, recalling the unusual 2800 megacycle signal that he had seen over Gulfport now mentioned that peculiar incident for the first time to Chase and McCoid. It occurred to him at that point to set his #2 monitor to scan at 2800 mcs. On the first scan, McClure told me, he got a strong 2800 mcs signal from their 2 o'clock position, the bearing on which the luminous unknown object had blinked out moments earlier.

Provenzano told me that right after that they had checked out the #2 monitor on valid ground radar stations to be sure it was not malfunctioning and it appeared to be in perfect order. He then checked on his #1 monitor and also got a signal from the same bearing. There remained, of course, the possibility that just by chance, this signal was from a real radar down on the ground and off in that direction. But as the minutes went by, and the aircraft continued westward at about 500 kts. the relative bearing of the 2800 mcs source did not move downscope on the #2 monitor, but kept up with them.

This quickly led to a situation in which the entire 6-man crew focussed all attention on the matter; the incident is still vivid in the minds of all the men, though their recollection for various details varies with the particular activities they were engaged in. Chase varied speed, to see if the relative bearing would change but nothing altered. After over a hundred miles of this, with the 2800 mcs source keeping pace with the aircraft, they were getting into the radar-coverage area of the Carswell AFB GCI (Ground Controlled Intercept) unit and Chase radioed that unit to ask if they showed any other air traffic near the RB-47. Carswell GCI immediately came back with the information that there was apparently another aircraft about 10 miles from them at their 2 o'clock position. (The RB-47 was unambiguously identifiable by its IFF signal; the *"other aircraft"* was seen by *"skin paint"* only, i.e., by direct radar reflection rather than via an IFF transponder, Col. Chase explained.)

This information, each of the men emphasized to me in one way or another, made them a bit uneasy for the first time. I asked McClure a question that the Colorado investigators either failed to ask or did not summarize in their Report. Was the signal in all respects comparable to that of a typical ground radar? McClure told me that this was what baffled him the most, then and now. All the radar signature characteristics, as read out on his ALA-5 pulse analyser, were completely normal -- it had a pulse repetition frequency and pulse width like a CPS-6B and even simulated a scan rate! But its intensity, McClure pointed out, was so strong that *"it would have had to have an antenna bigger than a bomber to put out that much signal."* And now, the implications of the events over Gulfport took on new meaning. The upscope-downscope sweep of his #2 monitor lobe implied that this source, presuming it to be the same one now also being seen on ground radar at Carswell GCI, had flown a circle around the RB-47 at 30-35,000 ft altitude while the aircraft was doing about 500 kts.

Shortly after Carswell GCI began following the two targets, RB-47 and unknown, still another significant action unfolded. McClure suddenly

noted the lobe on the #2 monitor was beginning to go upscope, and almost simultaneously, Chase told me, GCI called out that the second airborne target was starting to move forward. Keep in mind that no visual target was observable here; after blinking out at the 12 o'clock position, following its lightning-like traverse across the nose of the aircraft, no light had been visible. The unknown now proceeded to move steadily around to the 12 o'clock position, followed all the while on the #2 monitor and on the GCI scope down at Carswell near Ft. Worth.

As soon as the unknown reached the 12 o'clock position, Chase and McCoid suddenly saw a bright red glow *"bigger than a house"*, Chase said, and lying dead ahead, precisely the bearing shown on the passive radar direction-finder that McClure was on and precisely the bearing now indicated on the GCI scope. Three independent sensing systems were at this juncture giving seemingly consistent indications: two pairs of human eyes, a ground radar, and a direction-finding radar receiver in the aircraft.

One of the important points not settled by the Colorado investigations concerned the question of whether the unknown was ever painted on any radar set on the RB-47 itself. Some of the men thought the navigator had seen it on his set, others were unsure. I eventually located Maj. Hanley at Vandenberg and he informed me that all through the incident, which he remembered very well, he tried, unsuccessfully to pick up the unknown on his navigational radar (K-system). I shall not recount all of the details of his efforts and his comments, but only mention the end result of my two telephone interviews with him. The important question was what sort of effective range that set had. Hanley gave the pertinent information that it could just pick up a large tanker of the KC-97 type at about 4 miles range, when used in the *"altitude-hold"* mode, with antenna tipped up to maximum elevation. But both at the start of its involvement and during the object's swing into the 12 o'clock position, GCI showed it remaining close to 10 miles in range from the RB-47. Thus Hanley's inability to detect it on his K-system navigational radar in altitude-hold only implies that whatever was out there had a radar cross-section that was less than about 16 times that of a KC-97 (roughly twice 4 miles, inverse 4th-power law). The unknown gave a GCI return that suggested a cross-section comparable to an ordinary aircraft, Chase told me, which is consistent with Hanley's non-detection of the object. The Condon Report gives the impression the navigator did detect it, but this is not correct.

I have in my files many pages of typed notes on my interviews, and cannot fill in all of the intriguing details here. Suffice it to say that Chase then went to maximum allowable power, hoping to close with the unknown, but it just stayed ahead at about 10 miles as GCI kept telling them; it stayed as a bright red light dead ahead, and it kept painting as a bright lobe on the top of McClure's ALA-6 scope. By this time they were well into Texas still at about 35,000 ft and doing upwards of 500 knots, when Chase saw it begin to veer to the right and head between Dallas and Ft. Worth. Getting FAA clearance to alter his own flight plan and to make sure other jet traffic was out of his way, he followed its turn, and then realized he was beginning to close on it for the first time. Almost immediately GCI told him the unknown had stopped moving on the ground-radarscope. Chase and McCoid watched as they came almost up to it. Chase's recollections on this segment of the events were distinctly clearer than McCoid's. McCoid was, of course, sitting aft of Chase and had the poorer view; also he said he was doing fuel-reserve calculations in view of the excess fuel-use in their efforts to shake the unknown, and had to look up from the lighted cockpit to try to look out intermittently, while Chase in the forward seat was able to keep it in sight more nearly continuously. Chase told me that he'd estimate that it was just ahead of the RB-47 and definitely below them when it instantaneously blinked out. At that same moment McClure announced on the interphone that he'd lost the 2800 mcs signal, and GCI said it had disappeared from their scope. Such simultaneous loss of signal on what we can term three separate channels is most provocative, most puzzling.

Putting the aircraft into a left turn (which Chase noted consumes about 15-20 miles at top speed), they kept looking back to try to see the light again. And, about halfway through the turn (by then the aircraft had reached the vicinity of Mineral Wells, Texas, Chase said), the men in the cockpit suddenly saw the bright red light flash on again, back along their previous flight path but distinctly lower, and simultaneously GCI got a target again and McClure started picking up a 2800 mcs signal at that bearing! (As I heard one after another of these men describe all this, I kept trying to imagine how it was possible that Condon could listen, at the October, 1967, plasma conference at the UFO Project, as Col. Chase recounted all this and shrug his shoulders and walk out.)

Securing permission from Carswell GCI to undertake the decidely non-standard maneuver of diving on the unknown, Chase put the RB-47 nose down and had reached about 20,000 ft, he recalls, when all of a sudden the light blinked out, GCI lost it on their scope, and McClure reported loss of signal on the #2 monitor! Three-channel consistency once more.

Low on fuel, Chase climbed back up to 25,000 and headed north for Oklahoma. He barely had it on homeward course when McClure got a blip dead astern and Carswell radioed that they had a target once more trailing the RB-47 at about 10 miles. Rear-visibility from the topblisters of the RB-47 now precluded easy visual check, particularly if the unknown was then at lower altitude (Chase estimated that it might have been near 15,000 ft when he lost it in the dive). It followed them to southern Oklahoma and then disappeared.

2. Discussion:

This incident is an especially good example of a UFO case in which observer credibility and reliability do not come into serious question, a case in which more than one (here three) channel of information figures in the over-all observations, and a case in which the reported phenomena appear to defy explanation in terms of either natural or technological phenomena.

In the Condon Report, the important initial incident in which the unknown 2800 MC source appeared to orbit the RB-47 near Gulfport is omitted. In the Condon Report, the reader is given no hint that the object was with the aircraft for over 600 miles and for over an hour. No clear sequence of these events is spelled out, nor is

the reader made aware of all of the "three-channel" simultaneous appearances or disappearances that were so emphatically stressed to me by both Chase and McClure in my interviews with them. But even despite those degrees of incompleteness, any reader of the account of this case in the Condon Report must wonder that an incident of this sort could be left as unexplained and yet ultimately treated, along with the other unexplained cases in that Report, as calling for no further scientific attention.

Actually, various hypotheses (radar anomalies, mirage effects) are weighed in one part of the Condon Report where this case is discussed separately (pp. 136-138). But the suggestion made there that perhaps an inversion near 2 km altitude was responsible for the returns at the Carswell GCI unit is wholly untenable. In an Appendix, a very lengthy but non-relevant discussion of ground-return from anomalous propagation appears; in fact, it is so unrelated to the actual circumstances of this case as to warrant no comment here. Chase's account emphasized that the GCI radar(s) had his aircraft and the unknown object on-scope for a total flight-distance of the order of several hundred miles, including a near overflight of the ground radar. With such wide variations in angles of incidence of the ground-radar beam on any inversion or duct, however intense, the possibility of anomalous propagation effects yielding a consistent pattern of spurious echo matching the reported movements and the appearances and disappearances of the target is infinitesimal. And the more so in view of the simultaneous appearances and disappearances on the ECM gear and via visible emissions from the unknown. To suggest, as is tentatively done on p. 138 that the "red glow" might have been a "mirage of Oklahoma City", when the pilot's description of the luminous source involves a wide range of viewing angles, including two instances when he was viewing it at quite large depression-angles, is wholly unreasonable. Unfortunately, that kind of casual *ad hoc* hypothesizing with almost no attention to relevant physical considerations runs all through the case-discussions in the treatment of radar and optical cases in the Condon Report, frequently (though not in this instance) being made the basis of "explanations" that are merely absurd. On p. 265 of the Report, the question of whether this incident might be explained in terms of any "plasma effect" is considered but rejected. In the end, this case is conceded to be unexplained.

No evidence that a report on this event reached Project Bluebook was found by the Colorado investigators. That may seem hard to believe for those who are under the impression that the Air Force has been diligently and exhaustively investigating UFO reports over the past 22 years. But to those who have examined more closely the actual levels of investigation, lack of a report on this incident is not so surprising. Other comparable instances could be cited, and still more where the military aircrews elected to spare themselves the bother of interrogation, by not even reporting events about as puzzling as those found in this RB-47 incident.

But what is of greatest present interest is the point that here we have a well-reported, multi-channel, multiple-witness UFO report, coming in fact from within the Air Force itself, investigated by the Condon Report team, conceded to be unexplained, and yet it is, in final analysis, ignored by Dr. Condon. In no section of the Report specifically written by the principal investigator does he even allude to this intriguing case. My question is how such events can be written off as demanding no further scientific study. To me, such cases seem to cry out for the most intensive scientific study -- and the more so because they are actually so much more numerous than the scientific community yet realizes. There is a scientific mystery here that is being ignored and shoved under the rug; the strongest and most unjustified shove has come from the Condon Report. "Unjustified" because that Report itself contains so many scientifically puzzling unexplained cases (approximately 30 out of 90 cases considered) that it is extremely difficult to understand how its principal investigator could have construed the contents of the Report as supporting a view that UFO studies should be terminated.

Case 2. Lakenheath and Bentwaters RAF/USAF units; England, August 13-14, 1956.

Brief summary: Observations of unidentified objects by USAF and RAF personnel, extending over 5 hours, and involving ground-radar, airborne-radar, ground-visual and airborne-visual sightings of high-speed unconventionally maneuvering objects in the vicinity of two RAF stations at night. It is Case 2 in the Condon Report and is there conceded to be unexplained.

1. Introduction:

This case will illustrate, in significant ways, the following points:

a) It illustrates the fact that many scientifically intriguing UFO reports have lain in USAF/Bluebook files for years without knowledge thereof by the scientific community.

b) It represents a large subset of UFO cases in which all of the observations stemmed from military sources and which, had there been serious and competent scientific interest operating in Project Bluebook, could have been very thoroughly investigated while the information was fresh. It also illustrates the point that the actual levels of investigation were entirely inadequate in even as unexplainable and involved cases as this one.

c) It illustrates the uncomfortably incomplete and internally inconsistent features that one encounters in almost every report of its kind in the USAF/Bluebook files at Wright-Patterson AFB, features attesting to the dearth of scientific competence in the Air Force UFO investigations over the past 20 years.

d) It illustrates, when the original files are carefully studied and compared with the discussion thereof in the Condon Report, shortcomings in presentation and critique

given many cases in the Condon Report.

e) Finally, I believe it illustrates an example of those cases conceded to be unexplainable by the Condon Report that argue need for much more extensive and more thorough scientific investigation of the UFO problem, a need negated in the Condon Report and in the Academy endorsement thereof.

My discussion of this case will be based upon the 30-page Bluebook case-file, plus certain other information presented on it in the Condon Report. This "Lakenheath case" was not known outside of USAF circles prior to publication of the Condon Report. None of the names of military personnel involved are given in the Condon Report. (Witness names, dates, and locales are deleted from all of the main group of cases in that Report, seriously impeding independent scientific check of case materials.) I secured copies of the case-file from Bluebook, but all names of military personnel involved in the incident were cut out of the Xerox copies prior to releasing the material to me. Hence I have been unable to interview personally the key witnesses. However, there is no indication that anyone on the Colorado Project did any personal interviews, either; so it would appear I have had access to the same basic data used in the Condon Report's treatment of this extremely interesting case.

For no justified reason, the Condon Report not only deletes witness names, but also names of localities of the UFO incidents in its main sample of 59 cases. In this Lakenheath case, deletion of locality names creates much confusion for the reader, since three distinct RAF stations figure in the incident and since the discharged non-commissioned officer from whom they received first word of this UFO episode confused the names of two of those stations in his own account that appears in the Condon Report. That, plus other reportorial deficiencies in the presentation of the Lakenheath case in the Condon Report, will almost certainly have concealed its real significance from most readers of the Report.

Unfortunately, the basic Bluebook file is itself about as confusing as most Bluebook files on UFO cases. I shall attempt to mitigate as many of those difficulties as I can in the following, by putting the account into better over-all order than one finds in the Condon Report treatment.

2. General Circumstances:

The entire episode extended from about 2130Z, August 13, to 0330Z, August 14, 1956; thus this is a nighttime case. The events occurred in east-central England, chiefly in Suffolk. The initial reports centered around Bentwaters RAF Station, located about six miles east of Ipswich, near the coast, while much of the subsequent action centers around Lakenheath RAF Station, located some 20 miles northeast of Cambridge. Sculthorpe RAF Station also figures in the account, but only to a minor extent; it is near Fakenham, in the vicinity of The Wash. GCA (Ground Controlled Approach) radars at two of those three stations were involved in the ground-radar sightings, as was an RTCC (Radar Traffic Control Center) radar unit at Lakenheath. The USAF non-com who wrote to the Colorado Project about this incident was a Watch Supervisor on duty at the Lakenheath RTCC unit tht night. His detailed account is reproduced in the Condon Report (pp. 248-251). The Report comments on "the remarkable accuracy of the account of the witness as given in (his reproduced letter), which was apparently written from memory 12 years after the incident." I would concur, but would note that, had the Colorado Project only investigated more such striking cases of past years, it would have found many other witnesses in UFO cases whose vivid recollections often match surprising well checkable contemporary accounts. My experience thereon has been that, in multiple-witness cases where one can evaluate consistency of recollections, the more unusual and inexplicable the original UFO episode, the more it impressed upon the several witnesses' memories a meaningful and still-useful pattern of relevant recollections. Doubtless, another important factor operates: the UFO incidents that are the most striking and most puzzling probably have been discussed by the key witnesses enough times that their recollections have been thereby reinforced in a useful way.

The only map given in the Condon Report is based on a sketch-map made by the non-com who alerted them to the case. It is misleading, for Sculthorpe is shown 50 miles east of Lakenheath, whereas it actually lies 30 miles north-northeast. The map does not show Bentwaters at all; it is actually some 40 miles east-southeast of Lakenheath. Even as basic items as those locations do not appear to have been ascertained by those who prepared the discussion of this case in the Condon Report, which is most unfortunate, yet not atypical.

That this incident was subsequently discussed by many Lakenheath personnel was indicated to me by a chance event. In the course of my investigations of another radar UFO case from the Condon Report, that of 9/11/67 at Kincheloe AFB, I found that the radar operator involved therein had previously been stationed with the USAF detachment at Lakenheath and knew of the events at second-hand because they were still being discussed there by radar personnel when he arrived many months later.

3. Initial Events at Bentwaters, 2130Z to 2200Z:

One of the many unsatisfactory aspects of the Condon Report is its frequent failure to put before the reader a complete account of the UFO cases it purports to analyze scientifically. In the present instance, the Report omits all details of three quite significant radar-sightings made by Bentwaters GCA personnel prior to their alerting the Lakenheath GCA and RTCC groups at 2255 LST. This omission is certainly not because of correspondingly slight mention in the original Bluebook case-file; rather, the Bentwaters sightings actually receive more Bluebook attention than the subsequent Lakenheath events. Hence, I do not see how such omissions in the Condon Report can be justified.

a) First radar sighting, 2130Z. Bentwaters GCA operator, A/2c _____ (I shall use a blank to indicate the names razor-bladed out of my copies of the case-file prior to release of the file items to me), reported picking up a traget 25-30 miles ESE, which moved at very high speed on constant 295° heading across his scope until he lost it 15-20 miles to the NW of Bentwaters. In the Bluebook file, A/2c _____ is reported as describing it as a strong radar echo, comparable to that of a typical aircraft, until it weakened near the end of its path across his scope. He is quoted as estimating a speed of the order of 4000 mph, but two other cited quantities suggest even higher speeds. A transit time of 30 seconds is given, and if one combines that with

the reported range of distance traversed, 40-50 miles, a speed of about 5000-6000 mph results. Finally, A/2c _____ stated that it covered about 5-6 miles per sweep of the AN/MPN-11A GCA radar he was using. The sweep-period for that set is given as 2 seconds (30 rpm), so this yields an even higher speed-estimate of about 9000 mph. (Internal discrepancies of this sort are quite typical of Bluebook case-files, I regret to say. My study of many such files during the past three years leaves me no conclusion but that Bluebook work has never represented high-caliber scientific work, but rather has operated as a perfunctory bookkeeping and filing operation during most of its life. Of the three speed figures just mentioned, the latter derives from the type of observation most likely to be reasonably accurate, in my opinion. The displacement of a series of successive radar blips on a surveillance radar such as the MPN-11A, can be estimated to perhaps a mile or so with little difficulty, when the operator has as large a number of successive blips to work with as is here involved. Nevertheless, it is necessary to regard the speed as quite uncertain here, though presumably in the range of several thousand miles pr hour and hence not associable with any conventional aircraft, nor with still higher-speed meteors either.)

b) Second radar sighting, 2130-2155Z. A few minutes after the preceding event, T/Sgt _____ picked up on the same MPN-11A a group of 12-15 objects about 8 miles SW of Brentwaters. In the report to Bluebook, he pointed out that "these objects appeared as normal targets on the GCA scope and that normal checks made to determine possible malfunctions of the GCA radar failed to indicate anything was technically wrong." The dozen or so objects were moving together towards the NE at varying speeds, ranging between 80 and 125 mph, and "the 12 to 15 unidentified objects were preceded by 3 objects which were in a triangular formation with an estimated 1000 feet separating each object in this formation." The dozen objects to the rear "were scattered behind the lead formation of 3 at irregular intervals with the whole group simultaneously covering a 6 to 7 mile area," the official report notes.

Consistent radar returns came from this group during their 25-minute movement from the point at which they were first picked up, 8 mi. SW, to a point about 40 mi. NE of Bentwaters, their echoes decreasing in intensity as they moved off to the NE. When the group reached a point some 40 mi. NE, they all appeared to converge to form a single radar echo whose intensity is described as several times larger than a B-36 return under comparable conditions. Then motion ceased, while this single strong echo remained stationary for 10-15 minutes. Then it resumed motion to the NE for 5-6 miles, stopped again for 3-5 minutes, and finally moved northward and off the scope.

c) Third radar sighting, 2200Z. Five minutes after the foregoing formation moved off-scope, T/Sgt _____ detected an unidentified target about 30 mi. E of the Bentwaters GCA station, and tracked it in rapid westward motion to a point about 25 mi. W of the station, where the object "suddenly disappeared off the radar screen by rapidly moving out of the GCA radation pattern," according to his interpretation of the event. Here, again, we get discordant speed information, for T/Sgt _____ gave the speed only as being "in excess of 4000 mph," whereas the time-duration of the tracking, given as 16 sec, implies a speed of 12,000 mph, for the roughly 55 mi. track-length reported. Nothing in the Bluebook files indicates that this discrepancy was investigated further or even noticed, so one can say only that the apparent speed lay far above that of conventional aircraft.

d) Other observations at Bentwaters. A control tower sergeant, aware of the concurrent radar-tracking, noted a light "the size of a pin-head at arm's length," at about 10° elevation to the SSE. It remained there for about one hour, intermittently appearing and disappearing. Since Mars was in that part of the sky at that time, a reasonable interpretation is that the observer was looking at that planet.

A T-33 of the 512th Fighter Interceptor Squadron, returning to Bentwaters from a routine flight at about 2130Z, was vectored to the NE to search for the group of objects being tracked in that sector. Their search, unaided by airborne radar, led to no airborne sighting of any aircraft or other objects in that area, and after about 45 minutes they terminated search, having seen only a bright star in the east and a coastal beacon as anything worth noting. The Bluebook case-file contains 1956 USAF discussions of the case that make a big point of the inconclusiveness of the tower operator's sighting and the negative results of the T-33 search, but say nothing about the much more puzzling radar-tracking incidents than to stress that ehy were of "divergent" directions, intimating that this somehow put them in the category of anomalous propagation, which scarcely follows. Indeed, none of the three cited radar sightings exhibits any features typical of AP echoes. The winds over the Bentwaters area are given in the file. They jump from the surface level (winds from 230° at 5-10 kts) to the 6000 ft level (260°, 30 kts), and then hold at a steady 260° up to 50,000 ft, with speeds rising to a maximum of 90 kts near 30,000 ft. Even if one sought to invoke the highly dubious Borden-Vickers hypothesis (moving waves on an inversion surface), not even the slowest of the tracked echoes (80-125 mph) could be accounted for, nor is it even clear that the direction would be explainable. Furthermore, the strength of the individual echoes (stated as comparable to normal aircraft returns), the merging of the 15 or so into a single echo, the two intervals of stationarity, and final motion off-scope at a direction about 45° from the initial motion, are all wholly unexplainable in terms of AP in these 2130-2155Z incidents. The extremely high-speed westward motion of single targets is even further from any known radar-anomaly associated with disturbed propagation conditions. Blips that move across scopes from one sector to the opposite, in steady heading at steady apparent speed, correspond neither to AP nor to internal electronic disturbances. Nor could interference phenomena fit such observed echo behavior. Thus, this 30-minute period, 2130-2200Z, embraced three distinct events for which no satisfactory explanation exists. That these three events are omitted from the discussions in the Condon Report is unfortuante, for they serve to underscore the scientific significance of subsequent events at both Bentwaters and Lakenheath stations.

4. Comments on Reporting of Events After 2255Z, 8/13/56:

The events summarized above were communicated

to Bluebook by Capt. Edward L. Holt of the 81st Fighter-Bomber Wing stationed at Bentwaters, as Report No. IR-1-56, dated 31 August, 1956. All events occurring subsequent to 2200Z, on the other hand, were communicated to Project Bluebook via an earlier, lengthy teletype transmission from the Lakenheath USAF unit, sent out in the standard format of the report-form specified by regulation AFR200-2. Two teletype transmissions, dated 8/17/56 and 8/21/56, identical in basic content, were sent from Lakenheath to Bluebook. The Condon Report presents the content of that teletype report on pp. 252-254, in full, except for deletion of all names and localities and omission of one important item to be noted later here. However, most readers will be entirely lost because what is presented actually constitutes a set of answers to questions that are not stated! The Condon Report does not offer the reader the hint that the version of AFR200-2 appearing in the Report's Appendix, pp. 819-826 (there identified by its current designation, AFR80-17) would provide the reader with the standardized questions needed to translate much of the otherwise extremely confusing array of answers on pp. 252-254. For that reason, plus others, many readers will almost certainly be greatly (and entirely unnecessarily) confused on reading this important part of the Lakenheath report in the Condon Report.

That confusion, unfortunately, does not wholly disappear upon laboriously matching questions with answers, for it has long been one of the salient deficiencies of the USAF program of UFO report-collection that the format of AFR200-2 (or its sequel AFR80-17) is usually only barely adequate and (especially for complex episodes such as that involved here) often entirely incapable of affording the reporting office enough scope to set out clearly and in proper chronological order all of the events that may be of potential scientific significance. Anyone who has studied many Bluebook reports in the AFR200-2 format, dating back to 1953, will be uncomfortably aware of this gross difficulty. Failure to carry out even modest followup investigations and incorporate findings thereof into Bluebook case-files leaves most intriguing Bluebook UFO cases full of unsatisfactorily answered questions. But those deficiencies do not, in my opinion, prevent the careful reader from discerning that very large numbers of those UFO cases carry highly significant scientific implications, implications of an intriguing problem going largely unexamined in past years.

5. Initial Alerting of Lakenheath GCA and RTCC:

The official files give no indication of any further UFO radar sightings by Bentwaters GCA from 2200 until 2255Z. But, at the latter time, another fast-moving target was picked up 30 mi. E of Bentwaters, heading almost due west at a speed given as "2000-4000 mph". It passed almost directly over Bentwaters, disappearing from their GCA scope for the usual beam-angle reasons when within 2-3 miles (the Condon Report intimates that this close-in disappearance is diagnostic of AP, which seems to be some sort of tacit over-acceptance of the 1952 Borden-Vickers hypothesis), and then moving on until it disappeared from the scope 30 mi. W of Bentwaters.

Very significantly, this radar-tracking of the passage of the unidentified target was matched by concurrent visual observations, by personnel on the ground looking up and also from an overhead aircraft looking down. Both visual reports involved only a light, a light described as blurred out by its high speed; but since the aircraft (identified as a C-47 by the Lakenheath non-com whose letter called this case to the attention of the Colorado Project) was flying only at 4000 ft, the altitude of the unknown object is bracketed within rather narrow bounds. (No mention of any sonic boom appears; but the total number of seemingly quite credible reports of UFOs moving at speeds far above sonic values and yet not emitting booms is so large that one must count this as just one more instance of many currently inexplicable phenomena associated with the UFO problem.) The reported speed is not fast enough for a meteor, nor does the low-altitude flat trajectory and absence of a concussive shock wave match any meteoric hypothesis. That there was visual confirmation from observation points both above and below this fast-moving radar-tracked object must be viewed as adding still further credence to, and scientific interest in, the prior three Bentwaters radar sightings of the previous hour.

Apparently immediately after the 2255Z events, Bentwaters GCA alerted GCA Lakenheath, which lay off to its WNW. The answers to Questions 2(A) and 2(B) of the AFR200-2 format (on p. 253 of the Condon Report) seem to imply that Lakenheath ground observers were alerted in time to see a luminous object come in, at an estimated altitude of 2000-2500 ft, and on a heading towards SW. The lower estimated altitude and the altered heading do not match the Bentwaters sighting, and the ambiguity so inherent in the AFR200-2 format simply cannot be eliminated here, so the precise timing is not certain. All that seems certain here is that, at or subsequent to the Bentwaters alert-message, Lakenheath ground observers saw a luminous object come in out of the NE at low altitude, then stop, and take up an easterly heading and resume motion eastward out of sight.

The precise time-sequence of the subsequent observations is not clearly deducible from the Lakenheath TWX sent in compliance with AFR200-2. But that many very interesting events, scientifically very baffling events, soon took place is clear from the report. No followup, from Bluebook or other USAF sources, was undertaken, and so this potentially very important case, like hundreds of others, simply sent into the Bluebook files unclarified. I am forced to stress that nothing reveals so clearly the past years of scientifically inadequate UFO investigation as a few days' visit to Wright-Patterson AFB and a diligent reading of Bluebook case reports. No one with any genuine scientific interest in solving the UFO problem would have let accumulate so many years of reports like this one without seeing to it that the UFO reporting and followup investigations were brought into entirely different status from that in which they have lain for over 20 years.

Deficiencies having been noted, I next catalog, without benefit of the exact time-ordering that is so crucial to full assessment of any UFO event, the intriguing observations and events at or near Lakenheath subsequent to the 2255Z alert from Bentwaters.

6. Non-chronological Summary of Lakenheath Sightings, 2255Z-0330Z.

a. Visual observations from ground.

As noted two paragraphs above, following the 2255Z alert from GCA Bentwaters, USAF ground observers at the Lakenheath RAF Station observed

a luminous object come in on a southwesterly heading, stop, and then move off out of sight to the east. Subsequently, at an unspecified time, two moving white lights were seen, and "ground observers stated one white light joined up with another and both disappeared in formation together" (recall earlier radar observations of merging of targets seen by Bentwaters GCA). No discernible features of these luminous sources were noted by ground observers, but both the observers and radar operators concurred in their report-description that "the objects (were) travelling at terrific speeds and then stopping and changing course immediately." In a passage of the original Bluebook report which was for some reason not included in the version presented in the Condon Report, this concordance of radar and visual observations is underscored: "Thus two radar sets (*i.e.*, Lakenheath GCA and RATCC radars) and three ground observers report substantially same." Later in the original Lakenheath report, this same concordance is reiterated: "...the fact that radar and ground visual observations were made on its rapid acceleration and abrupt stops certainly lend credulance (*sic*) to the report."

Since the date of this incident coincides with the date of peak frequency of the Perseid meteors, one might ask whether any part of the visual observations could have been due to Perseids. The basic Lakenheath report to Bluebook notes that the ground observers reported "unusual amount of shooting stars in sky", indicating that the erratically moving light(s) were readily distinguishable from meteors. The report further remarks thereon that "the objects seen were definitely not shooting stars as there were no trails as are usual with such sightings." Furthermore, the stopping and course reversals are incompatible with any such hypothesis in the first place.

AFR200-2 stipulates that observer be asked to compare the UFO to the size of various familiar objects when held at arm's length (Item 1-B in the format). In answer to that item, the report states: "One observer from ground stated on first observation object was about size of golf ball. As object continued in flight it became a 'pin point'." Even allowing for the usual inaccuracies in such estimates, this further rules out Perseids, since that shower yields only meteors of quite low luminosity.

In summary of the ground-visual observations, it appears that three ground observers at Lakenheath saw at least two luminous objects, saw these over an extended though indefinite time period, saw them execute sharp course-changes, saw them remain motionless at least once, saw two objects merge into a single luminous object at one juncture, and reported motions in general accord with concurrent radar observations. These ground-visual observations, in themselves, constitute scientifically interesting UFO report-material. Neither astronomical nor aeronautical explanations, nor any meteorological-optical explanations, match well those reported phenomena. One could certainly wish for a far more complete and time-fixed report on these visual observations, but even the above information suffices to suggest some unusual events. The unusualness will be seen to be even greater on next examining the ground-radar observations from Lakenheath. And even stronger interest emerges as we then turn, last of all, to the airborne-visual and airborne-radar observations made near Lakenheath.

b. Ground-radar observations at Lakenheath.

