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Hynek's 'The Emerging Picture of the UFO Problem'

From: Moderator, UFO UpDates - Toronto
Date: Thu, 30 Jul 1998 08:36:56 -0400
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Subject: Hynek's 'The Emerging Picture of the UFO Problem'

Thanks to Francis Ridge <slk@EVANSVILLE.NET> & 'Jean' of the Current Encounters List for the lead on the following.

There are many Web-impaired subscribers to UpDates - this is mainly for them.

ebk

From: Brian Zeiler's 'Science, Logic, and the UFO Debate' site

<http://www.primenet.com/~bdzeiler/papers/aiaa12.htm>

The Emerging Picture of the UFO Problem
By Joseph Allen Hynek
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Evanston, Illinois

Presented at theAIAA 13th Aerospace Sciences Meeting Pasadena, Calif., January 20-22, 1975

Abstract

This paper intends to present the elements of the UFO problem, today. Truly unidentified reports of events in the air, and close to the ground, exist, events worldwide in origin and appearing to fit a relatively small number of patterns. The data, amenable to study of an interdisciplinary nature, involving a number of scientific disciplines and probably necessitating new departures in methodology, have been imperfectly studied in the past and have been virtually ignored by science. An increasing interest in, and open-mindedness about the UFO phenomenon, whatever its cause, on the part of established scientists and the educated public exists, and there has been created a Center for UFO Studies, whose activities are guided by a scientific board of established scientists in their respective disciplines. The outstanding objective of the attack on the UFO problem is the formulation of a hypothesis - or hypotheses - that encompasses the established parameters of the UFO phenomenon - no matter how far beyond the boundaries of present day science it may have to be.

The contemporary picture of the UFO phenomenon that has at long last emerged is that the UFO phenomenon is indeed a legitimate problem for science, though to which discipline, or disciplines,

it rightfully belongs is a problem in itself; it seems clearly to be an interdisciplinary problem, requiring an interdisciplinary methodology. The available data are only partly amenable to the strict experimental procedures of the physical scientists; the data are observational data and not laboratory and experimental, and hence are more akin to the observational data of the astronomer than to the experimental results of the physicist. Like the astronomer who must wait but be ready when an event such as an eclipse or a fireball occurs, the investigator of the UFO phenomenon cannot order events but must wait for them, but he knows not where or when. But neither the physicist nor the astronomer, unlike the biologist and the social scientists, deal with phenomena that exhibit intelligent behavior; the UFO investigator may be so confronted. If so, the methodology of the behavioral sciences would thus be applicable; indeed, of intelligent behavior on the part of the UFO can be definitely established, elements of game theory may need to be employed. It may involve the concept of "do they know that we know that they know that we know". In any case, a flexible methodology for this interdisciplinary problem is called for.

But one element that is common to all scientific endeavor is the problem of signal-to-noise ration; in the UFO phenomenon this problem is a major one. The UFO problem is, initially, a signal-to-noise problem. The noise is, and has been, so great that the existence of a signal has been seriously questioned. Isaac Asimov, whom no one could accuse of lacking in imagination, writes:

"Eyewitness reports of actual space ships and actual extraterrestrials are, in themselves, totally unreliable. There have been numerous eyewitness reports of almost everything that most rational people do not care to accept - of ghosts, angels, levitation, zombies, werewolves, and so on... The trouble is, that whatever the UFO phenomenon is, it comes and goes unexpectedly. There is no way of examining it systematically. It appears suddenly and accidentally, is partially seen, and then is more or less inaccurately reported. We remain dependent on occasional anecdotal accounts."

(in the December 14, 1974 issue of TV Guide, a media magazine with a very great circulation and hence powerful in forming public opinion.)

Here we see a very important part of the UFO problem, that of the presentation of data to men of science, and to men, like Asimov and others who excel in writing about science.

