

Science, Technology, and UFOs

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Science has, over the past few centuries, erected a strong framework of fact and theory that successfully compasses much of our experience. On this impressive and steadily rising framework are supported our ever-broadening technologies - the kinds of technologies so well represented by the aerospace technology in which many of you are engaged. These Laboratories here in East Hartford where we are meeting today exemplify the symbiotic interrelations of technology and science that mutually support and nurture both of these important activities of modern man.

Some Truisms About Science, Technology, and UFOs

A truism about science that has strong bearing on what I shall be saying to you concerning the UFO problem is this: Proud as we can be of today's cumulative record of scientific exploration of the world about us, we certainly do not yet know all that deserves the name of fundamental scientific knowledge. Indeed, do we not all subscribe to the spirit of the closing lines of Alfred Noyes' moving trilogy about science, *The Torchbearers*,

“Who that has once seen how truth leads on to truth
Shall ever dare to set a bound to knowledge?”

A truism about technology that has strong bearing on what I shall be saying about UFOs today is this: Given time, an edifice of expanding technology far more impressive than that which we see about us in 1967 could be erected simply on the basis of the present stock of fundamental scientific knowledge. The magnitude of the technological edifice that will grow with the seemingly exponential increase of future scientific discoveries is vastly greater, unforeseeably greater than our current technology.

A truism about modern man's outlook on nature and on his place therein that has strong bearing on the present status of the UFO problem is this: In his centuries-long struggle out of slavery to superstition and fear of the supernatural, modern science-oriented man has developed subtle but well-ingrained dispositions to reject observations and reports of the anomalous and the inexplicable; and that rejection is the more vehement the farther the observations seem to lie beyond the pale of present-day science.

Finally, a truism about UFOs themselves: Today, as for the past twenty years of the “UFO era,” a majority of scientists tend to view UFOs as a nonsense problem, one deserving only scorn or silent disdain. Throughout the entire world, only a small handful of scientists have taken the trouble to attempt direct checks on the puzzling and recurrent reports of UFO phenomena; compared with that handful, there has been a large and rather vocal group who have either explicitly or indirectly ridiculed the notion that there might be unconventional craft-like objects operating over our planet, and their

scoffing has been based not upon extensive personal investigations of UFO reports, but primarily upon *a priori* considerations. Most of this scorn has been directed against the suggestion that UFOs are of extraterrestrial origin.¹ Because I shall be referring to this latter idea frequently here, I shall use ETH to denote the extra-terrestrial hypothesis concerning UFOs. It will here imply the hypothesis that UFOs are some kind of extraterrestrial probes or vehicles, products of some technology other than our own.

Other Hypotheses Competitive with the ETH

Although I shall not here examine them in any detail, it will be well to list the principal alternative hypotheses for accounting for UFOs. One can group them usefully into the following eight categories:

- 1) Hoaxes, fabrications, and frauds;
- 2) Hallucinations, mass hysteria, rumor phenomena;
- 3) Lay misinterpretations of well-known physical phenomena (meteorological, astronomical, optical, *etc.*);
- 4) Advanced technologies (test vehicles, satellites, re-entry phenomena, *etc.*);
- 5) Poorly understood physical phenomena (rare atmospheric-electrical effects, cloud phenomena, plasmas of natural or technological origin, *etc.*);
- 6) Poorly understood psychological phenomena;
- 7) Extra-terrestrial probes, *i.e.*, the ETH;
- 8) Messengers of salvation and occult truth.

Skeptical scientists with limited exposure to the UFO record generally prefer to think that UFO reports can be explained adequately by some admixture of hypotheses 1, 2, 3, and perhaps occasionally 4. If they have given the existing UFO literature² more than cursory inspection, they may somewhat grudgingly add that possibly hypothesis 5 warrants study, since something of real scientific interest (perhaps in atmospheric physics, say) might be learned by a closer examination of selected reports.

I have encountered a substantial number of skeptical laymen, aware that many UFO reports seem to

¹ W. Markowitz, *Science*, 157 (1967), No. 1274. Markowitz, in concluding, expressed his fear that “21st-century science will contemplate with wonder the fact that, in an age of science such as ours, the U.S. Air Force was required to sponsor repeated studies of UFOs.” Dr. Edward U. Condon, director of a current UFO investigation sponsored by the USAF, in an interview of Sept. 27, 1967, with the *Rocky Mountain News*, was quoted as agreeing in general with Markowitz, and more specifically paraphrased Markowitz by saying that “the 21st century may die laughing when it looks back on the many things we have done. This Colorado UFO Study may be one ... I'm almost inclined to think such studies ought to be discontinued unless someone comes up with a new idea on how to approach the problem.”

