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One presentation delivered at the conference could not be included in these Proceedings. Dr. Berthold Schwarz showed a large number of slides taken by Mrs. Stella Lansing, showing possible UFO artifacts. These slides are not available for Center publication.

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Our thanks to Nancy Dornbos rightly belong at the head of this publication, for without her the published Conference Proceedings would have been literally impossible. She has singlehandedly, and with enviable fortitude, tackled what can be aptly described as a gruelling task, and with this edition at long last sees its completion. I speak for all the associates and friends of CUFOS when I express my admiration and appreciation for this fine lady.

Our heartfelt thanks,



J. Allen Hynek

J. Allen Hynek



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## THE PERIODICITY OF FLAPS

Irving E. Anderson

### Introduction

Since 1947 UFOs have been reported regularly enough to gain public attention. There were some reports prior to 1947 but the volume increased tremendously after that time. The sightings seemed to come in waves of intense activity which became known as "flap" periods. As time went on it was noticed that the flaps seemed to occur at intervals somewhat greater than five years. Initially many people thought the UFO phenomenon was strictly an American phenomenon. Unfortunately, many people who are not acquainted with the data are still under this impression. The international nature of the UFO phenomenon has played an important part in establishing the periodicity of UFO activity. The United States and Europe represent two separate reporting points in the same range of latitudes. Other countries around the world have also reported the phenomenon, but the patterns are much clearer in the United States and in Europe. Specifically, the French flap of 1954 and the subsequent flap 20 years later established the European pattern. The United States pattern started on the west coast in 1947 and moved eastward across the country. It is a premise of this paper that the movement across the United States can be traced by examining the activity of 1947, 1950, 1952, 1955, etc.

### Disclaimer

The contents of this paper should not be regarded as pronouncements of the Center for UFO Studies, nor should the statements herein be misconstrued as being endorsed by Dr. David R. Saunders. There has been no opportunity yet for a complete review of the hypothesis presented herein. The author takes full responsibility for any errors. It is hoped, however, that even if part or all of the hypothesis proves incorrect, the potential in this area of research will inspire some other researcher to give us the predictability we so desperately need.

### Research Approach

The hypothesis here presented grew out of a study of UFO activity in Illinois and a subsequent longitude analysis of many UFOCAT entries. A small number of spot checks were made to test the hypothesis and see if it did in fact place the phenomena at the right place at the right time. Several of these checks did prove accurate, and several others were probably within the limits of experimental error. However, at the present time the model of flap movement has not been checked against all known activity since 1947, and the spot checks may have appeared correct only by coincidence. Until an analysis of greater depth and accuracy is made, the information and theories presented here should be regarded only as a preliminary hypothesis. In his paper entitled "On the Problem of UFO Hypotheses," Dr. Hynek made the following observations:

"Any idea about why something exists, or happens, or works, can loosely be called an hypothesis. A high order of hypothesis is one that is not merely based on isolated facts, but satisfactorily explains all the observed facts."

Several different approaches were used in developing this hypothesis. Each method used certain isolated facts, and the cross matching of these facts led to the development of this hypothesis. The backbone of the hypothesis was developed during the study of Illinois UFO activity. The second phase was the analysis of UFO activity during 1950, and the accumulation of UFO activity counts for each ten degrees of longitude from 1947 through 1967. A third input to the hypothesis was the list of calls made to the Center for UFO Studies on the police hotline. A fourth factor, having substantial influence on the approach, were the numerous dialogues with Dr. David Saunders concerning the state of his research, for which I am deeply indebted.

It is important to keep in mind throughout this presentation that all information used for analysis was in the form of raw data counts. That is, if thirty different authors wrote about the same case, there would be thirty entries in UFOCAT for that case. Obviously, this is a dangerous research technique, since the results may indicate heavy activity at a time when only a small number of actual cases were reported. The reason for using this technique was twofold: (1) It was the easiest method and required the least amount of programming and computer time, and (2) The assumption was made that in most instances the number of cases written about would vary directly with the actual intensity of UFO activity, and would therefore justly exaggerate flaps and make them more obvious.

#### Initial Research

During my discussions with Dr. Saunders it was determined that one area of useful research would be the analysis of UFO activity occurring between the 61-month peaks. Dr. Saunders had not had an opportunity to study this area yet, but felt there was pay dirt there. As time went on it became necessary to restrict my research to a limited number of cases. I chose the subset of all the cases occurring in my home state, Illinois. It now appears that this choice may have been one of those lucky accidents in science. Because of its position in the middle of the United States, Illinois shows the effects of flaps probably more clearly than any other state. The UFO phenomenon can be thought of as a series of waves precessing their way across the United States from 1947 through 1973, and Illinois shows them both coming and going.