Scientific efforts can be seriously hampered if the popular image of a subject is grossly misleading. Funds can be curtailed and good men of science who wish to give time to the subject are apt to face misrepresentation whenever their work receives any public attention. Ball lightning is just as much an unknown as the UFO phenomenon, yet scientists can openly discuss these "balls of light" but are likely to be censured if they talk about similar unidentified lights which last much longer, are brighter, and move over greater distances, but are labeled UFOs. Proper presentation of the UFO phenomenon to the media may not seem an integral part of the UFO problem, per se, but its effects loom large.

The signal-to-noise aspect of the UFO problem is aggravated to a high degree because the signal is a totally unexpected signal, and represents an entirely new set of empirical observations which do not fit into any existing framework in any of the accepted scientific disciplines. One may even contemplate that the signal itself signals the birth of a new scientific discipline.

I return to the out-of-hand dismissal of the UFO phenomenon by persons like Isaac Asimov, in part, because of the poor presentation of the data to such persons. This is an important facet of the UFO problem itself and must be taken into account if we are to make any progress with the study of the signal. An analogy may be useful here: In the isolation of radium, Mme. Curie was obliged to work through tons of pitchblende to obtain a minuscule amount of radium. Yet there was no question of the signal in the "pitchblende noise". The radioactivity of the pitchblende was unquestioned. Let us suppose that instead there had been a rumor - an old wife's tale, or an alchemist's story - that there existed a miraculous unknown element which could be

used in the transmutation of elements, and which had miraculous healing powers and other exotic properties. Would any scientist, on the basis of such an alchemist's tale, have done what Mme. Curie did to lift the signal out of the noise of tons of pitchblende? Hardly. Mme. Curie knew that there was a signal - it wasn't a rumor. And although the labor was immense, there was a definite, scientifically accepted methodology for separating the signal from the noise.

Now, in the UFO problem we did not know at the start that there was a signal - there were merely tales, unacceptable to scientists as a body. Only those of us, through a long exposure to the subject, or motivated by a haunting curiosity to work in the field and to get our hands dirty with the raw data, came to know there was a signal. We know that we cannot find a trivial solution to the problem, i.e., a common sense solution that the phenomenon is either entirely a matter of misidentification, hallucinations, and hoaxes, or a known phenomenon of nature, e.g., of a meteorological nature. We know that there exists a subset of UFO reports of high strangeness and high witness credibility for which no one - and I emphasize - no one, has been able to ascribe a viable explanation. But the Isaac Asimovs and the trained scientists, as well as large segments of the public, do not know this. And we cannot expect them to know this unless we present data to them properly, and thus provide motivation to study the subject. We who have worked in the UFO field are somewhat in the position of Einstein who wrote to Arnold Sommerfeld in response to Sommerfeld's skepticism of the General Theory of Relativity:

"You will accept the General Theory of Relativity when you have studied it. Therefore I will not utter a word in its defense."

Emotional defense of the UFO phenomenon is pointless; the facts, properly presented, must speak for themselves.

With the noise level so high, and with the popular interpretation of UFOs as visitors from outer space rather than simply what their initials stand for, Unidentified Flying Objects - an unidentified phenomenon whose origin we do not know - it is very difficult for one to be motivated to study the subject.

The noise in the UFO problem is two-fold. There is the obvious noise, and also the more "sophisticated" noise, which might even be part of the signal. The obvious noise is akin to that well known to any scientist. An astronomer recognizes the noise of errors of observation, of instrumental errors, or that introduced by atmospheric distortion, by photon statistics, etc.

In our problem the noise is likewise comprised of errors of observation (though to a much greater degree), but also to wishful thinking, deliberate substitution of interpretation of an event for the event itself, as, "I saw a space ship last night" for "I saw a light in the sky last night", and the totally extraneous noise of the unbalanced imaginations of the pseudo-religious fanatics who propagate unfounded stories and who uncritically accept anything and everything that appeals to their warped imaginations.

Air Force Project Blue Book amply demonstrated the major and obvious noise problem. Study of some 12,600 cases in Air Force files showed that the great majority of initial reports - about 80% of them - proved merely to be misidentifications of common objects or phenomena, other types of mistakes, and a few hoaxes. This finding is fully substantiated by my own many years of experience in the investigation of UFO reports, and by the experience of serious investigators in various countries with whom I have discussed this matter.