The GCA surveillance radar at Lakenheath is identified as a CPN-4, while the RATCC search radar was a CPS-5 (as the non-com correctly recalled in his letter). Because the report makes clear that these two sets were concurrently following the unknown targets, it is relevant to note that they have different wavelengths, pulse repetition frequencies, and scan-rates, which (for reasons that need not be elaborated here) tends to rule out several radar-anomaly hypotheses (*e.g.*, interference echoes from a distant radar, second-time-around effects, AP). However, the reported maneuvers are so unlike any of those spurious effects that it seems almost unnecessary to confront those possibilities here.

As with the ground-visual observations, so also with these radar-report items, the AFR200-2 format limitations plus the other typical deficiencies of reporting of UFO events preclude reconstruction in detail, and in time-order, of all the relevant events. I get the impression that the first object seen visually by ground observers was not radar-tracked, although this is unclear from the report to Bluebook. One target whose motions were jointly followed both on the CPS-5 at the Radar Air Traffic Control Center and on the shorter-range, faster-scanning CPN-4 at the Lakenheath GCA unit was tracked "from 6 miles west to about 20 miles SW where target stopped ans assumed a stationary position for five minutes. Target then assumed a heading northwesterly (I presume this was intended to read 'northeasterly', and the non-com so indicates in his recollective account of what appears to be the same maneuvers) into the Station and stopped two miles NW of Station. Lakenheath GCA reports three to four additional targets were doing the same maneuvers in the vicinity of the Station. Thus two radar sets and three ground observers report substantially same." (Note that the quoted item includes the full passage omitted from the Condon Report version, and note that it seems to imply that this devious path with two periods of stationary hovering was also reported by the visual observers. However, the latter is not entirely certain because of ambiguities in the structure of the basic report as forced into the AFR200-2 format).

At some time, which context seems to imply as rather later in the night (the radar sightings went on until about 0330Z), "Lakenheath Radar Air Traffic Control Center observed object 17 miles east of Station making sharp rectangular course of flight. This maneuver was not conducted by circular path but on right angles at speeds of 600-800 mph. Object would stop and start with amazing rapidity." The report remarks that "...the controllers are experienced and technical skills were used in attempts to determine just what the objects were. When the target would stop on the scope, the MTI was used. However, the target would still appear on the scope." (The latter is puzzling. MTI, Moving Target Indication, is a standard feature on search or surveillance radars that eliminates ground returns and

returns from large buildings and other motionless objects. This very curious feature of display of stationary modes while the MTI was on adds further strong argument to the negation of any hypothesis of anomalous propagation of ground-returns. It was as if the unidentified target, while seeming to hover motionless, was actually undergoing small-amplitude but high-speed jittering motion to yield a scope-displayed return despite the MTI. Since just such jittery motion has been reported in visual UFO sightings on many occasions, and since the coarse resolution of a PPI display would not permit radar-detection of such motion if its amplitude were below, say, one or two hundred meters, this could conceivably account for the persistence of the displayed return during the episodes of "stationary" hovering, despite use of MTI.)

The portion of the radar sightings just described seems to have been vividly recollected by the retired USAF non-com who first called this case to the attention of the Colorado group. Sometime after the initial Bentwaters alert, he had his men at the RATCC scanning all available scopes, various scopes set at various ranges. He wrote that "...one controller noticed a stationary target on the scopes about 20 to 25 miles southwest. This was unusual, as a stationary target should have been eliminated unless it was moving at a speed of at least 40 to 45 knots. And yet we could detect no movement at all. We watched this target on all the different scopes for several minutes and I called the GCA Unit at (Lakenheath) to see if they had this target on their scope in the same geographical location. As we watched, the stationary target started moving at a speed of 400 to 600 mph in a north-northeast direction until it reached a point about 20 miles north-northwest of (Lakenheath). There was no slow start or build-up to this speed -- it was constant from the second it started to move until it stopped." (This description, written 11 years after the event, matches the 1956 intelligence report from the Lakenheath USAF unit so well, even seeming to avoid the typographical direction-error that the Lakenheath TWX contained, that one can only assume that he was deeply impressed by this whole incident. That, of course, is further indicated by the very fact that he wrote the Colorado group about it in the first place.) His letter (Condon Report, p. 249) adds that "the target made several changes in location, always in a straight line, always at about 600 mph and always from a standing or stationary point to his next stop at constant speed -- no build-up in speed at all -- these changes in location varied from 8 miles to 20 miles in length -- no set pattern at any time. Time spent stationary between movements also varied from 3 or 4 minutes to 5 or 6 minutes..." Because his account jibes so well with the basic Bluebook file report in the several particulars in which it can be checked, the foregoing quotation from the letter as reproduced in the Condon Report stands as meaningful indication of the highly unconventional behavior of the unknown aerial target. Even allowing for some recollective uncertainties, the non-com's description of the behavior of the unidentified radar target lies so far beyond any meteorological, astronomical, or electronic explanation as to stand as one challenge to any suggestions that UFO reports are of negligible scientific interest.

The non-com's account indicates that they plotted the discontinuous stop-and-go movements of the target for some tens of minutes before it was decided to scramble RAF interceptors to investigate. That third major aspect of the Lakenheath events must now be considered. (The delay in scrambling interceptors is noteworthy in many Air Force-related UFO incidents of the past 20 years. I believe this reluctance stems from unwillingness to take action lest the decision-maker be accused of taking seriously a phenomenon which the Air Force officially treats as non-existent.)

c. Airborne radar and visual sightings by Venom interceptor.

An RAF jet interceptor, a Venom single-seat subsonic aircraft equipped with an air-intercept (AI) nose radar, was scrambled, according to the basic Bluebook report, from Waterbeach RAF Station, which is located about 6 miles north of Cambridge, and some 20 miles SW of Lakenheath. Precise time of the scramble does not appear in the report to Bluebook, but if we were to try to infer the time from the non-com's recollective account, it would seem to have been somewhere near midnight. Both the non-com's letter and the contemporary intelligence report make clear that Lakenheath radar had one of their unidentified targets on-scope as the Venom came in over the Station from Waterbeach. The TWX to Bluebook states: "The aircraft flew over RAF Station Lakenheath and was vectored toward a target on radar 6 miles east of the field. Pilot advised he had a bright white light in sight and would investigate. At thirteen miles west (east?) he reported loss of target and white light."

It deserves emphasis that the foregoing quote clearly indicates that the UFO that the Venom first tried to intercept was being monitored via three distinct physical "sensing channels." It was being recorded by ground radar, by airborne radar, and visually. Many scientists are entirely unaware that Air Force files contain such UFO cases, for this very interesting category has never been stressed in USAF discussions of its UFO records. Note, in fact, the similarity to the 1957 RB-47 case (Case 1 above) in the evidently simultaneous loss of visual and airborne-radar signal here. One wonders if ground radar also lost it simultaneously with the Venom pilot's losing it, but, as is so typical of AFR200-2 reports, incomplete reporting precludes clarification. Nothing in the Bluebook case-file on this incident suggests that anyone at Bluebook took any trouble to run down that point or the many other residual questions that are so painfully evident here. The file does, however, include a lengthy dispatch from the then-current Bluebook officer, Capt. G. T. Gregory, a dispatch that proposes a series of what I must term wholly irrelevant hypotheses about Perseid meteors with "ionized gases in their wake which may be traced on radarscopes", and inversions that "may cause interference between two radar stations some distance apart." Such basically irrelevant remarks are all too typical of Bluebook critique over the years. The file also includes a case-discussion by Dr. J. A. Hynek, Bluebook consultant, who also toys with the idea of possible radar returns from meteor wake-

ionization. Not only are the radar frequencies here about two orders of magnitude too high to afford even marginal likelihood of meteor-wake returns, but there is absolutely no kinematic similarity between the reported UFO movements and the essentially straight-line hypersonic movement of a meteor, to cite just a few of the strong objections to any serious consideration of meteor hypotheses for the present UFO case. Hynek's memorandum on the case makes some suggestions about the need for upgrading Bluebook operations, and then closes with the remarks that "The Lakenheath report could constitute a source of embarrassment to the Air Force; and should the facts, as so far reported, get into the public domain, it is not necessary to point out what excellent use the several dozen UFO societies and other 'publicity artists' would make of such an incident. It is, therefore, of great importance that further information on the technical aspects of the original observations be obtained, without loss of time from the original observers." That memo of October 17, 1956,is followed in the case-file by Capt. Gregory's November 26, 1956 reply, in which he concludes that "our original analyses of anomalous propagation and astronimical is (*sic*) more or less correct"; and there the case investigation seemed to end, at the same casually closed level at which hundreds of past UFO cases have been closed out at Bluebook with essentially no real scientific critique. I would say that it is exceedingly unfortunate that "the facts, as so far reported" did not get into the public domain, along with the facts on innumerable other Bluebook case-files that should have long ago startled the scientific community just as much as they startled me when I took the trouble to go to Bluebook and spend a number of days studying those astonishing files.

Returning to the scientifically fascinating account of the Venom pilot's attempt to make an air-intercept on the Lakenheath unidentified object, the original report goes on to note that, after the pilot lost both visual and radar signals, "RATCC vectored him to a target 10 miles east of Lakenheath and pilot advised target was on radar and he was 'locking on.'" Although here we are given no information on the important point of whether he also saw a luminous object, as he got a radar lock-on, we definitely have another instance of at least two-channel detection. The concurrent detection of a single radar target by a ground radar and an airborne radar under conditions such as these, where the target proves to be a highly maneuverable object (see below), categorically rules out any conventional explanations involving, say, large ground structures and propagation anomalies. That MTI was being used on the ground radar also excludes that, of course.

The next thing that happened was that the Venom suddenly lost radar lock-on as it neared the unknown target. RATCC reported that "as the Venom passed the target on radar, the target began a tail chase of the friendly fighter." RATCC asked the Venom pilot to acknowledge this turn of events and he did, saying "he would try to circle and get behind the target." His attempts were unsuccessful, which the report to Bluebook describes only in the terse comment, "Pilot advised he was unable to 'shake' the target off his tail and requested assistance." The non-com's letter is more detailed and much more emphatic. He first remarks that the UFO's sudden evasive movement into tail position was so swift that he missed it on his own scope, "but it was seen by the other controllers." His letter then goes on to note that the Venom pilot "tried everything -- he climbed, dived, circled, etc., but the UFO acted like it was glued right behind him, always the same distance, very close, but we always had two distinct targets." Here again, note how the basic report is annoyingly incomplete. One is not told whether the pilot knew the UFO was pursuing his Venom by virtue of some tail-radar warning device of type often used on fighters (none is alluded to), or because he could see a luminous object in pursuit. In order for him to "acknowledge" the chase seems to require one or the other detection-mode, yet the report fails to clarify this important point. However, the available information does make quite clear that the pursuit was being observed on ground radar, and the non-com's recollection puts the duration of the pursuit at perhaps 10 minutes before the pilot elected to return to his base. Very significantly, the intelligence report from Lakenheath to Bluebook quotes this first pilot as saying "clearest target I have ever seen on radar", which again eliminates a number of hypotheses, and argues most cogently the scientific significance of the whole episode.

The non-com recalled that, as the first Venom returned to Waterbeach aerodrome when fuel ran low, the UFO followed him a short distance and then stopped; that important detail is, however, not in the Bluebook report. A second Venom was then scrambled, but, in the short time before a malfunction forced it to return to Waterbeach, no intercepts were accomplished by that second pilot.

7. Discussion:

The Bluebook report material indicates that other radar unknowns were being observed at Lakenheath until about 0330Z. Since the first radar unknowns appeared near Bentwaters at about 2130Z on 8/13/56, while the Lakenheath events terminated near 0330Z on 8/14/56, the total duration of this UFO episode was about six hours. The case includes an impressive number of scientifically provocative features:

1) At least three separate instances occurred in which one ground-radar unit, GCA Bentwaters, tracked some unidentified target for a number of tens of miles across its scope at speeds in excess of Mach 3. Since even today, 12 years later, no nation has disclosed military aricraft capable of flight at such speeds (we may exclude the X-15), and since that speed is much too low to fit any meteoric hypothesis, this first feature (entirely omitted from discussion in the Condon Report) is quite puzzling. However, Air Force UFO files and other sources contain many such instances of nearly hypersonic speeds of radar-tracked UFOs.

2) In one instance, about a dozen low-speed (order of 100 mph) targets moved in loose formation led by three closely-spaced targets, the assemblage yielding consistent returns over a path of about 50 miles, after which they merged into a single large target, remained motionless for some 10-15 minutes,

and then moved off-scope. Under the reported wind conditions, not even a highly contrived meteorological explanation invoking anomalous propagation and inversion-layer waves would account for this sequence observed at Bentwaters. The Condon Report omits all discussion of items 1) and 2), for reasons that I find difficult to understand.

3) One of the fast-track radar sightings at Bentwaters, at 2255Z, coincided with visual observations of some very-high-speed luminous source seen by both a tower operator on the ground and by a pilot aloft who saw the light moving in a blur below his aircraft at 4000 ft altitude. The radar-derived speed was given as 2000-4000 mph. Again, meteors won't fit such speeds and altitudes, and we may exclude aircraft for several evident reasons, including absence of any thundering sonic boom that would surely have been reported if any near hypothetical secret 1956-vintage hypersonic device were flying over Bentwaters at less than 4000 ft that night.

4) Several ground observers at Lakenheath saw luminous objects exhibiting non-ballistic motions, including dead stops and sharp course reversals.

5) In one instance, two luminous white objects merged into a single object, as seen from the ground at Lakenheath. This wholly unmeteoric and unaeronautical phenomenon is actually a not-uncommon feature of UFO reports during the last two decades. For example, radar-tracked merging of two targets that veered together sharply before joining up was reported over Kincheloe AFB, Michigan, in a UFO report that also appears in the Condon Report (p. 164), quite unreasonably attributed therein to "anomalous propagation."

6) Two separate ground radars at Lakenheath, having rather different radar parameters, were concurrently observing movements of one or more unknown targets over an extended period of time. Seemingly stationary hovering modes were repeatedly observed, and this despite use of MTI. Seemingly "instantaneous" accelerations from rest to speeds of order of Mach 1 were repeatedly observed. Such motions cannot readily be explained in terms of any known aircraft flying then or now, and also fail to fit known electronic or propagation anomalies. The Bluebook report gives the impression (somewhat ambiguously, however) that some of these two-radar observations were coincident with ground-visual observations.

7) In at least one instance, the Bluebook report makes clear that an unidentified luminous target was seen visually from the air by the pilot of an interceptor while getting simultaneous radar returns from the unknown with his nose radar concurrent with ground-radar detection of the same unknown. This is scientifically highly significant, for it entails three separate detection-channels all recording the unknown object.

8) In at least one instance, there was simultaneous radar disappearance and visual disappearance of the UFO. This is akin to similar events in other known UFO cases, yet is not easily explained in terms of conventional phenomena.

9) Attempts of the interceptor to close on one target seen both on ground radar and on the interceptor's nose radar, led to a puzzling rapid interchange of roles as the unknown object moved into tail-position behind the interceptor. While under continuing radar observation from the ground, with both aircraft and unidentified object clearly displayed on the Lakenheath ground radars, the pilot of the interceptor tried unsuccessfully to break the tail chase over a time of some minutes. No ghost-return or multiple-scatter hypothesis can explain such an event.

I believe that the cited sequence of extremely baffling events, involving so many observers and so many distinct observing channels, and exhibiting such unconventional features, should have led to the most intensive Air Force inquiries. But I would have to say precisely the same about dozens of other inexplicable Air Force-related UFO incidents reported to Bluebook since 1947. What the above illustrative case shows all too well is that highly unusual events have been occurring under circumstances where any organization with even passing scientific curiosity should have responded vigorously, yet the Air Force UFO program has repeatedly exhibited just as little response as I have noted in the above 1956 Lakenheath incident. The Air Force UFO program, contrary to the impression held by most scientists here and abroad, has been an exceedingly superficial and generally quite incompetent program. Repeated suggestions from Air Force press offices, to the effect that "the best scientific talents available to the U.S. Air Force" have been brought to bear on the UFO question are so far from the truth as to be almost laughable, yet those suggestions have served to mislead the scientific community, here and abroad, into thinking that careful investigations were yielding solid conclusions to the effect that the UFO problem was a nonsense problem. The Air Force has given us all the impression that its UFO reports involved only misidentified phenomena of conventional sorts. That, I submit, is far from correct, and the Air Force has not responsibly discharged its obligations to the public in conveying so gross a misimpression for twenty years. I charge incompetence, not conspiracy, let me stress.

The Condon Report, although disposed to suspicion that perhaps some sort of anomalous radar propagation might be involved (I record here my objection that the Condon Report exhibits repeated instances of misunderstanding of the limits of anomalous propagation effects), does concede that Lakenheath is an unexplained case. Indeed, the Report ends its discussion with the quite curious admission that, in the Lakenheath episode, "...the probability that at least one genuine UFO was involved appears to be fairly high."

One could easily become enmeshed in a semantic dispute over the meaning of the phrase, "one genuine UFO", so I shall simply assert that my own position is that the Lakenheath case exemplifies a disturbingly large group of UFO reports in which the apparent degree of scientific inexplicability is so great that, instead of being ingored and laughed at, those cases should all along since 1947 have been drawing the attention of a large body of the world's

best scientists. Had the latter occurred, we might now have some answers, some clues to the real nature of the UFO phenomena. But 22 years of inadequate UFO investigations have kept this stunning scientific problem out of sight and under a very broad rug called Project Bluebook, whose final termination on December 18, 1969 ought to mark the end of an era and the start of a new one relative to the UFO problem.

More specifically, with cases like Lakenheath and the 1957 RB-47 case and many others equally puzzling that are to be found within the Condon Report, I contest Condon's principal conclusion "that further extensive study of UFOs probably cannot be justified in the expectation that science will be advanced thereby." And I contest the endorsement of such a conclusion by a panel of the National Academy of Sciences, an endorsement that appears to be based upon essentially zero independent scientific cross-checking of case material in the Report. Finally, I question the judgment of those Air Force scientific offices and agencies that have accepted so weak a report. The Lakenheath case is just one example of the basis upon which I rest those objections. I am prepared to discuss many more examples.

8. The Extraterrestrial Hypothesis:

In this Lakenheath UFO episode, we have evidence of some phenomena defying ready explanation in terms of present-day science and technology, some phenomena that include enough suggestion of intelligent control (tail-chase incident here), or some broadly cybernetic equivalent thereof, that it is difficult for me to see any reasonable alternative to the hypothesis that something in the nature of extraterrestrial devices engaged in something in the nature of surveillance lies at the heart of the UFO problem. That is the hypothesis that my own study of the UFO problem leads me to regard as most probable in terms of my present information. This is, like all scientific hypotheses, a working hypothesis to be accepted or rejected only on the basis of continuing investigation. Present evidence surely does not amount to incontrovertible proof of the extraterrestrial hypothesis. What I find scientifically dismaying is that, while a large body of UFO evidence now seems to point in no other direction than the extraterrestrial hypothesis, the profoundly important implications of that possibility are going unconsidered by the scientific community because this entire problem has been imputed to be little more than a nonsense matter unworthy of serious scientific attention. Those overtones have been generated almost entirely by scientists and others who have done essentially no real investigation of the problem-area in which they express such strong opinions. Science is not supposed to proceed in that manner, and this AAAS Symposium should see an end to such approaches to the UFO problem.

Put more briefly, doesn't a UFO case like Lakenheath warrant more than a mere shrug of the shoulders from science?

Case 3. Haneda AFB, Tokyo, Japan, August 5-6, 1952.

Brief summary: USAF tower operators at Haneda AFB observed an unusually bright bluish-white light to their NE, alerted the GCI radar unit at Shiroi, which then called for a scramble of an F94 interceptor after getting radar returns in same general area. GCI ground radar vectored the F94 to an orbiting unknown target, which the F94 picked up on its airborne radar. The target then accelerated out of the F94's radar range after 90 seconds of pursuit that was followed also on the Shiroi GCI radar.

1. Introduction:

The visual and radar sightings at Haneda AFB, Japan, on August 5-6, 1952, represent an example of a long-puzzling case, still carried as an unidentified case by Project Bluebook, at my latest check, and chosen for analysis in the Condon Report. In the latter, is is putatively explained in terms of a combination of diffraction and mirage distortion of the star Capella, as far as the visual parts are concerned, while the radar portions are attributed to anomalous propagation. I find very serious difficulties with those "explanations" and regard them as typical of a number of rather casually advanced explanations of long-standing UFO cases that appear in the Condon Report. Because this case has been discussed in such books as those of Ruppelt, Keyhoe, and Hall, it is of particular interest to carefully examine case-details on it and then to examine the basis of the Condon Report's explanation of it, as example of how the Condon Report disposed of old "classic cases."

Haneda AFB, active during the Korean War, lay about midway between central Tokyo and central Yokohama, adjacent to Tokyo International Airport. The 1952 UFO incident began with visual sightings of a brilliant object in the northeastern sky, as seen by two control tower operators going on duty at 2330 LST (all times hereafter will be LST). It will serve brevity to introduce some coded name-designations for these men and for several officers involved, since neither the Condon Report, nor my copies of the original Bluebook case-file show names (excised from latter copies in accordance with Bluebook practice on non-release of witness-names in UFO cases):

Coded Designation	Identification
Airman A	One of two Haneda tower operators who first sighted light. Rank was A/3c.
Airman B	Second Haneda tower operator to first sight light. Rank was A/1c.
Lt. A	Controller on duty at Shiroi GCI unit up to 2400, 8/5/52. Rank was 1st Lt.
Lt. B	Controller at Shiroi after 0000, 8/6/52, also 1st Lt.
Lt. P	Pilot of scrambled F94, also 1st Lt.
Lt. R	Radar officer in F94, also 1st Lt.

Shiroi GCI Station, manned by the 528th AC&W (Aircraft Control and Warning) Group, lay approximately 20 miles NE of Haneda (specifically at 35° 49' N, 140° 2' E) and had a CPS-1 10-cm search radar plus a CPS-4 10-cm height-finding radar. Two other USAF facilities figure in the incident, Tachikawa AFB, lying just over 20 miles WNW of Haneda, and

Johnson AFB, almost 30 miles NW of Haneda. The main radar incidents center over the north extremity of Tokyo Bay, roughly midway from central Tokyo to Chiba across the Bay.

The Bluebook case-file on this incident contains 25 pages, and since the incident predates promulgation of AFR200-2, the strictures on time-reporting, etc., are not here so bothersome as in the Lakenheath case of 1956, discussed above. Nevertheless, the same kind of disturbing internal inconsistencies are present here as one finds in most Bluebook case reports; in particular, there is a bothersome variation in times given for specific events in different portions of the case-file. One of these, stressed in the Condon Report, will be discussed explicitly below; but for the rest, I shall use those times which appear to yield the greatest over-all internal consistency. This will introduce no serious errors, since the uncertainties are mostly only 1 or 2 minutes and, except for the cited instance, do not alter any important implications regardless of which cited time is used. The over-all duration of the visual and radar sightings is about 50 minutes. The items of main interest occurred between 2330 and 0020, approximately.

Although this case involves both visual and radar observations of unidentified objects, careful examination does not support the view that the same object was ever assuredly seen visually and on radar at the same time, with the possible exception of the very first radar detection just after 2330. Thus it is not a "radar-visual" case, in the more significant sense of concurrent two-channel observations of an unknown object. This point will be discussed further in Section 5.

2. Visual Observations:

a. First visual detection.

At 2330, Airmen A and B, while walking across the ramp at Haneda AFB to go on the midnight shift at the airfield control tower, noticed an "exceptionally bright light" in their northeastern sky. They went immediately to the control tower to alert two other on-duty controllers to it and to examine it more carefully with the aid of the 7X50 binoculars available in the tower. The Bluebook case-file notes that the two controllers already on tower-duty "had not previously noticed it because the operating load had been keeping their attention elsewhere."

b. Independent visual detection at Tachikawa AFB.

About ten minutes later, according to the August 12, 1952, Air Intelligence Information Report (IR-35-52) in the Bluebook case-file, Haneda was queried about an unusually bright light by controllers at Tachikawa AFB, 21 miles to their WNW. IR-35-52 states: "The control tower at Tachikawa Air Force Base called Haneda tower at approximately 2350 to bring their attention to a brilliant white light over Tokyo Bay. The tower replied that it had been in view for some time and that it was being checked."

This feature of the report is significant in two respects: 1) It indicates that the luminous source was of sufficiently unusual brilliance to cause two separate groups of Air Force controllers at two airfields to respond independently and to take alert-actions; and 2) More significantly, the fact that the Tachikawa controllers saw the source in a direction "over Tokyo Bay" implies a line-of-sight distinctly south of east. From Tachikawa, even the north end of the Bay lies to the ESE. Thus the intersection of the two lines of sight fell somewhere in the northern half of the Bay, it would appear. As will be seen later, this is where the most significant parts of the radar tracking occurred subsequently.

c. Direction, intensity, and configuration of the luminous source.

IR-35-52 contains a signed statement by Airman A, a sketch of the way the luminous source looked through 7-power binoculars, and summary comments by Capt. Charles J. Malven, the FEAF intelligence officer preparing the report for transmission to Bluebook.

Airman A's own statement gives the bearing of the source as NNE; Malven's summary specifies only NE. Presumably the witness' statement is the more reliable, and it also seems to be given a greater degree of precision, whence a line-of-sight azimuth somewhere in the range of 25 to 35° east of north appears to be involved in the Haneda sightings. By contrast, the Tachikawa sighting-azimuth was in excess of 90° from north, and probably beyond 100°, considering the geography involved, a point I shall return to later.

Several different items in the report indicate the high intensity of the source. Airman A's signed statement refers to it as "the intense bright light over the Bay." The annotated sketch speaks of "constant brilliance across the entire area" of the (extended) source, and remarks on "the blinding effect from the brilliant light." Malven's summary even points out that "Observers stated that their eyes would fatigue rapidly when they attempted to concentrate their vision on the object," and elsewhere speaks of "the brilliant blue-white light of the object." Most of these indications of brightness are omitted from the Condon Report, yet bear on the Capella hypothesis in terms of which that Report seeks to dispose of these visual sightings.

Airman A's filed statement includes the remark that "I know it wasn't a star, weather balloon or Venus, because I compared it with all three." This calls for two comments. First, Venus is referred to elsewhere in the case-file, but this is certainly a matter of confusion, inasmuch as Venus had set that night before about 2000 LST. Since elsewhere in the report reference is made to Venus lying in the East, and since the only noticeable celestial object in that sector at that time would have been Jupiter, I would infer that where "Venus" is cited in the case-file, one should read "Jupiter." Jupiter would have risen near 2300, almost due east, with apparent magnitude -2.0. Thus Airman A's assertion that the object was brighter than "Venus" may probably be taken to imply something of the order of magnitude -3.0 or brighter. Indeed, since it is most unlikely that any observer would speak of a -3.0 magnitude source as "blinding" or "fatiguing" to look at, I would suggest that the actual luminosity, at its periods of peak value (see below) must have exceeded even magnitude -3 by a substantial margin.

Airman A's allusion to the intensity as compared with a "weather balloon" refers to the comparisons (elaborated below) with the light

suspended from a pilot balloon released near the tower at 2400 that night and observed by the tower controllers to scale the size and brightness. This is a very fortunate scaling comparison, because the small battery-operated lights long used in meteorological practice have a known luminosity of about 1.5 candle. Since a 1-candle source at 1 kilometer yields apparent magnitude 0.8, inverse-square scaling for the here known balloon distance of 2000 feet (see below) implies an apparent magnitude of about -0.5 for the balloon-light as viewed at time of launch. Capt. Malven's summary states, in discussing this quite helpful comparison, "The balloon's light was described as extremely dim and yellow, when compared to the brilliant blue-white light of the object." Here again, I believe one can safely infer an apparent luminosity of the object well beyond Jupiter's -2.0. Thus, we have here a number of compatible indications of apparent brightness well beyond that of any star, which will later be seen to contradict explanations proposed in the Condon Report for the visual portions of the Haneda sightings.

Of further interest relative to any stellar-source hypothesis are the descriptions of the configuration of the object as seen with 7-power binoculars from the Haneda tower, and its approximate angular diameter. Fortunately, the latter seems to have been adjudged in direct comparison with an object of determinate angular subtense that was in view in the middle of the roughly 50-minute sighting. At 2400, a small weather balloon was released from a point at a known distance of 2000 ft from the control tower. Its diameter at release was approximately 24 inches. (IR-35-52 refers to it as a "ceiling balloon", but the cloud-cover data contained therein is such that no ceiling ballon would have been called for. Furthermore, the specified balloon mass, 30 grams, and diameter, 2 ft, are precisely those of a standard pilot balloon for upper-wind measurement. And finally, the time [2400 LST = 1500Z] was the standard time for a pilot balloon run, back in that period.) A balloon of 2-ft diameter at 2000-ft range would subtend 1 milliradian, or just over 3 minutes of arc, and this was used by the tower observers to scale the apparent angular subtense of the luminous source. As IR-35-52 puts it: "Three of the operators indicated the size of the light, when closest to the tower, was approximately the same as the small ceiling balloons (30 grams, appearing 24 inches in diameter) when launched from the weather station, located at about 2000 ft from the tower. This would make the size of the central light about 50 ft in diameter, when at the 10 miles distance tracked by GCI....A lighted weather balloon was launched at 2400 hours..." Thus, it would appear that an apparent angular subtense close to 3 minutes of arc is a reasonably reliable estimate for the light as seen by naked eye from Haneda. This is almost twice the average resolution-limit of the human eye, quite large enough to match the reported impressions that it had discernible extent, *i.e.*, was not merely a point source.

But the latter is very much more clearly spelled out, in any event, for IR-35-52 gives a fairly detailed description of the object's appearance through 7-power binoculars. It is to be noted that, if the naked-eye diameter were about 3 minutes, its apparent subtense when viewed through 7X-binoculars would be about 20 minutes, or two-thirds the naked-eye angular diameter of the full moon -- quite large enough to permit recognition of the finer details cited in IR-35-52, as follows: "The light was described as circular in shape, with brilliance appearing to be constant across the face. The light appeared to be a portion of a large round dark shape which was about four times the diameter of the light. When the object was close enough for details to be seen, a smaller, less brilliant light could be seen at the lower left-hand edge, with two or three more dim lights running in a curved line along the rest of the lower edge of the dark shape. Only the lower portion of the darker shape could be determined, due to the lighter sky which was believed to have blended with the upper side of the object. No rotation was noticed. No sound was heard."

Keeping in mind that those details are, in effect, described for an image corresponding in apparent angular size to over half a lunar diameter, the detail is by no means beyond the undiscernible limit. The sketch included with IR-35-52 matches the foregoing description, indicating a central disc of "constant brilliance across entire area (not due to a point source of light)", an annular dark area of overall diameter 3-4 times that of the central luminary, and having four distinct lights on the lower periphery, "light at lower left, small and fairly bright, other lights dimmer and possibly smaller." Finally, supportive comment thereon is contained in the signed statement of Airman A. He comments: "After we got in the tower I started looking at it with binoculars, which made the object much clearer. Around the bright white light in the middle, there was a darker object which stood out against the sky, having little white lights along the outer edge, and a glare around the whole thing."