During one of our discussions Dr. Saunders mentioned that the 61-month cycles could be thought of in terms of a sine wave. I attempted to apply this logic to the counts for Illinois, and initially produced a wave with one-half the period used by Dr. Saunders. Another factor seemed to emerge at this time. The intensity of the flap seemed to be directly related to the corresponding node of the sine wave. That is, at node number one, the intensity of activity was high; at node two, the intensity was low; at node three the intensity was at a medium level; at node four the intensity was again at a low level; and at the fifth node the intensity was at the same high level as at node one. Since

the general level of reporting increased over the time period in question, one must attempt to visualize this pattern as superimposed on an upward-slanting line.

The data used to produce this pattern were the Illinois sightings dating from 1947 through 1967. From current literature I was aware of the flap of 1973, and from the UFO Central Hotline I knew of a mini-flap during October and November, 1975. I also knew that Dr. Saunders had predicted a flap in December, 1977. When I extended the curve produced by the Illinois data, it passed through the appropriate spots on the time line for each of these three flap periods.

It had been my hope throughout this research that sufficient predictability would be found to allow the positioning of a mobile van to collect "second generation" data. It was this desire that led me next to examine more closely the activity of November, 1957.

The November, 1957 activity is still somewhat of an enigma. It is commonly thought to be a false flap, caused by the launching of the satellites. However, my analysis of the activity in Illinois, Indiana and Ohio during that month seems to indicate there may be more to it than that. Peak activity in Illinois seems to decrease as activity picks up in Indiana. If reporting were due to strictly non-UFO factors, one would expect an even pattern rather than one which seems to indicate a phenomenon moving eastward across the United States. A full examination of the U.S. data for November, 1957 is probably needed before this question can be resolved.

The detailed analysis of the November, 1957 data for Illinois produced another area of confusion. I was specifically looking for a pattern of movement within the state, and hoped to find the rate of eastward movement. My efforts were thwarted by the impression that the phenomenon was moving both east and west with respect to Illinois. Furthermore, early flaps seemed to be heading east, but the flap of 1973 seemed to be heading west up the river valleys of the eastern United States. Eventually I developed what I call the "ball theory" as a possible explanation for this situation.

The "ball theory" is based on the fact that the earth is shaped roughly like a ball, and any spherical surface that comes into contact with a plane exhibits certain properties. As the ball approaches the plane, the point of tangency can be considered the epicenter of contact. If the ball then passes through the surface of the plane, all those points on the ball which have penetrated the plane will lie around the epicenter. As more of the ball penetrates the plane, the lines of expansion on the ball will form concentric circles (or ovals); but to an observer on the ball itself, these lines might be interpreted as an easterly or westerly movement.

Applying this theory, it is possible that the epicenter of the 1947 flap was actually in the Pacific, producing an apparent eastward movement of the phenomena. It is also possible that the phenomena were centered over the Midwest during November, 1957, causing an apparent movement in both directions. Finally, the epicenter of 1973 may have been in the Atlantic, thereby producing an apparent westerly movement up the east coast river valleys.

The rate of penetration into the region beyond the plane would determine how rapidly the circles would expand, and would tend to mask the actual directional movement. The depth of penetration and the corresponding dimensions of the circles of influence may explain why there is heavy activity in a whole region rather than along one restricted longitude.

### Phase Two

The above analysis still did not give me the daily predictability I had hoped for initially. The first work-up of Illinois data produced a wave based on a  $30\frac{1}{2}$  month interval. Dr. Saunders had the impression that all activity in Illinois should occur during the month of July, because of Illinois' longitude. The actual analysis seemed to indicate that the peaks were spread over several months. I was also looking for smaller intervals, to fit some of the events observed for the rest of the world. I looked at intervals somewhat greater than five months, and also somewhat greater than 10 months, without much success.

The four states of the Intensity Model, along with discussions about Fred Merritt's four legitimate catenas, triggered the idea that the activity in Illinois might be the result of one-fourth of the full 61-month cycle. It was found that heavy activity periods in Illinois seemed to fall at the nodes of a sine wave with an interval of approximately 15.4 months. If properly connected, each of these nodes occurred at a 61-month interval on one of four separate lines. The main line of this group of four seemed to duplicate the line proposed by Dr. Saunders in his sidereal invariant model. Since Dr. Saunders had previously computed the actual number of days in the 61-month cycle to a high degree of accuracy, it was relatively easy to compute a rate of movement by dividing 360 degrees by the exact number of days in the 15.4 month cycle. The exact numbers computed and the specific times and places generated from them are not being presented in this paper, to eliminate the problem of a self-fulfilling prophecy. These computations will be given to the Center for UFO Studies for verifying and monitoring future events. It should be pointed out that an error in computation of about six one-thousandths of a degree per day will result in an error of about 65 degrees over a period of 30 years.