² The totality of UFO “literature” includes much that is scientifically worthless. I regard as the outstanding contribution to the more solid UFO literature *The UFO Evidence*, edited by Richard H. Hall, and published 1964 by NICAP. Another very recent addition to the UFO literature that deserves wide study is a book by Ted Bloecher, *Report on the UFO Wave 011947*, also available from NICAP. Recent, useful books by Stanton and Young are cited below. An earlier and quite significant reference is E.J. Ruppelt's *Report on the Unidentified Flying Object* (Doubleday, 1956). A useful source on a selection of about 160 interesting cases is *The Reference for Outstanding UFO Sighting Reports*. Others could be cited, but the main point stressed here is that there do exist references from which a reliable estimate of the nature of the UFO problem may be drawn.

comprise credible accounts of machine-like objects maneuvering in our atmosphere in unusual manner, who prefer hypothesis 4. I reject it categorically as an explanation of any but occasional reports of inherently small interest (re-entry luminosity, unaccounted sonic booms, sunlit contrails, *etc.*). A recently published book by Bloecher (see reference 2) has strong bearing on hypothesis 4, since Bloecher has uncovered over 800 UFO sightings in an approximately two-week period in the summer of 1947, when the “flying saucers” first received public attention. Many of those reports are essentially similar to 1967 sightings; so one seems forced to say that at least as early as 1947 (and probably substantially earlier), the UFOs were with us. To assert that some secret technology was, right after World War II, producing superlative vehicles still far beyond the known state of propulsion technology should be particularly unbelievable here at United Aircraft. I say that all such ideas centered on hypothesis 4 can be regarded as having only vanishingly small probability of explaining the UFO puzzle. Persons subscribing (often fervently) to hypothesis 8 undoubtedly contributed in a significant way to discrediting the UFO problem. Cultist and crackpot ideas abound in a garish “literature” of paperbacks and magazine articles, mainly aimed at the suggestion that the Space Brothers from Venus, Mars, and Saturn are here to save us from such hazards as “unbalancing the atomic state of the upper atmosphere with H-bomb radiations.” This all-too-visible group is frequently identified by scientists as constituting the totality of those who take the UFO problem seriously.

To lump serious students of the UFO problem together with the cultist-crackpot fringe is an error that results simply from limiting one's examination to a superficial, armchair approach to the UFO record. One can, in fact, easily and quickly separate the crackpots and identify the serious investigators. Regrettably few scientists have yet taken the trouble to do so.³

Mirages and Ball Lightning

One of the few scientists who have examined a substantial number of UFO reports and still scorn hypothesis 7 is Dr. Donald H. Menzel, former Director of Harvard Observatory. His second book⁴ is chiefly aimed at explaining UFOs in terms of hypothesis 3 and especially in terms of atmospheric-physical phenomena (refractive anomalies, mirages, meteorological optical effects, *etc.*). In a small fraction of all the reports he treats, he adduces hypotheses 1, 2, or 4; but mainly he stresses hypothesis 3. I have elsewhere⁵ cited a number of specific examples of objections to Dr. Menzel's

³ Predisposition to identify the entire UFO problem with the crackpot aspects was particularly well documented in the views expressed by a number of scientists interviewed as part of an hour-long program produced in the CBS Reports series on May 10, 1966, entitled “UFO: Friend, Foe, or Fantasy.” The viewer could only conclude from this program that scientists believe that UFOs are seen and discussed almost entirely by persons who have “a need for miracles, a need to believe.” My own investigative experience runs exactly counter to this: I have found that the “believers” are hardly interested at all in UFO reports *per se*, not needing them to back up their firm convictions. And by contrast, the impressive reports come from responsible persons whose typical reluctance to come forward and report what they have seen results from concern that they in no way be confused with such “believers.” Scientists who condemn UFO witnesses as “believers” deserve strong criticism for their non-scientific behavior!

⁴ D.H. Menzel, *The World of Flying Saucers: A Scientific Examination of a Major Myth of the Space Age* (Doubleday, 1963).

⁵ J.E. McDonald, *UFOs: Greatest Scientific Problem of Our Times?* presented to the American Society of Newspaper Editors (Washington D.C., April 22, 1967).

approach in explaining away UFO reports. A characteristic defect of his treatment is, in my opinion, his use of arguments that are perhaps qualitatively reasonable but definitely not quantitatively reasonable. In other instances, I would object that he simply ignores essential parts of the sighting in arriving at his conclusion.

In the famous July 24, 1948, Chiles-Whitted sighting over Montgomery, Alabama, involving two experienced Eastern Airlines pilots, Dr. Menzel insists on the “meteor” explanation of the fast, glowing object that passed a DC-3 on near-collision course, despite the clear-cut testimony of both men that, just as the object passed on their starboard side, it executed an abrupt pull-up. I have recently interviewed both Chiles and Whitted, confirming this important point and many others that cannot be squared with the “meteor” explanation that Dr. Menzel stresses, that Air Force consultant Dr. J.A. Hynek first proposed in 1949, and that A.F. Project Bluebook officially accepted as its explanation 6 years ago.⁶

Both pilots reiterated to me, quite recently, that each saw square ports or windows along the side of the fuselage-shaped object from the rear of which a cherry-red wake emerged, extending back 50-100 feet aft of the object. To term this a “meteor” is not even qualitatively reasonable. One can reject the testimony; but reason forbids calling the object a meteor.