All of these configurational details, like the indications of a quite un-starlike brilliance, will be seen below to be almost entirely unexplainable on the Capella hypothesis with which the Condon Report seeks to settle the Haneda visual sightings. Further questions ultimately arise from examination of reported apparent motions of the luminous source, which will be considered next.

d. Reported descriptions of apparent motions of the luminous source.

Here we meet the single most important ambiguity in the Haneda case-file, though the weight of the evidence indicates that the luminous object exhibited definite movements. The ambiguity arises chiefly from the way Capt. Malven summarized the matter in his IR-35-52 report a week after the incident: "The object faded twice to the East, then returned. Observers were uncertain whether disappearance was due to a dimming of the lights, rotation of object, or to the object moving away at terrific speed, since at times of fading the object was difficult to follow closely, except as a small light. Observers did agree that when close, the object did appear to move horizontally, varying apparent position and speed slightly." Aside from the closing comment, all of Malven's summary remarks could be interpreted as implying either solely radial motion (improbable because it would imply the Haneda observers just happened

to be in precisely the spot from which no cross-wise velocity component could be perceived) or else merely illusion of approach and recession due to some intrinsic or extrinsic time-variation in apparent brightness.

In contrast to the above form in which Malven summarized the reported motions, the way Airman A described them in his own statement seems to refer to distinct motions, including transverse components: "I watched it disappear twice through the glasses. It seemed to travel to the East and gaining altitude at a very fast speed, much faster than any jet. Every time it disappeared it returned again, except for the last time when the jets were around. It seemed to know they were there. As for an estimate of the size of the object -- I couldn't even guess." Recalling that elsewhere in that same signed statement this tower controller had given the observed direction to the object as NNE, his specification that the object "seemed to travel to the East" seems quite clearly to imply a non-radial motion, since, if only an impression of the latter were involved, one would presume he would have spoken of it in some such terms as "climbing out rapidly to the NNE". Since greater weight is presumably to be placed on direct-witness testimony than on another's summary thereof, it appears necessary to assume that not mere radial recession but also transverse components of recession, upwards and towards the East, were observed.

That the luminous source varied substantially in angular subtense is made very clear at several points in the case-file: One passage already cited discusses the "size of the light, when closest to the tower...", while, by contrast, another says that: "At the greatest distance, the size of the light appeared slightly larger than Venus, approximately due East of Haneda, and slightly brighter." (For "Venus" read "Jupiter" as noted above. Jupiter was then near quadrature with angular diameter of around 40 seconds of arc. Since the naked eye is a poor judge of comparative angular diameters that far below the resolution limit, little more can safely be read into that statement than the conclusion that the object's luminous disc diminished quite noticeably and its apparent brightness fell to a level comparable to or a bit greater than Juptier's when at greatest perceived distance. By virtue of the latter, it should be noted, one has another basis for concluding that when at peak brilliance it must have been considerably brighter than Jupiter's -2.0, a conclusion already reached by other arguments above.

In addition to exhibiting what seems to imply recession, eastward motion, and climb to disappearance, the source also disappeared for at least one other period far too long to be attibuted to any scintillation or other such meteorological optical effect: "When we were about half way across the ramp (Airman A stated), it disappeared for the first time and returned to approximately the same spot about 15 seconds later." There were scattered clouds over Haneda at around 15-16,000 ft, and a very few isolated clouds lower down, yet it was full moon that night and, if patches of clouds had drifted very near the controllers' line-of-sight to the object, they could be expected to have seen the clouds. (The upper deck was evidently thin, for Capt. Malven notes in his report that "The F94 crew reported exceptional visibility and stated that the upper cloud layer did not appreciably affect the brilliancy of the moonlight.") A thin cloud interposed between observer and a distant luminous source would yield an impression of dimming and enhanced effective angular diameter, not dimming and reduced apparent size, as reported here. I believe the described "disappearances" cannot, in view of these several considerations, reasonably be attributed to cloud effects.

I have now summarized the essential features of the Haneda report dealing with just the visual observations of some bright luminous source that initiated the alert and that led to the ground-radar and airborne-radar observations yet to be described. Before turning to those, which comprise, in fact, the more significant portion of the over-all sighting, it will be best to turn next to a critique of the Bluebook and the Condon Report attempts to give an explanation of the visual portions of the sighting.

3. Bluebook Critique of the Visual Sightings:

In IR-35-52, Capt. Malven offers only one hypothesis, and that in only passing manner: He speculates briefly on whether "reflections off the water (of the Bay, I presume) were...sufficient to form secondary reflections off the lower clouds," and by the latter he refers to "isolated patches of thin clouds reported by the F-94 crew as being at approximately 4000 feet..." He adds that "these clouds were not reported to be visible by the control tower personnel," which, in view of the 60-mile visibility cited elsewhere in the case-file and in view of the full moon then near the local meridian, suggests that those lower clouds must have been exceedingly widely scattered to escape detection by the controllers.

What Malven seems to offer there, as an hypothesis for the observed visual source, is cloud-reflection of moonlight -- and in manner all too typical of many other curious physical explanations one finds scattered through Bluebook case-files, he brings in a consideration that reveals lack of appreciation of what is central to the issue. If he wants to talk about cloud-reflected moonlight, why render a poor argument even weaker by invoking not direct moonlight but moonlight secondarily reflected off the surface of Tokyo Bay? Without even considering further that odd twist in his tentative hypothesis, it is sufficient to note that even direct moonlight striking a patch of cloud is not "reflected in any ordinary sense of that term. It is scattered from the cloud droplets and thereby serves not to create any image of a discrete light source of blinding intensity that fatigues observers' eyes and does the other things reported by the Haneda observers, but rather serves merely to palely illuminate a passing patch of cloud material. A very poor hypothesis.

Malven drops that hypothesis without putting any real stress on it (with judgment that is not always found where equally absurd "explanations" have been advanced in innumerable other Bluebook case-files by reporting officers or by Bluebook staff members). He does add that there was some thunderstorm activity reported that night off to the northwest of Tokyo, but mentions that there was no reported electrical activity therein. Since the direction is opposite to the line of sight and since the reported visual phenomena bear no relation to lightning effects, this carried the matter no further, and the report drops that point there.

Finally, Malven mentions very casually an idea that I have encountered repeatedly in Bluebook files

yet nowhere else in my studies of atmospheric physics, namely, "reflections off ionized portions of the atmosphere." He states: "Although many sightings might be attributed to visual and electrical reflections off ionized areas in the atmosphere, the near-perfect visibility on the night of the sighting, together with the circular orbit of the object would tend to disprove this theory." Evidently he rejects the "ionized areas" hypothesis on the ground that presence of such areas is probably ruled out in view of the unusually good visibility reported that night. I trust that, for most readers of this discussion, I would only be belaboring the obvious to remark that Bluebook mythology about radar and visual "reflections" off "ionized regions" in the clear atmosphere (which mythology I have recently managed to trace back even to pre-1950 Air Force documents on UFO reports) has no known basis in fact, but is just one more of the all too numerous measures of how little scientific critique the Air Force has managed to bring to bear on its UFO problems over the years.

Although the final Bluebook evaluation of this entire case, including the visual portions, was and is "Unidentified", indicating that none of the above was regarded as an adequate explanation of even the visual features of the report, one cannot overlook extremely serious deficiencies in the basic reporting and the interrogation and follow-up here. This incident occurred in that period which my own studies lead me to describe as sort of a highwater mark for Project Bluebook. Capt. Edward J. Ruppelt was then Bluebook Officer at Wright-Patterson AFB, and both he and his superiors were then taking the UFO problem more seriously than it was taken by USAF at any other time in the past 22 years. Neither before nor after 1952-3 were there as many efforts made to assemble case-information, to go out and actually check in the field on sightings, etc. Yet it should be uncomfortably apparent already at this point in this discussion of the Haneda case that quite basic points were not run to ground and pinned down. Ruppelt, in his 1956 book, speaks of this Haneda case as if it were regarded as one of the most completely reported cases they'd received as of mid-1952. He mentioned that his office sent a query to FEAF offices about a few points of confusion, and that the replies came back with impressive promptness, etc. If one needed some specific clue to the regrettably low scientific level of the operation of Bluebook even during this period of comparatively energetic case-investigation, one can find it in study of the Haneda report. Even so simple a matter as checking whether Venus was actually in the East was obviously left undone; and numerous cross-questions and followup queries on motions, angles, times, etc., not even thought of. That, I stress, is what any scientist who studies the Bluebook files as I have done will find all through 22 years of Air Force handling of the UFO problem. Incompetence and superficiality -- even at the 1952 highwater mark under Ruppelt's relatively vigorous Project-direction.

4. Condon Report Critique of the Visual Sightings:

On p. 126 of the Condon Report, the luminous source discussed above is explained as a diffracted image of the star Capella: "The most likely source to have produced the visual object is the star Capella (magnitude 0.2), which was 8° above horizon at 37° azimuth at 2400 LST. The precise nature of the optical propagation mechanism that would have produced such a strangely diffracted image as reported by the Haneda AFB observers must remain conjectural."

Suggesting that perhaps "a sharp temperature inversion may have existed at the top of (an inferred) moist layer, below which patches of fog or mist could collect," the Report continues as follows: "The observed diffraction pattern could have been produced by either (1) interference effects associated with propagation within and near the top of an inversion, or (2) a corona with a dark aureole produced by a mist of droplets of water of about 0.2 mm diameter spaced at regular intervals as described by Minnaert (1954). In either event, the phenomenon must be quite rare. The brightness of the image may have been due in part to 'Raman brightening' of an image seen through an inversion layer."

And in the final paragraph discussing this case, the Condon Report merely rounds it off to: "In summary, it appears that the most probable causes of this UFO report are an optical effect on a bright light source that produced the visual sighting..." (and goes on to a remark on the radar portions we have yet to examine here).

There are some very serious difficulties with the more specific parts of the suggested explanation, and the vagueness of the other parts is sufficiently self-evident to need little comment.

First, nothing in the literature of meteorological optics discusses any diffraction-produced coronae with a dark annular space extending out to three or four diameters of the central luminary, such as is postulated in the above Condon Report explanation. The radial intensity pattern of a corona may be roughly described as a damped oscillatory radial variation of luminosity, with zero-intensity minima (for the simple case of a monochromatic luminary) at roughly equal intervals, and no broad light-free annulus comparable to that described in detail by the Haneda controllers. Thus, lack of understanding of the nature of coronae is revealed at the outset in attempting to fit the Haneda observations to such a phenomenon.

Second, droplets certainly do not have to be "spaced at regular intervals" to yield a corona, and Minnaert's book makes no such suggestion, another measure of misunderstanding of the meteorological optics here concerned. Nor is there any physical mechanism operating in clouds capable of yielding any such regular droplet spacing. Both Minnaert and cloud physics are misunderstood in that passage.

Third, one quickly finds, by some trial calculations, using the familiar optical relation (Exner equation) for the radial positions of the minima of the classical corona pattern, that the cited drop diameter of 0.2 mm = 200 microns was obtained in the Condon Report by back-calculating from a tacit requirement that the first-order minimum lay close to 3 milliradians, for these are the values that satisfy the Exner equation for an assumed wavelength of about 0.5 microns for visible light. This discloses even more thorough misunderstanding of corona optics, for that first-order minimum marks not some outer edge of a broad dark annulus as described and sketched by the Haneda tower operators, but the outer edge of the innermost annulus of high intensity of diffracted light. This clearly identifies basic misunderstanding of the matters at hand.

Fourth, the just-cited computation yielded a droplet diameter of 200 microns, which is so large as to be found only in drizzling or raining clouds and never in thin scattered clouds of the sort here reported, clouds that scarcely attenuated the full moon's light. That is, the suggestion that "patches

of fog or mist" collected under an hypothesized inversion could grow droplets of that large size is meteorologically out of the question. If isolated patches of clouds interposed themselves on an observer's line of sight to some distant luminary, under conditions of the sort prevailing at Haneda that night, drop diameters down in the range of 10-20 microns would be the largest one could expect, and the corona-size would be some 10 to 20 times greater than the 3 milliradians which was plugged into the Exner equation in the above-cited computation. And this would, of course, not even begin to match anything observed that night.

Fifth, the vague suggestion that "Raman brightening" or other "interference effects associated with propagation within and near the top of an inversion" is involved here makes the same serious error that is made in attempted optical explanations of other cases in the Condon Report. Here we are asked to consider that light from Capella, whose altitude was about 8° above the NE horizon (a value that I confirm) near the time of the Haneda observations, was subjected to Raman brightening or its equivalent; yet one of the strict requirements of all such interference effects is that the ray paths impinge on the inversion surface at grazing angles of incidence of only a small fraction of a degree. No ground observer viewing Capella at 8° elevation angle could possibly see anything like Raman brightening, for the pertinent angular limits would be exceeded by one or two orders of magnitude. Added to this measure of misunderstanding of the optics of such interference phenomena in this attempted explanation is the further difficulty that, for any such situation as is hypothesized in the Condon Report explanation, the observer's eye must be physically located at or directly under the index-discontinuity, which would here mean up in the air at the altitude of the hypothesized inversion. But all of the Haneda observations were made from the ground level. Negation of Raman brightening leaves one more serious gap in the Capella hypothesis, since its magnitude of 0.2 lies at a brightness level well below that of Jupiter, yet the Haneda observers seem to have been comparing the object's luminosity to Juptier's and finding it far brighter, not dimmer.

Sixth, the Condon Report mentions the independent sighting from Tachikawa AFB, but fails to bring out that the line of sight from that observing site (luminary described as lying over Tokyo Bay, as seen from Tachikawa) pointed more than 45° away from Capella, a circumstance fatal to fitting the Capella hypothesis to both sightings. Jupiter lay due East, not "over Tokyo Bay" from Tachikawa, and it had been rising in the eastern sky for many days, so it is, in any event, unlikely to have suddenly triggered an independent response at Tachikawa that night. And, conversely, the area intersection of the reported lines of sight from Haneda and Tachikawa falls in just the North Bay area where Shiroi GCI first got radar returns and where all the subsequent radar activity was localized.

Seventh, nothing in the proffered explanations in the Condon Report confronts the reported movements and disappearances of the luminous object that are described in the Bluebook case-file on Haneda. If, for the several reasons offered above, we conclude that not only apparent radial motions, but also lateral and climbing motions were observed, neither diffraction nor Raman effects can conceivably fit them.

Eighth, the over-all configuration as seen through 7X binoculars, particularly with four smaller lights perceived on the lower edge of the broad, dark annulus, is not in any sense explained by the ideas qualitatively advanced in the Condon Report on the weak basis now remarked.

Ninth, the Condon Report puts emphasis on the point that, whereas Haneda and Tachikawa observers saw the light, airmen at the Shiroi GCI site went outside and looked in vain for the light when the plotted radar position showed one or more targets to their south or south-southeast. This is correct. But we are quite familiar with both highly directional and hemi-directional light sources on our own technological devices, so the failure to detect a light from the Shiroi side does not very greatly strengthen the hypothesis that Capella was the luminary in the Haneda visual sightings. The same can be said for lack of visual observations from the F-94, which got only radar returns as it closed on its target.

I believe that it is necessary to conclude that the "explanation" proposed in the Condon Report for the visual portions of the Haneda case are almost wholly unacceptable. And I remark that my analysis of many other explanations in the Condon Report finds them to be about equally weak in their level of scientific argumentation. We were supposed to get in the Condon Report a level of critique distinctly better than that which had come from Bluebook for many years; but much of the critique in that Report is little less tendentious and ill-based than that which is so dismaying in 22 years of Air Force discussions of UFO cases. The above stands as only one illustration of the point I make there; many more could be cited.

Next we must examine the radar aspects of the 8/5-6/52 Haneda case.

5. Radar Observations:

Shortly after the initial visual sighting at Haneda, the tower controllers alerted the Shiroi GCI radar unit (located about 15 miles NE of central Tokyo), asking them to look for a target somewhere NE of Haneda at an altitude which they estimated (obviously on weak grounds) to be somewhere between 1500 and 5000 feet, both those figures appearing in the Bluebook case-file. Both a CPS-1 search radar and a CPS-4 height-finder radar were available at Shiroi, but only the first of those picked up the target, ground clutter interference precluding useful CPS-4 returns. The CPS-1 radar was a 10-cm, 2-beam set with peak power of 1 megawatt, PRF of 400/sec, antenna tilt 3°, and scan-rate operated that night at 4 rpm. I find no indication that it was equipped with MTI, but this point is not certain.

It may help to keep the main sequence of events in better time order if I first put down the principal events that bear on the radar sightings from ground and air, and the times at which these events occurred. In some instances a 1-2 minute range of times will be given because the case-file contains more than a single time for that event as described in separate sections of the report. I indicate 0015-16 LST (all times still LST) as the time of first airborne radar contact by the F-94, and discuss that matter in more detail later, since the Condon Report suggests a quite different time.

Time (LST)	Events
2330	Tower controllers at Haneda see bright light to NE, call Shiroi GCI within a few minutes thereafter.
2330-45	Lt. A, Shiroi radar controller on evening watch, looks for returns, finds 3-4 stationary blips to NE of Haneda on low beam of CPS-1.
2345	Lt. B comes on duty for midwatch at Shiroi; he and Lt. A discuss possible interceptor scramble.
2355	Lt. A calls Johnson AFB, asks for F-94 scramble. Fuel system trouble causes delay of 5-10 min in the scramble.
0001	Lt. B has unknown in right orbit at varying speeds over north Tokyo Bay, 8 miles NE of Haneda. Loses contact again.
0003-04	F-94 airborne out of Johnson AFB, Lt. P as pilot, Lt. R, radarman.
0009-10	Shiroi alerts F-94 to airborne target to its starboard as it heads down Tokyo Bay, and Lt. P visually identifies target as C-54 in pattern to land at Haneda. Lt. B instructs Lt. P to begin search over north Bay area at flight altitude of 5000 ft.
0012	Shiroi regains CPS-1 contact on unknown target in right orbit over same general area seen before, target splits into three separate targets, and Lt. B vectors F-94 towards strongest of three returns.
0015-16	F-94 gets airborne radar contact on moving target at range and bearing close to vector information, has to do hard starboard turn to keep on-scope as target moves with acceleration across scope.
0017-18	After 90 seconds pursuit, with no lock-on achieved, target moves off-scope at high speed; Shiroi GCI tracks both unknown and F-94 into its ground clutter, where both are then lost in clutter.
0033	Shiroi releases F-94 from scramble-search.
0040	F-94 visually spots another C-54, over Johnson.
0120	F-94 lands back at Johnson

Thus the period 2330 on 8/5 through about 0018 on 8/6 is of present interest. Next, events in that period will be examined in closer detail.

a. Initial attempts at radar detection from Shiroi GCI.

When, at about 2335 or so, Haneda requested Shiroi to search the area of the bay to the NE of Haneda (SSW from Shiroi, roughly), Lt. A, then duty controller at Shiroi, found his CPS-4 giving too much ground clutter to be useful for the relatively low estimated heights Haneda had suggested. Those heights are indicated as 1500-2000 ft in one portion of the case-file, though Airman A elsewhere gave 5000 ft as his impression of the height. Clearly, lack of knowledge of size and slant ranges precluded any exact estimates from Haneda, but they offered the above indicated impressions.

Trying both low and high beams on the CPS-1 search radar, Lt. A did detect three or four blips "at a position 050° bearing from Haneda, as reported by the tower, but no definite movement could be ascertained..." The report gives no information on the range from Shiroi, nor inferred altitude of those several blips, only the first of a substantial number of missing items of quite essential information that were not followed up in any Bluebook inquiries, as far as the case-file shows. No indication of the spacing of the several targets is given either, so it is difficult to decide whether to consider the above as an instance of "radar-visual" concurrency or not. One summary discussion in the Bluebook case-file so construes it: "The radar was directed onto the target by visual observations from the tower. So it can safely be assumed that both visual and radar contacts involved the same object." By contrast, the Condon Report takes the position that there were no radar observations that ever matched the visual observations. The latter view seems more justified than the former, although the issue is basically unresolvable. One visual target won't, in any event, match 3-4 radar targets, unless we invoke the point that later on the main radar target split up into three separate radar targets, and assume that at 2335, 3-4 unknown objects were airborne and motionless, with only one of these luminous and visually detectable from Haneda. That is conceivable but involves too strained assumptions to take very seriously; so I conclude that, even in this opening radar search, there was not obvious correspondence between visual and radar unknowns. As we shall see, later on there was definitely not correspondence, and also the F-94 crew never spotted a visual target. Thus, Haneda cannot be viewed as a case involving the kind of "radar-visual" concurrency which does characterize many other important cases. Nonetheless, both the visual and the radar features, considered separately, are sufficiently unusual in the Haneda case to regard them as mutually supporting the view that inexplicable events were seen and tracked there that night.

One may ask why a radar-detected object was not seen visually, and why a luminous object was not detected on search radar; and no fully satisfactory answer lies at hand for either question. It can only be noted that there are many other such cases in Bluebook files and that these questions stand as part of the substantial scientific puzzle that centers around the UFO phenomena. We know that light-sources can be turned off, and we do know that ECM techniques can fool radars to a certain extent. Thus, we might do well to maintain open minds when we come to these questions that are so numerous in UFO case analyses.

b. F-94 scramble.

When Lt. B came on duty at 2345, he was soon able, according to Capt. Malven's summary in IR-35-52, "to make radar contact on the 50-mile high beam," whereupon he and Lt. A contacted the ADCC flight controller at Johnson AFB 35 miles to their west, requesting that an interceptor be scrambled to investigate the source of the

visual and the radar sightings.

An F-94B of the 339th Fighter-Interceptor Squadron, piloted by Lt. P, with Lt. R operating the APG-33 air-intercept radar, was scrambled, though a delay of over ten minutes intervened because of fuel-system difficulties during engine runup. The records show the F-94 airborne at about 0003-04, and it then took about 10 minutes to reach the Tokyo Bay area. The APG-33 set was a 3-cm (X-band) set with 50 KW power, and lock-on range of about 2500 yards, according to my information. The system had a B-scope, *i.e.*, it displayed target range vs. azimuth. The case-file notes that: "The APG-33 radar is checked before and after every mission and appeared to be working normally."

At 0009, Shiroi picked up a moving target near Haneda and alerted the F-94 crew, who had no difficulty identifying it visually as an Air Force C-54 in the Haneda pattern. The crew is quoted in the report as reporting "exceptional visibility." Shiroi instructed the F-94 to begin searching at 5000 ft altitude as it got out over the Bay. But before proceeding with events of that search, a GCI detection of a moving target at about 0001 must be reviewed.

c. First GCI detection of orbiting object.

Just before the F-94 became airborne out of Johnson AFB, Lt. B picked up the first definitely unusual moving target, at about 0000-01. His statement in the Bluebook case-file reads: "At the time of the scramble, I had what was believed to be the object in radar contact. The radar sighting indicated the object to be due south of this station over Tokyo Bay and approximately eight (8) miles northeast of Haneda. The target was in a right orbit moving at varying speeds. It was impossible to estimate speed due to the short distance and times involved." That passage is quoted in the Condon Report, but not the next, which comes from Malven's summary and indicates that Lt. B only meant that it was impossible to estimate the target's speed with much accuracy. The omitted passage is interesting, for it is one of a number of indications that anomalous propagation (which is the Condon Report's explanation for the radar sightings) is scarcely creditable: "An F-94 was scrambled to investigate. The object at this time had left the ground clutter and could be tracked (on the CPS-1) at varying speeds in a right orbit. Although impossible to accurately estimate speed, Lt. B gave a rough estimate of 100-150 knots, stopping, and hovering occasionally, and a maximum speed during the second orbit (just before F-94 was vectored in) of possibly 250-300 knots."

A map accompanying IR-35-52 shows the plotted orbiting path of the unknown target. The orbit radius is approximately 4 miles, centered just off the coast from the city of Funabashi, east of Tokyo. The orbiting path is about half over land, half over water. The map-sketch, plus the file comments, imply that GCI had good contacts with the target only while it was moving out over the Bay. The ground-clutter pattern of the CPS-1 is plotted on the same map (and on other maps in the file), and it seems clear that the difficulty in tracking the target through the land portion of the roughly circular orbit was that most of that portion lay within the clutter area. The presumption is strong that this set did not have MTI, which is unfortunate.

The circumference of the orbit of about 4-mi radius would be about 25 miles. Taking Lt. B's rough estimate of 100-150 knots in the first of the two circuits of this orbit (*i.e.*, the one he detected at about 0001), a total circuit-time of perhaps 12-13 minutes is indicated. Although the basis for this time-estimate is quite rough, it matches reasonably well the fact that it was about 0012 when it had come around again, split up into three targets, and looped onshore again with the F-94 in pursuit this time.

If the object executing the above orbits had been the luminous object being watched from Haneda, it would have swung back and forth across their sky through an azimuth range of about 30°. Since no such motion seems to have been noted by the Haneda observers, I believe it must be concluded that the source they watched was distinct from the one radar-tracked in orbit.

d. Second orbit and F-94 intercept attempt.

The times given in Lt. B's account of this phase of the sighting do not match those given by the pilot and radarman of the F-94 in their signed statements in the file. Other accounts in the file match those of the aircrew, but not the times in Lt. B's summary. This discrepancy (about 10-12 minutes) is specifically noted in Capt. Malven's IR-35-52 summary: "The ten minute difference in time between the statement by Lt. B, 528th AC&W SQ, and that reported by other personnel concerned, is believed to be a typographical error, since the statement agrees on every other portion of the sighting." That Lt. B and the aircrew were describing one and the same intercept seems beyond any doubt; and in view of Malven's quoted comment, I here use the times recorded by the aircrew and accepted as the correct times in other parts of the case-file. Further comment on this will be given below.

After completing the first of the two orbits partially tracked by GCI Shiroi, the target came around again where it was out of the CPS-1 ground-clutter pattern, and Lt. B regained contact. Malven's summary comments on the next developments as follows: "At 0012 the object reportedly broke into three smaller contacts, maintaining an interval of about 1/4 miles, with one contact remaining somewhat brighter. The F-94 was vectored on this object, reporting weak contact at 1500 and loss of contact at 0018. Within a few seconds, both the F-94 and the object entered the ground clutter and were not seen again."

The same portion of the incident is summarized in Lt. B's account (with different times), with the F-94 referred to by its code-name "Sun Dial 20." Immediately following the part of his account referring to the first starboard orbit in which he had plotted the target's movements, at around 0001, comes the following section: "Sun Dial 20 was ordered to search the Tokyo Bay area keeping a sharp lookout for any unusual occurrences. The object was again sighted by radar at 0017 on a starboard orbit in the same area as before. Sun Dial 20 was vectored to the target. He reported contact at 0025 and reported losing contact at 0028. Sun Dial 20 followed the target into our radar ground clutter area and we were unable to give Sun Dial 20 further assistance in re-establishing contact. Sun Dial 20 again resumed his visual search of the area until 0014, reporting negative visual sighting

on this object at any time." If Malven's suggestion of typographical error is correct, the in-contact times in the foregoing should read 0015 and 0018, and presumably 0017 should be 0012. But regardless of the precise times, the important point is that Lt. B vectored the F-94 into the target, contact was thereby achieved, and Lt. B followed the target and pursuing F-94 northeastward into his ground clutter. I stress this because, in the Condon Report, the matter of the different times quoted is offered as the sole basis of a conclusion that ground radar and airborne radar were never following the same target. This is so clearly inconsistent with the actual contents of the case-file that it is difficult to understand the Report rationale.

Even more certain indication that the GCI radar was tracking target and F-94 in this crucial phase is given in the accounts prepared and signed by the pilot and his radarman. Here again we meet a code-designation, this time "Hi-Jinx", which was the designation for Shiroi GCI used in the air-to-ground radio transmissions that night and hence employed in these next two accounts. The F-94 pilot, Lt. P states: "The object was reported to be in the Tokyo Bay area in an orbit to the starborad at an estimated altitude of 5,000 feet. I observed nothing of an unusual nature in this area; however, at 0016 when vectored by Hi-Jinx on a heading of 320 degrees, and directed to look for a bogie at 1100 o'clock, 4 miles, Lt. R made radar contact at 10 degrees port, 6000 yards. The point moved rapidly from port to starboard and disappeared from the scope. I had no visual contact with the target."

And the signed statement from the radarman, Lt. R, is equally definite about these events: "At 0015 Hi-Jinx gave us a vector of 320 degrees. Hi-Jinx had a definite radar echo and gave us the vector to intercept the unidentified target. Hi-Jinx estimated the target to be at 11 o'clock to us at a range of 4 miles. At 0016 I picked up the radar contact at 10 degrees port, 10 degrees below at 6,000 yards. The target was rapidly moving from port to starboard and a 'lock on' could not be accomplished. A turn to the starboard was instigated to intercept target which disappeared on scope in approximately 90 seconds. No visual contact was made with the unidentified target. We continued our search over Tokyo Bay under Hi-Jinx control. At 0033 Hi-Jinx released us from scrambled mission..."

Of <u>particular</u> importance is the very close agreement of the vectoring instructions given by Shiroi GCI to the F-94 and the actual relative position at which they accomplished radar contact; GCI said 4 miles range at the aircraft's 11 o'clock position, and they actually got radar contact with the moving target at a 6000-yard range, 10 degrees to their port. <u>Nearly exact agreement</u>, and thus incontrovertibly demonstrating that ground-radar and airborne radar were then looking at the same moving unknown target, despite the contrary suggestions made in the Condon Report. Had the Condon Report presented all of the information in the case-file, it would have been difficult to maintain the curious position that is maintained all of the way to the final conclusion about these radar events in the Condon Report's treatment of the Haneda case.

That the moving target, as seen by both ground and airborne radar was a distinct target, though exhibiting radar cross-section somewhat smaller than that typical of most aircraft, is spelled out in Malven's IR-35-52 summary: "Lt. B, GCI Controller at the Shiroi GCI site, has had considerable experience under all conditions and thoroughly understands the capabilities of the CPS-1 radar. His statement was that the object was a bonafide moving target, though somewhat weaker than that normally obtained from a single jet fighter." And, with reference to the airborne radar contact, the same report states: "Lt. R, F-94 radar operator, has had about seven years' experience with airborne radar equipment. He states that the object was a bonafide target, and that to his knowledge, there was nothing within an area of 15-20 miles that could give the radar echo." It is exceedingly difficult to follow the Condon Report in viewing such targets as due to anomalous propagation.

Not only were there no visual sightings of the orbiting target as viewed from the F-94, but neither were there any from the Shiroi site, though Lt. B specifically sent men out to watch as these events transpired. Also, as mentioned earlier, it seems out of the question to equate any of the Haneda visual observations to the phase of the incident just discussed. Had there been a bright light on the unknown object during the time it was in starboard orbit, the Haneda observers would almost certainly have reported those movements. To be sure, the case-file is incomplete in not indicating how closely the Haneda observers were kept in touch as the GCI-directed radar-intercept was being carried out. But at least it is clear that the Haneda tower controllers did not describe motions of the intensely bright light that would fit the roughly circular starboard orbits of radius near four miles. Thus, we seem forced to conclude either that the target the F-94 pursued was a different one from that observed at Haneda (likely interpretation), or that it was non-luminous during that intercept (unlikely alternative, since Haneda observations did not have so large a period of non-visibility of the source they had under observation 2330-0020).