The model can now be seen as four separate lines of activity working their way around the earth at a rate specified by the above discussion. In effect, we have a phenomenon that is making four passes around the earth in the time it takes the earth to make just a little more than five rotations around the sun. It can be theorized that the earth must be in a particular position for a flap to occur. This model suggests that these positions occur at 15.4 month intervals, and that since there are four lines of activity circling the earth, each of these lines may manifest the intensity pattern shown in Illinois. The model further suggests that these intensity patterns are 90 degrees out of phase with one another. Therefore, heavy activity on line three would occur at the same time as medium activity on line one, but activity on line three would occur on the opposite side of the world from that on line one. Some support for this theory comes from the fact that it could explain why the interval is greater than five years; that is, the extra days are required for the phenomenon to complete its fourth rotation around the earth and line up in the absolute sidereal position required for a flap to occur.

Several other factors may help support this theory. The UFO Central hot-line list seems to indicate that there are reporting peaks at three to four month intervals. If the 15.4 month interval is divided by four, it produces a figure commensurate with this interval. This modification of the theory requires only a minor change which uses the same logic as the original theory. In addition, the model seems to indicate that it would be possible for three flaps to occur in one year, each about three months apart. This does seem to be what happened in the year 1967.

#### Conclusion

As can readily be seen, much of the information used consists of isolated facts drawn together by some common threads. They therefore do not meet the requirements for scientific proof of the hypothesis presented in this paper. The amount of effort required to check each of these pieces of theory against the available data is more than enough for a task force, especially when one considers that the effects on the phenomenon of latitude, and the earth's  $23\frac{1}{2}$  degree inclination, have not even been mentioned. I hope this paper will serve to inspire, or incense, some reader(s) to complete the research required to confirm or deny these hypotheses.

If they are upheld, they will establish once and for all that the manner with which some physical scientists dismissed the phenomenon in the past is no longer appropriate. Confirmation would also seem to indicate that it is time UFO researchers got out to obtain the "second generation" data needed by physical scientists to determine the nature of the phenomenon. When one acknowledges a problem arising from flaps occurring over the oceans rather than over land, one is indirectly attributing a certain "naturalness" to the phenomenon. Its behavior may be under intelligent control, but its appearance would seem to be dictated by some natural law.

AN OVERVIEW OF THE UFO PHENOMENON IN AUSTRALASIA  
AND SOME NOTES ON INVESTIGATIONS INTO THAT SUBJECT

Harry Griesberg

Australian Co-Ordination Section  
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One of the earliest recorded close encounters in Australia was reported to have happened in 1893 (1) when a farmer watched as a saucer shaped object landed in one of his fields and a "being" emerged. This "being" shone a beam of some kind onto the farmer, whose one arm where the beam had struck was paralysed for life.

In 1909 the general public in New Zealand came to discuss the possibility of extraterrestrial life, when for a few weeks unusual "airships" were reported moving through their skies. The newspapers of the time carried details of cigar shaped objects, sometimes with lights on, which flew at both high and low level across the country. Three occupant cases were recorded.

Although there was world wide interest in the subject in 1947, Australia remained quiet. General opinion here at this stage seemed to be that the phenomenon was purely American both in scope and in origin.

A few isolated reports were received in the early 1950s but it wasn't until the global wave of 1954 that we experienced a small flap. Melbourne, Victoria (2) was the scene of several descriptions of saucer shaped objects, some even during the daylight.

Early records of investigators indicate that very little activity was recorded from then until 1963-64. From here on in we have recorded close encounters of the three types found elsewhere in the world and seem little different from other countries in this respect.

Distribution of documentation on Australian aspects of the phenomenon has not yet been achieved to any wide degree. However, this is being rectified with the growing awareness that the phenomenon is indeed global in nature.

Government Policy

In Australia the only known Government department interested in receiving reports is the Department of Defense (Air Office), i.e., the Royal Australian Air Force (RAAF). Intelligence officers at one major RAAF base in

each state receive reports from the general public, investigate them to a small degree, and pass unknowns to the Department of Defense in Canberra. Here, Australian-wide reports are collected together and a summary of explanations is available from them each year. However, their investigations are considered superficial and some of their conclusions are very debatable, e.g.,

1. Kimba, South Australia (3). Four people in three separate vehicles reported observing an orange rectangle in a clearing on the side of a deserted road at 9:50 p.m., with the figure of a man in a white suit inside it. The RAAF conclusion was "possibly burning methane gas."
2. Gosford, New South Wales. A man observed a silver colored object come from the north, heading eastwards. It stopped, then ascended until lost to sight. The RAAF concluded "probably Venus." The time was midday and Venus was less than one degree from the sun.

RAAF policy was outlined in a recent letter to ACOS and the contents of this letter are reproduced to give some insight into government thinking:

"Between January 1960 and December 1974, 868 sightings were reported to the Royal Australian Air Force. Ninety per cent of the sightings were attributed to causes which included aircraft, satellites, meteors, space debris re-entry, meteorological balloons, stars and planets. Seven per cent of reports were either received too late or did not provide sufficient information to permit proper analysis and evaluation. Three per cent of reports were attributed to unknown causes.