Another example of both Dr. Menzel's and Project Bluebook's insistence on explanations that are not even qualitatively reasonable can be found in a multiple-witness sighting at Vandalia, Ohio, on the morning of March 8, 1950. Despite the fact that the object was sighted in daytime conditions by several pilots in the air (hence viewing the glowing object through a windshield and viewing it from a moving platform), Dr. Menzel concludes (along with Bluebook) that this was a case of the planet Venus misidentified as a UFO. That ground radar at Wright Patterson AFB got an echo from the unknown, he explains always as due to a radar return from an “ice cloud,” ignoring the point that only in the closing portions of the extended observation were clouds present. Two F-51 pilots were scrambled and, by Dr. Menzel's own admission, had no difficulty in climbing up with the object in a steady view (until a cloud deck finally interfered).

Anyone who has tried to find Venus and then to keep it located while engaged in even the slightest distractive activity will surely agree that it is essentially out of the question for a fighter-pilot to execute flight maneuvers and keep Venus identified in daytime conditions.

Still more qualitatively unreasonable is the testimony of one of the commercial airline pilots, whom I have quite recently located and interviewed. TWA Capt. Dean Miller, inbound to Vandalia, saw the object dead ahead of his plane, in a direction not at all matching Venus' sky location; and, while he had it well in sight, observed the shiny or glowing elongated object move out from its hovering position and climb through a ninety-degree arc to another position again inconsistent with Venus' position in the southeastern sky.

The fact that one military pilot objected to the Bluebook Venus explanation on grounds that he looked in the same part of the sky the following day and found no such object as he had pursued in his F-51, Dr. Menzel explains away as follows: “Weather conditions the first day would have distorted the image and made it unlike the pale light of Venus occasionally visible in the daytime. It was not visible at all the following day because of different weather conditions.”

⁶ Mort Young, *UFO: Top Secret* (Simon & Schuster, 1967).

Are any quantitative arguments offered to support such a conclusion? No. As a matter of fact, for the substantial angular altitude of Venus at the time of this protracted ground-air-radar observation, nothing but direct smoke- or cloud-obscurations could comprise a "weather condition" that would significantly affect the difficult task of finding Venus in the daytime sky. I here add to my previous criticisms of Dr. Menzel's approach to the UFO problem because he has had what I can only view as a deleterious influence on scientific thinking about the UFO problem. A scientific colleague of mine, who was in Russia not many months ago, asked many Russian astronomers how they felt about the UFO problem and was told by most that Menzel explained the whole thing quite satisfactorily. I strongly disagree. Some of his explanations are acceptable, but the bulk of them do not seem to me to constitute reasonable assessments of the facts.

Because we always have more to learn, most scientists approaching the UFO problem for the first time will surely keep hypothesis 5 well in mind. There may be still poorly understood atmospheric or even astronomical phenomena which are being misinterpreted by observers as vehicular objects of unconventional nature. I agree with the importance of repeatedly assessing this possibility and carefully matching it against the details of well reported UFO observations. The serious difficulty with this hypothesis is posed by the many reports from apparently quite credible witnesses in which the object seen is entirely too much like a fabricated product of technology (*i.e.*, machinelike) to warrant an explanation, say, in terms of some poorly understood plasma phenomena. I have said before (reference 5) that attempts to account for the core of the UFO problem in terms of corona-discharge and ball lightning effects represent failure to confront the fact that the bulk of the important cases are not even remotely like such plasmoids. In my opinion, Philip J. Klass, one of the editors of *Aviation Week*, has yet to advance arguments adequate to support his repeated contentions that UFOs are simply various types of plasmoids. To be sure, plasma-like glows accompany many nighttime reports of high credibility, but daytime reports of formations of disc-like objects flying overhead or pacing aircraft under fair weather conditions are not as easily subsumed under the plasmoid heading as Klass would suggest.

A report of seemingly high credibility which, interestingly enough, was jointly heard from the eye-witnesses by Dr. Menzel, Mr. Klass, and myself, along with several hundred editors of major American newspapers (see reference 5) is a case in point. On the afternoon of May 21, 1966, we were told, Mr. William C. Powell and Miss Muriel McClave were flying in a Luscombe over Willow Grove, Pennsylvania, at about 4500 feet altitude, with 15-mile visibility. Power, the pilot, has 18,000 hours to his flying record. After a flight of Navy jets climbed out under his wing from Willow Grove Naval Air Station, Powell spotted an object closing on the jets from their rear. Noting absence of a vertical tail-fin, he watched more closely and saw it make an abrupt (no bank, no slewing) turn of about 150-to-160 degrees and head for his aircraft. He and Miss McClave watched it approach on seeming collision course at their level, until it passed their starboard wing at a distance Powell put at perhaps 100 yards. The object was described by both as a domed disc, of diameter 30 to 40 feet, with a bright white dome on a red discoid base. One can reject the testimony here, of course; but it would not seem reasonable to try to account for this as some refraction anomaly or other aberration of meteorological optics, nor is it reasonable to assert that here was some peculiar fair-weather variant of ball lightning. Examples equally difficult to force into those pigeonholes are very easily multiplied (see references 2 and 5 for more examples).

