SCIENCE IN DEFAULT:
22 YEARS OF INADEQUATE UFO INVESTIGATIONS

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(Material presented at the Symposium on UFOs,
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**Part 1 of 2 Parts**

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     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 wide spread 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 nearly 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.

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     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 meaning less 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 any thing 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.

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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.

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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.

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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 Forces 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 meteorological 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 ample 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 analyzer. 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 almost certainly have been for gotten 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 his flight experience. The light went from their 11 o'clock to the 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 focused 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 analyzer, 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 to had 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 decidedly 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 he 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 that 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 siqhting, 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 target 25-30 miles ESE, which moved at very high speed on constant 295 deg. 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 siqhting, 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 GCS radiation 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 deg. 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 they 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 deg. at 5-10 kts) to the 6000 ft level (260 deg., 30 kts), and then hold at a steady 260 deg. 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 stationary, and final motion off-scope at a direction about 45 deg. 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, 213O-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 unfortunate, 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 AFR 200-2 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 AFR 200-2 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 AFR 200-2. 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) traveling 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.

    AFR 200-2 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 AFR 200-2 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 and 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 Blue book 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, 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 Blue book 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 astronomical 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.