"The University of Colorado under contract to the USAF spent two years processing and investigating all American reports. The findings were published in 1968 by Bantam Books, as the 'Condon Report.' The general conclusion was that 'nothing has come from the study of UFOs in the past 21 years that has added to scientific knowledge' and that 'further extensive study of UFOs probably cannot be justified in the expectation that science will be advanced thereby.' A panel of eminent scientists, chosen by the US National Academy of Sciences, has examined and endorsed the Condon Report.

"The USAF 'Project Blue Book' investigation of unidentified aerial objects between 1953 and 1965 analysed 7641 UFO reports. The conclusions were:

- a. 80 per cent of sightings were natural phenomena, hoaxes, birds or man-made objects.
- b. 17 per cent of sightings provided insufficient data to permit thorough analysis and evaluation; and
- c. 3 per cent were unidentified.

"United States and Soviet space exploration has found no evidence to support the theory of life on planets in our solar system. The Mariner series of space explorations to Mars appears to have proved it a 'dead' planet. The only other source of extraterrestrial life, therefore, would have to be in another solar system.

The nearest visible star to Earth is Alpha Centauri which is about 25 million million miles away. Even if life forms existed there and were capable of space travel at speeds currently known to man, i.e., about 25,000 mph, they would take about 115,000 years to reach Earth. Consequently, the probability of extratresstrial life forms visiting Earth is extremely remote."

### The Phenomenon Itself

#### a. Overall View

Australian civilian UFO organizations receive and look at an estimated 1000 plus reports per year (4) considered by the reporters to be UFOs. After initial investigations we have some 15% left. However, two-thirds of these are lights in the sky, which provide little information at all.

This leaves approximately 5% or so of the annual reports Australia-wide which are of interest as being in the unknown category. Documentation of a lot of these in the past has been fairly good but distribution of documented reports has not really occurred. Consequently even within Australia some interesting reports are unknown to most interested parties.

#### b. Flap Areas

It has been noted that there have been several areas within the country where a more than average number of UFO reports have been generated over a fairly short interval of time. These areas have been:

a. Tully, North Queensland	1966
b. Clare, South Australia	1968
c. Tyringham, New South Wales	1973
d. North East Tasmania	1974

Within each of these areas there have been similar trends of events, usually one or two isolated reports being heard about, followed by a flood of others within a very short time period, occurring within, say, 25-30 Km. of the original reports. Local newspapers and radio stations carry some of the reports and accounts of events are circulated by the community itself. Policemen, doctors, lawyers and farmers all report seeing unusual objects at close quarters. However, the publicity is very often only local and it is usually only by chance that one encounters a flap while it is going on.

Close encounters of the three kinds are to be found here. Older reports from the same area turn up upon questioning the locals.

#### c. Patterns

In general, patterns within Australia, especially flap areas, follow those documented elsewhere in the world. Most close encounters with the phenomenon (here we refer to unknowns only) occur at night, in isolated country areas with only one or two reporters present, usually in a vehicle.

In Type 2 close encounters where a suspected "landing" has occurred, the majority of cases where crops have been found swirled have been rotated anti-clockwise.

d. Close Encounters

Professor Hynek's classification has been followed. To date, no catalogue of Australian close encounters has been published, either internally or overseas. Various catalogues, e.g., Vallee's, have included known cases here.

At the present moment, close encounter catalogues of the three types are being prepared for global distribution.

e. Investigations

Investigating organizations exist in all Australian states and have been documenting cases to the best of their ability for many years. In 1973 Prof. Hynek visited Australia and at his request an Australian Co-ordination Section for the Center for UFO Studies was established.

In October 1975 a conference jointly organized by ACOS and UFO Research Inc. of South Australia was held. This was attended by all responsible Australian UFO groups participating in ACOS and promoted cooperation and the organization of future research.

At this conference were four scientists personally interested in the UFO phenomenon, who have agreed to act as consultants to all organizations in the country.

Items to be looked at include standardisation of investigation systems, report forms and possible computerisation of data. A second conference is planned for 1976 in South Australia.

Summary

The UFO phenomenon is as evident as as elusive within Australia as it is in other parts of the world. A population of only 13 million and a very large country mean very few good reports are made. Investigation methods and levels here are probably 3-5 years behind the USA, both because of the government's attitude and also because of apathy among the scientific community.

It is hoped that with the assistance of the small nucleus of interested scientists presently assisting as consultants, a combined effort by Australian organizations will provide some degree of help towards the eventual solution of the UFO enigma.

NOTES

1. Related by Dr. M. Lindtner, formerly of NSW.
2. The 1954 era is presently being researched by Victorian groups.
3. See Flying Saucer Review Case Histories no. 18.
4. For the first time, ACOS is preparing Australian-wide statistics for the year 1975.