The ratio of 4:1 seems to be sort of an invariant; it was present in the early Project Sign report (1949) and has been so far, present down the years since then. The high noise is a betenoir for the makers of catalogues of UFO reports; clearly if 80% of the raw reports represent noise, very little of consequence can be extracted from such extensive lists unless a mechanism is employed to upgrade the original basic data. Dr. Saunders, from whom we shall hear later, and who has done extensive work in the production of the voluminous UFOCAT, is, of course, well aware of the high noise level and has made

provision in his coding system whereby cases having a high degree of probability of being 'signal', can be extracted from the noise. Less scientifically oriented investigators or organizations may not be fully aware of the strong dilution factor the noise level represents.

The obvious noise inputs can be allowed for; it is the data input which may or may not be noise that remains to vex us. Take, for example, close encounters in which physical effects and craft occupants, respectively, are reported. Project Blue Book considered all of these as noise, dismissing the first almost always as a "hoax" and the second as "psychological".

But were they all hoaxes or the products of unbalanced minds? Today, with a far larger data base than was available to Blue Book (for not only a great many UFO reports in this country never made their way to Blue Book, but the flow of foreign reports, gathered by UFO organizations and investigators in many other countries also largely by-passed Blue Book), we recognize the self-same patterns occurring today as were reported in the 1950's. It has become increasingly harder to dismiss these reported patterns. Some of what many of us regarded originally as noise may even prove to be part of the signal! Take, for example, the reports from widely scattered regions of the globe, of the seemingly paranormal aspects of some UFO reports. These "contactee" cases have generally been regarded even by seasoned UFO investigators as crackpot emanations. Could they, however, possibly be part of an extremely complex signal that our culture does not know how to interpret?

All of this, of course, complicates our assessment of the UFO problem. But it does remain, foremost, a signal-to-noise ratio problem. Let us therefore acknowledge the noise and its ubiquitous presence, and turn to the main elements of the emerging picture of the UFO phenomenon.

The aspects of the UFO problem and the scientific objectives relating to them are, in my opinion, these:

- (1) Truly unidentified reports of events in the air or close to or on the ground exist._

To deny this would be tantamount to saying that we, as scientists, understand everything that happens in the sky, in the air, and on the ground. (We don't understand ball lightning, for example!) A large percent of these sightings have been popularly termed UFOs, and also popularly interpreted most frequently as evidence of extraterrestrial intelligence. Such an interpretation is obviously unwarranted without a detailed study of the content of reports of unidentified sightings. It is essential to establish with a high degree of probability, if not with certainty, the characteristics, both specifically and statistically, of the content of these unidentified sightings, for the contents of the reported sightings constitute the UFO phenomenon. For, the "U" in UFO simply means unidentified, and may cover a wide range of unrelated causes.

- (2) Those sightings termed UFO sightings represent a phenomenon that is worldwide and appears to manifest in a relatively small number of patterns of appearance and behavior._

These patterns are being well delineated by UFO investigators and some are the subject of later papers in this program, and so I will only broadly summarize them, based on my own work in the subject. The content of the most reliable reports, as judged by the caliber of the witnesses, describes, on a global basis, apparently physical craft which have the following properties: they can maneuver with ease in our atmosphere, they appear largely unaffected by gravity and the inertial properties of matter (as exhibited by the ability of hovering a few feet above the ground or high in the air with seeming little effort, and the ability to accelerate, often noiselessly, at incredible rates by ordinary standards). They appear capable of detection by radar on occasion, as attested by some of the best accounts which involve radar confirmations of visual sightings, and vice versa. At night they are primarily visible by self-generated light and only secondarily by reflection, and virtually all colors of the spectrum are reported, with a change in color often observed as the UFO accelerates.