I have now made brief comments about all of the listed hypotheses except 6, the psychological

hypotheses. Having discussed this one with many psychologists, I am forced to the conclusion that it is quite unlikely that UFO reports will prove to be some globally epidemic wave of hallucination or psychosis, interesting and significant as this would be.

My list of eight hypotheses is not exhaustive because other hypotheses still more bizarre can be proposed (time-travel, hidden terrestrial societies, mad millionaires with secret laboratories, *etc.*). However, these eight cover the most commonly proposed ideas advanced by persons seeking to explain the enigma of the UFOs, and perhaps I have now offered adequate suggestion of why I reject most of those.

The Official Air Force Project Bluebook Position

Since I have presented a fairly long discussion of the Air Force position and the history of its handling of the UFO problem elsewhere (reference 5), I shall not do more than summarize here. As I studied the Air Force record, it appeared to me that, following an important turning point of 1953 (Robertson Panel), the official objective has been to debunk “flying saucers” as a nonsense problem that imposes a bothersome public relations burden on the Air Force. From visits to Wright-Patterson AFB and discussions with a number of persons affiliated with Project Bluebook, I conclude that only abysmally limited scientific competence has been brought to the study of UFOs within A.F. circles during the past fifteen years. Unfortunately, during all this time, the scientific community and the public were repeatedly assured that substantial scientific talent was being used in A.F. UFO studies. This was untrue, and I believe that it has been scientifically disastrous to UFO studies that this image was steadfastly built up.

Jerome Stanton, in a valuable analysis of the history of the UFO problem,⁷ speaks of the way in which the Air Force “created the impression that a scientific investigation of UFOs was going on when in fact nothing of the kind was being done.” Stanton asserts that “Until the well-publicized sightings of 1965 and 1966, no serious effort to do more than narrow down the residue of unknowns to as small a percentage as possible appears to have been made.”

To me, the record reveals only a rather low-powered, low-priority whitewash job by a very tiny project (one officer, sergeant, secretary, as of 1966 when I visited Bluebook). Stanton, after reviewing a few instances of the many outrageously unscientific UFO evaluations has issued, asks: “What is the motive for identifications so absurd that they fool no one, destroy public confidence, and insult and anger the people who report such things in good faith?” He rejects, as I do, the suggestion that the Air Force knows the UFOs are extraterrestrial and are trying to avoid public panic. He concludes, as I have, on the basis of all evidence seen to date, that we confront here no grand conspiracy, but rather an incompetently handled operation devoid of scientific talent.

Another journalist who has, like Stanton, recently surveyed UFO history, comes up with a rather different conclusion. In another one of the few valuable UFO books, Mort Young (see reference 6) prefers the “grand conspiracy” hypothesis. He states that “the government is trying to keep flying saucers out of the realm of serious, public discussion.” He presents a number of cases which, I agree, constitute a form of cover-up. Where I would disagree with Young is in his equating the sum of many

⁷ Jerome Stanton, *Flying Saucers: Hoax or Reality* (Belmont Books, 1966).

such cover-ups to a “grand conspiracy.” I remain on record as regarding them as just a lot of little cover-ups of the type that can become all too common in a military milieu, especially when a highly visible official position would be embarrassed by a policy of candor.

The UFO problem has been so badly mishandled, for so many years by Project Bluebook, that it is almost easier to imagine this part of a grand design of some high-level intelligence agency than to accept the conclusion that any program could possibly be handled so ineptly. I have to concede a point to those who criticize my position when they stress, “It's hard to imagine that they could be that incompetent.” Readers unfamiliar with UFO history cannot possibly appreciate the full force of that argument against what I nevertheless defend as the grand foul-up.

For the record, let me reiterate that I have never been dogmatic about insisting on the grand foul-up theory, and I have never scoffed at those knowledgeable students of the UFO problem who defend the only seemingly sensible alternative, grand conspiracy. The existence of repeated small UFO cover-ups so confuses the issue that one cannot be certain. The group which I regard as having made by far the most significant contribution toward past clarification of the UFO question, the National Investigations Committee on Aerial Phenomena (NICAP), has always inclined toward the grand conspiracy theory. Before anyone casually pooh-poohs their position, he will do well to make himself aware of the body of evidence upon which NICAP has based its preference for that theory. The evidence is impressive, puzzling, and argues caution in defense of the grand foul-up interpretation.