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## THE UFO INVESTIGATOR..... REPORTER OR RESEARCHER?

Bradley Earl Ayers

As a person who has spent a good deal of his professional life in the intelligence gathering and investigative field, I find the challenges confronting the serious UFO investigator to be unique and unprecedented. There are no hard and fast ground rules, no firmly established procedures, no proven techniques. As the answer to this mystery continues to elude us, our approach to the problem must become more imaginative, innovative and comprehensive.

The human observer is, at once, the source and the evidence that the UFO phenomenon does exist. Physical proof, sufficient as a basis for scientific conclusion, is lacking. Thus, it is the observer who remains as the primary source. The witness as a person, together with the sighting report, of necessity becomes the focal point of scientific study.

The UFO Field Investigator is the delicate link between raw data and refined scientific inquiry. He is a producer, and it is his complete and objective perceptions that provide the basis for study of the phenomenon. It is the Field Investigator, who, after eliminating all other possible explanations and without physical evidence, must train himself to focus upon the only other target remaining: the human element. It is the Field Investigator (and I consider myself rather typical in this respect), working on his own, usually with imagination and a limited technical background as his only tools, who is the vanguard in this probe of the unknown.

It is not enough that the Field Investigator interview and report the story of the witness, collect meteorological and astronomical data, and conduct a physical inspection of the sighting area. All of these actions are necessary, but they are superficial in that they fail to adequately probe the real evidence....the human observer. This is not to suggest that the routine steps in any inquiry are not important. In many cases they will lead directly to a logical explanation for the sighting, and the file may be closed. But in those situations where there is no logical answer, where we do have in fact a UFO and there is no physical trace, the person making the report must become the object of the investigation.

It is when this point is reached in the investigative process that the Field Investigator becomes a researcher as well as a reporter. Within the limits of law and those restrictions imposed by the witness, the investigator must probe the background, character, behavior and

personality of the observer. He must weigh the "human evidence" he develops against his own perceptions of the observer. The investigator must be capable of making some analysis of the witness' traits and behavioral characteristics, personal strengths and vulnerabilities, habits, lifestyle, past experiences, values, judgement, goals and aspirations. The Field Investigator must become, in essence, a "human behavior researcher."

This expanded role will place greater demands on the investigator and will require a higher degree of professionalism. If he expects to find public acceptance and cooperation as a social researcher, the investigator must consciously seek to overcome the attitudes of suspicion, indifference and ridicule that have for so long plagued serious inquiry. While maintaining an intellectual position that I refer to as "open-minded skepticism," the Field Investigator must consciously strive to overcome the crackpot image. On the positive side, this means establishing a personal working rapport with local law enforcement agencies, news media and other elements in the community that are frequently involved with UFO sighting reports. On the negative side, it means avoiding connection with the blatantly sensational aspects of the UFO controversy, resisting the temptation to pick-up on "off the shelf" theories, revealing and exposing falsehoods and charlatans, and discreetly separating oneself from the kooks and weirdos that seem to proliferate in this field.

When at work, dealing with the sighting report, the Field Investigator must make every effort to gain the confidence of the witness without, WITHOUT, compromising his own intellectual objectivity or betraying the privacy and trust of the interviewee. It is a very thin line to walk and it takes a high degree of compassion, sensitivity and most important, it requires an intense, rigorous, objective yet humane attitude of critical inquiry on the part of the researcher.

The investigator must pragmatically evolve techniques that will support this expanded, more comprehensive inquiry. He will not only have to talk with the witness and the immediate family, he may have to go into the neighborhood and talk with those acquainted with the witness, collect (with proper authorization) information from medical records and police files, probe beyond the obvious external aspects of the individual's personality, persistently chipping away at the human element in his investigation. (I can say, from personal experience, I have never been disappointed, never ceased to be surprised (better, amazed) at the incredible depth and capacity of a human personality.) Sometimes the revelation may come almost incidentally, just about the time you think the investigation is at a deadend or wrapped up. A word or phrase dropped in passing, a small note in a medical file, a comment by the local sheriff's

deputy, an employer or teacher, a small clue that sometimes tells you more about the person you are dealing with than any amount of interviewing or interrogation.

Given our lack of success in understanding UFOs, thus far, I don't think we can underestimate the importance of the witness' personality and behavioral characteristics, in our research. Until we understand more about the mechanics and capacity of human perception, I don't think we can treat the human factor with any less importance than we treat the other aspects of a sighting report. In this connection, I think we must all attempt to gain a better understanding of the complex sensory machinery called the human mind. I invite your attention to the theoretical and scientific writing on this subject by J. A. V. Butler (Science News 22, 1951) and more recently, the late Dr. Wilder Penfield's book, Mystery of the Mind (1975) as well as the writings of Dr. Hynek on the subject of human perception. Further, I suggest the Field Investigator keep abreast of contemporary behavioral influences by expanding his background research beyond the physical sciences, psychology and physiology, into the areas of metaphysics, the psychic sciences and parapsychology. If we expect to achieve the long sought breakthrough, we cannot limit ourselves to conventional, academic and scientifically accepted areas of inquiry.