The UFOs are capable of physical effects: they are reported to

leave "landing marks" or other physical evidence of their proximity, such as rings or other types of imprints on the ground, plant life is withered or blighted, they are capable of being recorded photographically, capable of influencing animals (it has frequently been reported that attention to the presence of a UFO was first given by animals), and physiological effects on humans have been frequently reported, e.g., temporary paralysis and blindness, headaches, nausea, but permanent or fatal damage has been rarely reported.

The question of whether the UFO phenomenon is a manifestation of some type of intelligence, whether extraterrestrial, "meta-terrestrial", or indeed some aspect of our own, is a critical one. Certainly, in those close encounter cases in which creatures or occupants, ostensibly the pilots of the craft, are reported, intelligent behavior of some sort seems obvious. Even if the occupants are robots, a more distant intelligence is implied. The almost universally reported response to detection by these occupants is an important part of the picture; upon detection the creatures are reported to disappear quickly and take off. Except in certain cases, there appears to be no desire for any involvement with the human race.

The non-occupant cases, ranging from lights seen at night (whose behavior, general appearance, and trajectories do not conform to obvious explanation), to the metallic looking discs frequently reported in the daytime, to the domed, portholed craft reported mostly at night, all exhibit behavior which can be characterized as intelligent as contrasted to random-walk behavior.

The very peculiar property of the UFO, and one which has caused many to dismiss the entire subject, is the extreme localization of the phenomenon in space and time. "Why didn't more people see what so-and-so reported?" is frequently asked. The answer is probably two fold: It has been the experience of most investigators that close encounter cases manifest preferentially in relatively isolated places, away from dwellings and installations frequented by humans. This is evident from a study of specialized catalogs of these events from which as much noise as possible has been vetted. One might be tempted to say of such cases that a sort of "avoidance principle" has been followed, but much more study is needed to firmly establish this point.

Secondly, why UFOs are not seen by large groups of people, or sequentially by independent groups of people along the trajectory of a UFO, is simply that vertical rather than horizontal trajectories are greatly favored. Recently, it was pointed out on a popular TV broadcast that when a particularly bright meteor occurred it was seen by large groups of people, photographed by many, and its trajectory accurately traced. Why is this not the case of UFOs? This was the famous case of a bright daylight fireball that travelled almost horizontally, miles high, across several states, and crossed areas of high summer tourist density (camera equipped!). UFOs, however are most frequently reported as descending at a steep angle, hovering for a few moments, and then taking off again on a nearly vertical trajectory. Coupled with the appearance in generally isolated regions this offers a reasonable explanation of the paucity of witnesses.

The majority of the sightings are at night, and, as Vallee and Poher have shown, if rectification for mankind's sleeping habits are valid, the majority of events (but not sightings) occur in the very early hours of the morning.

All in all, the emerging picture of the UFO problem revolves about the equally emerging picture of the UFO phenomenon as one that represents a set of entirely new and empirical observations which our present scientific framework is severely strained to encompass. Instead, the hovering, the rapid accelerations, and the apparently effortless maneuvers of the UFOs clearly imply a far advanced technology - if, as UFO investigators tend to agree, the reported events do represent signal and not noise.

(3) The UFO phenomenon has been ignored or very imperfectly studied by the scientific fraternity.

I believe this has largely been due to the poor presentation of the subject matter. It could hardly be expected that the scientific fraternity could have been self-motivated to study UFO reports in the face of the extremely high signal-to-noise

ratio and the poor 'sponsorship' of the subject. In TV parlance, the program has had a bad sponsor. It was presented mostly in tabloids, in pulp magazines, and in the sensational press.

- (4) _UFO data are amenable to study of an interdisciplinary nature, involving a number of scientific disciplines and probably necessitating new departures in methodology._

We do not know to whom the UFO problem really belongs - to the physical scientist, to the sociologist, or to the psychiatrist. We know only that it exists. Radar returns and other physical effects of the UFO phenomenon including photographs, are obviously susceptible to laboratory and other physical analysis.