If the grand conspiracy theory does in fact prove to be correct, that is, if we ultimately learn that for the past fifteen or more years it has been accepted at some high level in our intelligence machinery that UFOs are extraterrestrial surveillance devices, while a studied effort has been maintained to conceal that from domestic and foreign scientific view, then I shall be only one of an outraged body of scientists throughout the world who will ask how a decision to conceal such information from the world scientific community could have been arrogated to itself by any national intelligence or military organization. I have made this same statement before a number of scientific audiences in recent months, and I am deeply troubled to find that more than a few who have heard it have taken the trouble to tell me that I am naive if I think that such deception is out of the question. I do not wish here to pursue further this line of thought, important as it is in the minds of all who have diligently examined the UFO evidence; to dwell too long on these points before a group not already thoroughly familiar with the incredible history of the UFO problem is to invite criticism of forgetting the primary scientific issues at stake. Just let one remark summarize: that one of the by-products of extensive study of the UFO record is a puzzled preoccupation with the cover-up vs. foul-up question.

Evidence For and Against the Extraterrestrial Hypothesis (ETH)

The ETH seems, of course, absurdly improbable on both first and second inspection. One has two choices: intrasolar-system origin, or origin in a planetary system of some distant star. Scientists aware of the growing body of knowledge concerning conditions on the other planets of the solar system find it difficult to imagine that a high technology could possibly exist on any other planet of our solar system. That's too bad, since it crowds into a tight corner the supporter of the ETH. He is, quite properly,

confronted with the challenge to come up with some answer as to how the UFOs cross the vast reaches of interstellar space in reasonable intervals of time. In that challenge lies the heart of most present scientific rejection of the ETH, a seemingly insuperable propulsion problem. Markowitz (reference 1) has recently made much of this, and earlier, Purcell and others have examined the problem with rather discouraging results.

My own inclination (supported by months of study of the UFO evidence) is to appeal to the implications of that boundless future of science and technology that we seem to be able to discern as an extrapolation of our own present-day progress. What seemed absurdly impossible a century ago, we do today and take it for granted. A few weeks before the Wrights flew, noted astronomer Simon Newcomb published an article showing why heavier-than-air flight by man was out of the question. His error was simple: he failed to reckon with the possibility that engines of sufficiently low weight-to-power ratio would be produced; he must have known only of Hiram Maxim's monstrosities. The Wrights got off the ground at Kitty Hawk with an engine of 15 lb/hp. Manley, Langley's assistant, had one operating at about the same time with a ratio of only 3.6 lb/hp. As the ratio went down, absolute thrust ratings went up. Imagine how Newcomb's aplomb would have been shattered to witness a thrust-test on a Pratt & Whitney turbojet in the 50,000-lb class, only one human lifetime later than his "conclusive" 1903 analysis.

Propulsion is indeed very much at the heart of the ETH puzzle. So compare Goddard's 1935 record of a rocket ascent to a then-impressive 7500-ft altitude with our rocket technology thirty years later, and then reflect that, broadly speaking, this progress was made on the basis of scientific fundamentals already available well before 1935. This stunning gain came without any truly new scientific insights, but "merely" through improvements in innumerable contributing technologies. When one reflects a bit along these lines, and recalls that, months after the first success at Kitty Hawk, Dayton newspapers refused to run any stories about all those silly rumors about two brothers who were actually flying on the outskirts of town (it just didn't make sense), then one is disinclined to be overpowered by arguments of those, who, like Markowitz, would reject the ETH on grounds that nothing in our existing propulsion technology and nothing in our currently foreseeable technology makes sense out of the notion of interstellar travel. To be sure, we don't yet have any ideas for getting out to Tau Ceti, but the pace and tempo of our own technology ought to give pause to those who would insist that there are no Tau Cetians who can do that which we still regard as impossible.

I like to put it this way: Imagine the consternation, the sheer disbelief of a Solomon Islander who, with only the most shadowy prior contact with twentieth-century industrial-scientific technology, suddenly found himself witness to a 1942 amphibious invasion. How could the mind of one still in the Stone Age encompass the arrival of dozens of enormous ships of all shapes, from which fire, smoke, and unpleasant crashing noises spewed, and from some of which still other smaller ships were discharged, only to have the latter run up on the beach and disgorge a bewildering variety of men and moving devices out of which more noise and fire came. Imagine his puzzlement to then see dozens of aircraft move over, drop bombs, strafe, and engage in intricate air combat with still other aircraft, the like of which we are to here imagine he has never before seen.

One can pursue this metaphor much farther, obviously, and I believe it is a good exercise for those inclined to arch skepticism about UFOs. For we may be like the Solomon Island Stone-ager relative to

the bewildering variety and number of UFOs that seem to be credibly reported as operating in our environment. We cannot understand how any society could produce such devices, accomplish such feats, display as many craft of such unprecedented performance characteristics, and do things that to us border on the miraculous. But remembering the Solomons invasion may give us perspective on our own present situation; and thinking about how our own technology has forged ahead in mere decades may give us second thoughts about Science, Technology, and UFOs.