If we are to confront the challenge of the UFO enigma, with a true scientific effort, then we start at the point where the evidence originated. The Field Investigator must make the crucial first step. The results of the kind of comprehensive field research I've suggested, the personal facts that are discovered about the observer--private and confidential as they must be--can be juxtaposed with the UFO sighting report and other physical and external facts that are collected. The end product, I strongly contend, may provide us some clue to the answer to this strange, elusive and perplexing phenomenon in our midst.

We are agreed that people are perceiving something quite strange. But, despite years of study, we don't know what UFOs are; and our inquiry thus far, has given us little solid ground to proceed on. All we know is that people go on seeing SOMETHING. We usually emphasize the word "SOMETHING" when making this statement. I suggest we begin giving the word "PEOPLE" the same kind of emphasis in our research.

PEOPLE are seeing SOMETHING. The WHAT, HOW and WHY remain a mystery. But, the answer lies somewhere. In the absence of physical evidence, we must probe the only evidence we have....the human observer.

We all must work to elevate and legitimize our research in every way. I have cited a number of ways the investigator must strive to upgrade

and expand his role. I think the Center could also significantly aid those of us working the field in the following ways:

First, I would like to see Field Investigator(s) designated for particular areas, their names together with a letter of introduction and authorization (containing some background) transmitted officially to the law enforcement agencies within that area.

Secondly, I would like to see the Center issue some sort of identification card with personal description and photograph of the Field Investigator, as tangible, visible confirmation of his official role and function as a representative of the Center. I think both of these steps could be easily and inexpensively accomplished and would do much to enhance the stature of investigators in the eyes of the community and the reporting witness.

Thirdly, I would like to see the Center devise, print and distribute to designated Field Investigators a simple but formal calling card or "business card" offering a brief explanation of the Center, its purpose and objectives as an institution of serious scientific inquiry, and providing an address and phone number for verification and further inquiry for the recipient or witness. On the reverse of the card, the Field Investigator could print his name, address and phone number so that the recipient might verify the investigator's legitimacy and, if necessary, follow-up on any ongoing investigation with new or additional information. These calling cards could be used by the Investigator upon introducing himself during an inquiry and could be left with a witness or interviewee as a gesture of serious interest and good faith. I believe these three relatively simple measures would do much to facilitate work in the field and do much to foster a better relationship with witnesses and improve public acceptance and understanding of the Investigator's efforts.

In conclusion, I suggest that the UFO Field Investigator must transcend his accepted function as a reporter and, in the case of unexplained sightings, research the personalities involved. Do we understand the full capacity of human perception? Do we adequately tap the complex machine called the human mind in our investigations? Have we given the human element full consideration in our research? Is there some pattern, some invisible thread that links those of us who have had a UFO experience? I believe that only through the kind of total investigation and research that I have suggested will we answer these questions and fulfill the exciting, monumental scientific challenge the UFO phenomenon poses.

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## ARE UFO SIGHTINGS RELATED TO POPULATION?

Vicente-Juan Ballester Olmos

### Introduction

In Spain, people from all walks of life have been reporting strange-looking phenomena in the skies for many years. It can be proven beyond all reasonable doubt that witnesses have had genuine visual experiences of anomalous phenomena, many of which behave like flying machines, and a few of which have even reached the ground. Finally, there are serious people who report the presence of "beings" associated with the objects.

Since 1969 I have been particularly concerned with UFO landing events, classified as Type-I reports by Jacques Vallée and as Close Encounters by J. Allen Hynek. A preliminary data-gathering effort disclosed in 1971 100 cases of this category in the Iberian Peninsula (1). It was then apparent that much of value was still buried in the details of the reports I had accumulated, and accordingly a large-scale project was launched. This consisted mainly in the improvement of the existing sample and the collection of a more complete catalog, so that an in-depth, computer-aided analysis of all parameters of UFO landing occurrences could be planned.

In the process of examining my new data, which currently consists of a set of 200 Type-I reports of high credibility (2), I have faced the problem of a possible relationship between the flow of UFO observations and population indices. The spirit that guides this presentation is that of sharing my views in order to encourage discussion, in the hope that this may suggest further work in the near future.

### The Emergence of UFO Waves

The non-homogeneous character of the distribution of landing incidents in time is already well-known. Figure 1 represents the curve of reported Type-I phenomena in Spain and Portugal during 26 years, showing one of the patterns which best distinguish the evolution of UFO activity; namely, the wave phenomenon, which is responsible for the fluctuations in the frequency of observations within well-defined intervals.