6. <u>Condon Report Critique of the Radar Sightings</u>:

The Bluebook case-file contains essentially no discussion of the radar events, no suggestion of explanations in terms of any electronic or propagational anomalies. The case was simply put in the Unexplained category back in 1952 and has remained in that category since then at Bluebook.

By contrast, the Condon Report regards the above radar events as attributable to <u>anomalous propagation</u>. Four reasons are offered (p. 126) in support of that conclusion:

1) The tendency for targets to disappear and reappear;

2) The tendency for the target to break up into smaller targets;

3) The apparent lack of correlation between the targets seen on the GCI and airborne radars;

4) The radar invisibility of the target when visibility was "exceptionally good."

Each of these four points will now be considered.

First, the "tendency for the targets to disappear and reappear" was primarily a matter of the orbiting target's moving into and out of the ground-clutter

pattern of the CPS-1, as is clearly shown in the map that constitutes Enclosure #5 in the IR-35-52 report, which was at the disposal of the Colorado staff concerned with this case. Ground returns from AP (anomalous propagation) may fade in and out as ducting intensities vary, but here we have the case of a moving target disappearing into and emerging from ground clutter, while executing a roughly circular orbit some 4 miles in radius. I believe it is safe to assert that nothing in the annals of anomalous propagation matches such behavior. Nor could the Borden-Vickers hypothesis of "reflections" off moving waves on inversions fit this situation, since such waves would not propagate in orbits, but would, at best, advance with the direction and speed of the mean wind at the inversion. Furthermore, the indicated target speed in the final phases of the attempted intercept was greater than that of the F-94, *i.e.*, over 400 knots, far above wind speeds prevailing that night, so this could not in any event be squared with the (highly doubtful) Borden-Vickers hypothesis that was advanced years ago to account for the 1952 Washington National Airport UFO incidents.

Second, the breakup of the orbiting target into three separate targets cannot fairly be referred to as a "tendency for the target to break up into smaller targets." That breakup event occurred in just one definite instance, and the GCI controller chose to vector the F-94 onto the strongest of the resultant three targets. And when the F-94 initiated radar search in the specific area (11 o'clock at 4 miles) where that target was then moving, it immediately achieved radar contact. For the Condon Report to gloss over such definite features of the report and merely allude to all of this in language faintly suggestive of AP seems objectionable.

Third, to build a claim that there was "apparent lack of correlation between the targets seen on the GCI and airborne radars" on the sole basis of the mismatch of times listed by Lt. B on the one hand and by the aircrew on the other hand, to ignore the specific statement by the intelligence officer filing IR-35-52 about this being a typographical error on the part of Lt. B, and, above all, to ignore the obviously close correspondence between GCI and airborne radar targeting that led to the successful radar-intercept, and finally to ignore Lt. B's statement that the F-94 "followed the target into our radar ground clutter", all amount to a highly slanted assessment of case details, details not openly set out for the reader of the Condon Report to evaluate for himself. I believe that all of the material I have here extracted from the Haneda case-file fully contradicts the third of the Condon Report's four reasons for attributing the radar events to AP. I would suggest that it is precisely the impressive correlation between GCI and F-94 radar targeting on this non-visible, fast-moving object that constitutes the most important feature of the whole case.

Fourth, it is suggested that AP is somehow suspected because of "the radar invisibility of the target when visibility was 'exceptionally good.'" This is simply unclear. The exceptional visibility of the atmosphere that night is not physically related to "radar invisibility" in any way, and I suspect this was intended to read "the invisibility of the radar target when visibility was exceptionally good." As cited above, neither the Shiroi crew nor the F-94 crew ever saw any visible object to match their respective radar targets. Under some circumstances, such a situation would indeed be diagnostic of AP. But not here, where the radar target is moving at high speed around an orbit many miles in diameter, occasionally hovering motionless (see Malven's account cited earlier), and changing speed from 100-150 knots up to 250-300 knots, and finally accelerating to well above an F-94's 375-knot speed.

Thus, all four of the arguments offered in the Condon Report to support its claim that the Haneda radar events were due to anomalous propagation must be rejected. Those arguments seem to me to be built up by a highly selective extraction of details from the Bluebook case-file, by ignoring the limits of the kind of effects one can expect from AP, and by using wording that so distorts key events in the incident as to give a vague impression where the facts of the case are really quite specific.

It has, of course, taken more space to clarify this Haneda case than the case is given in the Condon Report itself. Unfortunately, this would also prove true of the clarification of some fifteen to twenty other UFO cases whose "explanation" in the Condon Report contains, in my opinion, equally objectionable features, equally casual glossing-over of physical principles, of important quantitative points. Equally serious omissions of basic case information mark many of those case discussions in the Condon Report. Here I have used Haneda only as an illustration of those points; but I stress that it is by no means unique. The Condon Report confronted a disappointingly small sample of the old "classic" cases, the long-puzzling cases that have kept the UFO question alive over the years, and those few that it did confront it explained away by argumentation as unconvincing as that which disposes of the Haneda AFB events in terms of diffraction of Capella and anomalous propagation. Scientifically weak argumentation is found in a large fraction of the case analyses of the Condon Report, and stands as the principal reason why its conclusions ought to be rejected.

Here are some other examples of UFO cases considered explained in the Condon Report for which I would take strong exception to the argumentation presented and would regard as both unexplained and of strong scientific interest (page numbers in Condon Report are indicated): Flagstaff, Ariz., 5/20/50 (p. 245); Washington, D. C., 7/19/52 (p. 153); Bellefontaine, O., 8/1/52 (p. 161); Gulf of Mexico, 12/6/52 (p. 148); Odessa, Wash., 12/10/52 (p. 140); Continental Divide, N.M., 1/26/53 (p. 143); Seven Isles, Quebec, 6/29/54 (p. 139); Niagara Falls, N.Y., 7/25/57 (p. 145); Kirtland AFB, N.M., 11/4/57 (p. 141); Gulf of Mexico, 11/5/57 (p. 165); Peru, 12/30/66 (p. 280); Holloman AFB, 3/2/67 (p. 150); Kincheloe AFB, 9/11/67 (p. 164); Vandenberg AFB, 10/6/67 (p. 353).

Case 4. Kirtland AFB, November 4, 1957.

Brief summary: Two CAA control tower operators observe a lighted egg-shaped object descend to and cross obliquely the runway area at Kirtland AFB (Albuquerque), hover near the ground for tens of seconds, then climb at unprecedented speed into the overcase. On radar, it was then followed south some miles, where it orbited a number of minutes before returning to the airfield to follow an Air Force aircraft outbound from Kirtland.

1. Introduction:

This case, discussed in the Condon Report on p. 141, is an example of a UFO report which had lain in Bluebook files for years, not known to anyone outside of Air Force circles.

Immediately upon reading it, I became quite curious about it; more candidly, I became quite suspicious about it. For, as you will note on reading it for yourself, it purports to explain an incident in terms of an hypothesis with some glaringly improbable assumptions, and makes a key assertion that is hard to regard as factual. Let me quote from the first descriptive paragraph: "Observers in the CAA (now FAA) control tower sawan unidentified dark object with a white light underneath, about the 'shape of an automobile on end', that crossed the field at about 1500 ft and circled as if to come in for a landing on the E-W runway. This unidentified object appeared to reverse direction at low altitude, while out of sight of the observers behind some buildings, and climbed suddenly to about 200-300 ft., heading away from the field on a 120° course. Then it went into a steep climb and disappeared into the overcast." The Condon Report next notes that: "The Air Force view is that this UFO was a small, powerful private aircraft, flying without flight plan, that became confused and attempted a landing at the wrong airport. The pilot apparently realized his error when he saw a brightly-lit restricted area, which was at the point where the object reversed direction..." The Report next remarks very briefly that the radar blip from this object was described by the operator as a "perfectly normal aircraft return", that the radar track "showed no characteristics that would have been beyond the capabilities of the more powerful private aircraft available at the time," and the conclusion arrived at in the Condon Report, without further discussion, is that: "There seems to be no reason to doubt the accuracy of this analysis."

2. Some Suspect Features of the Condon Report's Explanation

It seemed to me that there were several reasons "to doubt the accuracy of this analysis." First, let me point out that the first line or two of the account in the Condon Report contains information that the incident took place with "light rain over the airfield", late in the evening (2245-2305 MST), which I found to be correct, on checking meteorological records. Thus the reader is asked to accept the picture of a pilot coming into an unfamiliar airfield at night and under rain conditions, and doing a 180° turn at so low an altitude that it could subsequently climb suddenly to about 200-300 ft; and we are asked to accept the picture of this highly hazardous low-altitude nighttime turn being executed so sharply that it occurred "while out of sight of the observers behind some buildings." Now these are not casual bystanders doing the observing, but CAA controllers in a tower designed and located to afford full view of all aircraft operations occurring in or near its airfield. Hence my reaction to all of this was a reaction of doubt. Pilots don't live too long who execute strange and dangerous maneuvers of the type implied in this explanation. And CAA towers are not located in such a manner that "buildings" obscure so large a block of airfield-airspace as to permit aircraft to do 180° turns while hidden from tower view behind them (at night, in a rain!).

3. Search for the Principal Witnesses:

The foregoing points put such strong *a priori* doubt upon the "private aircraft" explanation advanced in the Condon Report that I began an independent check on this case, just as I have been checking several dozen other Condon Report cases in the months since publication of the Report. Here, as in all other cases in the Report, there are no witness-names given to facilitate independent check, but by beginning my inquiries through the FAA, I soon got in touch with the two CAA tower observers, both of whom are still with FAA, one in Okalhoma, one in California. Concurrently, I initiated a number of inquiries concerning the existence of any structures back in 1957 that could have hidden an aircraft from tower view in the manner suggested by the Report. What I ultimately learned constitutes only one example of many that back up the statement I have been making recently to many professional groups: The National Academy of Sciences is going to be in a most awkward position when the full picture of the inadequacies of the Condon Report is recognized; for I believe it will become all too obvious that the Academy placed its weighty stamp on this dismal report without even a semblance of rigorous checking of its contents.

The two tower controllers, R. M. Kaser and E. G. Brink, with whom I have had a total of five telephone interviews in the course of clarifying the case, explained to me that the object was so unlike an aircraft and exhibited performance characteristics so unlike those of any aircraft flying then or now that the "private aircraft" explanation was quite amusing. Neither had heard of the Air Force explanation, neither had heard of the Condon Project concurrence therein, and, most disturbing fo all, neither had ever heard of the Condon Project: No one on the Condon Project ever contacted these two men! A half-million-dollar Project, a Report filled with expensive trivia and matters shedding essentially no light on the heart of the UFO puzzle, and no Project investigator even bothers to hunt down the two key witnesses in this case, so casually closed by easy acceptance of the Bluebook "aircraft" explanation.

Failure to locate those two men as part of the investigation of this case is all the more difficult to understand because CAA tower operators involved as witnesses of a UFO incident while actually on duty would seem to constitute just the type of witnesses one should most earnestly seek out in attempts to clarify the UFO puzzle. In various sections of the Condon Report, witness-shortcomings (lack of experience, lack of familiarity with observing things in the sky, basic lack of credibility, etc.) are lamented, yet here, where the backgrounds of the witnesses and the observing circumstances are highly favorable to getting reliable testimony, the Colorado group did not bother to locate the witnesses. (This is not an isolated example. Even in cases which were conceded to be Unexplained, such as the June 23, 1955 Mohawk Airlines multiple-witness sighting near Utica, N.Y. [p. 143 in Report],

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DEPARTMENT OF ASTRONOMY
LOS ANGELES, CALIFORNIA 90024

September 18, 1969

Professor E. U. Condon
Department of Physics and Astrophysics
University of Colorado
Boulder, Colorado 80302

Dear Professor Condon:

Thank you for your letter of September 12 calling the proposed flying saucer party to my attention. I agree with you entirely on its impropriety and enclose a copy of my letter to members of the Board of the AAAS.

Incidentally, I am one of those who you refer to who has not had an opportunity to read the Condon report. I would be most interested in seeing a copy, and if you have one available I'd be very grateful to receive it.

I don't know whether we can have any success in squelching the thing. Thornton Page and Carl Sagan are still behind it; Thornton is a wonderful guy, but I think he falls for bad ideas once in a while, and I suspect Sagan actually believes in the stuff. Anyhow, we tried.

Sincerely yours,

George O. Abell

GEORGE O. ABELL
Professor of Astronomy

GOA/aes
Enclosure

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DEPARTMENT OF ASTRONOMY
LOS ANGELES, CALIFORNIA 90024

September 18, 1969

Board of Directors
American Association for the
Advancement of Science
1515 Massachusetts Avenue, N. W.
Washington, D. C., 20005

Gentlemen:

Last year when a symposium on unidentified flying objects had been scheduled for the Dallas meeting of the AAAS, I wrote to the committee members of Section D (which was planning to sponsor that particular symposium) urging that it be postponed. At the time, I more or less assumed that if it were to be postponed it would probably be eliminated altogether, and I forgot, subsequently, all about it.

Now, however, it has come to my attention that the symposium is, indeed, being planned for the December meeting at Boston. I am afraid this development got me completely by surprise, but the more I think about it, the more I am convinced that it would be a very foolish idea to go ahead with the symposium, and once again I strongly urge that it not be held. I admit that a lot of people are interested in the subject of UFO's, and no doubt the symposium would be jolly good fun, but I cannot imagine that any useful science will come out of it and can imagine that a great deal of embarrassing publicity will. When a symposium is proposed, it seems to me one must have a purpose in holding it. What can the purpose be in holding a symposium on UFO's? Surely, it would not be to determine whether or not there is anything to the whole business. Certainly it would not be a review of all the scientific information concerning the subject. (Indeed, the only extensive scientific investigation of UFO's I am aware of is the one by the Condon committee, and Condon has already expressed his strong disapproval of the symposium and has flatly refused to have anything to do with it.) As a matter of fact, I think the symposium could be nothing more than a debate between believers and nonbelievers on whether (1) UFO's exist at all, and (2) whether or not they are extraterrestrial vehicles controlled by intelligent occupants. There will be no shortage of volunteers to argue on the side of the believers--there are thousands of them. Most are of questionable objectivity and some of questionable integrity. Even if there are competent people to argue both sides, is there any real hope of any light being thrown on the subject, let alone any rational conclusion being reached?

The symposium is bound to receive a great deal of publicity, thereby dignifying as science the debate on whether flying saucers are extraterrestrial in origin. Most of the public want to believe that they are, and will regard the "nonbelievers" (skeptics, of course, is a better word) as "obstructionists", "members of the scientific establishment", and in general highly biased. The "believers" will be the maligned pioneers that can never get their word published in reputable journals because the establishment is trying to repress them. In other words, I cannot imagine scientists will learn anything from the symposium except a bit of popular psychology, whereas the public will either think that the members of the AAAS consider the whole subject serious science and that the supporters of the extraterrestrial hypothesis are themselves legitimate scientists with legitimate theories which are widely accepted by all but a few diehards, or worse, the AAAS will come out of it with the smell of a repressive organization trying to hush up a matter which is of vital interest and concern to all.

I am well aware of the Gallop poll a year or more ago showing an overwhelming majority of the public do take flying saucers seriously. Another subject that a majority of the public takes seriously (or at least does not reject) is astrology. Here, again, there are the believers and the nonbelievers. I would be very surprised if there are not many believers among PhD's in the AAAS. At least 10% or 15% of the UCLA faculty, I suspect, are believers, and about a third of the students; these figures come from my own polls. Again, there have been very few objective studies of astrology by the experts to test its validity, but there have been millions of words written in its support and published in such reputable journals as the American Astrologer and Horoscope Magazine. Carl Payne Tobey has personally been responsible for many studies that prove astrology works. As evidence of his qualifications as a scientist and mathematician, I quote a remark made by him to me on a television discussion that we once shared: "I'll have you know that I solved a problem that has been plaguing mathematicians for centuries; I have discovered the prime number Dendrite."

I frankly think as much science will come out of a symposium on astrology as on UFO's. We find very much the same kind of protagonists on both sides of both issues. The only difference in my mind is a slight one of degree; with some knowledge of the possibilities of interstellar travel and of the likelihood of intelligent civilizations in the galactic neighborhood of the Sun, I would regard it not quite impossible that there could be extraterrestrial visitors. In my wildest imagination I can conceive of the situation, but it is so fantastically improbable that I would need the most overwhelming evidence that this were so in order to take it seriously. Similarly, we cannot say it is impossible that there are unknown forces of nature whereby the planets somehow control human destiny, but I regard this as slightly more improbable yet.

Gentlemen, I urge you again to think of the form such a symposium will take, the kind of publicity it would receive, the kind of speakers who would participate, and the kinds of information or conclusions that would be likely to result before proceeding further with the symposium.

Sincerely yours,

George O Abell

GEORGE O. ABELL
Professor of Astronomy

GOA/aes

The New York Times
TIMES SQUARE NEW YORK N Y 10036

Sept. 30, 1969

Dr. Edward U. Condon
1006 JILA Blg.
University of Colorado
Boulder, Colo.

Dear Ed,

I have the various letters that you and others have sent me concerning the AAAS symposium on UFO's and can understand your feelings on the subject. It seems to me that, long before your study ended, you had become sick and tired of the subject and of all the kooky stuff associated with it.

Nevertheless, I feel that what motivated you to undertake the study in the first place should justify the AAAS treatment. Far from encouraging silly treatment in the public eye, I think it will, if well done, play a positive role in educating people in how science seeks the truth.

You, it seems to me, have concluded that UFO's do not represent a physical phenomenon of any interest, so why bother with the subject. But I am convinced that UFO's do constitute a human phenomenon. And a most important and remarkable one, at that.

I believe that, when we were discussing the possibility of my doing a book on the subject I mentioned my interest in it along these lines. After all there are plenty of examples of scientists who "see" things that are not there (for example, in the so-called "observer effect"). Where large parts of the population can be so deceived, I believe we should find out precisely how and why.

My suspicion is that the phenomenon applies to a great many more things than just flying saucers.

I therefore plan to accept the invitation to participate. The AAAS has discussed a great many sillier subjects in its time, without serious harm.

With warm personal regards,

Sincerely,

Walter Sullivan

P.S. Our book division is checking on distribtion of the report, discussed in andther letter from you. I will report shortly.

Pre-AAAS ... the CSICOP Pan Paranoia

symposium to be chaired both with a firm hand and with a sense of humor; questions from the floor will be in written form and passed through the Chairman's hands before being aired. I do not see how such a symposium can fail but serve science well.

A position quite similar to the above has been stated in the document "Science and the Future," a conference summary of a joint meeting sponsored by the British Association for the Advancement of Science and by the American Association for the Advancement of Science, 13-19 April 1969, in Boulder, Colorado. In a discussion of "Education Throughout Life" the following paragraphs appear:

> "Students are often taught 'the scientific method' in a rigid and formal way which neglects the role of creativity, which reduces its intellectual and social value, and which implies that it is a limited sequence of steps. It should, instead, be thought of as a continuing series of predictions, tests (with adequate controls), and creative hypotheses, and it can only be thoroughly understood by active involvement in this continuing process. There is danger in mistaken ideas amongst the general public of what constitutes a scientific experiment; many 'experiments' are performed by individuals, but few of them are scientific in any sense. It may well be far more important to have a large body of people who know how to choose between alternatives on public policy matters based on science, or at the least to be able to follow complex arguments, than it is to have people understand detailed procedures of scientific methods. Perhaps the Associations should include in their programs doubtfully scientific areas of current public interest, such as astrology, extrasensory perception, and unidentified flying objects, to show how these can be considered in a scientific way.
>
> "It is clear to us that the present and future well-being of mankind depends upon scientific knowledge. Distrust of science, however, commonly arises from ignorance, or from a mistaken idea of the motivations of scientists. It is very important for young people to know that a 'self-correcting' process is inherent in science. Although scientists are aware of this, young people must learn that science and scientists are not free from error and other limitations. Positive and creative attitudes should be promoted, especially at Association meetings, rather than mere negative or apologetic stands.

"We consider that it is desirable to have courses at school level on choice-making, and on the difficulties of making true judgements when one is too close to a subject. The Associations should help in discovering such courses if they exist, in developing them if they do not yet exist, and in any case by promoting continuing discussion and study through symposia and other means, and by expressing publicly their concerns about these matters. A conscious and explicit presentation of value-judgements is needed at all stages, together with statements of what choices are involved and of what possibly different points of view may exist.

"What is good at the present time in one field and for one country may be evil for the future, or in another field, or for the world. Decisions involving value-judgements must be made, and we should stress that the avoidance of decision is in itself a decision."

The statement was authored by a subgroup chaired by Kenneth Hutton of the British Association with William Kabisch, of the AAAS as Raporteur, and the following scientists as members of the subgroup :

Edward Condon
Ian Cox
Steven Dedijer
Dame Kathleen Lonsdale
Robert Morrison
Carl Sagan

Cordially,

Carl Sagan

cc: Roberts, Page, P. Morrison, Condon, AAAS Board

As I was going up the stair
I met a man who wasn't there.
He wasn't there again today.
I wish, I wish he'd stay away.

THESE IMMORTAL lines by Hughes Mearns might well have been writ large above the ornate portals of the Hotel Sheraton-Plaza's ballroom in Boston. It was there, on December 26 and 27, 1969, that the prestigious American Association for the Advancement of Science held its symposium on "Unidentified Flying Objects." The "man who wasn't there" (literally) and who refused to "stay away" (figuratively) was, of course, Dr. Edward U. Condon, University of Colorado Professor of Physics and the Project Director of Colorado University's "Scientific Study of Unidentified Flying Objects" commissioned by the United States Air Force.

FROM S.J. LORIEN FILES

SCIENCE ADVANCES ON UFOs

Unsatisfied with brush-off, prestigious American Association for Advancement of Science symposum takes issue with Condon Report.

By Walter McGraw

His absence was noted very early on, even before the beginnings of the symposium itself, as a matter of fact. During the morning prior to the symposium's opening session at 2:00 P.M. on the 26th there was a press conference which was greatly curtailed by the unfortunate Boston weather. A combination of snow, freezing then thawing temperatures, followed by rain made Boston a mess in which one could scarcely journey or even wade. One of the symposium participants never did arrive and several of them were not yet in Boston at the time of the press conference, thus only a few of the hardier (or luckier) participants were available for questioning.

Each of these followed the time-honored custom of introducing himself, modestly giving his credits and then roughly summarizing his paper. The last of these, Dr. Lester Grinspoon, Associate Clinical Professor of Psychiatry, Harvard Medical School, and Director of the Massachusetts Mental Health Center in Boston, said he would take up the matter of why people have become so emotionally involved with UFOs and "why even the organizing of this panel was accompanied by a great deal of emotionalism."

It fell to Dr. Thornton Page, Fisk Professor of Astronomy and Director of the Van Vleck Observatory, Wesleyan University, and a NASA Associate, to explain the organization of the symposium. It had, he said, originally been planned for the 1968 AAAS meeting in Dallas but had been postponed because the "Colorado Report" had not been released at that time. A delay of a year was agreed on to allow the participants time to study the Report.

But what was Grinspoon referring to? Well, some "conservative scientists" had objected to the idea of the symposium being held under AAAS auspices but "clever action" had resulted in the formation of a panel headed by Dr. Page and they had, with difficulty, put together an interdisciplinary list of speakers who would represent a cross section of scientific views on UFOs.

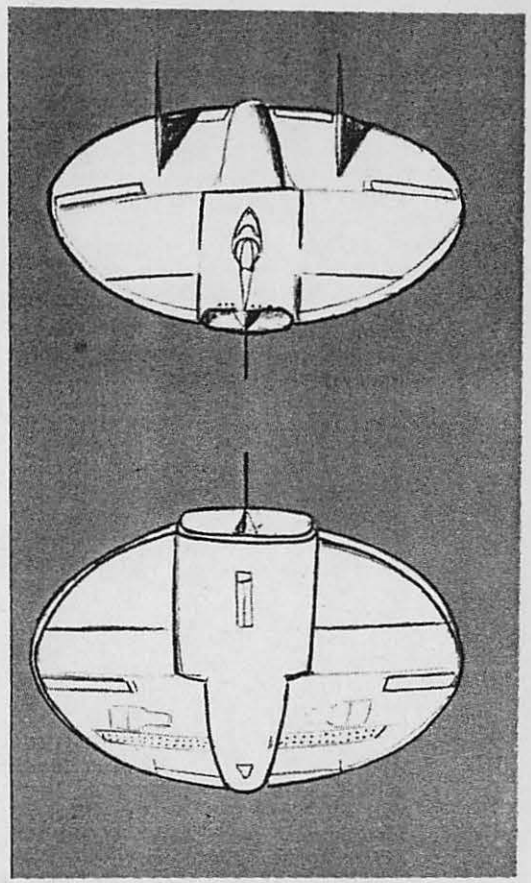
"We had hoped to have Condon speak here at the symposium," Page went on. "Unfortunately it is a psychological fact that he is too emotionally involved to do that, so he is not here . . . will not appear and he doesn't want to have anything to do with it. And he made a big effort to prevent us having this meeting here this afternoon and tomorrow. He wrote, in fact, to the Vice-President of the United States to try to stop us."

Page explained that Condon felt false conclusions would be drawn from the fact that the AAAS was holding this kind of a meeting when the last word had been said with the Colorado Report's contention that "study of UFO reports is not likely to advance science. . ."

Another panel member, Dr. Carl Sagan, Director of the Laboratory for Planetary Studies and Associate Professor of Astronomy at Cornell University, pointed out that many scientists (he corrected himself after saying "conservative scientists") were afraid the weight of the news coverage would go to those who believe in the extraterrestrial intelligence (ETI) theories on UFOs so that the AAAS would appear to be coming out in favor of terrestrial visits by "little green men."

As to whether or not the Condon Report has put an end to the need for scientific discussion of UFOs there were, naturally, a variety of answers. Two of the speakers not at the press conference were Dr. James E. McDonald, Senior Physicist at the Institute for Atmospheric Physics and Professor of Meteorology at the University of Arizona, and Dr. Donald H. Menzel, Paine Professor of Astronomy at Harvard and Director Emeritus of the Harvard College Observatory. It was pointed out that these men hold (and would express) divergent views on the Condon report: Menzel for and McDonald against.

Dr. William Hartmann, Assistant Professor of Astronomy and Staff Member of the Lunar and Planetary Laboratory at the University of



Arizona, who had worked on the Condon study, said he feels just looking at UFO cases is of no value but that much can be learned about the psychology of people who make UFO reports.

Sagan quickly added that Condon did not state he was against UFO research but that research in interesting areas should be funded through ordinary channels rather than by the government.

Page said the Report really is many reports and not consistent with itself. There are, he pointed out, within the Report itself several statements that "disagree with the major conclusions and recommendations written by Condon himself." However, he added, there is one area where none of the scientists present are in disagreement.

As recommended by Condon, the Air Force recently has closed its Project Blue Book. It has been announced that the Blue Book files are to be moved from the Wright-Patterson Air Force Base to the USAF Archives at Maxwell AFB at Montgomery, Ala., where access to them will be controlled by the Office of Information, Department of the Air Force, in Washington. However, Page had learned this applies only to non-classified files; classified les will stay at Wright-Patterson. He made further inquiry to find out what happens to classified files; classified files will stay a time they either are declassified or burned. So it seems much of the Blue Book material will be kept out of the hands of scientists and then possibly destroyed.

Page stated he believes this is not beyond the realm of possibility because of a personal experience he had in 1953. He was one of five scientists who composed the Robertson Panel put together by the United States Central Intelligence Agency to evaluate potential dangers to the country from alleged UFO sightings. At that time he found that all the original data gathered prior to 1942 had been destroyed because a report based on that data had been written. He pointed out that scientists do not study controversial data by looking at someone else's conclusions but by going to original sources.

Dr. Allen Hynek, Chairman of the Department of Astronomy and Director of the Lindheimer Research Center at Northwestern University, stated that as the result of his having been an UFO consultant to the Air Force for 21 years he is in a position to know that the "hard core" cases are classified. The net result of this, he made clear, will be that only unimportant, explained cases will be available for study at Maxwell AFB while the ones with any pertinence to the question will be held in secrecy and then possibly destroyed.

The scientists at the press conference seemed to agree that if the Air Force's own commissioned report said that UFOs are of so little import that they warrant no further government research there can be no reason for keeping any files about them classified. Page, during the last session of the symposium, announced that "representations" possibly would be made to the Air Force to have the Blue Book files preserved, declassified and opened up for study.

The seriousness with which the "Special AAAS Committee" (which included both the retiring AAAS president and an AAAS vice-president) took the news of the possible destruction of the Blue Book files illustrates how some AAAS members feel about the Condon Report being the "last word" on the subject of UFOs. However, during the three symposium sessions the Report was referred to often and in complimentary terms as a "most complete and useful document," "most thorough" and "a collection of interesting and valuable data."

Off the record many found much in the Report to quibble about. One feeling was summed up by the suggestion that Condon had found himself doing a job he did not believe in on a subject about which he had preconceived ideas. He had followed, it seems, what the humorous science publication *The Journal of Irreproducible Results* calls Gordon's Law: "If a research project is not worth doing at all, it is not worth doing well."

As for the feelings of scientists in general, AAAS president Walter Orr Roberts, in his opening of the first session of the UFO symposium, estimated that the vast majority were neutral, knew little about the subject and felt that such terrestrial problems as pollution, overpopulation and human medicine deserved much higher priorities. Judging by the relative attendance at the various sessions he was right.

Perhaps most typical of the view held by most of the speakers was the one expressed by Dr. Franklin Roach, Visiting Professor of Astronomy at the University of Hawaii and Professor Emeritus of the University of Colorado, who had been the principal investigator on the Condon project. He pointed out the huge distances involved in traversing from even the nearest of our neighboring planetary systems (100 million times the distance to the moon) and the time such journeys would take. On the other hand he feels intelligent beings must exist in other parts of the universe and he does not rule out the possibility that they *could* visit our own planet. He pointed out that such visits would be impossible with the space technology we have today and that some experts say they could be accomplished only by metaphysics (magic). However, he also pointed out, two considerations must be kept in mind. First, look at the tremendous speed with which our own knowledge of space technology has grown in the last 50 years, since 1920. And as time goes on the rate of growth seems to accelerate. His second point concerned the astronomic view of time which deals with billions of years — to an astronomer a million years is only the blink of an eye. It is conceivable that there are in the universe intelligent beings who have been developing their cultures for at least a million years longer than we have. We cannot even imagine what their knowledge of physics might encompass in relation to materials and energy sources now unknown to us. It is conceivable that with what Roach called their "megaphysics" (what our physics may be like a million years from today) they could overcome the time and space problems involved.

He concludes it is conceivable we could be visited by intelligent beings from other inhabited planets in the universe but no UFO evidence indicates to him that this already has happened.