So What? And So Where Next?

“So What?” I’m glad to report that I have been asked that by only one or two scientists out of the hundreds to whom I have been speaking about UFOs in the past year or so. One ought not need to emphasize that if the ETH is correct, it would constitute one of the most startling scientific revelations of all times. (Scientists need not look for Nobel prize material herein; the priority credit for judiciously arriving at and publishing the ETH concept appears assignable to writer Major Donald E. Keyhoe; his 1950 journal of publication was *Time Magazine!*)

Not only would science move ahead enormously, once it got over what can now only be predicted as a dreadful shock of recognition, if the ETH is correct, but also the technological gains that could accrue from contact with and study of a technological society far beyond ours could be enormous. I cannot refrain from smiling a bit at some of the arguments made in recent years in support of efforts at interstellar communication, arguments centering around what I like to call the “interstellar brain drain,” the leap ahead we’d enjoy if we could make radio-or other remote-contact with high civilizations far out in the galaxy. But, in principle, that argument makes good sense; doubters can review some facets of it in Cameron’s book.⁸

Still, there might be other consequences of a full confrontation of the UFO problem, consequences unforeseeable and even fraught with hazard to us all. I like to think not; and twenty-plus years of evidence provides a good deal of reassurance, I believe. Freeman Dyson has waved aside unwarranted optimism about the benevolence of advanced technologies and has remarked that, for all we know, technology may be a cancer sweeping across the Galaxy. Possibly; but I’m glad to report that a close look at the UFO evidence does not suggest that we are about to be given an exposure to such a virus.

What a closer look at the UFO evidence does, however, suggest is this: Current scientific attitudes towards the UFO problem must be radically altered. We must stop smugly laughing at “all those nuts” who see UFOs, stop accepting hollow assurances from the official agency that has so long and so incredibly mishandled the UFO problem, and stop assuming that the very idea of our being under extraterrestrial surveillance is so amusingly absurd.

In past months, I have been at most of the Washington agencies one might expect to take a new, hard look at UFOs. To sum up briefly my results - zero-point-zero. Despite NASA’s claim that it has keyed its whole space program to the “search for Life in space,” NASA seems not to be even slightly interested in looking into the UFO problem. Other science-oriented agencies may see subtle political hazards in moving into the UFO problem. Congress seems indisposed to initiate any action. And at every tum

⁸ A.J. Cameron, *Interstellar Communication* (W.A. Benjamin, 1963).

one hears, "Wait till Colorado makes its report."

The Condon Committee

After the 1965 summer wave of sightings and a long series of editorial criticism (references 5, 7), the Air Force took steps to do something about UFOs. I have talked with enough persons directly and indirectly associated with the sequence of events that led from that August, 1965 epoch to the October, 1966 announcement of a \$300,000 project at the University of Colorado, to feel entirely confident in saying that public relations difficulties, not scientific considerations, were of dominant importance in the establishment of the project now headed at Colorado by Dr. Edward Condon.

Frankly, my early hopes that the Condon Committee would work vigorously and open mindedly to unravel the UFO problem have dimmed very considerably as time has gone by. This is not the place to elaborate in detail my growing pessimism; but I must say, candidly, that I no longer view Dr. Condon's approach as either scientifically vigorous or scientifically very open-minded. Dr. Condon has stated directly to me that he is not himself interested in doing any interviewing of the witnesses in the classic cases which have led to the very problem he took on. And he has repeatedly indicated an almost whimsical preoccupation with the crackpot and cultist aspects of the UFO problem. I submit that one can easily and with confidence make a very effective separation of the irrelevant crackpot material from that warranting scientific attention; hence, I find it difficult to justify Dr. Condon's interest in these aspects to the exclusion of consideration of reports of pilots, scientists, engineers, law enforcement officers, and all the other credible witnesses whose testimony has been so impressive to most who have been willing to examine it at first hand.

I had hopes that the Condon Committee would prove a turning point in scientific confrontation of the UFO problem, and I fully understand how easy it is in Washington to say, "Let's wait for Colorado." It makes sense; but only in Washington, not in those circles where a large volume of UFO evidence has already been weighed. In such circles, the present situation appears gloomy because of Dr. Condon's publicly expressed attitudes.

There are issues so sensitive here that I cannot fully discuss them in the present context. But a basic prerequisite seems now to get some entirely new study underway, entirely removed from sponsorship by any of the agencies that have had any past responsibility for UFO studies. I do not here cry, "Whitewash!" I do not see whitewashing underway. I see, instead, a lot of persons whose minds have long been made up about UFOs, going through motions that are not scientifically motivated, and moving in directions that do not augur well for early clarification of the UFO problem.