Waves start, evolve, and die, but it is interesting for us to pose the problem of knowing if they arise from psychological or sociological causes or if, on the contrary, they depend on a cyclic character of the UFO phenomenon. Are UFO waves promoted by social or psychological factors such as mass hysteria and the collective contagion of illusory experiences? Do waves consist of the observational reflection of a true variation in the intensity of UFO activity, as manifestations of a physical entity outside the mental tensions of the human being? To answer these two questions, we should study whether the model which represents psycho-sociological processes of this type fits the empirical model of UFO waves.

The phenomenon of collective hysteria is linked to lack of information

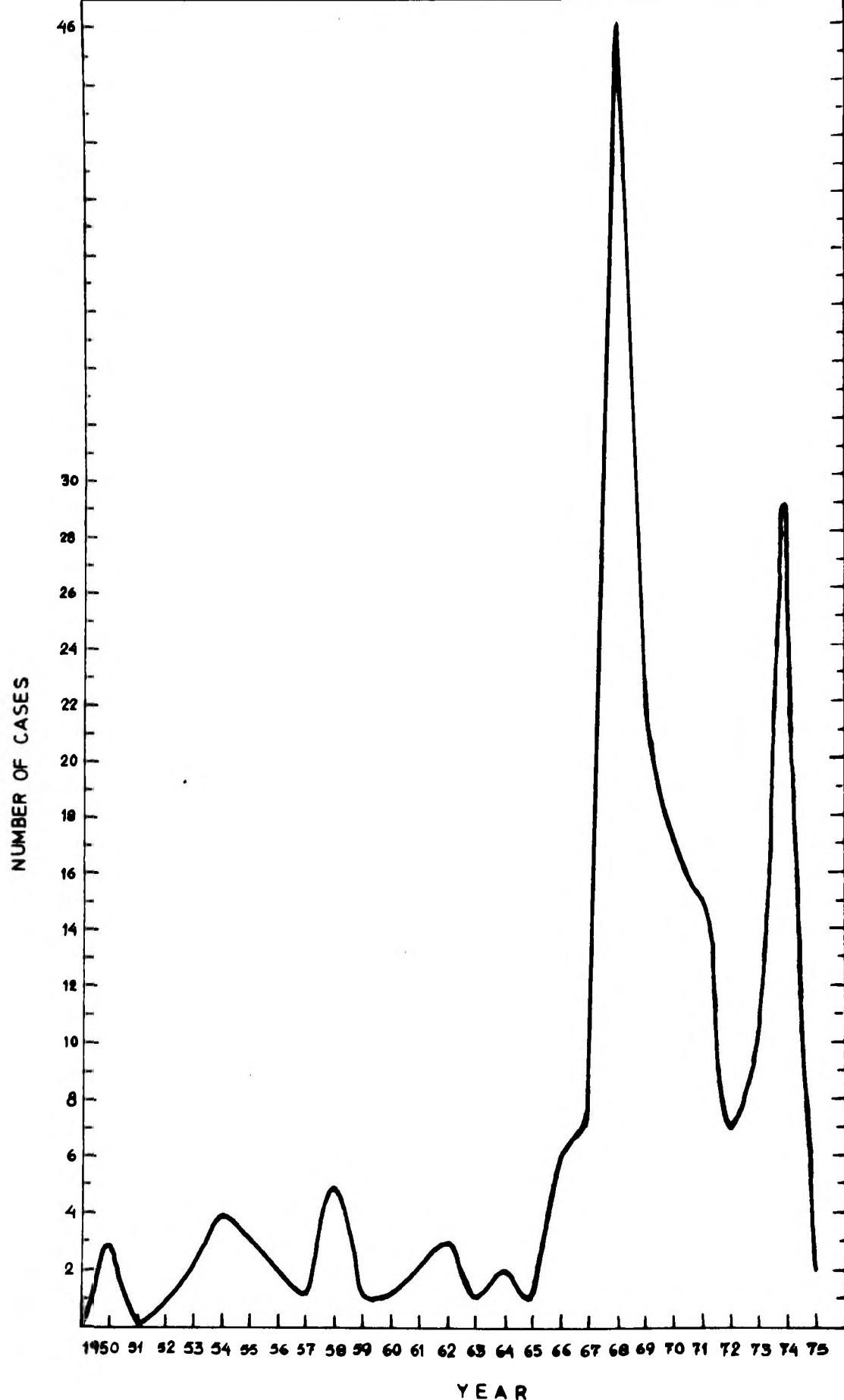


FIGURE 1

YEARLY DISTRIBUTION OF IBERIAN LANDING REPORTS.

and to emotionalism. A given stimulus - real or imaginary - frees popular worries and engenders a series of events of neurotic type. Once the baseless rumors which precede and promote the contagion are nullified by disseminating the necessary information, the mass hysteria ceases, as the stimulus is no longer ambiguous. Contemporary attacks of this sort have affected schools, factories, and even entire cities.