Sagan said much the same thing. His paper seemed to repeat much the same things stated in other papers. One would imagine he could have avoided this repetition since he was a coauthor of the official summary of all the papers submitted prior to the meetings. Incidentally, he was the only participant to give the subject of UFOs the cute treatment usually employed on it by pseudosophisticated cub reporters. He dealt with what he called "the Santa Claus hypothesis" and compared UFOs with "reincarnation, the philosophers' stone, *elixir vitae*, psychokinesis, precognition, telepathy and time travel" as things it would be nice to believe in if it were not obviously impossible to do so. One listener wondered out loud why he had not included in his list "the infallibility of physical scientists." Then for some strange reason (since

the panel of speakers was, indeed, interdisciplinary including a sociologist, a psychologist and a psychiatrist) he turned to his own psychological musing as to why so many have accepted the extraterrestrial hypothesis (ETH) as an explanation for UFOs rather than choosing to believe them to be "projections of mankind's collective unconsciousness, time travelers, visitors from another dimension, angels' halos, apparitions from the spirit world . . . or harbingers of divine wrath." He concluded that in this a-religious age many persons have a psychological need for the emotion-rich concept of benign visitors coming to solve our problems. He judged this to be "politically" dangerous since if we believe this we will tend not to try to help ourselves.

Grinspoon, a psychiatrist, read a paper he prepared jointly with Dr. Allan D. Persky, Junior Associate in Medicine, Psychiatry, at Harvard, in which they point out that, unlike other areas of scientific interest, UFOs generate an emotionalism usually associated with politics, morality and religion. They attribute this to the anxious times in which we live and, on the part of a fraction of the community, a growing tendency to temporary and transient mental disturbances, a tendency to suffer illusions or delusions under stress. He said UFOs provide universal symbols and the saucer shapes so often described may be a throwback to infantile impressions of the mother's breast at feeding time. Another universal symbol, the phallus, may account for the cigar-shaped UFO reports, he said.

Sagan later pointed out that the cigar-shaped craft usually are described as "mother ships." Still later *New York Times* science editor Walter Sullivan pointed out that on TV "mother ships" always are portrayed as being round but then he allowed as how the broadcast industry is "always pretty careful about things like that."

Grinspoon went on to say that anxiety also may influence the reactions to UFO reports displayed by many scientists who are concerned about death and immortality. "For some of those who vehemently defend the ETH, it symbolically represents a denial of the finite nature of life. On the other hand, those who have need to deny anxiety about death and immortality may attack the hypothesis with considerable passion."

Prof. Robert Hall, Chairman of the Department of Sociology of the University of Illinois at Chicago, also admitted "scientists, too, are human" and pointed to many historical cases where they refused to accept the possibility of new discoveries and ideas but rather "denied evidence" and used "illogical arguments" and "buck-passing." The latter technique, he said, can be seen today by the physical scientists saying of UFO reports that "there is no physical phenomenon." He disagrees with this while admitting that many UFO reports could be the result of honest mistakes, "delusions and illusions" and "mass hysteria." He pointed out that "the night sky is full of ambiguous stimuli" and that many varying phenomena may be responsible for UFO reports around which there has grown "a system of belief."

But he also said "many people (including intelligent and reliable witnesses) have reported flying objects. . . " and that some of the "hard core UFO reports stand up better than many a court case." He concluded that "there is clearly a phenomenon of surpassing importance here" which warrants further scientific research.

In this he clearly agreed with Hynek who said that after screening

"thousands of reports" over a 21-year period and after the "interrogation of hundreds of witnesses" he is convinced that a minor but impressively large number of the reports "do not specify any known physical event . . . or any known psychological process." After talking to these witnesses you find it pretty hard to call them crazy, he added. He concluded by saying "that sufficient strong reason exists to merit the serious attention of the scientific fraternity to the UFO phenomenon even though the final solution of the problem may be as far off as the explanation of an aurora borealis was in 1800. The present evidence should constitute a challenge and an invitation to inquiry for . . . 'the first requirement of a scientist is that he be curious; he should be capable of being astonished and eager to find out.'"

McDonald was the only speaker who stated he found the ETH the most probable explanation of the UFO reports, just as he was the only speaker to go all out in an attack on the methodology used to research the Condon Report. He pointed out that he has talked to witnesses quoted in the Report and found that salient details of their stories have been omitted. In other cases the witnesses involved were not even interrogated by study investigators. He cited, in detail, four cases where he feels his more complete investigations uncovered details that invalidated the conclusions reached in the Report. He said he has many more such cases.

He also was the only speaker to criticize the panel of the National Academy of Sciences which endorsed the study's findings. "I fear," he said, "that this particular instance will ultimately prove an embarrassment to the National Academy of Sciences."

Menzel and Hartmann were, of course, in sharp disagreement with James McDonald and Allen Hynek. Hartmann stated bluntly "all of the UFO reports can be due to mistakes and hoaxes." He criticized Hynek and McDonald on the ground that they present as evidence only lists of cases where information is insufficient to come to the ordinary answer that would be otherwise forthcoming and said "we cannot go on giving lists of unanswered puzzles as substitutes for unanswerable arguments."

Menzel was even more critical of cases that have been, at one time or another, cited by Hynek and/or McDonald. In his paper (read for him by Roberts because he had a bad cold) Menzel was the only symposium member to attack personalities. He accused McDonald of being "skilled enough an interviewer to get any evidence he wants." Of Hynek he said that a study of the cases that impress him "may throw light on Hynek but not on science." He did, however, express gratitude to McDonald for once having objected to what he (McDonald) called having his cases submitted to the "Menzelian approach" of critical analysis. "I'm flattered to be an adjective," Menzel said.

The Menzelian approach in this paper, predictably, was to cite possible natural answers where Hynek and McDonald claimed none could be found. Among others, he spoke of the Washington, D.C., airport case which he long has explained away as anomalous propagation saying, "After all it isn't surprising to find bubbles of hot air over Washington."

He concluded by saying he was happy with the Condon Report and with the closing of Project Blue Book. He also feels that Report has killed popular interest in UFOs and "I hope the silent majority will rise up against giving more money for investigation" of UFO reports.

Walter Sullivan also feels that the public interest in UFOs has declined and is still declining.

McDonald and Hynek later were asked if they wished to offer any rebuttal to Menzel's paper and McDonald cited in detail one case where he and Menzel had come to very different conclusions. He mentioned point after point that he claimed Menzel had ignored and ended by saying there are many other cases he also could rebut.

In his roundup of the symposium Dr. Philip Morrison, Professor of Physics at the Massachusetts Institute of Technology, said of McDonald's cases, "They're the sharpest I've heard."

Morrison also spoke on the nature of scientific evidence and warned against the prejudice and emotionalism to be found in both camps. He made it clear that he neither believes in ETH nor would he support a request for more federally-funded investigations of UFO reports but "there are things we don't understand" and "I would like to consider a link by link study" of a UFO report that has been solidly investigated, he said.

Perhaps the strongest point Morrison made was his comment on the many references made by speakers to the paranoia evident in attitudes toward UFOs. Even the Air Force and the Scientific Establishment have displayed unwarranted fears which led to unnecessary mysteries and rumors. If the Air Force had not classified many of the cases, scientists, given the whole story, could have explained them easily and quickly. And if scientists had looked at UFOs more dispassionately many public misconceptions never would have grown up.

The only justifiable fears seem to be those of solid citizens who are reluctant or unwilling to detail their UFO experiences because they are afraid they will be held up to public ridicule and be considered kooks by their friends. Dr. R.M.L. Baker, Jr., senior scientist at the Computer Sciences Corporation and lecturer at the Department of Engineering at the University of California at Los Angeles, said, "People are scared to death to talk about these things."

Morrison said he regrets this because science needs all the data it can get. He also cited the need for more public education on the needs and methods of science.

This brought the symposium full circle as this had been the subject of Page's opening paper in which he pointed unhappily to the rejection of the physical sciences by America's youth and their increasing choice of the social sciences and the humanities as college majors. In a much criticized experiment Page added an elective course to the Wesleyan catalogue "Science 101: Flying Saucers." The course was oversubscribed and Page is "convinced that the students learned a good deal of astronomy, physics and biology" from the carefully worked-out investigation that the course made into the many realms of *UFO*logy.

Page noted that 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." Page said he finds that by exploiting an interest the students already have he then can lead them to both an appreciation of and some basic knowledge in the sciences.

Sagan added that the younger generation also is interested in astrology, ESP and the ideas of Velikovsky mostly, he feels, because it thus hopes to outrage the Establishment. Hence his own acceptance of the ideas that the AAAS should not ignore an area where youth can say science is trying to ignore controversial subjects.

But Page's approach was much more positive. "For a number of reasons a large faction of students and the public is interested in UFOs. Teachers should capitalize on this in teaching courses of broad appeal; scientists in general should take advantage of public interest in correcting public misconceptions about science."

It is hoped that the actions of the Special AAAS Committee will help in this endeavor. If it does succeed it will be because people recognize that a man with Hynek's credentials at last was able to point out in a national scientific forum that the Report written by the man who wasn't there but who would not stay away "constitutes as good an argument as any for further study of UFO reports . . . *if you read the text and not just the press digest.*"

It is proposed that the papers presented at the symposium be published in book form. Perhaps this will do something to alleviate a problem that came up during the Hynek-Menzel clash. Menzel complained that he could find no writings on the subject of UFO reports by Hynek save in those "respected scientific journals *The Saturday Evening Post* and *Playboy*." Hynek already had complained that no major scientific journal would accept papers on UFO reports by any scientist so that "scientists must read about UFOs (in popular magazines like FATE) like small boys look at four-letter words on a back fence."

Is it possible, now the Condon Report is out of the way and the late unlamented Project Blue Book is buried (but let us hope not burned), that more scientists will look into this mystery — a mystery that goes back not 22 years but for centuries? If so, this would do much to restore youth's confidence in the physical sciences and in "correcting public misconceptions about science."

THE HOMING ELEPHANT

TWO NIGHTS BEFORE Christmas, 1968, not a creature was stirring in Coal Valley, Ill., except a one-ton elephant who was banging at the door of Larry Dorland's house. Dorland, caretaker at the local zoo, leaped to his feet and ran to the window to determine the cause of the racket. He found himself staring at Kathy Sh-Boom, a shaggy-eared four-year-old, usually content in her pen a quarter-mile away.

He led Kathy back to her compound and discovered a fire had broken out in an adjacent furnace room. He called firemen who quickly extinguished the blaze. The damage came to about $1,000 not counting Kathy's singed ear.

Dorland said Kathy had opened a 30-inch door into the furnace room, wiggled her 40-inch girth through it, then opened another door to escape the heat. In the cool of the night she headed straight for the caretaker's house.

Final Program, AAAS General Symposium, Boston, Mass., 26 - 27 Dec. 1969

Unidentified Flying Objects

Arranged by a Special AAAS Committee:

THORNTON PAGE, Chairmen, (Fisk Professor of Astronomy and Director of the Van Vleck Observatory, Wesleyan University, NAS Research Associate, NASA Manned Spacecraft Center)

PHILIP MORRISON (Professor of Physics, Massachusetts Institute of Technology)

WALTER ORR ROBERTS (President, University Corporation for Atmospheric Research, and retiring President of AAAS)

CARL SAGAN (Director of Laboratory for Planetary Studies, and Assosiate Proffessor of Astronomy, Cornell University)

FRIDAY, DECEMBER 26 — Sheraton-Plaza Ball Room

2:00 p.m. Chairman: WALTER ORR ROBERTS

UFO's and the Public (Session 1)

Introduction; Educational Aspects

THORNTON PAGE (Fisk Professor of Astronomy and Director of the Van Vleck Observatory, Wesleyan University, and NAS Research Associate, NASA Manned Spacecraft Center)

Astronomers' Views on UFO's

FRANKLIN ROACH (Visiting Professor of Astronomy, University of Hawaii, Professor Emeritus, University of Colorado)

Historical Perspectives; Photos of UFO's

WILLIAM HARTMANN (Assistant Professor of Astronomy and Staff Member, Lunar and Planetary Laboratory, University of Arizona)

Sociological Aspects of UFO's

ROBERT HALL (Chairman, Department of Sociology, University of Illinois, Chicago, Illinois)

Psychology and Epistemology of UFO Interpretations

DOUGLASS PRICE-WILLIAMS (Chairman, Department of Psychology, Rice University)

Psychiatry and UFO Reports

LESTER GRINSPOON (Associate Professor of Psychiatry, Harvard Medical School, and Director, Massachusetts Mental Health Center, Boston, Massachusetts)

Discussion

SATURDAY, DECEMBER 27 — Sheraton-Plaza Ball Room

9 a.m. Chairman: CARL SAGAN

UFO Reports (Session 2)

21 Years of UFO Reports

J. ALLEN HYNEK (Chairman, Department of Astronomy, and Director, Lindheimer Astronomical Research Center, Northwestern University)

Science in Default: 22 Years of Inadequate UFO Investigations

JAMES E. McDONALD (Senior Physicist, Institute for Atmospheric Physics, and Professor of Meteorology, University of Arizona)

Physical Explanations of UFO Reports

DONALD H. MENZEL (Paine Professor of Astronomy, Harvard University, and Director Emeritus of the Harvard College Observatory)

Motion Pictures of UFO's

R. M. L. BAKER, JR. (Senior Scientist, Computer Sciences Corporation, and Lecturer, Department of Engineering, University of California at Los Angeles)

Unusual Radar Echoes

KENNETH R. HARDY (Chief, Weather Radar Branch, Meteorology Laboratories, Air Force Cambridge Laboratories, Bedford, Massachusetts)

(Informal Discussion, after 12 noon)

SATURDAY, DECEMBER 27 — Sheraton-Plaza Ball Room

2 p.m. Chairman: THORNTON PAGE

Retrospective, and Future UFO Studies (Session 3)

The Extraterrestrial and Other Hypotheses

CARL SAGAN (Director, Laboratory for Planetary Studies, and Associate Professor of Astronomy, Cornell University)

(SATURDAY, DECEMBER 27, Session 3, continued)

Methods and Reliability of Data Collection

FRANK DRAKE (Chairman, Department of Astronomy, and Associate Director, Center for Radio Physics and Space Research, Cornell University)

Influence of the Press and Other Mass Media

WALTER SULLIVAN (Science Editor, The New York Times)

Discussion

The Nature of Physical Evidence

PHILIP MORRISON (Professor of Physics, Massachusetts Institute of Technology)

The symposium is intended to demonstrate the application of scientific methodology to a contemporary controversy, and to acquaint scientists with the wide variety of facts and interpretations. It is not expected that any firm conclusion will be reached about "the correct interpretation" of the imperfect and differing data available. Presentations and discussion should be of interest to astronomers, physicists, meteorologists, sociologists, psychologists, and educators.

At the ends of Sessions 1 and 2 there will be a brief period devoted to panel discussion between the invited speakers and the Chairman. Questions from the audience must be written out and passed to the Chairman who will arrange them in proper sequence, read them over the public address system, and ask one or more of the speakers to answer. Because of scheduling limitations, it may be necessary to interrupt this discussion at the end of the alotted time, but the Chairman will continue with further questions after this formal adjournment.

The Committee will provide the audience with mimeographed summaries of UFO reports which several speakers will mention, some of them taken from the Condon Report. It may also recommend publication of the Proceedings.

Press Release

AAAS Annual Meeting, 26-30 December 1969

General Symposium on UFO's

Arranged by a Special Committee of the AAAS, comprising T. Page, Chairman, P. Morrison, W. O. Roberts, and C. Sagan.

Times:	Session 1,	2-5 p.m.	26 Dec. 1969
	Session 2,	9-12 a.m.	27 Dec.
	Session 3,	2-5 p.m.	27 Dec.

Place: Sheraton-Plaza Ballroom

(For full names and addresses of the 4 Committee Members, 3 Session Charimen, and 15 invited speakers, see Program copy attached.)

[Please note schedule of papers in program. Press notices should not precede presentation of papers.]

The following summaries of papers were prepared by Thornton Page and Carl Sagan from material supplied by the authors of the Symposium papers.

Please Check
Release Times

The topic of this symposium is controversial, and the AAAS Special Committee of 3 astronomers and a physicist has spent a year and a half arranging a program that will present as fairly and as logically as possible the facts and various interpretations that have been offered. It is not intended to establish any one interpretation as the "correct" one, but rather to discuss the observations and some of the speculations by a critical examination of the evidence -- the traditional scientific method.

In the first talk in Session 1, Dr. Thornton Page discusses educational aspects, both of this Symposium and of UFO's in general. He notes the valuable collection of information in the Condon Report ("Scientific Study of UFO's" by the group of 36 scientists under the direction of Dr. E. U. Condon of the University of Colorado) which is difficult reading for the average layman. Public-opinion polls show that over 40% of adult Americans believe that "Flying Saucers" are real visitors from other worlds, whereas many senior scientists feel that such visitations are impossible and that discussion or study of UFO's is a waste of time. Dr. Page believes that a large middle group of scientists (whom he calls "liberal") are willing and able to apply their specialist-knowledge. He says "this will educate both the scientists and the public in matters of great current interest" (such as space travel, the earth's atmosphere, analysis of imperfect data, social psychology and the origin of life).

The second educational aspect is the use or misuse of student interest in UFO's in teaching science. Disagreeing with Dr. E. U. Condon, Dr. Page asserts that "student interest in a subject, even if it derives from misconceptions, is better than no interest at all." Current data on U.S. college students show declining interest in science, and he found that a general course entitled "Flying Saucers" attracted many students who would otherwise have taken no physical science course at all. Dr. Page claims that most of his 100 students learned a good deal of introductory astronomy and physics, and that they are able to recognize the roughly 90% of UFO visual sightings which have in the past been identified by the USAF.

Turning to the magazine articles and "pulp press" publications on UFO's declaimed by Dr. Condon, Page reviews 71 books printed since 1948, 28 pamphlets and 73 magazine articles printed in the last 9 years. Publication dates imply waves of U.S. public interest in 1949-50, 1954, 1957-60, and 1966-68, and the point of view ranges from conservative scientific evaluation to highly speculative interpretation. This range in "speculativeness" is greater for the books on UFO's than for magazine articles: 10% of the books are extremely conservative and 20% are highly speculative with emphasis on extraterrestrial contacts. Over 50% of the magazine articles are non-conservative inquiry, and another 20% are historical accounts of one or

more UFO reports. Both books and magazine articles include 20 to 30% emphasizing the extraterrestrial hypothesis. Dr. Page claims that most readers recognize the extremely speculative "contact" stories as a type of science fiction; hence these books (20%) can be discounted. Over 75% of the UFO literature is reasonably scientific.

Drs. Franklin Roach and William Hartmann, two of the Colorado Research Group (who helped prepare the Condon Report) and both professional astronomers, shift the discussion to the astronomer's viewpoint. Dr. Roach notes that the "central question is ... visitation by non-terrestrial intelligent beings." Astronomers, who deal with extraterrestrial bodies and phenomena, may disagree on UFO's, but are unanimous on the large size, long history, and complex composition of our Milky Way Galaxy. During the past 30 years, advances in astronomy have "brought consideration of extraterrestrial intelligence out of the disreputable category into the category of respectable speculation."

However, we are reasonably sure that there is no intelligent life on the nearby planets in our solar system, and the huge distances to even the nearest stars (100 million times the distance to the moon) show that interstellar travel is "far in the future" for earth men. This reasoning led one retired astronomer to assert that interstellar travel is impossible, but Roach points out that he neglects the very

long times (billions of years) involved in the evolution of stars and planets. If our space technology continues to grow as it has since 1920, interstellar travel may be possible after 100,000 or a million years, and there can easily be intelligent beings a million years ahead of us evolutionally on a few of the 100 billion planets in our Galaxy. Instead of reasoning on "the physics and metaphysics of UFO's," Dr. Roach suggests "megaphysics" referring to a culture one million years ahead of ours, using materials and energy sources not yet discovered by earth men.

He then turns to the question of the meager number of UFO sightings and photographs made by astronomers. Roach has spent over 30 years observing the faint background light of the night sky (zodiacal light and galactic light) sometimes augmented by auroras, meteors, asteroids and other foreground phenomena (but no UFO's). Although he surveyed the whole sky systematically, he shows by a simple calculation that the probability of seeing or photographing a UFO in a telescope is extremely small. Even if all the 310 astronomical telescopes of the world are taken into account, their combined sky coverage is less than 0.01%.

Small fractions of the earth's surface are now patrolled more completely by meteor cameras. One such is the 300,000 square-mile area (centered in Nebraska) covered by the Smithsonian Prairie Meteorite Network of 64 cameras, used to photograph the sky all night long every night.

Dr. William Hartmann, another member of the Colorado UFO project (who analyzed photographs for Dr. Condon), summarizes the history of UFO's in the U.S. and recognizes two phenomena, one sociological and one possibly physical. After categorizing UFO sightings as IFO's (identified), EFO's (extraordinary), and AFO's (alien -- extraterrestrial visitors), he notes that most are IFO's, and that possible combinations of natural phenomena make the identification of alleged EFO's sometimes very difficult. Although his chapter in the Condon Report admits that several photographic cases cannot be explained, Hartmann feels that "all of the UFO reports can be due to mistakes and hoaxes." He emphasizes the fact that "second-hand accounts cannot be trusted," and "it does no good to ... look at UFO cases as a statistical sample because we know most of the data are atrocious."

The history of UFO reports demonstrates these aspects of the socio-psychological phenomena; after Kenneth Arnold's "honest misinterpretation of some ordinary phenomena, possibly a group of aircraft" in June, 1947, "the American public was 'primed' to seize upon flying saucers with glee and excitement." The several hoaxes which followed showed that "some citizens were sufficiently motivated to go to great lengths to claim sightings of the strange new objects."

Dr. Hartmann cites the well-publicized cases of UFO attacks on aircraft, and green lights in 1948-49, later explained as skyhook balloons and meteors. "The explanations came not only late but unheralded, as explanations always do." The famous Tremonton, Utah, movies of 1952 led to stories that "the Air Force had films of objects that had been proven self-luminous and performing maneuvers at speeds of thousands of miles per hour. This is demonstrably false ... but it kept the UFO mythology alive."

A popular movie called "The Day the Earth Stood Still" in 1952 featured a flying saucer landing at Washington, D.C. This suggestion convinced radar operators at Washington National Airport that they were tracking UFO's in 1952, and many visual sightings were simultaneously reported (though later identified as stars and meteors), all of which "kept UFO's high in the public mind," and led to the "charge of obfuscation against the Air Force.... The poor organization and performance of the Air Force investigation encouraged these charges." Hartmann blames the press for "a cruel disservice to the public" in that "most reporters made no initial effort to research their UFO stories -- they couldn't afford to; the stories might have disappeared!"

After the launching of the first two Soviet artificial satellites in 1957, the monthly UFO-report rate shot up by a factor of seven, illustrating the "spaceflight effect," which resulted from the public's increased awareness of

space activities. This interest received another boost in 1965 with the successful Mariner flight to Mars, which perhaps reminded the U.S. public of H. G. Wells' "War of the Worlds," and Orson Welles' 1938 radio broadcast, and led to another rash of UFO reports.

Hartmann identifies two more effects: the "airship effect, in which observers conceive of moving lights in a dark sky connected as a single entity," and "the excitedness effect, in which observers with the worst information are most likely to submit reports." He proposes that people like to believe in fantasies, "whether the fantasy is true or not," and feels that UFO's "may teach us something about the sources of our beliefs."

Turning to the possible physical phenomena, Hartmann notes that the residues of unexplained UFO reports includes "no reports of disc-shaped metal ships, no landing gear, or evidence of intelligence.... Instead, amorphous glowing objects with dimensions of a few feet or yards." He concedes that "there may be a very few, perhaps less than a dozen, that involve ... phenomena marginally outside the borders of accepted science."

Professor Robert Hall, the first of three behavioral scientists, starts by summarizing well-established sociological knowledge of rumor processes, systems of belief, mass hysteria, hysterical contagion, and systematic misperception, all of which may apply to UFO reports. He points out that

all reasonable observers "agree that for many years, in all parts of the world, many people (including intelligent and reliable witnesses) have reported flying objects, ... that a great many people have become involved in trying to account for these reports, ... and that scientists have sometimes defended a 'position' with more emotion than logic." He assumes that all the thousands of reports do not have a single cause; "they contain a potpourri of deceptions, delusions, and illusions, and ... some accurate testimony."

"The sky," says Professor Hall, "especially the night sky, is full of ambiguous stimuli, and people generally have a powerful need to reduce ambiguity ... by explanations in terms of something familiar." This has led to "systems of belief" -- individuals' cognitive structures integrated into the social system, each supported by the beliefs of others. Thus an ambiguous event is interpreted so as to fit in with the individual's system of belief, and "gaps tend to be fitted with consistent improvisations." The body of knowledge called behavioral sciences is one system of belief; the physical sciences, another.

Professor Hall gives four examples of mass hysteria and hysterical contagion studied by sociologists (from the reaction to Orson Welles' 1939 radio drama, "Invasion from Mars," to the 1967 June bug epidemic in North Carolina), each of which was based on an ambiguous event transformed by public anxiety or tension into an unambiguous threat.

The hysteria lasted a few days or weeks. By contrast, the public interest in UFO's has lasted over 20 years, does not generally involve a threat, and spread around the world unlike any other well documented case of mass hysteria.

Answering the question, "whether there is a residual subset of UFO reports for which there must have been a real, novel physical stimulus," rather than misperception, Professor Hall points out that some of the "hard-core UFO reports stand up better than many a court case" as far as witness credibility goes. This is based on standard legal criteria of credibility of testimony, and is open only to the criticism that UFO witnesses are influenced by others, by reports, or by "information read or heard long before." In fact, "a system of belief" has been established to some extent around the UFO phenomenon.

Turning to scientists' reactions, Hall notes that "scientists, too, are human," and recalls historical cases where they refused to change their systems of belief (Aristotelians at the time of Galileo, and the French Académie des Sciences in the 19th century). This refusal has taken three forms: "denial of evidence," "illogical arguments," and "buck passing." The last is illustrated today by physical scientists saying of UFO reports "there is no physical phenomenon."

Professor Hall concludes that "there is clearly a phenomenon of surpassing importance here," but that the

argument is really who has to change his system of belief, the physical scientist or the behavioral scientist?

Dr. Douglass Price-Williams goes on to discuss the very terms used in discussing (and reporting) UFO's. "Each of the three words runs into trouble," he says; "'Unidentified' embraces too much, 'flying' suggests something mechanistic, and 'objects' presumes existence." He then examines the "puzzling residue" of truly unidentified phenomenon and points out that one group of commentators views the puzzling few percent as "insignificant and unrelated," while another group sees them as significant and related. This is partly due to the different sets or "populations" considered, and Price-Williams points out three such populations: "A. Easily explained -- no controversy. B. Two or more different explanations. C. No explanation offered." Many other sightings, not officially reported, or not yet properly studied, form a fourth population, but can be expected later to be reassigned to A, B, or C. He notes that we must still demonstrate whether or not "Population C" reports have a "descriptive identity" separate from an assumed explanation, and allowing for the errors in human testimony. Some of these errors are predictable: humans are incapable of estimating the distance of an object of unknown size, if it is not nearby, and are unreliable in estimating motion against featureless backgrounds. "Most people tend to express themselves in thing-language" --

hence the term "flying saucer." After describing the many uncertainties in human testimony, Price-Williams urges a search for "latent disruptions ... relationships between attributes which emerge as statistical invariants across a mass of reports." He refers to several such attempts, and urges statistical studies "on a much larger scale than has been attempted hitherto." When this is done it will be the time to formulate hypotheses and test them against the recorded data. Social psychologists have developed techniques ("models") for testing broad hypothesis against similar "noisy" data.

Focusing on individual human reactions, Drs. Lester Grinspoon and Alan Persky attempt a psychiatric interpretation of a limited set of UFO witnesses, pointing out the extreme emotions demonstrated both by witnesses and by interpreters (including perhaps many present at this Symposium). Unlike other topics of scientific study, UFO's rouse a fervor usually reserved for politics, morality, or religion. After discussing the unconscious mental processes of "primary-process thinking" illusions, delusions, hallucinations, "borderline neuroses," the "Isakower phenomenon," and anxiety displacement, Dr. Grinspoon notes that a large and possibly growing fraction of the community, while generally normal, are subject to transient mental disturbances in stressful situations. He believes that stresses on the individual increased during the 1950's and 1960's due to "the increasingly

anxious times in which we live," and cites evidence of this trend in several psychological studies. Under these stresses it is natural for many members of the community to suffer illusions or delusions, substituting fantasy "to supply what reality has denied." UFO's provide universal symbols, fitting many fantasies together into a systematized delusion that can strongly influence what a witness reports in a UFO sighting -- although the psychiatrist cannot evaluate this reliably without face-to-face interviews with the witnesses involved.

One of the recent well-known contact reports seems to be a clear case of "folie à deux," where one member of a close human couple unconsciously transfers a delusion to the other. Of course there are cases of antisocial witnesses who purposefully falsify reports under the hope of personal gain. But Drs. Grinspoon and Persky propose a subtler cause that may account for other UFO reports, based on the Isakower phenomenon, wherein a drowsy person experiences visual impressions that recall his earliest infantile impressions, in particular the round image of his mother's breast at feeding time. Since this may account for saucer-shapes as a basic "inner projection," Grinspoon and Persky go on to phallic symbols, another universal, which may account for cigar-shapes in recent UFO reports. They point out that these two symbols have become identified with gratification and power and may be linked with the emotional fervor connected with UFO's.

Although clinical data are needed to confirm this theory, Grinspoon and Persky feel that the universal sex symbols and anxiety stress are demonstrably related to human reactions to UFO's. Anxiety may play a second role (separate from the generation of UFO reports) in the fervent reaction of some scientists to the extraterrestrial hypothesis; the concern may be about death and immortality. "For some of those who vehemently defend the extraterrestrial hypothesis, it symbolically represents a denial of the finite nature of life. On the other hand, those who have a need to deny anxiety about death and immortality may attack the hypothesis with considerable passion ... clearly an obstacle to solving the UFO puzzle."

In the opening paper of Session 2, Dr. J. Allen Hynek summarizes his 20 years' experience with UFO reports as a consultant to the U.S. Air Force Project Blue Book. In this talk he avoids explanations, and stresses the fact that the many UFO reports "exist after the deletion of pronouncements by crackpots, visionaries, religious fanatics, etc.," that a large fraction are "readily identifiable," but that the small residue not identified are reported by credible witnesses widely scattered over the surface of the earth. After "detailed examination of thousands of reports and interrogation of hundreds of witnesses," Hynek is convinced that the residue of truly unidentified reports "do not specify any known physical event ... or any human psychological process," and that translating them in terms of such

known events or processes "would alter the meaning of the original report." Quoting Thomas Goudge on the philosophy of science, Hynek notes that scientific advance must allow for "genuinely new empirical observations and new explanation schemes," such as the recent scheme of fundamental particles in nuclear physics.

It is too easy to assume that UFO reports "are not really scientific data, or are nothing but misperceptions of familiar objects," and Hynek feels that the serious scientist must attempt to separate "signal" from "noise" and to understand the UFO reports by credible witnesses. Psychiatrists have shown, Hynek says, that "the subject of UFO's is foreign to the problems of mental patients," and Hynek's interrogation of UFO enthusiasts has shown that they do not generate UFO reports. His experience has shown the "mis-perceptions fall into patterns which are easily recognizable."

After eliminating misperceptions, hoaxes, and the many identified reports, Hynek classifies the "screened" residue in a two-dimensional array of "strangeness -- the difficulty of fitting it into a rational explanation scheme" and "credibility -- the probability that the reported event actually took place." Four types of reports -- strange but reasonably credible -- have turned up repeatedly over the past 20 years: "nocturnal lights;" "daylight discs" and other shapes; "close encounters;" including some that have definite physical effects (on automobiles, farm animals, and the ground); and "radar sightings," some simultaneous

with visual sightings. (Brief reports, some taken from the Condon Report, will be passed out to the audience in mimeographed form.)