Until spectrograms of nocturnal lights are obtained, and accurate measures of angular accelerations, trajectories, sounds, and of colors and color changes become available, less precise methods, akin to those used in the piecing together of intelligence data, must be employed. Statistical methods, as those already used by Poher, Saunders, and Vallee, can be powerfully employed.

As long as our primary data are presented in the form of witness accounts, one has the same problem, for instance, as does the investigator of air crashes when questioning witnesses, or a detective investigating a suspected case of arson. It is becoming abundantly clear that in the UFO problem, the methodology must be adapted to the phenomenon, and not the phenomenon to a particular methodology.

- (5) _There is an increasing interest in, and an open-minded attitude toward, the UFO phenomenon. whatever its cause, on the part of established scientists and the educated public._

A very interesting aspect of the emerging picture of the UFO problem is the increasing willingness of scientists and technical persons to enter into discussion of the UFO phenomenon, even though conducted on the controversial level. An increasing number of knowledgeable persons no longer dismiss the subject as sheer nonsense and as being in the same category as witchcraft, demonology, werewolves, etc., although one still finds serious books on UFOs shelved in libraries and bookstores under "Occult", "Mysticism", and "Science Fiction."

- (6) _There has been created a Center for UFO Studies, a free association of scientists motivated by their common interest in the UFO problem._

The Center was established to fulfill three main functions. First, to provide a focal point for the efforts of those scientists who have become intrigued by and concerned about the UFO problem and wish to contribute their expertise in their respective disciplines to an attack on the problem; second, to provide a locus for those who wish to obtain authoritative and reliable information about the UFO phenomenon, documents, reports, etc., which are not easily available elsewhere; and thirdly, to provide a place where people who have had a UFO experience can report it without fear of ridicule and where they can feel that such a report can contribute to a scientific approach to this problem.

The Center is not open to general membership, for obvious reasons, but does have the status of a not-for-profit corporation, and as such, can accept contributions that are tax-deductible. It openly seeks financial support so that it can support and publish the research of its scientific members, maintain a library, organize symposia, and act as a "clearing house" for inquiries from other scientific bodies and from the public.

- (7) _The outstanding objective in the attack on the UFO problem is the formulation of an hypothesis, or hypotheses, - no matter how far reaching or how much in apparent conflict with the present day scientific concepts such hypotheses may have to be - that will encompass the patterns of UFO behavior that have been established by the most careful analysis._

Given the elements of the present picture of the UFO phenomenon, it is clear that any viable hypothesis that meets these picture

elements satisfactorily will be, according to present views, "far out". There have been other times in the history of science when striking departures from classical concepts were necessary. Since new hypotheses must in some way use present knowledge as a springboard, it is a sobering thought to contemplate that the gap between the springboard of the known and a viable UFO hypothesis might even be so great as to prevent the formulation of an acceptable hypothesis at present. Thus, for example, only a century ago, an inconsequential period of time in total history, the best scientific minds could not have envisioned the nuclear processes which we now feel certain take place in the deep interiors of stars. The question of energy production on the sun capable of maintaining the sun's prodigious outflow of energy for hundreds of millions of years - a time period demanded by the fossil history millions of years - was simply not answerable by any hypothesis conceivable to the scientists of a century ago. It is indeed sobering, yet challenging, to consider that the entire UFO phenomenon may be only the tip of the proverbial iceberg in a signalling an entirely new domain of the knowledge of nature as yet totally unexplored, an unexplored and as unimagined as nuclear processes would have been a century ago.

It is necessary to be aware of this possibility but it should not cow us into hopeless inactivity. There may be viable hypotheses which can be couched in present terms. The UFO phenomenon exists, and this fact alone should represent a challenge to science and not a roadblock. We have a responsibility as scientists to support those who accept this challenge even though we may not ourselves be inclined to pursue the matter. In any event, ridicule of those who do consider this subject should not enter, for ridicule is certainly not a part of the scientific method.

It is to support these scientists who have become intrigued by the challenge of the UFO phenomenon that the Center for UFO Studies has been created, and the scientific board of the Center welcomes your interest and cooperation.

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