The situation is gloomy enough that there are days when, despite my having been driven by my studies ever further towards support of the ETH, with all of its profound implications, I almost wish someone would come along and show conclusively the UFOs are just "something seen by a lot of nuts," nothing more. Then I could forget the whole thing and get back to what I was working on when I decided in the spring of 1966, to take my first close look at the full history of the UFO problem. But that hope, I know, is futile. The evidence is just not that weak and vulnerable. Quite the opposite.

Hence, for the moment, the best plea I can make to you, as fellow-scientists, is to try to do as a number of us have, take a closer look at the UFO evidence and decide for yourselves. Evidently the need is for a much greater weight of scientific opinion pleading for a vigorous investigation backed by ample resources. I have elsewhere indicated some of the approaches that I think need to be used (reference 5); at the moment, the problem seems to be slipping back to the prior level of convincing the appropriate agencies and persons in Washington that there really is a problem here. The latter task was the one task many of us hoped Dr. Condon would perform when he took on the UFO study. Instead, he appears to be deepening the problem by virtue of his evidently slight interest in the whole business.

A Longer-Range View

After about eighteen months of study and direct interviewing of about 300 witnesses in important UFO cases, I can say to you that I see the UFO problem as one of extraordinary scientific importance.

I regard the ETH as the most probable hypothesis to explain the UFO evidence. To go from that expression of hypothesis-preference to a position of claiming adequate proof is not a small step, needless to say. That step will not be taken until quite large financial resources are behind monitoring and observational programs, supported by budgets that will probably dwarf the present NASA budgets. And that step will not be taken until large numbers of scientists in many disciplines begin to confront the enormously intriguing questions posed by the UFOs. If my remarks to you today serve in any small measure to increase the number of scientists and engineers seriously concerned with the UFO problem, I shall consider my time well spent.

Addendum

In the discussion following this UARL presentation on January 26, 1968, a number of floor-questions asked what specific scientific programs or investigations the speaker would recommend to achieve clarification of the UFO problem. A brief summary of possible scientific investigations is appended below for completeness.

1. As someone has observed, the most important step in solving any problem is to recognize that there is a problem. The scientific community will take this step only when a substantial number of scientists have investigated enough past and current UFO reports to sense that (a) an astonishingly large body of observations by credible observers points to the presence of entirely unconventional machine-like objects maneuvering in our global airspace, (b) that this has been occurring for more than 20 years, and (c) that despite all official reassurances, there has never been any substantial scientific examination of this body of observations. One might hope that the Condon Committee will accomplish this first step, though basis for optimism seems to be diminishing.
2. Assuming accomplishment of Step 1, a first escalation of scientific effort would be justified. A number of task groups should be created to investigate certain specific questions:
 - (a) An extremely intensive examination should be made, on an international basis, of all known sighting reports from all accessible parts of the world. I would estimate that we probably know of less than ten per cent of all sightings, due to the "ridicule lid" holding them below the level of visibility. This lid will immediately disappear upon accomplishment of Step 1, with the result that an order-of-magnitude increase in reports may be expected to come to the surface almost immediately. As with past reports, not all will be significant. However, by securing full cooperation of press and other media, rapid clarification of what constitutes a worthless report, what constitutes a significant report can very quickly be communicated to persons in most of the countries of the world. Such an educational program poses no intrinsic problems, although it would require a degree of cooperation between mass media and scientists that does not now exist with respect to UFOs. Step 1 being accomplished, that degree of cooperation would appear instantly, in my opinion.
 - (b) In order to undertake the first adequate quantitative analysis of significant patterns of movements and appearances of UFOs over the globe, computer processing of the suddenly increased body of available reports would be necessary. Design of Step 2a would have to be made with careful regard to Step 2b, to insure effective data-handling and data retrieval of the large body of observational material that would have to be processed. At the start (first few months only), limitations of number of scientists with adequate familiarity with the UFO problem would be a handicap. My own experience leads me to suggest that a crash-training program could be confined to a period of at most two to three months for the personnel doing the design work for Steps 2a and 2b. Fortunately, there does, in fact, exist a quite usable UFO literature upon which to draw in this initial training effort. Once new reporting procedures and reporting questionnaires were designed for compatibility with adequate data-processing, something like three or four hundred scientists in the physical and social sciences could be engaged in Steps 2a and 2b in a number of investigative centers distributed around the world.

- (c) Concurrently, special investigative groups, not primarily concerned with interviewing or data-processing, should attack selected questions that appear to be of high priority. For example, the moot point of UFO disturbances in large power systems clearly warrants exceedingly careful scrutiny. I know of about a dozen instances in which there seems to be evidence for such disturbances; there is much more evidence indicating frequent presence of UFOs near power facilities without any apparent system-disturbances. The fact that a number of UFO observations accompanied the Northeast Blackout of Nov. 9, 1965, is not widely known; that many smaller-scale electrical disturbances appear to have accompanied close passage of a UFO is also not generally appreciated.

Engineers and physicists should pursue this question as one that might involve “hazard considerations;” their objective would be to reject or otherwise pass on the current suspicion of some students of the UFO problem that a potentially serious problem could exist in this area.