Hynek goes on to say that many such credible reports are withheld because reputable witnesses are reluctant to be subjected to public ridicule. He deplores the fact that there is "no properly constituted scientific body to which UFO reports can be made, and no reputable journal that will publish well-investigated reports." The press tends to play up the sensational reports and "it treats all UFO reports as jokes." Dr. Hynek concludes that "strong reason exists to merit the serious attention of the scientific fraternity to the UFO phenomenon even though the final solution may be as far away as the explanation of the aurora borealis was in 1807.

Dr. James McDonald, noting the residue of about 1000 unexplained reports in the U.S.A.F. Project Blue Book files, criticizes as inadequate investigations by the Air Force and by the scientific community at large. His paper is entitled "Science in Default: 22 Years of Inadequate UFO Investigations." Some of this inadequacy he blames on sociological factors and on misrepresentation in the press. Social pressure tends to make the most credible witnesses reluctant to report puzzling sightings, and the press generally implies that all reports are given expert scientific analysis. He cites a large number of cases where, he feels, the analysis was faulty or superficial or cavalier. Air Force interest

naturally declined in 1947 when it became clear that UFO's did not involve foreign aircraft and was only slightly revived by the waves of UFO reports in the U.S. in 1952, 1957, and 1965. McDonald believes that the inadequacies of the Air Force investigations were due to incompetence not conspiracy. "Charging inadequacy of all past UFO investigations," McDonald says, "I speak not only from a background of close study of the past investigations, but also from a background of three years of rather detailed personal research, involving interviews with over five hundred witnesses in selected UFO cases, chiefly in the U.S. In my opinion, the UFO problem, far from being the nonsense problem that it has often been labeled by many scientists, constitutes a problem of extraordinary scientific interest." He believes this problem is worthy of "new and more extensive scientific investigation." He points out that "UFO sightings exhibit similar characteristics throughout the world," and that the authors of the Condon Report "conceded that about one third of the 90 cases they investigated could not be explained. It is far from clear," he says, "how this justified the conclusion that further study is not needed."

Dr. Donald Menzel, author of one of the earliest books on flying saucers, explains many of the UFO reports in terms of misapprehended natural atmospheric phenomena. He admits that some of these can be very complex, due to the many unusual circumstances possible. Free-floating lights, seen

at night for instance, are explained by temperature inversions, in which warmer air at altitudes of a few thousand feet refracts distant light sources such as auto headlights, so they are seen "high in the air." The phenomenon is known as "looming." Of course, there are other misapprehended natural phenomena -- searchlights on clouds, auroral displays, lightning, and such astronomical events as meteors and bright planets.

Daytime discs and other shapes, Menzel finds, are often flocks of birds, or single birds too distant to be recognized. Swarms of insects can often appear to be a single body, hovering or moving erratically. Windblown paper is often mistaken for large solid bodies, and "dust devils" (dust picked up by small vortices in air over flat plains) may be reported as "flying saucers." Again, there are many artifacts (kites, balloons, aircraft) that can easily be misidentified, particularly by people wearing glasses or subject to common eye defects. The reported motions of objects in the sky are unreliable because of the well-known optical illusion of autokinesis, whereby fixed objects of lights often seem to move when viewed by the human eye against a featureless background.

Radar "angele," "bogeys," and other echoes from apparently "empty space" are common and can be explained in at least three ways: Firstly, ionized layers in the atmosphere reflect radar waves, and can give "angels" on the radar screen

that hover or move; secondly, localized clouds of air that have higher water content or different temperature from the surrounding atmosphere can give similar echoes; thirdly, some radar sets have imperfect radio beams with sidelobes that pick up echoes from different directions. Menzel maintains that such false radar echoes sometimes coincide by chance with visual UFO sightings. The UFO contact reports he dismisses as frauds or extreme hallucinations. The physical effects, such as burned areas on the ground, can be explained by unusual human activities and the electrical effects on cars as driver misunderstanding of his vehicle.

In summary, Dr. Menzel is convinced that all so-called "unidentified flying objects can be identified in terms of normal physical phenomena in the atmosphere or biological activities (including human ones)". As examples, he cites "Ezekiel's wheel" (scattering of sunlight by high clouds), aurorae, and ball lightning, which were viewed as mysterious and "unidentified" in the past, and are now explained by atmospheric physics.

Dr. Kenneth R. Hardy of the Air Force Cambridge Research Laboratories, further amplifies Dr. Menzel's remarks on clear-air radar echoes by describing detailed studies made with a multi-wavelength ultra-sensitive radar at Wallops Island, Virginia. Dr. Hardy's experiments showed that atmospheric refraction can allow radar echoes from over the horizon, and that single birds often give "dot angel"

echoes as far as 15 or 20 miles away. Swarms of insects, and even single large flies, have often been detected, but no UFO's in 5 years' of radar observations from Wallops Island.

By contrast, 16-mm motion pictures of four UFO's shown by Dr. R. M. L. Baker, Jr., have not been explained. These, and two others that have been studied carefully, Dr. Baker prefers to call "anomalistic observational phenomena" (avoiding the assumption that they were "objects"). The photographic images are poorly defined, and show no structural detail. The first movie was taken in August 1950 at Great Falls, Montana, where two reliable witnesses viewed two silvery disks and photographed them as they passed behind a water tower. Baker measured over 200 frames of the film for angular sizes and angular motions of the objects and went on to photograph a variety of known physical objects, including jet aircraft under various lighting conditions with a camera of the same type. He rules out any identification with aircraft, balloons, birds, insects, meteors, and other natural phenomena, leaving this Montana case as truly unidentified.

The second movie, also well-known, was taken near Tremonton, Utah, in July, 1952, when a pair of adults and two children saw a dozen white objects milling about in a cloudless sky. Identification with birds is "rather appealing" although the measured motions and erratic brightness fluctuations are "not exactly what one would expect from a

flock of soaring birds," and Baker also classifies this case as anomalistic.

In March 1967, a policeman took an 8-mm movie of an oval object also seen by several other people. His camera was poorly focussed and there was no background or foreground (after the film ran out, the object reportedly moved down behind trees about 150 feet away.) Baker's measurements show that the "blob" was elliptical and gradually diminished in angular size, with no fluctuations in brightness. Local reports rule out aircraft, and Baker includes that it is "an information-poor depiction of an anomalistic observational phenomenon."

The fourth movie was taken in January 1958 at Honolulu, Hawaii showing two of nine reported UFO's on 8-mm color film. The local airfield reported no jet aircraft in the area. Baker's measured angular motion corresponds to 900 miles per hour at 2 miles' distance, or 170 mph at 2000 feet distance, and the three witnesses claimed the motion was faster at other times, over a total of 5 minutes.

Dr. Baker's studies of about a dozen other films of UFO's led him to believe that they were hoaxes or normal phenomena. Two others he classes as anomalistic: a pair of white dots viewed in Florida in 1955, and a bright yellow, pear-shaped object photographed from an airplane over Venezuela in 1963. To them can be added a pair of still photographs taken at McMinnville, Oregon, in May 1950,

which was analyzed by the Condon Study with the conclusion that "they were silvery discs, tens of meters in diameter, evidently artificial," and not considered fraudulent.

In summary, Dr. Baker says that his studies show that some fraction of UFO reports are anomalistic, perhaps evidence of some atmospheric phenomena not yet well understood. He believes "that we will simply frustrate ourselves by endless arguments over past, incomplete-data scenarios; what we need is more sophisticated analysis of fresh observational data.... It is very unlikely that existing optical and radar monitoring systems would collect the types of quantitative data required.... The hard data we have are of poor quality because of inadequate equipment employed.... For the existing soft data (visual UFO reports) we have no quantitative procedure to evaluate their credibility or to derive clear-cut characteristics of the anomalistic phenomena.... Experiments should be devised ... but it is not necessary to presuppose the existence of intelligent extraterrestrial life to justify them...."

The third session begins with a discussion by Carl Sagan on "Extraterrestrial and Other Hypotheses." He believes that there is insufficient evidence to exclude the possibility that some UFO's are space vehicles from advanced extraterrestrial civilizations. But he argues that even were we to accept some of the alleged high-strangeness high-reliability cases, there are other speculative hypotheses

about as probable or improbable as the extraterrestrial hypothesis. "Why are there so few advocates" he asks, "of UFO's as projections of mankind's collective unconscious, as time travelers, as visitors from another dimension, as angels' halos, as apparitions from the spirit world -- or from Middle Earth, or Wonderland, or Perelandra? Or as harbingers of divine wrath, or fulfillments of prophecies in the Bhagavad Gita? Who can rigorously disprove all these possibilities?" He proposes that the fashionability of the extraterrestrial hypothesis is a function of the psychological needs and the scientific interests of our times -- and that these many other, perhaps whimsical, alternatives may be equally plausible or implausible, but not quite so fashionable. The idea of benign (or hostile) superbeings visiting the earth from afar is such an emotion-rich concept in this areligious age, Sagan argues, that we should demand even more rigorous evidence here than in other areas where our emotions are not so heavily invested. He also cautions against too facile dismissal of the extraterrestial hypothesis -- again because of possible emotional involvement in the hypothesis. He stressed the importance of having a tolerance for ambiguity when the evidence is inconclusive. Even with very optimistic assumptions on the number of intelligent civilizations in the Galaxy and on the rate at which they launch interstellar vehicles, he says, it is extraordinarily unlikely that the earth would be visited more than once every few thousand years.

The thrust of the discussion by Dr. Frank Drake is on witness reliability from several experiences in examining meteor and meteorite falls in the rural United States. Drake concludes that witnesses are surprisingly reliable in reports of the timing or geometry of an unusual event but are extraordinarily unreliable in the reporting of such more detailed information as colors or accompanying sound. He believes that such experiences are of relevance in assessing the reliability of reported UFO citings and that some fraction of a given UFO report may be reliable while other fractions are not.

Since 1947 when some unidentified newspaper man conjured up the term "flying saucer" to describe the objects reported in that year by Kenneth Arnold, the press, said Walter Sullivan, Science Editor of The New York Times, has played an important role in the UFO phenomenon. There seems to be a strong tendency for a rash of UFO reports to follow the reporting by the press and other news media of one spectacular episode. Those who believe that intelligent beings from elsewhere have visited the earth, according to Mr. Sullivan, tend to attribute this to the encouragement, by reading about other sightings, of those who otherwise would be diffident about making reports.

The question remains, Mr. Sullivan said: Were the additional sightings genuine, or were they natural phenomena misidentified through overstimulation of the public imagination?

Mr. Sullivan leaned to the latter hypothesis. If the news media were completely silent on the subject, he said, it is unlikely that there would be many reports. The current slump in reports can be taken as an example of this. The press lost interest -- or sensed that its readers had lost interest.

Project Apollo, with its repeated journeys by men to the moon and back, with no remarkable sightings, plus the gradual accumulation of negative evidence, such as that set forth in the Condon report, have made the ETI hypothesis seem far fetched to a large number of citizens, Mr. Sullivan said.

The news media, however, continued to condition the public for receptivity to the "flying saucer" hypothesis in their entertainment features, Mr. Sullivan added. Comic strips and TV serial shows keep before the public eye the image of saucer-shaped craft and journeys, across space, of exotic humanoids. This can be expected to keep the saucer concept alive, Mr. Sullivan said, until enough time has elapsed without a positive sighting to relegate flying saucers to the same category as ghosts and witches.

The closing paper, by Dr. Philip Morrison, will summarize some aspects of the symposium and stress the question of the nature of scientific evidence.

--The End--

AAAS General Symposium on UFO's

Session 1, Paper 1, 2:00 p.m. Friday, 26 Dec 1969

Introduction; Educational Aspects of the UFO Phenomenon
a Summary by Thornton Page (First Draft, 22 Oct 1969)

The purpose of this Symposium, briefly stated in the Program booklet, is almost entirely educational -- an attempt to bring the varied facts on UFO's to the attention of scientists, and to show enthusiasts the implications of very much better organized facts in the physical, biological, and social sciences. However, there are two more specific educational aspects I wish to discuss: (a) The possible harm done to science education by psuedo-scientific UFO reports, magazines, and books, and (b) The use of student interest in UFO's to benefit the teaching of science.

Educational Aspects of the Symposium

It is appropriate to start with a reference (1) to the "Scientific Study of UFO's" prepared by E. U. Condon and his 36-member staff at the University of Colorado during 1967 and 1968. This 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 Bantam-Book paper-back edition contains almost 1000 pages, including case studies, analyses along the lines of several different scientific disciplines, and a 20-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, issued a report that also was not widely read.

The U. S. 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% of the 13000 reports received by USAF Project BLUEBOOK could have been recognized as normal physical phenomena by persons who had studied elementary astronomy in highschool or college. Of course, the press, and other mass media, influenced public reaction (in a manner to be discussed near the end of the Symposium), and there is a natural tendency of the average layman to be intrigued by mysterious or unexpected appearances (a topic to be discussed later in this Session). As we all know, public demand helped to build up a large body of published literature, much of it fallacious (or highly speculative) and of special appeal to readers uneducated in science, particularly youngsters of highschool age.

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 (to be presented in Session 2 tomorrow) and the vastly more speculative views of a large fraction of the U.S. public. This Symposium is directed toward a middle group (AAAS members) 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 wide-spread UFO phenomenon. For instance, I hope the psychologists take note of "Page's Law": that the wave of UFO concern moves eastward around the world, completing one full circuit in about 17 years.

The Special Committee which organized the Symposium is convinced that logical discussion of a topic that has already been widely publicized will serve a beneficial educational purpose, both among the scientists present, and for the general public, who will hear some of our discussion through the press, and may have some ~~of their~~ misconceptions corrected. It would be ridiculous to claim that a 2-day Symposium can come up with "the correct answer" to the UFO question. As E. U. Condon writes (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....."

Harmful Effect of UFO Literature

Dr. Condon, who unfortunately chose not to be with us here today, 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 but that many of the books and magazine articles on UFO's (summarized in Table 1) are unsuitable and misleading. However, if the obviously sensational and the fictional ones are excluded, a fair proportion of the remainder is made up of honest attempts to describe unusual events and explain them.

Of course, it can be argued that popular books and articles on science fiction, astrology, drugs, and sex (equally available) are deleterious for young readers. I, for one, do not agree with Condon that UFO literature (and science fiction) is all bad. 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

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. Along with many other science teachers, I had become frustrated with the diminishing undergraduate interest in physical science -- at a time when space

exploration, electronic computers, and nuclear physics seem to me to offer more exciting work than anything in my previous experience. The source of disinterest (even hostility) has been traced to the poor teaching of math and physics in gradeschool and highschool, 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. Statistical data demonstrating this discrepancy are given in Table 2.

Of course, my colleagues on the faculty laughed at my offering "Flying Saucers" in the fall semester, 1967, even when it was over-subscribed and re-offered by student demand in the spring of 1968 (as "Flying Sickles" -- a reference to UFO reports in the Soviet Union). The course was maintained for another school year, but discontinued because of my absence on space-astronomy work at the NASA Manned Spacecraft Center in Houston.

Very briefly, the 1-semester course consisted of two lectures and a discussion session each week, with a 2-week reading period near the end. We started with a review of UFO reports, then spent 5 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 villianous) 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 Nov. 1967, when there was a bright "moon dog" (ring around the moon) reported to me by every one of the 50 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 extra-terrestrial hypothesis. The students

learned that conditions on other planets of the solar system are not conducive to 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 (2)).

The two-week reading period was spent on writing a term paper, on a topic selected from a list of 30 (Table 3), no more than two students on any one topic. 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 best authors appeared on a half-hour TV show to explain their views on UFO's, thus gaining first-hand experience of the publicity aspects. Earlier in the semester, two outside speakers widely recognized for their UFO studies (Hynek and Menzel) had lectured to the class, and told all of the students 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 for a regular science program, and that it loses its appeal after 3 or 4 repetitions. 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 64 cameras of the Prarie Network (3), after a session in which we decided that all of the astronomical telescopes in use have almost no chance of photographing a UFO passing through the telescope

field (4). On the other hand, the Prarie Network has about 65% coverage of the sky for bright objects over 440,000 square miles in the Midwest -- about 0,22% of the earth's surface. A similar Canadian network (5), and the earlier Czeck network (6) raise this area coverage to about 0.5%. The network results (negative for UFO's, positive for meteors) will be discussed later in the Symposium.

Conclusions

The general advancement of science depends heavily on the public's education in science. This is because most of the significant research today depends on public support (university, foundation, or government financing). It is therefore obvious that all students (and older citizens) must be given enough science education to recognize worthwhile scientific effort. For a number of reasons, a large fraction of students and the public is 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 in correcting public misconceptions about science.

References:

(1) Scientific Study of Unidentified Flying Objects, E. U. Condon, Bantam Books, N.Y., Jan. 1969

(2) Freeman Dyson,

(3) The Prarie Meteorite Network, R. E. McCrosky and H. Boeschenstein, Smithsonian Astrophys. Obs. Special Report No. 173, Cambridge, Mass., May, 1965

(4) Photographic Sky Coverage for the Detection of UFO's, Thornton Page, SCIENCE 160, 1258, June, 1968

(5)

(6)

Table 3. Science 101 Topics

(Each student must pick one of these for a term paper on which he will do outside reading. An outline of the paper is required before 22 Nov., and the completed paper (about 3000 words) by 11 Dec. Each paper will be read by 2 students and Prof. Page. The 3 best papers will be published in pamphlet form.)

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

AAAS General Symposium Session 1
Paper 3

THE UFO AFFAIR - HISTORICAL PERSPECTIVES

William K. Hartmann
Lunar and Planetary Laboratory
University of Arizona
Tucson, Arizona 85721

ABSTRACT

The UFO phenomenon can be divided into two parts - the sociological phenomenon and a hypothetical physical phenomenon. The sociological phenomenon is now relatively well understood and sheds interesting light on the development of popular myths and fads. It also demonstrates that the UFO affair could have propagated itself without any extraordinary phenomena at all. This, plus the poor quality of UFO evidence, shows that lists of puzzling UFO reports are of no probative value. A challenge is therefore issued to proponents of extraordinary UFO's to select and present one compelling case in detail.

With minor revisions, December 30, 1969

Paper Read in the General Symposium on UFO's,
American Association for the Advancement of Science, December 26, 1969

Sociological Perspectives on UFO Reports

by Robert L. Hall

In my contribution to this symposium I should like to turn attention away from sundogs and spaceships and focus attention on human behavior. Reasonable men may disagree as to whether UFO reports imply the existence of an important, unfamiliar physical phenomenon worthy of study. However, we can agree that for many years, in all parts of the world, many people (including intelligent, reliable witnesses) have been reporting flying objects which they found puzzling. We can agree that their reports contain many recurrent features which, if taken at face value as reliable testimony, would suggest something other than conventional aircraft and meteorological and astronomical phenomena. We can agree that a great many people are interested and have become involved in trying to account for these reports, or perhaps more often, in defending a position about what accounts for them. I am afraid that we must even agree that scientists have sometimes been caught up in the controversy and defended a position with more emotion than logic. We might differ as to which scientists are being emotional and which are being logical, but we are clearly witnessing some kind of phenomenon which stirs both scientific controversy and human emotion. There are clearly some important behavioral phenomena, though we may disagree about what physical events must be posited to account for the behavior which we observe.

As a behavioral scientist I focus my attention on questions about these behavioral phenomena--reports of flying objects, elaborate beliefs about the reported objects, human controversy in defense of beliefs, and even the behavior of scientists in analyzing the reports. I begin with the plausible assumption that the thousands of reports do not have a single cause: they contain a potpourri of deceptions, delusions and illusions, and at least some accurate testimony. Our basic problem is to sort out those components.

I shall organize my comments around three main issues. First, I shall summarize some knowledge about such processes as rumor and systems of belief, mass hysteria and hysterical contagion as these may apply to reports of flying objects. Second, I shall discuss the plausibility of systematic misperception to account for the "hard core" of UFO sightings and the question of whether there exists a subset of UFO reports which requires other interpretation. Third, I shall take the risky step of commenting to the group of scientists present here on the behavior of scientists in response to UFO reports and other similar phenomena.

Systems of Belief and Contagion of Belief

Nearly all rational observers agree that the great majority of reports of flying objects have their origin in misidentifications of familiar phenomena, together with a few hoaxes and delusions. The sky, especially the night sky, is full of ambiguous stimuli, and people generally show a powerful need to reduce ambiguity. Much research in sociology and social

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<u>Systems of Belief and Contagion of Belief</u>

Nearly all rational students agree that the great majority of reports of flying objects have their origin in misidentifications of familiar phenomena, together with a few hoaxes and delusions. The sky, especially at night, is full of ambiguous stimuli, and people generally show a [illegible] need to reduce ambiguity. Much research in sociology and social

psychology indicates that the typical first reaction to ambiguity is an effort to explain an ambiguous event in terms of something familiar. This kind of improvised clarification is the essence of rumor. Thus, for example, following the explosion of the first atomic bomb over Hiroshima, the early rumors were: (1) the city had been sprayed with gasoline and set afire, or (2) a huge cluster of incendiary bombs had been dropped, or (3) a fine magnesium powder had been sprayed on the city and ignited by electric power lines (Shibutani, 1966, p. 32-34). The reaction is characteristic: given an ambiguous event and a lack of trusted information to explain it, people improvise explanations, trying first those explanations which require no really new knowledge, but build directly on what they already believe.

Hynek, in the process of interviewing hundreds of UFO witnesses, has observed a phenomenon which he has labelled the "escalation of hypotheses," which appears to be a specific instance of the general tendency to explain first in familiar terms. That is, in numerous cases the persons reporting a UFO have indicated that they first tried to fit their observations into familiar categories and came to regard the phenomenon as strange and unidentified only after its appearance and actions seemed clearly to rule out familiar interpretations, such as airplane, helicopter, cloud, birds, stars and planets. This is an important point and seems quite contrary to statements sometimes made by noted UFO sceptics, who refer to witnesses as eager to find something strange.

What people believe is usually organized into elaborate systems of belief. That is, each person has a cognitive structure consisting of many items of information and belief which are interdependent, and people are organized into social systems in which each person lends support to beliefs of others in the system. A lonely belief is an unstable belief; just as nature abhors a vacuum, nature abhors an isolated belief.

There has been very extensive research on cognitive structure and cognitive processes in recent years (e.g., see Zajonc, 1968; McGuire, 1969; Tajfel, 1969; Abelson et al., 1969), and any brief summary statements can be risky. However, it appears that people tend in most circumstances to hold beliefs consistent with those of people around them, because they interact selectively or are influenced or both. It appears that people perceive more readily and accurately those things that are consistent with their preexisting knowledge and beliefs than things that are not. It appears that ambiguous situations tend to be interpreted so as to fit in with and support preexisting belief and knowledge, and gaps in knowledge tend to be filled with consistent improvisations. When there is a strong system of belief with substantial social support, it is likely to be defended vigorously, beyond the dictates of logic. Conversely when reasonable men report events which receive no social support from their friends and do not fit their own prior beliefs, we have to take these reports seriously.

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Combining knowledge of reaction to ambiguity with knowledge of systems of belief, we expect that an ambiguous event will tend to become assimilated into a preexisting system of belief. Suppose we take a case of someone committed to a system of belief which asserts man's basic evil and the imminent arrival of a saviour descending from heaven. Such a person, seeing a strange aerial event, might interpret it as the approach of a threatening, punishing angel, or as the coming of a saviour. However, in the hard core cases of UFO reports we find no such thing; the witnesses frequently find their observations jarring to their own beliefs but insist nevertheless on what they have seen. Often those witnesses say that they never took UFO reports seriously or that they thought those reports were nonsense. When such a person sights a puzzling UFO, we would expect him to try very hard to categorize it in familiar ways. In fact I would find it puzzling and behaviorally anomalous if witnesses to a dramatic, ambiguous event promptly interpreted it in a way that lay outside their previous beliefs and contrary to the beliefs of others around them unless, indeed, their observations seemed quite unequivocal. This would be an extraordinary suspension of the usual laws of human behavior.

A few cases of so-called mass hysteria and hysterical contagion have been relatively well documented and described, such as the public reaction to Orson Welles' "Invasion from Mars" (Cantril, 1940), the case of the phantom anaesthetist of Mattoon (Johnson, 1945), the Seattle windshield-pitting epidemic (Medalia and Larsen, 1958), and the "June Bug" epidemic in North Carolina (Kerckhoff and Back, 1968). Apparently the recipe for this type of hysterical outbreak is a combination of a high level of anxiety or tension with some kind of ambiguous event which is interpreted as posing a serious threat. The ambiguous event is transformed, in beliefs, into an unambiguously threatening event which apparently justifies the diffuse anxiety which was its antecedent (Smelser, 1963, chaps. 5-6). The documented cases of hysterical contagion generally last a few days, or at most a few weeks. The period of mass hysteria associated with the "invasion from Mars" was brief, lasting a day or less. The windshield-pitting epidemic around Seattle had two periods of activity: the first was scattered around in several towns within about a fifty mile radius of Seattle over a period of about a week; there was a pause of about one week; the second period was intense and concentrated in the city of Seattle for about one week. In Mattoon, Illinois, there was an outbreak of mass hysteria involving reports of a mad gasser who was alleged to sneak around squirting gas at women. This outbreak was limited to the city of Mattoon and lasted about three weeks. In a North Carolina factory there was an outbreak of mysterious symptoms including nausea, skin rash, and fainting, which were attributed by the victims to the bites of tiny (indeed invisible) insects. Nearly all cases were in one area of the factory, and 95% of the cases occurred in a period of four days, and the entire set of reports covered about eleven days.

Some effort has been made to liken UFO reports to these cases of hysterical contagion. It appears quite clear that hysterical contagion contributes some cases to the massive number of reports, but there are many difficulties in trying to argue that the hard core cases can be explained in this way.

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For one, the persons reporting UFOs in many cases do not interpret them as any serious personal threat. They often describe a UFO with puzzlement but not fear. For another, the continuation of UFO reports over at least decades and their spread over all parts of the world would both be unprecedented for a case of hysterical contagion. Also the fact that many reports are made by people previously unfamiliar with UFO reports would argue against contagion as the mechanism underlying the best reports. Also, in many cases the events described by UFO witnesses are not fleeting and ambiguous events, such as the invisible insects and figures fleeing in the dark that have been described by witnesses in cases of hysterical contagion. Frequently they are accounts of prolonged observation with much solid detail. Finally, witnesses often report details which are consistent with other reports that have not been described in the mass media. It is admittedly difficult to establish a witness's lack of prior exposure to specific information. However, if the witness is not a UFO buff who reads special publications and if the news media have not reported the relevant details, then we are stretching a point to explain the reported details as the result of contagion.

It seems clear from the behavior of people who write about UFOs that there have come to be strong, socially supported systems of belief surrounding UFO reports. These systems of belief complicate the problem by interfering with perception and interpretation of events. Some UFO buffs, in writing case descriptions, load their reports with interpretation, making it difficult to separate fact from fiction. On the other hand, some sceptical scientists, faced with detailed reports by reliable witnesses, loudly and confidently assert interpretations which conflict strongly with available testimony and show a startling degree of disrespect for the reason and common sense of intelligent witnesses.

Hard-Core Cases: Physical Event or Motivated Misperception?

Let us grant that many UFO reports are misidentifications of familiar objects, perhaps given a boost sometimes by such processes as psychological projection and hysterical contagion. The question remains whether there is a residual subset of UFO reports for which there must have been a real, novel physical stimulus, or whether it is plausible to argue that the "hard-core" cases are also systematic misperceptions, guided by psychological mechanisms such as projection and contagion of belief.

Let us consider first the question of the credibility of human testimony. Our legal system is based largely on the assumption that, under certain conditions, we can accept human testimony as factual. Many people, including attorneys and judges as well as behavioral scientists, have rather clear-cut criteria for assessing the credibility of testimony: the witness's reputation in his community, previous familiarity with the events and persons involved in the testimony, apparent motives for prevarication or distortion, and internal characteristics of the testimony such as consistency, recency, verifiable detail, etc. Also testimony is more credible with multiple witnesses, especially independent ones, and with multiple channels of observations (e.g., both visual and auditory; both unaided observation and observatio

through instruments). If we apply these criteria to the witnesses and the testimony of hard-core UFO reports, some of them stand up better than many a court case. In some cases there has even been a kind of "cross-examining" of witnesses in reinterviewing by scientists such as Hynek and MacDonald. Examples of hard-core cases in which I find familiar explanations, including systematic misperception, implausible are the Lakenheath case, reported in the Colorado report (Gillmor, 1968, 248-256 and 163-164) and more fully by MacDonald in the present symposium; and the RB-47 case, reported in the Colorado report (Gillmor, 1968, 260-266 and 136-139) and in much more detail, with additional witnesses, by MacDonald in the present symposium. Other examples of hard-core cases include Hollywood on February 5-6, 1960 (Symposium, 1968, 54-57), Arrey, New Mexico, on April 24, 1949 (Symposium, 1968, 63-64), Red Bluff, California on August 13, 1960 (Symposium, 1968, 109-110), Admiralty Bay on March 16, 1961 (Symposium, 1968, 64-65), and Redlands, California on February 2, 1968 (Symposium, 1968, 52-53).

One difficult problem in assessing the testimony in such cases is the difficulty in establishing whether witnesses did, in fact, report independently or whether they were in a position to influence one another's reports. Another problem is that of determining the preexisting knowledge and belief of a witness. There are many cases in which witnesses deny previous knowledge and cases in which they strongly deny ever believing reports of UFOs before they saw one. Nevertheless human memory is fallible in such matters, and it is conceivable that witnesses are unconsciously influenced by information read or heard long before.

I believe that most behavioral scientists who examine the evidence would agree that reports as persistent and patterned as hard-core UFO reports must be systematically motivated in some way, not simply random misperceptions. Either there must be a distinctive physical phenomenon which these witnesses have observed, or there must be a powerful ill-understood motivation rooted in projection, or contagion of belief, or a similar mechanism. Given these alternatives, I find it more plausible to believe that there is a distinctive physical stimulus than to believe that multiple witnesses misperceive in such a way as to make them firmly believe they saw something which jars their own beliefs and subjects them to ridicule of their associates--something they report observing both with unaided eyesight and through instruments over a prolonged period and they can describe calmly and in detail.

Scientists' Responses to Off-Beat Phenomena

In our scientific ideals we like to set goals for ourselves and our students that are superhuman in their detachment and openness to challenge and revision. In the hard world of real scientists, there are altogether too many anecdotes which suggest that scientists, too, are human. When Galileo's telescope made it possible to sight the moons of Jupiter, many refused to look through the telescope (Russell, 1953, p. 9). They "knew" that there could not be such bodies around Jupiter, and therefore they "knew" that the telescope was a deceptive instrument. Even more instructive cases

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come from the history of meteorites. To quote an account by Professor Oliver (1965):

> "In the next three centuries (after 1492), a good many meteorites fell in Europe, but the reaction against superstitions of the Middle Ages led the scientists of the day to such great scepticism that they refused to face facts, in some cases. Perhaps the most notorious instance refers to meteorites: in the 18th century the learned men of the day did not believe stones could fall from the skies, hence they affirmed they did not. Even the great French Academie des Sciences went on record denying that meteorites had an origin outside the atmosphere, despite accounts of falls by reliable witnesses, which were ridiculed, and the splendid pioneer work of Ernest F. F. Chladni about 1794."