Secondly, the large category of automobile-stopping cases warrants intensive study by engineers and physicists to try to draw from available reports implications of the possible mechanism of this frequent process. Magnetic effects come under serious suspicion here, though it is difficult to propose any single adequate mechanism at present.

Thirdly, the long-rumored but only superficially studied cases of aircraft-interferences might be studied by persons with suitable backgrounds, given completely free entry into all necessary files.

Fourthly, historians of various specialties should be urged to begin critical review of pre-1900 sightings that seem to bear provocative similarity to current sightings. The important “airship episode” of 1896-97 constitutes only a single such topic warranting the most careful study. Much amateur speculation on pre-1800 sightings is, at present, worthless; scholarly scrutiny of this curious body of early reports might, in light of new insights gained from other parts of the escalated UFO studies, shed new and important light on whether the UFO phenomena have been going on for much more than a few decades. This has potentially important bearing on “hazard considerations,” for obvious reasons.

Fifth, psychologists and psychiatrists should focus attention of the substantial subgroup of reports (usually skirted by physical scientists such as myself) in which seemingly credible and stable observers have reported paranormal psychological experiences in conjunction with UFO observations. Details will be skirted here, in keeping with my usual unwillingness to become too specific on this matter lying well outside my own area of competence.

Sixthly, the “occupant problem” should be searchingly explored by psychologists and biologists, armed with the most complete available assemblage of reports from all parts of the globe concerning observers who have reported seeing one or another type of creature, entity, humanoid, *etc.*, emerge from UFOs. At present, this subset of UFO reports is getting essentially no solid scientific attention. Accomplishment of Step 1 would immediately push this subset into a position of prominent importance. I myself can only say that I am deeply puzzled by the large number of occupant reports of which I now have knowledge. I make no present judgment, however, as to their significance.

3. Towards the end of the time-period needed to carry out Steps 2a, 2b, and 2c, certain follow-on efforts would probably be undertaken.

Step 3a would be the deployment on a global basis of an adequate network of new UFO-sensors, designed on the basis of information assembled in previous steps of the escalating UFO program. Past evidence points conclusively to the fact that UFOs can be tracked, at least under some conditions, on radar. We already have radar equipment all over the globe. Special study groups would review all available past data on radar-sightings to suggest best procedures for collecting far more complete radar data from existing gear. On the basis of that study, plus continuing efforts, new electromagnetic sensing devices should be conceived and deployed. There is on record a wide range of electromagnetic disturbances accompanying close passage of UFOs (see reference 5). Systematic searching with broad-band EM sensors, with frequency-scanning devices covering the full radio spectrum, and with both existing and specially-designed magnetometers could, with adequate support, rapidly increase our knowledge of how to secure new types of objective (rather than subjective) instrumental (rather than anecdotal) data on the movements of UFOs.

In addition, optical and spectroscopic techniques of observing UFOs would be developed. It is often objected that we already have many networks of radar and optical observing devices, but close examination of how they are set up almost invariably reveals that built into such systems is a sharp selectivity, with provisions to reject all "tracks" not satisfying pre-set criteria. Such selectivity is almost indispensable in monitoring systems to avoid being flooded with unwanted data. Our present technologies in all these areas are capable of an extremely rapid improvement over the present zero-level effort in remote-sensing of UFOs. Much of the initial design discussions aimed at Step 3 could and should begin soon after Steps 2 are set in motion, possibly sooner. From the results of Step 3 would come the first reliable basis for searching for significant patterns of UFO movements. Obviously, the search for such patterns holds high priority in solving the UFO mystery.

4. Attempts at communication, possibly in entirely novel manner not now under consideration even by students of the UFO problem, should be a goal of earlier studies. Interestingly, there do already exist credible reports of "communication," but on a level so technologically primitive as to do injustice to terrestrial science. That "response" does seem to have been obtained in a few instances is intriguing. But far more elaborate techniques and systems are easy to imagine. Social scientists, however, need to ponder certain "hazard considerations" before Step 4 is set in motion, so there is little point in attempting more specific proposals here. Along with efforts towards communication should go extensive studies aimed at elucidating propulsion techniques and a host of other currently inexplicable "performance features" of UFOs.

The above suggestions are intended only to indicate a bit more specifically the kinds of scientific efforts that one might envisage should the UFO problem be generally recognized as a scientific problem rather than the nonsense problem that it has been regarded for the past two decades. To accomplish Steps 1 and 2 might require an international total expenditure of a few tens of millions of dollars, say the price of an SST or a few large bombers or one small naval vessel. To go on to Steps 3 and 4 would, of course, involve greater total expenditures, but still at a level small compared with the international total funding of present space programs. Ultimately, if we are indeed under some form of extraterrestrial surveillance, global expenditures at the level of billions of US dollars per year would become a small

price to pay for clarification of such a profoundly important issue.

The problem of the moment, however, is to see that there is a UFO problem.