It has been reported (Paneth and Hey, 1969) that scepticism was so strong that the reports of witnesses were changed to conform with acknowledged theories, and museum keepers followed scientific advice and threw away meteorites lest they be accused of clinging to foolish superstitions.

There are many anecdotes about the reluctance of scientists, often distinguished ones, to accept new observations. The point seems to be that scientists are human and behave according to the same principles of human behavior as non-scientists. Indeed we might describe the body of scientific knowledge accepted at any given time and the people who bear that knowledge as constituting an unusually strong belief system which resists inconsistent items of knowledge even more powerfully than a layman defending his political beliefs.

To the extent that observation challenges established beliefs, scientists resist accepting the observation. This resistance seems to take several forms. One form of resistance to change of scientific knowledge and belief is the avoidance or denial of evidence, similar to those who would not look through Galileo's telescope or those who refused to believe reports of meteorite showers. Another form of resistance shows up in illogical arguments by men who are customarily precise and logical. For example, we see some scientists arguing something like this: "I can cite hundreds of cases of people who were excited and reported an aircraft or a star as a UFO and hundreds of humorous cases of unbalanced people with demonstrably false stories; <u>therefore</u> it is plausible that the rest of the cases are similar." I know from personal experience as a military flyer in wartime that flyers sometimes shot at Venus or at an island, believing it to be an aircraft. It would be foolish for me to conclude from this that there were no aircraft in the sky. Another form of avoidance is the kind of buck passing that has occurred often with respect to UFO reports. If there <u>is</u> a new physical phenomenon behaving as the reports describe, this may force physical scientists to confront an anomaly and modify something in their present knowledge and belief to accord with these observations. Consequently they say that there is no physical phenomenon; it is all psychological--human errors of

observation and interpretation, mental aberrations, hysterical contagion, and the like. On the other hand, if there is not a physical phenomenon, then behavioral scientists are confronted with an anomaly and may have to modify something in their knowledge and belief to account reasonably for the persistence of so many apparently sound UFO reports. Consequently I, speaking as a behavioral scientist, say that there must be a real physical phenomenon. So we pass the buck back and forth without forming any adequate explanation, either physical or behavioral.

The very strength of our resistance to the evidence on UFOs suggests to me that there is clearly a phenomenon of surpassing importance here. It is going to force some of us to make some fundamental changes in our knowledge, and this is a good definition of scientific importance. The arguments are really arguments about who has to change. In whose domain does this phenomenon lie? Do the physical scientists have to accept the existence of such a puzzling and anomalous physical object or phenomenon? If so, they must set out to account for it. Or do the behavioral scientists have to accept the puzzling and anomalous fact that hundreds of intelligent, responsible witnesses can continue to be wrong for many years? If so they must then set out to account for this massive fallibility.

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PSYCHOLOGY AND EPISTEMOLOGY OF UFO INTERPRETATIONS

by Douglass R. Price-Williams

Rice University

This contribution is concerned with the psychology and epistemology of interpretations given to reports of unidentified flying objects, and not to the individual make-up of or logic used by witnesses. The theme underlying the presentation is that distinctions must be kept between description, definition and explanation. Failure to keep these distinctions often ends up in lack of clarity in discussing these reports, and often to logical mistakes. I propose to enumerate four stages through which inquiry has to follow, and to comment in passing on attempts made so far.

Stage I. Reports of curious aerial (for the most part) phenomena are generated. This is the starting-point and here already we meet the first difficulty. Our primary descriptive term and the title of this symposium has met logical complaint from people of quite differing interpretations: Hynek[1], Page[2], Baker[3], Menzel[4], and Vallee[5]. Each of the three words runs into trouble. "Unidentified" because it embraces too much; "flying" because it suggests something mechanistic (we do not talk of a cloud flying, except in poetry); "objects" because it already presumes a conclusion. Smuggled into this term is already an assumption masquerading as a description. The error is compounded when the other term "flying saucers" is regarded as synonymous with "UFOs", as now we have an explanation masquerading as a description. However, it looks as if we are stuck

with the term--UFOs, and although something like anomalous observational phenomena--Baker's proposal--is logically preferable, we had better go on using it, remembering that the usage does not commit us to any interpretation.

Stage II. The reports now undergo differentiation. Investigators--experts of various kinds--have managed to eliminate the "unidentifiableness" of many reports, indeed the majority, and traced them to quite identifiable and understood phenomena. Nevertheless there is left a residue of still curious and puzzling phenomena. It is at this second stage where controversy really begins. What appears to be an insignificant and unrelated residue to one viewpoint, is to an opposing viewpoint both significant and related. Whereas the first group may dismiss the residue as something akin to error variance, the second group accept the residue as signal, or at least are committed to the viewpoint that it could be signal, for which further investigation is necessary. Such further investigation brings us to the next stage, but there exists a problem which impedes easy transition to the third stage. This is the problem of populations of reports. It becomes clear very quickly to the student of the subject that different authors are often alluding to different samples, and it is by no means obvious how the different samples are related. It would seem that three populations can be organized.

Population A. Those reports which are explained by reference

to known phenomena, and which our questioning second group is not prepared to defend as still requiring investigation. In other words, everyone agrees that Report X is that of a meteor, so let us eliminate it from our residue. No controversy here.

Population B. Those reports which are explained by the first group as exemplars of known phenomena, but which explanation meets disagreement from the second group. There is valid and real controversy here, but note that--at this Stage II--we need not necessarily have a conflict of two hypotheses, two kinds of explanations. Someone may disagree with Report Z as constituting ball lighting, without being committed to an explanation in terms of extra-terrestrial vehicles. The controversy is over whether one should leave Report Z in the residue of still needing investigation or not. The reverse of this situation can be noted in the Colorado Report. Rejection of a photograph of a UFO as constituting evidence of an extra-terrestrial vehicle does not commit the rejector to an explanation in terms of known phenomena[6].

Population C. Those reports which both groups agree with as being unidentifiable and unexplainable in terms of known phenomena. Presumably all the "Unidentifieds" in the Air Force files belong to this population, as well as the unexplainables in the Colorado Report.

All three populations are defined in terms of having been examined and evaluated. It becomes clear that there are many

reports which have not been introduced to the scientific forum at all and which, therefore, await assignment. It is necessary to make what may appear to be a somewhat trite point about population grouping, as otherwise we are not ever certain whether we are talking about the same thing.

It is worthwhile noting that the Colorado Report essentially terminates at Stage II. The scientific filtering there still left anything from 20 to 30 per cent reports unexplained. Apparent reluctance of the Report to proceed further is the decision to test the hypothesis of extraterrestrial intelligence, on the basis of the totality of their reports. A consequence of this approach is to present equivocal conclusions when unexplained instances are confronted. Thus, regarding photographic cases: "The present data are compatible with, but do not establish the hypothesis that (1) the entire UFO phenomena is a product of misidentification, poor reporting and fabrication, or (2) a very small part of the UFO phenomena involves extraordinary events."[7] Again, with Colorado Case No. 14, First Sighting,: "There is no reason to doubt the credibility of the sighting; however, the question of <u>what</u> was seen remains unresolved."[8] Or again with Case No. 17: "Investigation revealed neither a natural explanation to account for the sighting, nor sufficient evidence to sustain an unconventional hypothesis."[9] It would seem that the Colorado investigators had difficulty in distinguishing (a) phenomena of a certain kind that

are unexplained from (b) phenomena that could be attributed to extra-terrestrial intelligence. As the only hypothetical properties of the latter appear to be that which are reported as the former, the hypothesis of ETI formulated in this way leads only to circular reasoning, and is not in a form amenable to empirical acceptance or rejection.

Stage III. This, then, is the stage where we have for inspection at least Population C, and those reports from Population B, which after further debate, may get transferred to C. It must be remembered that the residue of reports at this stage only have the communality of still being unexplained. That they may have descriptive identity or class definition has yet to be demonstrated and argued, and not assumed. Descriptive identity is not to be misunderstood as explanatory identity. A null-set can still have properties. We can make classes of disease symptoms without knowing their causes. Nevertheless, Stage III is a key link in our sequence, as failure to define the data at this point makes further analysis unamenable to systematic investigation. We need, therefore, to give considerable thought to it.

The problem is to extract information from the reports, irrespective as to whether a physical, psychological, or sociological type of explanation is to be invoked. Now information is reduced by the presence of equivocation and by the presence of noise. We need to apply these concepts from information theory to the

case in hand. In doing so, I am concerned only with the major source of data, that is to say human testimony. The same principles must apply to other sources such as information from radar and automatic instruments, but these contain different technical factors and others no doubt in this Symposium will be concerned with them.

Class definitions have been attempted previously, by NICAP[10] and by Vallee[11]. Both are mainly based on the principles of dividing the descriptions into the main variables or attributes of shape, size, color, kinematics, etc. on the one hand, and by witness reliability on the other hand. Vallee, in particular, is sensitive to some aspects of the noise factor, distinguishing his types to show resemblance or lack of resemblance to interfering irrelevant stimuli, such as satellites, meteors, etc. At the outset it should be obvious that the data we are inspecting and analyzing is that of the report of the witness(es). As McDonald[12] has shown, secondary elaborations, such as newspaper accounts (which have their own motivation, e.g., interest to their readers) are often untrustworthy. Reduction of noise must include this factor. Also there is the noise factor of time delay in reporting the event. Hall[13] has covered other aspects of witness reliability. On the whole noise factors appear to be well appreciated in this field. Equivocation factors are not immediately obvious as having been fully appreciated. Before

we are confident of assigning percentages to attributes of shape, size and so forth, and basing explanations on them, we should appreciate that descriptions are peculiarly open to assumptive contexts. Shepard[14] understands this, and his remarks refer to fresh methods of information retrieval of reports; a very useful suggestion which, however, means starting anew. Wertheimer[15] undoubtedly appreciates this, but his short chapter in the Colorado Report concludes only that there is room for error. We need to find a method of reducing equivocation without going to the extreme of throwing up our hands in horror at the fallibility of human testimony, thereby invoking the complaint of McDonald[16] that the psychologists' "puristic insistence on the miserable observing equipment with which the human species is cursed makes me wonder how they dare cross a busy traffic intersection."

Now equivocation can be regarded as information which the organism cannot discriminate reliably, and is the very heart of our difficulty in definition. When a witness reports that he has seen for a short time a disc-shaped object hovering one hundred feet away from him at tree-top level, what credibility can be placed on the descriptive attributes of disc-shaped, large, one hundred feet, hovering and tree-top level? There is little doubt that the difficulties are formidable. Most people are unused to angular estimation; most people tend to express themselves in thing-language and not process-language. Many reports just do not give

the basic information necessary to judge the relative accuracy of estimates of shape, size, distance, etc. Perceptual cues that may or may not have been present to the witness are often not noted in the reports. We often are not told what visual angle the observer made his observation from; what degree of illumination was present; what frame of reference was used. We do not know whether the witness has some implicit assumptions as to shape and size of UFOs. The list might be multiplied.

There are only two ways of adjusting to this state of affairs, other than planning anew the entire retrieval procedure of reporting these phenomena in order to accommodate to the facts of visual perception. The first would be to go painstakingly through existing reports, noting what aspects of what reports can be relatively relied on. We can note whether the "object" was seen against a background which contains what has been called "microstructure" or against the kind of background as the sky which contains "film-color"[17]. This is a basic datum as judgment of distance and hence size depend on it. We can note whether the phenomenon was observed from directly above or below or viewed obliquely and how this correlates with the reported shape[18]. We can ask whether there are quite different reports of movements of the phenomena when the witness is relatively stationery as against when he is moving as in an aeroplane or automobile, or alternatively whether they are much the same. Or again as regards movement, whether the reported motion was seen against a fixed background or against a possible moving background as a

cloud. Such, and further, probing of the present data could be made, and would constitute some kind of check, however rough.

The second way is to examine the data for what might be called latent descriptions. By latent descriptions is meant a relationship between attributes which emerge as a statistical invariant across the mass of reports. This requires going beyond the case-by-case approach and necessitates a cross-correlation of a number of reports, on a statistical basis. NICAP's[19] linkage of reported motion and color is a step in this direction, as is Vallee's[20] analysis of estimated size of object to distance from the observer, but the analysis needs to be done on a far larger scale than has only been tentatively attempted hitherto. This could be done separately for Population A and Population C reports, so that comparative assessment is possible. Unfortunately, it appears that the mass of data has not even been marshalled into the form which this can be done[21]. Interpretations of such relationships, if they prove to exist, is another matter, of course, and this brings us to the last stage.

Stage IV. Having arranged and refined the data, the stage is relatively clear for hypotheses to be brought to bear on them. Our sequence of stages is not meant to insinuate an inductive approach in which the systematic refinement of data astonishingly reveals an explanation. A hypothesis may demand a datum which nobody has yet reported or anyone thought of asking for, and may include other factors than descriptions. The intention here

is only to seek a confrontation of data and hypotheses, a feature which is somewhat lacking in this field. This is due partly to the "dirty" condition of the data, partly to the dominance of a priori assumptions. Indeed assumptions have tended to be voiced in ways which encourage ignoring of the data rather than their correct role of indicating the required threshold of evidence. Furthermore, little thought has been given to how certain hypotheses could, in principle, be tested. This is crucially true of the extra-terrestrial hypothesis. I have already indicated that "proof" of this cannot rest merely on the bizarre nature of the reports. Apart from trapping such an object, the only approach that seems at all possible is to posit a model embodying aerodynamic and engineering properties that are then matched against the observed data as reported. This approach has been tried by some[22]. Yet there are logical hazards here even. One might say there is a higher and lower limit within which such a model can operate. The higher limit is bounded by postulating 'magical' mechanisms, with which anything is possible. The lower limit is bounded by the fact that if the model makes physical sense, then presumably it has the status of an invention, and we could build such. It would be truly ironic if a "flying saucer" was constructed on the basis of clues that were wholly the product of a twentieth-century myth.

Unfortunately there is a poverty of hypotheses between the extremes of extra-terrestrial machines and misinterpretations

of known phenomena. There is no doubt that the peculiar nature of the data and the main source of their generation presents genuine and difficult epistemological and methodological problems. What we have is a compound relationship of data, different hypotheses, observational uncertainty and reliability of witnesses. Possibly what we need primarily is a model for sorting out these factors, probably some application of the Bayesian model[23].

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Section VI, Chap. I, pp. 559-567.

16. J. E. McDonald: Symposium on Unidentified Flying Objects, U. S. Govt. Printing Office, Washington, D. C., 1968, p. 38.

17. J. J. Gibson: "Perception of Distance and Space in the Open Air", in D. C. Beardslee and M. Wertheimer (eds.) Readings in Perception, Van Nostrand, Princeton, N. J., 1965 ed., p. 423.

18. Allusion to shape constancy. See A. Durham and K. Watkins: "Visual Perception of UFOs" Part II, Flying Saucer Review, 1967, 13, No. 4, p. 25.

19. R. H. Hall (ed.): The UFO Evidence, NICAP, Washington, D.C., 1964, p. 152.

20. J. and J. Vallee: Challenge to Science, Ace Books, Inc., N. Y., 1966, p. 186. The allusion in the book is really to size constancy.

21. Project Blue Book, Special Report No. 14, 1955, made a study in which the data up to 1952 were converted into IBM punched-card form. The analysis, however, consisted of nominal classifications of attributes and geographical and time distributions plus single attribute comparison with known phenomena. While not without value, the study did not pursue the line of investigation demanded here. Unfortunately, we learn from D. Saunders in his book, UFOs? Yes!, (Signet Books, N.Y., 1968, p. 115) that the card deck was thrown away. J. A. Hynek (in a letter reported by W. Markowitz: "The Physics and Metaphysics of Unidentified Flying Objects", Science, 1967, 157, p. 1276) reveals that the Air Force does not have the material in machine readable form. D. J. Pearson (then at the Centre for Computing and Automation, Imperial College, University of London) did perform a time-series analysis of 1500 British sightings. He was prepared to construct a master program using the University of Colorado project's data, when communication with the project staff broke down (Flying Saucer Review, 1968, 14, No. 6, p. 28). The negotiations with the Colorado Project involved 7000 reports. After Dr. Saunders left the project, the data was not allowed to be released to Pearson (Personal communication to me from Pearson, Oct. 21, 1969).

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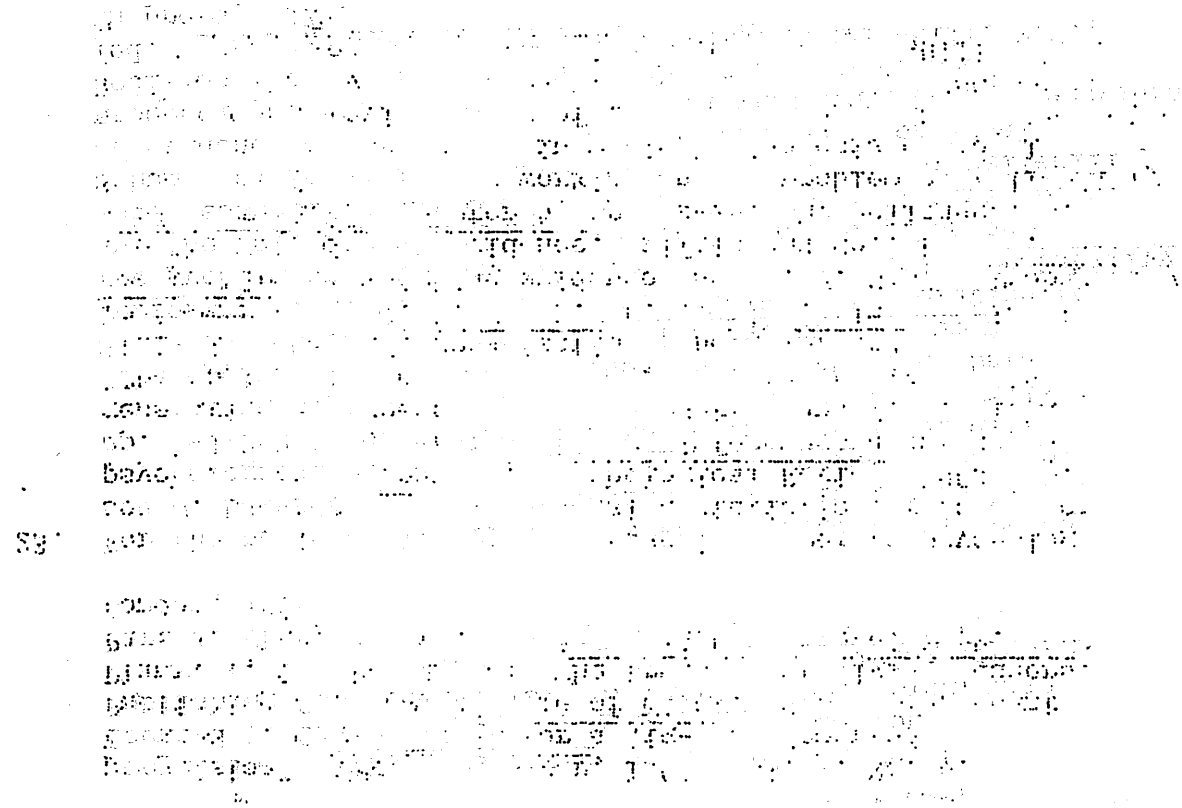

AAAS General Symposium on UFO's

Session 1

Paper 6

Some Psychiatric Considerations About Reports Of Unidentified Flying Objects

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asleep, or during other trance-like states. The Isakower phenomenon is a special instance of the latter. In the mentally ill, this withdrawal may express itself in the form of delusions or hallucinations. In either group the regression to more primitive modes of thinking allows the emergence of highly cathected images or symbols. Two such symbols are the penis and the breast, both of high phylogenetic and ontogenetic significance and related to concepts of omnipotence and omniscience. The fact that many UFO reports describe objects which are "cigar-shaped" or "saucer-shaped," penis or breast like, is suggestive that unconscious determinants may be of importance in some of these sightings.

In closing, we cannot avoid commenting on what appears to us to be an inordinate degree of affective heat generated among scientists involved in the study of the UFO phenomenon, whatever it is. None of us is ever as objective about our work as we often think we are. While intellectually we are acutely sensitive to the need for objectivity, we nevertheless to a greater or lesser degree narcissistically invest our own data, results, hypotheses and theories. It follows, then, that to the extent that this is true, an attack on a man's work is affectively experienced by that man as an attack on himself. Thus, we expect in critical discussion of any scientific topic some bruising of feelings. What is extraordinary about the UFO problem is the degree to which feelings have become involved and polarized. Mature scientists accuse each other of publicity-seeking, deceiving the public, stealing documents, and in other ways being dishonest, and they even threaten each other with lawsuits. It was not even possible to organize this panel

without arousing considerable passion. Clearly the affective involvement among people who are engaged in the study of this phenomenon is at an order of magnitude higher than it is in other kinds of investigation. This affect appears to be generated from the nuclear issue of whether or not at least some UFO sightings indicate the existence of extra-terrestial intelligent beings.

Psychoanalytic experience has demonstrated how often the anxiety generated by the same unconscious conflict will be handled by different people in ways which are diametrically opposed. For example, one person may successfully deal with anxiety arising from unconsious hostile-aggressive urges by becoming a sergeant in the Marine Corps, whereas another, by devoting large amounts of time and energy to the pursuit of peace and other humanitarian goals. We suspect that the extraordinary affect generated by the UFO controversy derives from the fact that some common unconscious conflicts are being displaced onto it. Because again we have no clinical data at our disposal, we cannot know for certain what are the origins of the unconscious anxiety. However, if pressed, we would guess that it may derive from two areas of unconscious concern. We have already mentioned the possibility that repressed infantile sexual conflicts may play a part in some UFO experiences. Similarly for some scientists studying UFO phenomena, anxiety arising from these same unconscious conflicts may be dealt with, through sublimation and displacement, in terms of the issue of whether or not UFO's represent some strange form of life. It is also possible that some of the affective energy which is displaced onto the UFO controversy derives from the unconscious concern with death and immortality.

To carry it a bit further into the realm of speculation it is our guess that for some of those who vehemently defend the extra-terrestial hypothesis it symbolically represents a denial of the finite nature of life. On the other hand, those that have a need to deny that there is any anxiety at all around the issues of death and immortality may be led to attack the hypothesis with considerable passion. While this extraordinary degree of involvement in these positions may have adaptive value for the individual partisans, it is clearly an obstacle to the effort to solve the UFO puzzle.

AAAS Symposium
Session 2, Paper 1
9 am, 27 Dec. 1969

SUMMARY

TWENTY-ONE YEARS OF UFO REPORTS

J. Allen Hynek

The role adopted by the speaker in the presentation of this paper is that of a reporter giving an account of his experience with UFO reports submitted to the Air Force Project Blue Book and those gathered from other sources or reported to him personally and with the interrogation of hundreds of witnesses in the past two decades. The speaker eschews the discussion or presentation of any theories of the UFO phenomenon but confines himself to the incontrovertible fact that UFO reports exist, in this and many other countries, and have been made on a continuing basis for the past many years.

On the basis of his experience the speaker concludes, as far as the observational data of the problem are concerned, that:

1. Reports of UFO observations exist after the deletion of the pronouncements of crackpots, visionaries, religious fanatics et al.
2. A large number of reports are readily identifiable by trained investigators as misperceptions of known objects and events.
3. A small residue of UFO reports are <u>not</u> so identifiable. Of these it can be said that:
   A. They are widely scattered over the earth and come from such widely separated places as northern Canada, Australia, and South America.
   B. They are made by persons of normal competence, who are basically responsible, and psychologically normal; i.e., they can be termed credible witnesses.

existence of the "restricted UFO report" involving strange reports made by credible witnesses in the press, on TV, or in scientific journals. Reasons for this are discussed in detail but the situtation stems primarily from the natural reluctance of witnesses of good reputation in their communities to subject themselves to almost certain ridicule, to the fact that there is no properly constituted scientific body to which reports can be made, nor a reputable scientific journal that will entertain the publication of properly investigated restricted UFO reports. As far as the press is concerned, editors have no way of discriminating between the classes of UFO reports and the natural tendency of editors to stress entertaining news items leads them to play up UFO hoaxes and to treat all UFO reports as jokes of which the witnesses are naturally the butt.

The conclusion of the present paper is that sufficiently strong reason exists to merit the serious attention of the scientific fraternity to the UFO phenomenon even though the final solution of the problem may be as far off as the explanation of the aurora borealis was in 1800. The present evidence should constitute a challenge and an invitation to inquiry for, as Schroedinger has written, "The first requirement of a scientist is that he be curious; he should be capable of being astonished and eager to find out."

Session 2
Paper 2

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, 134th MEETING

Subject	Science in Default: 22 Years of Inadequate UFO Investigations
Author	James E. McDonald, Professor of Atmospheric Sciences
Address	The University of Arizona, Tucson, Arizona, 85721
Time	9:00 a.m., December 27, 1969
Place	Sheraton Plaza Ballroom
Program	General Symposium, Unidentified Flying Objects
Convention Address	Sheraton Plaza Hotel

RELEASE TIME
A.M.'s December 28

No scientifically adequate investigation of the UFO problem has been carried out during the entire 22 years that have now passed since the first extensive wave of sightings of unidentified aerial objects in the summer of 1947. Despite continued public interest, and despite frequent expressions of public concern, only quite superficial examinations of the steadily growing body of unexplained UFO reports from credible witnesses have been conducted in this country or abroad. The latter point is highly relevant, since all evidence now points to the fact that UFO sightings exhibit similar characteristics throughout the world.

Charging inadequacy of all past UFO investigations, I speak not only from a background of close study of the past investigations, but also from a background of three years of rather detailed personal research, involving interviews with over five hundred witnesses in selected UFO cases, chiefly in the U. S. In my opinion, the UFO problem, far from being the nonsense problem that it has often been labeled by many scientists, constitutes a problem of extraordinary scientific interest.

The grave difficulty with essentially all past UFO studies has been that they were either devoid of any substantial scientific content, or else have lost their way amidst the relatively large noise-content that tends to obscure the real signal in the

UFO reports. The presence of a percentually large number of reports of misidentified natural or technological phenomena (planets, meteors, and aircraft, above all) is not surprising, given all the circumstances surrounding the UFO problem. Yet such understandable and usually easily recognized instances of misidentification have all too often been seized upon as a sufficient explanation for all UFO reports, while the residue of far more significant reports (numbering now of order one thousand) are ignored. I believe science is in default for having failed to mount any truly adequate studies of this problem, a problem that has aroused such strong and widespread public concern during the past two decades. Unfortunately, the present climate of thinking, above all since release of the latest of a long series of inadequate studies, namely, that conducted under the direction of Dr. E. U. Condon at the University of Colorado, will make it very difficult to secure any new and more thorough investigations, yet my own examination of the problem forces me to call for just such new studies. I am enough of a realist to sense that, unless the present AAAS UFO Symposium succeeds in making the scientific community aware of the seriousness of the UFO problem, little immediate response to any call for new investigation is likely to appear.

In fact, the over-all public and scientific response to the UFO phenomena is itself a matter of substantial scientific interest, above all in its social-psychological aspects. Prior to my own investigations, I would never have imagined the widespread reluctance to report an unusual and seemingly inexplicable event, yet that reluctance, and the attendant reluctance of scientists to exhibit serious interest in the phenomena in question, are quite general. One regrettable result is the fact that the most credible of UFO witnesses are often those most reluctant to come forward with a report of the event they have witnessed. A second regrettable result is that only a very small number of scientists have taken the time and trouble to search out the really puzzling reports that tend to be diluted out by the much larger number of trivial and non-significant UFO reports. The

net result is that there still exists no general scientific recognition of the scope and nature of the UFO problem.

* * *

Within the federal government, official responsibility for UFO investigations has rested with the Air Force since early 1948. Unidentified aerial objects quite naturally fall within the area of Air Force concern, so this assignment of responsibility was basically reasonable. However, once it became clear (early 1949) that UFO reports did not seem to involve advanced aircraft of some hostile foreign power, Air Force interest subsided to relatively low levels, marked, however, by occasional temporary resurgence of interest following large waves of UFO reports, such as that of 1952, or 1957, or 1965.

A most unfortunate pattern of press reporting developed by about 1953, in which the Air Force would assert that they had found no evidence of anything "defying explanation in terms of present-day science and technology" in their growing files of UFO reports. These statements to the public would have done little harm had they not been coupled systematically to press statements asserting that "the best scientific facilities available to the U. S. Air Force" had been and were being brought to bear on the UFO question. The assurances that substantial scientific competence was involved in Air Force UFO investigations have, I submit, had seriously deleterious scientific effects. Scientists who might otherwise have done enough checking to see that a substantial scientific puzzle lay in the UFO area were misled by these assurances into thinking that capable scientists had already done adequate study and found nothing. My own extensive checks have revealed so slight a total amount of scientific competence in two decades of Air Force-supported investigations that I can only regard the repeated asseverations of solid scientific study of the UFO problem as the single most serious obstacle that the Air Force has put in the way of progress towards elucidation of the matter.

I do not believe, let me stress, that this has been part of

some top-secret coverup of extensive investigations by Air Force or security agencies; I have found no substantial basis for accepting that theory of why the Air Force has so long failed to respond appropriately to the many significant and scientifically intriguing UFO reports coming from within its own ranks. Briefly, I see grand foulup but not grand coverup. Although numerous instances could be cited wherein Air Force spokesmen failed to release anything like complete details of UFO reports, and although this has had the regrettable consequence of denying scientists at large even a dim notion of the almost incredible nature of some of the more impressive Air Force-related UFO reports, I still feel that the most grievous fault of 22 years of Air Force handling of the UFO problem has consisted of their repeated public assertions that they had substantial scientific competence on the job.

Close examination of the level of investigation and the level of scientific analysis involved in Project Sign (1948-9), Project Grudge (1949-52), and Project Bluebook (1953 to date), reveals that these were, viewed scientifically, almost meaningless investigations. Even during occasional periods (*e.g.*, 1952) characterized by fairly active investigation of UFO cases, there was still such slight scientific expertise involved that there was never any real chance that the puzzling phenomena encountered in the most significant UFO cases would be elucidated. Furthermore, the panels, consultants, contractual studies, etc., that the Air Force has had working on the UFO problem over the past 22 years have, with essentially no exception, brought almost negligible scientific scrutiny into the picture. Illustrative examples will be given.

The Condon Report, released in January, 1968, after about two years of Air Force-supported study is, in my opinion, quite inadequate. The sheer bulk of the Report, and the inclusion of much that can only be viewed as "scientific padding", cannot conceal from anyone who studies it closely the salient point that it represents an examination of only a tiny fraction of the most puzzling UFO reports of the past two decades, and that its level of scientific argumentation is wholly unsatisfactory. Furthermore,

of the roughly 90 cases that it specifically confronts, over 30 are conceded to be unexplained. With so large a fraction of unexplained cases (out of a sample that is by no means limited only to the truly puzzling cases, but includes an objectionably large number of obviously trivial cases), it is far from clear how Dr. Condon felt justified in concluding that the study indicated "that further extensive study of UFOs probably cannot be justified in the expectation that science will be advanced thereby."

I shall cite a number of specific examples of cases from the Condon Report which I regard as entirely inadequately investigated and reported. One at Kirtland AFB, November 4, 1957, involved observations of a wingless egg-shaped object that was observed hovering about a minute over the field prior to departure at a climb rate which was described to me as faster than that of any known jets, then or now. The principal witnesses in this case were precisely the type of witnesses whose accounts warrant closest attention, since they were CAA tower observers who watched the UFO from the CAA tower with binoculars. Yet, when I located these two men in the course of my own check of cases from the Condon Report, I found that neither of them had even been contacted by members of the University of Colorado project! Both men were fully satisfied that they had been viewing a device with performance characteristics well beyond anything in present or foreseeable aeronautical technology. The two men gave me descriptions that were mutually consistent and that fit closely the testimony given on Nov. 6, 1957, when they were interrogated by an Air Force investigator. The Condon Report attempts to explain this case as a light-aircraft that lost its way, came into the field area, and then left. This kind of explanation runs through the whole Condon Report, yet is wholly incapable of explaining the details of sightings such as that of the Kirtland AFB incident. Other illustrative instances in which the investigations summarized in the Condon Report exhibit glaring deficiencies will be cited. I suggest that there are enough significant unexplainable UFO reports

just within the Condon Report itself to document the need for a greatly increased level of scientific study of UFOs.

That a panel of the National Academy of Sciences could endorse this study is to me disturbing. I find no evidence that the Academy panel did any independent checking of its own; and none of that 11-man panel had any significant prior investigative experience in this area, to my knowledge. I believe that this sort of Academy endorsement must be criticized; it hurts science in the long run, and I fear that this particular instance will ultimately prove an embarrassment to the National Academy of Sciences.

The Condon Report and its Academy endorsement have exerted a highly negative influence on clarification of the long-standing UFO problem; so much, in fact, that it seems almost pointless to now call for new and more extensive UFO investigations. Yet the latter are precisely what are needed to bring out into full light of scientific inquiry a phenomenon that could well constitute one of the greatest scientific problems of our times.

* * *

Some examples of UFO cases conceded to be unexplainable in the Condon Report and containing features of particularly strong scientific interest: Utica, N.Y., 6/23/55; Lakenheath, England, 8/13/56; Jackson, Ala., 11/14/56; Norfolk, Va., 8/30/57; RB-47 case, 9/19/57; Beverly Mass., 4/22/66; Dunnybrook, N.D., 8/19/66; Haynesville, La., 12/30/66; Joplin, Mo., 1/13/67; Colorado Springs, Colo., 5/13/67.

Some examples of UFO cases considered explained in the Condon Report for which I would take strong exception to the argumentation presented and would regard as both unexplained and of strong scientific interest: Flagstaff, Ariz., 5/20/50; Washington, D. C., 7/19/52; Bellefontaine, O., 8/1/52; Haneda AFB, Japan, 8/5/52; Gulf of Mexico, 12/6/52; Odessa, Wash., 12/10/52; Continental Divide, N.M., 1/26/53; Seven Isles, Quebec, 6/29/54; Niagara Falls, N.Y., 7/25/57; Kirtland AFB, N.M., 11/4/57; Gulf of Mexico, 11/5/57; Peru, 12/30/66; Holloman AFB, 3/2/67; Kincheloe AFB, 9/11/67; Vandenberg AFB, 10/6/67; Milledgeville, Ga., 10/20/67.

DRAFT

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

ANNUAL MEETING

Session 2
Paper 4

Subject.....Motion Pictures of UFO's

Author.....Robert M. L. Baker, Jr., PhD., Senior Scientist of Computer Sciences Corporation and Lecturer, Department of Engineering, University of California at Los Angeles

Address.....4444 Via Marina, Marina del Rey, California 90291

Time.....9 A.M., 27 December 1969

Place.....Sheraton-Plaza Ball Room

Program.....General Symposia: Unidentified Flying Objects Convention

Address.....Sheraton-Plaza, Boston

1. INTRODUCTION

From the data that I have reviewed and analyzed since 1954, it is my belief that there does exist substantial evidence to support the claim that an unexplained phenomenon -or phenomena- is present in the environs of the Earth, but that it may not be "flying," may not always be "unidentified," and may not even be substantive "objects." I would, therefore, prefer the label "Anomalistic Observational Phenomena" rather than "UFO." In this regard, I will concentrate on the anomalistic observational phenomena (motion pictures) and not attempt to support any particular hypothesis as to the source of the phenomena.

In this report I will show and discuss four film clips and discuss two others in a brief fashion.

Two of these films have been dealt with rather thoroughly in the past. (See W. K. Hartmann's remarks on pp. 407-415 of Scientific Study of Unidentified Flying Objects; pp. 319-333 of An Introduction to Astrodynamics by Baker and Makemson, Academic Press, N.Y., 1967; and pp. 31-36 of the Journal of the Astronautical Sciences, Vol. XV, No. 1, Jan-Feb 1968.) The third film clip was taken by Policeman William Fisher on 9 March 1967 and has not, to my knowledge, been as thoroughly analyzed as the first two clips. The fourth film was taken by Mr. Clifford C. Delacy at Kaimuki, Honolulu, Hawaii on 3 January 1958. Like Fisher's film, I do not know of any thorough-going analysis. I believe that these film clips are rather typical of the anomalistic or "UFO" motion pictures. Although I an convinced that many of the films indeed demonstrated anomalistic phenomena, they all have the characteristic of rather ill-defined blobs of light, and one can actually gain little insight into the real character of the phenomena. For example, linear distance, speed, and acceleration cannot be determined precisely, nor can size and mass. This situation is not particularly surprising, since, without a special purpose sensor system expressly designed to obtain information pertinent to anomalistic observational phenomena, or a general purpose sensor system operated so as not to disregard such data, the chance for obtaining high quality hard data is quite small.

The following films represent rather ungratifying subjects for research, both because of their low information content (they simply show little dots of light) and because their analysis must often rely, in part, on the soft-data of eye-witness reports.

2. MONTANA 1950 FILM

Two anomalistic unidentified flying objects were sighted and later photographed at about 11:30 A.M. Montana Standard Time in August (exact date is uncertain), 1950 by Nicholas Mariana at Great Falls,

7. CONCLUSIONS

As already mentioned in this report, "UFO" films are ungratifying objects for research--at least this statement is true for those which I have seen to date. The problem is that amateur photographic equipment is usually brought into action after the most remarkable or interesting aspect of the phenomenon has passed away--the photographer is usually excited, his camera is not at hand, and he is ill-prepared to do an adequate photographic job. Furthermore, films taken with amateur photographic equipment cannot be expected to be as adequate for a competent photogrammetric analysis. Thus, we find ourselves viewing films of little blobs or dots of light. About the only correlation among them is that the images are usually elliptical and usually come in pairs. The characteristics of these blobs and dots may well rule out most conventional natural phenomena, but cannot really allow for a definition of what really is being portrayed on the film. It is a very frustrating experience to analyze these films. One often wishes to grasp on to some candidate natural phenomenon; but later one finds that the theory is shaken and in all honesty the conventional natural phenomena hypothesis is faulty and should not be rationalized further.

If the only alternatives to birds, airplane reflections, mirages, balloons, Venus, etc., was little green men from another solar system scooting around in flying saucers, then I suppose one would be forced to say that such creatures and machines are so unlikely that any alternative, no matter how hard it is to justify, is "better." I do not hold to this concept of <u>one</u> alternative hypothesis. I believe that we <u>are</u> seeing hard observational data (albeit extremely vague in meaning due to its inadequate information content) that result from some as yet not well understood phenomenon or phenomena. It may be small comets propelling themselves in some peculiar manner.

through our atmosphere, it may be some bizare electromagnetic phenomena related to, say, ball-lightning, it may be ephemeral natural meteoritic satellites of the Earth, or it may be a thousand other things. Whatever it is, we are obliged by the scientific method to find out more about the phenomenon or phenomena. It is my conclusion that there is only so much quantitative data that we can squeeze out of vast amounts of data on anomalistic observational phenomena that has been collected to date, even from the "bit buckets" of surveillance-radar uncorrelated targets (UCT's). I believe that we will simply frustrate ourselves by endless arguments over past, incomplete data scenarios; what we need is more sophisticated analyses of fresh anomalistic observational data. We must come up with more than just a rehash of old data such as the fuzzy white dots shown here today.

I emphasize that it is very unlikely that existing optical and radar monitoring systems would collect the type of quantitative data that is required to identify and study the phenomena. Moreover, we currently have no quantitative basis upon which to evaluate and rank (according to credibility) the myriad of eyewitness reports. Thus, continuing to "massage" past anomalistic events would seem to be a waste of our scientific resources. In balance, then, I conclude that:

(1) We have not now, nor have we been in the past, able to achieve a complete-or even partially complete-surveillance of space in the vecinity of the Earth, comprehensive enough to betray the presence of, or provide quantitative information on, anomalistic phenomenona.

(2) Hard data on anomalistic observational phenomena do, in fact exist, but they are of poor quality, because of the inadequacies of equipment employed in obtaining them.

(3) Soft data on anomalistic phenomena also exist, but we have no quantitative procedure to evaluate their credibility and develop clear-cut conclusions on the characteristics of the anomalistic phenomena.

(4) It follows from the scientific method that an experiment or experiments should be devised, and closely related study programs be initiated expressly to define anomalistic data better.

(5) In order to justify such an experiment and associated studies, it is not necessary to presuppose the existence of intelligent extraterrestrial life operating in the environs of the Earth, or to make dubious speculations either concerning "their" advanced scientific and engineering capabilities or "their" psychological motivations and behavior patterns.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, GENERAL SYMPOSIUM ON UFO'S

Subject .....Unusual Radar Echoes
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Time ..... a.m., December 27, 1969
Place .....Sheraton-Plaza Ball Room
Program .....General Symposium on UFO's, Session 2, Paper 5

Symposium
Address .....Boston Sheraton-Plaza

RELEASE TIME
P.M. December 27

Ever since radar first probed the atmosphere, scientists concerned with the interpretation of the returned signal have been intrigued by mysterious echoes, or "angels" from invisible targets in the apparently clear atmosphere. The nature of these targets as proposed by various investigators fall into four categories: (1) surface and airborne targets below the line of sight which are brought into view by anomalous propagation, (2) insects and birds, (3) direct backscatter from sharp gradients or fluctuations in the index of refraction in the clear air, and (4) unidentified flying objects (UFO's). The objective of this summary is to outline some of the key properties of the various types of clear-air and unusual radar echoes and to describe briefly how the targets responsible for these echoes can be identified and how they are related to atmospheric structure and processes. Multiwavelength ultra-sensitive radars, located at Wallops Island, Virginia, have been used over the past five years to study radar echoes from the clear atmosphere. Such clear-air echoes are detected consistently with these radars. Although the echo sources were difficult to identify initially, there is no longer any mystery about the general mechanisms which give rise to the echoes. In all of the detailed investigations which have been conducted with the Wallops Island radars, all classes of targets fall readily into category 1, 2, or 3 listed above. At no time has any object been detected at Wallops Island which remained unexplained and therefore put in the category of a UFO.

after considerable effort and study, have been explained. Assuredly equally strange and bewildering radar echoes will be seen occasionally as new radars are put into operation or as the existing radars continue to carry out their remote probing mission. If a lesson has been learned from past analysis of mysterious radar echoes, it is that strange echoes or radar phenomena are rarely assessed, identified, or explained correctly when observed for the first time or for a short interval. Understanding of the mechanism responsible for the strange echoes comes only after repeated observations and usually a painstaking analysis. The single observation of an unknown event with one radar is open to such a wide variety of interpretations that little is gained by proceeding on that single piece of information. It is necessary to take account of the various possibilities for the explanation of the strange echo, including the possible effect of the performance of the radar and recording system, and then proceed with a plan for a well designed experimental (and possible theoretical) investigation of the event hoping for a recurrence of the phenomenon which lends itself to study.

References:

(1) Bean, B. R. and E. J. Dutton, 1966: Radio Meteorology. Nat. Bur. of Standards Monograph 92. U.S. Government Printing Office, 435 pp.

(2) Condon, E. U., 1969. Scientific Study of Unidentified Flying Objects. Bantam Books, N. Y., 965 pp.

Case #1

Example of Nocturnal Light

Date of Sighting: September 22, 1966, approximately 3:00 a.m.
Duration of Sighting: Approximately 1 hour
Location: Deadwood, South Dakota
Clear night, stars all visible, very light breeze

Statement obtained from witnesses:

At about 2:40 a.m., Officers A and B were patrolling to the North end of "76" Hill, Deadwood, S.D. "76" Hill is a mountain extending up out of the canyon at the north end of Deadwood. Highway U.S. 14 passes up this mountain. Officer A stated that as they drove up to the top of the hill, they noticed a large white, round object in the sky a little to the Northeast of them. They stopped at a parking area on top of the hill and were facing to the ENE as they observed the object. It appeared to be at about a 50 degree angle into the sky from where they stood. It looked like the object was between Deadwood and Sturgis. Officer A radioed to Rapid City on the State Radio in the car and asked if they could see it. Rapid City replied in the negative, but told them to log on their radio sheet the time and duration of the sighting. Sturgis then radioed Officer A that they could see the object in the direction of Deadwood, so it apparently was between Deadwood and Sturgis. The radio operators at Spearfish, Belle Fourche and Leed all radioed in stating that they could also see the object. Officer A stated that they watched it hang motionless in the sky from 15 - 20 minutes. He stated that on 2 or 3 occasions, he shined the light from the police car spot-light on the object and it would black out, then come back on when the spot-light was turned off. Also during this period, it would turn to a pale green, then to red then back to white. It was about the size of a silver dollar held out at arms length. After watching it for about 15 - 20 minutes, they then noticed a smaller object, about the size of a pea held at arms length, streaking in toward the larger object from the Northwest. It got close to the large object then stopped. It too was a bright white color. Then at about the same time, they noticed another object, the same size, streaking in from the Southeast. It stopped also close by the larger object. After the smaller objects came in close range to the larger, and had stopped, then the larger object started moving to the right, then down, then to the left, then up again, in square type formations. As it did this, it would send out occasional blue shafts of light toward the ground. These shafts of light would last only 2 or 3 seconds, then go out. Again Officer A shined his spot-light on the larger object and it would go out, then come back on when the spot was turned off. The radio operators at the above mentioned other locations also radioed that they could see this object manuevering, with the other two remaining motionless in one position. After about 30 minutes of this, the smaller objects shot off at high speed in the direction from which they had come. Officer A said it appeared to take about 5 seconds for them to shoot off into the distance to where they couldn't be seen again. Then for another 25 minutes or so, the larger object stayed in one spot, shooting out the shafts of blue light, then it began moving at high speed, stopping, backing up, then moving forward again at high speeds, till finally it too had disappeared into the Southeastern skies. No noise was noticed from any of the objects. No airplanes were heard or observed during the sightings.

Case #2

Example of Nocturnal Night

Date: September 22, 1967
Observer: Catholic Priest

The following is excerpted from a personal letter from Observer.

"I think it is necessary that I tell you my opinion. I was the last person in the world, I would say, to imagine that I had seen one, (UFO) because I have been very skeptical. In the first place, I think a person can see anything they want to see in the sky, if they look long enough, for a flashing moment anyway. Number two, I think it highly illogical that a rational creature other than man, if he was interested in our planet, would certainly make an effort to contact man, where as all we see are the objects. If we were visitors from another planet one of the first things we would do when we got there is to make contact with another rational creature. We have no record of this, which as I say, my judgment of the matter was that they did not exist. I was rather cynical I would say, and suspected anyone that said they saw them. I go to great bother to stress to show you that my mind was not pre-disposed to imagining that I saw them. As a matter of fact, I was one who had to be totally convinced.

"I was coming down the road one Friday night, I would say, I may be wrong, the 4th Friday of September, the time was about 8:30. I saw this light on my window, I was coming south from Versailles, about 3 miles outside of Gravois, when I noticed this light about the size of, I would say, bigger than a big grapefruit. I immediately suspected, because this light was so clear and bright and low lying, I suspected that this was a reflection from some light from the ground reflected in the window and I said to myself I'll prove it is a reflection, so I turned the window down. The light didn't go away, it was still there, so I pulled the car into the side of the road. I watched it and I was amazed, there was no doubt about it, it was there. It appeared not to be too far away, although I presume it was quite a distance away and this looked so real to me, that I even waved to it. I watched it for 15 minutes. There was a constant stream of traffic going toward the lake. It amazed me that no one else got out of their cars, they kept on going. I was standing there on the side of the road looking up at it. It was dusky. After a while it seemed to move off, but it didn't move in a uniform motion. It made kind of a round swing and eventually it seemed to head off toward the northwest and then it swung a little to the north and then it seemed to go towards the northeast.

"After that I wasn't too far, as a matter of fact only about a mile from another gentleman, who was equally as skeptical as I am, about as hard-headed also. I went up and very gingerly I told him what I had seen and he and his son had seen the same thing. Definitely we saw something, no doubt about that.

"Now how far distant was it? I thought myself it looked like at one stage that it was round with a dome shape on the side further away but it was such a short span of time that maybe I could have imagined it. I saw it definitely stationary for about 15 minutes. I timed it. And I saw it take off in that direction. What it was I will not even try and judge, but I know it was no hallucination." (How fast was it moving and when did it move?) "I couldn't judge, it seemed to me to be going far faster than an airplane, it couldn't have been an airplane." (What color was the object?) "It was a bright yellow." (Could you see any other lights on the object?) "No." (Could you see any definite shape to it?) "No definite shape except for what I said, for a while I thought it was kind of flat with a dome shape on top,

and I was real cool and calm and not a bit excited. As a matter of fact I was amazed." (Could you hear any sound?) "There was a sound going on at the time and it is amazing that you ask that, but whether you can identify that sound with the object I think you would find very hard. There was definitely sound going on. It was very interesting to me. I was interested in that, but again there is no way of identifying the two. But it was a rather strange sound. I was wondering if it was some kind of an animal, but I never heard anything that could make that kind of sound."

Case #3

Example of a "Daylight Disc"

Date: January 16, 1952
Six Witnesses
Location: Artesia, New Mexico

Description of Incident:

On 16 January 1952, two members of a balloon project from the General Mills Aeronautical Research Laboratory and four other civilians observed two unidentified aerial objects in the vicinity of the balloon they were observing. The balloon was at an altitude of 112,000 ft. and was 110 ft. in diameter at the time of the observation.

The objects were observed twice, once from Artesia, New Mexico, and once from the Artesia Airport. In the first instance, one round object appeared to remain motionless in the vicinity, but apparently higher, than the balloon. The balloon appeared to be 1½ inches in diameter and the object 2½ inches in diameter and the color was a dull white. This observation was made by the two General Mills observers.

A short time later the two observers and four civilian pilots were observing the balloon from the Artesia Airport. Two objects at apparently extremely high altitude were noticed coming toward the balloon from the northwest. They circled the balloon, or apparently so, and flew off to the northeast. The duration of observation was about 40 seconds on the second instance. The two objects were the same color and size as the first object, as was observed from Artesia. The two objects were flying side-by-side, and when the object appeared to circle the balloon, they disappeared causing the observers to assume they were disc-shaped and had turned on edge to bank.

The above example was never followed up by the Air Force, although the report was made originally to the Air Force and was classified for twelve years.

Case #4

An Example of a "Daylight Disc"

Date: June, 1958
Location: A small town in Minnesota

The following is excerpted from a personal letter from Observer:

"Prior to 1958 I discounted reports about UFOs. I had witnessed many falling stars through the years and had watched meteors traveling through the evening skies that emitted puffs of smoke and exploding rounds and bright lights and knew they were what my dad told us when we were kids.

"But then came my own experience of actually seeing and hearing one of these unidentified objects and I might as well relate it to you so that you have another 'hoax or hallucination' as they have been so often termed.

"It was about 6:30 p.m. on a day in June, 1958. My wife and I had just finished supper. I went out and started the garden hose to water our shrubbery and plants around the place. The sun had dropped below the horizon but the western sky was quite golden after the rain shower. There was a large thunderhead cloud in the southwest sky. This was beautifully lit up on the one side by the descending sun in creamy white and pinkish colors and the dark blue and black away from the sun. I heard a sort of whining noise. I though that one of my neighbors about a block away might be running a skillsaw on some odd job and again attended to my watering.

"The sound became stronger and a steady whine. For a moment I thought it might be my wife with the vacuum cleaner but remembered she was doing the supper dishes. By this time the sound was really quite loud and seemed to be coming from the southwestern part of the sky. I wondered whether it could be an army jet plane but the sound was not like what I had heard of jets before. Finally, I turned around and looked up toward the thunderhead from where the sound now seemed to be coming. As I looked I saw this thing come out from behind the thunderhead. The first few moments I believed it to be a helicopter but then I saw the shape and no propeller and the sound was not the chop-chop of a copter.

"I stood there spellbound for a few moments as this thing came forward and downward--the hose squirting water all over the place. Then I started to yell to attract my wife's attention. I knew I was seeing something I had never seen before. My wife heard me yelling and came rushing out of the house, asking 'What's the matter - are you hurt - what happened?'

"I still stood there sort of rooted to the spot, the water running down the road. I couldn't talk coherently but pointed the nozzle of the hose up to the sky and finally was able to say, 'Look, up there, see that strange flying thing - up there, there' -- and tried to get her to focus her attention to what I was trying to show her but by the time she could understand what I was trying to tell her she just saw the last part of it as it went back behind the thunderhead.

"I remarked to here that this was something new in flying machines - probably some new government test and said that no doubt others in the town saw it and we'd read about it in the next daily journal.

"There was no mention of anything in our local paper and I couldn't imagine that this thing should have been unnoticed by anyone else around here. Later I

realized that in town with trees in the streets, it probably had not been visible. Then too, many people were in the houses and probably in cars. Our neighbors were gone from home and though I had yelled like a maniac nobody had come out of the neighboring homes. I made a pencil sketch of it and kept quiet.

"What I saw was plain as day. It was near enough so that I got a good view in several positions. It sort of spiraled and glided and was silvery in the sun reflection with what appeared to be portholes showing dark as interiors would. In comparison with the top of Hermann's Monument I would judge it to be about 150 feet in diameter. I don't know what height thunderheads usually are but the distance could be judged from that.

"Nobody can tell me that I didn't see what I saw or didn't hear it. Why should a man in my walk of life - a landscape architect, known to be mentally sound - suddenly think he saw and heard something he didn't?"

Case #5

An Example of a Close Encounter with Physical Effects

Date: 20 January 1967
Three Witnesses
Location: Methuen, Massachusetts

Witnesses were proceeding Northeast on a street which runs through a lonely area bordered by woods, field and a few houses. Reaching the top of the hill they suddenly came upon a straight string of bright glowing red lights moving NE along the roadside to their North. They appeared to be at an altitude of 500-600 feet and just off the road at a point estimated to be about 400-500 feet away from them. Witnesses immediately slowed the car and proceeded toward the lights. When almost broadside to the lights which now seemed to be hovering, the object, to which they were apparently attached swung around in a smooth side-ways turn revealing a new light configuration and color. Four distinct lights formed a perfect trapazoid. Two red lights formed the top and two white lights formed the base. One witness was certain she saw a dimmer white light just above the two red lights. All were impressed by the large size of the individual lights and the apparent size of the object that they must have been attached to. The red lights were compared to the color and brightness of a hot electric stove burner. A metallic glow reflecting metal "like the color and texture of an erector set metal" was seen about the lights. The center of the trapazoid seemed to be dark and non-reflecting. The driver pulled over to the side of the road directly broadside to the object which seemed to be lower and only 100-300 feet away. The witnesses decided it would be best to stay in the car which was idling with lights and radio on. Then abruptly the engine, lights and radio failed completely except for the generator light which just barely lit up and was pulsating off and on. The driver immediately tried to start the car but the engine would only "moan" and would not start. Thinking that the lights and radio switch being on might be overloading the battery, the driver tried to start the car again after switching them off but was unsuccessful. The driver had opened the side-window. The others were afraid to put down the larger windows. No noise was heard. Then the object began moving slowly and then shot away at great speed in a SW direction. The driver was then able to start the car and the lights worked perfectly as did the radio later on when they turned it on.

Case #6

Example of a Close Encounter with Physical Effects

Date: 6 March 1966
Location: Missouri
Time of Observation: 11:00 a.m.

Excerpt from tape recording of account by witness:

The sky was clear and the sun was behind the observer. Witness was driving a Corvair and her dog, a St. Bernard, was sleeping in the back seat." Then the dog started acting very strangely, barking and seemingly quite upset. The dog jumped up on the front seat with the hair standing up on the back of his neck. All of the sudden he acted as though someone had whipped him and tried to get down under the seat. He was whimpering and was real scared." The observer then saw the beam of light on the road ahead of the car. The light beam extended about one foot over each side of the road, which has a 24' pavement, and the beam was blue-white in color and bright enough so that the observer could see what appeared to be dust particles in the beam. As the observer looked through the beam the road beyond seemed distorted as though by heat waves. As the car entered the beam it slowed from about 50 to 60 miles per hour to about 10 miles per hour. As the car began to slow, the observer looked out and up through the windshield and saw a disc-shaped object hovering over the road. She estimated it to be some 1,000 feet high, it appeared to be quite large. It appeared larger than a dime held at arms length. Witness reported the object appeared to be metal with a raised or domed area at the top. Witness could see no detail, lights on the object or seams. The light beam narrowed to a small area in the lower center of the disc. The object appeared to be stable, it did not wobble. The surface seemed to be very smooth. The light beam was very bright and witness had to close her eyes partially to look at the object. Witness stated that her eyes bothered her for 3 days following the sighting. When the car slowed to about 10 miles per hour, she pushed the accelerator to the floor, but the car would not respond. After passing through the beam the automobile ran smoothly again. She then drove straight home and did not look at the object. The total duration of the sighting was about 10 seconds.

Case #7

Example of a Radar Visual Sighting
(Briefly mentioned in the Hynek Paper)

Date of Sighting: 4 November 1957
Location: Kirtland Air Force Base, Albuquerque, New Mexico

Observation made from Control Tower:

At 10:45 p.m. both witnesses were on duty alone in the control tower at Kirtland AFB, New Mexico; the tower is slightly over one hundred feet high. One of the controllers looked up to check cloud conditions and noticed a white light traveling east between 150-200 miles per hour at an altitude of approximately 1500 feet on Victor 12. Witness then called the radar station and asked for an identification of the object. The radar operator reported that the object was on an approximate 90 degree azimuth heading. The object angled across the east end of Runway #26 and now in a southwesterly direction. It began a sharp descent. One witness gave a radio call in an attempt to contact what was believed to be an unknown aircraft that had become confused about a landing pattern. The object was then observed through binoculars, and appeared to have the shape of "an automobile on end". This was estimated to be 15-18 feet high. One white light was observed at the lower side of the object. The object slowed to an estimated speed of fifty miles per hour, and disappeared behind a fence at "Drumhead", a restricted area which is brilliantly floodlighted. This was approximately one-half mile from control tower. It reappeared, now moving eastward, and one witness gave it a green light from the tower, thinking it might be a helicopter in distress. The object at this point was at an altitude of 200-300 feet; it then veered in a south-easterly direction, ascended abruptly at an estimated rate of climb of 45,000 feet per minute, and disappeared. Witnesses stated the object climbed "like a jet", faster than any helicopter.

Although there were scattered clouds with a high overcast, visibility was good. Surface winds were variable at 10-30 knots. Witnesses observed the object for 5 or 6 minutes and approximately half of that time through binoculars.

The Radar Operator stated that the object was first sighted on the approximate east boundary at Kirtland AFB on an east south east heading. Then it reversed course to a west heading and proceded to the Kirtland low frequency range station where object began to orbit. From the low frequency range station, the object took a north west heading at a high rate of speed and disappeared at approximately 10 miles from the observer. About 20 minutes after disappearance an AF C-46 took off to the west making a left turn out. At this time observer scanned radar to the south and saw the object over the outer marker approximately 4 miles south of north south runway. The object flew north at a high rate of speed toward within a mile south of the east west runway where he made an abrupt turn to the west and fell into trail formation with the C-46. The object maintained approximately ½ mile separation from the C-46 on a southerly heading for approximately 14 miles. When the object turned up north to hover over the outer marker it stayed in the position for approximately 1½ minutes and then faded from the scope.

American Association for the Advancement of Science

1515 MASSACHUSETTS AVENUE, NW, WASHINGTON, D.C., 20005

(Sheraton-Boston Hotel) 29 December, 1969

The Hon. Robert Seamans, Jr.
Secretary of the Air Force
Washington, D.C.

Dear Mr. Secretary:

The scientists listed below, convened at a General Symposium during the Annual Meeting of the Association, understand that USAF Project BLUE BOOK has been discontinued in accordance with Dr. E. U. Condon's recommendation in the Colorado Study of Unidentified Flying Objects. We know that Project BLUE BOOK accumulated, over the past two decades, irreplaceable data of great historical interest and potential value to physical and (particularly) behavioral scientists.

After two days' discussion of the data involved, the Colorado Study, and several proposed studies by sociologists and psychologists, we formally request that you, Mr. Secretary

(1) Ensure that *all* of the material, both classified and unclassified, be preserved without alteration or loss,

(2) Declassify promptly all documents filed by the Aerial Phenomena Section of the Wright-Patterson Air Force Base which are classified by virtue of AFR 200-17 and AFR 80-17,

(3) Make all the unclassified documents available to qualified scientific investigators at a more suitable location than the USAF Archives (we recommend a major university in the mid-west), and

(4) Order an annual review of the remaining classified documents in the present file to determine when they can be declassified without alteration in accordance with current USAF security procedure.

My twelve colleagues, who receive copies of this letter, would appreciate your favouring us with a reply. I can distribute it to the others if you address it to Dr. Page, 18639 Point Lookout Drive, Houston, Texas 77058.

Sincerely,

Thornton Page (Wesleyan University)
Chairman, AAAS Special Committee, for

Walter Orr Roberts, Retiring President, AAAS
Franklin E. Roach, University of Hawaii
William Hartmann, University of Arizona
Lester Grinspoon, Harvard University
Robert Hall, University of Illinois
Philip Morrison, Mass. Inst. of Technology
Douglass Price-Williams, Rice University
J. Allen Hynek, Northwestern University
James McDonald, University of Arizona
Carl Sagan, Cornell University
Walter Sullivan, The New York Times
George Kocher, University of S. California

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made out a good case for disregarding all radar cases except (I would say) those in which solid visual evidence was also present. This has been my attitude all along: radar returns can be caused by so many anomalies or physical effects that radar reports can be considered as supporting but never as primary evidence in the UFO problem.

Menzel's contribution

Dr. Menzel's paper was presented by Dr. Roberts because of Menzel's illness. Of all the papers, it was the only one to descend to personalities and in particular it lambasted McDonald. I received a lesser blast but still one which, interpreted, made me out as being some where in between a misguided scientist and a congenital idiot. When the time came for rebuttal from the floor, I declined, although McDonald did not and gave Menzel a dressing down (all in good scientific terms, of course). Menzel had stated that he had "solved" many cases for the Air Force that I failed to solve. One case he gave as an example was that of two witnesses in an EM (car stopping) case who, he said, had mistaken the moon for the UFO; the car stopping was, according to him, "entirely irrelevant!" He failed to point out that the moon was in the wrong part of the sky—the witnesses saw the "moon" low in the northern(!) sky, whereupon it suddenly came close and hovered over their car. Perhaps a new textbook in astronomy should be written!