It becomes obvious that, like UFO appearances, events of this nature happen suddenly, acquire an intensity for a certain period, and subsequently disappear. An apparently correct formula for determining if there are differentiated mechanisms triggering UFO waves and psychological social disorders, is to critically compare the context and properties of both.

A well-documented incident in the psychological literature is the case of the "phantom anesthetist" of Mattoon. From the published work (3), the typical features of these mental epidemics can be derived, and a synthesis of the events which developed in that Illinois town is accordingly extracted.

On the night of September 1, 1944, a woman reported to the police that someone had opened her bedroom window to spray her with a gas with a cloying smell, which had partially paralyzed her legs and left her rather ill. As soon as the news appeared on the front page of the local paper, the reports to the police increased until they reached the number of seven in a single night, all referring to similar attacks and symptoms. The Mattoon police, with the help of the state police and scientific crime detection experts, organized a full-scale search for the evasive "gasser," yet it was a futile one. Once all efforts to locate the hypothetical culprit had proven fruitless, the press began to speak of excessive imagination and hysteria. The last report recorded by the police was on the night of September 12, the whole matter disappearing in less than two weeks.

Besides the absence of definite proof of the actual presence of an individual who committed such acts (he did not behave as a voyeur, thief, or criminal), the persons who succumbed to the epidemic were primarily women, of below average economic and educational level. It was concluded that the hypothesis of collective hysteria could justify and explain all the facts better than any other.

If one compares the main characteristics of this event, which can be generalized for others of the same type, with characteristics of UFO reports, a number of differences stand out:

1. The extent of a UFO wave is much more spread out, in time and space, than hysterical epidemics. The corresponding short-duration, sudden increase in UFO reporting in small areas is what we call a "flap," but here I am considering the phenomenon of a wave which transgresses borders and lasts for several months.

2. Reliable and representative UFO reports are produced by emotionally balanced people. The number of responsible, well-educated witnesses, of high social standing, is not at all negligible, and the rate of male witnesses is manifestly higher than that of female witnesses.

3. In the case of UFO events, there exists much tangible evidence left by the reported phenomena. I cite the catalog of physical evidence compiled by Ted Phillips (4), which lists 561 UFO-trace cases. There are also photographs and films and other records of the passing of an object or of its effects.

4. UFO events are not unique, but are repeated ad infinitum. Regardless of the culture or race of the observer, the country where the sightings develop, or their date, a coherent set is formed.

Another sociological hypothesis that could be applied to the birth of UFO waves relates to the notoriety gained by a case through its widespread publicity in the news media. People, hypersensitized by the UFO information output, are more attentive to the skies and generate more cases because they interpret in UFO terms whatever unclear thing they see. Unstable people are self-deceived, and hoaxes are perpetrated, and this also contributes to the rash of "cases."

The first counterargument to this thesis has to do directly with the media. Organized jointly by the Lumieres Dans La Nuit group and France-Inter radio station, a French skywatch was announced on the radio during a popular UFO program. The public was asked to remain alert on the night of March 23, 1974, for possible appearances of unidentified flying objects. Even though this suggestion received maximum publicity and was fully obeyed by tens of thousands of people, not a single report was produced. Thus I support the assertion of Jean-Claude Bourret, producer of the above program, who stated that "the sensitization of public opinion by the news media does not provoke an augmentation in reports." (5)

If waves were generated by the influence of the media on the citizenry, it would be inferred that the group of reports emanating from this chance process would be extremely heterogeneous, since they would proceed from uncontrolled mental biases. As a matter of fact, statistics show that the principal features of UFO observations have a marked repetitive character. The general uniformity in appearance and behavior of the phenomena and the stability of patterns exceed in remarkable degree any presumed level of "saucer" knowledge of the witnesses, thus substantiating the feeling that UFOs are alien to their percipients.

The frequent confirmation of reports in a wave region, the high strangeness of the most carefully-investigated events, the tangible evidence collected at sighting sites, the reliability of observers, and the articulation of the reports, together with the many splendid reports the researcher receives firsthand on the condition that anonymity be preserved - all these suggest that in wave periods the flow of UFO manifestations is indeed genuinely more abundant.

In spite of the available evidence, the rhetoric of some skeptics is inclined towards a vague concept called societal stress, by which certain political events create distress and tensions in the hearts of communities and give rise to "sightings" by the nervous public. Thus, as Aime Michel so aptly pointed out to me (6), the French newspapers wrote that the 1973 wave in that country had been caused by the underlying anxiety for the sickness and death of President Pompidou, while the American journalists attributed the U.S. wave to the Watergate scandal! Yet the sharp reporters did not realize that the waves were simultaneous! Major UFO waves also overlapped in the past, like those of 1950 and 1954, a fact which was not discovered until many years later, when

the reporters had already forgotten them.

Paraphrasing David Jacobs, who made an excellent dichotomy of the hypothesis of social tension at the 1975 MUFON UFO symposium (7), the explanations given by psychiatrists and psychologists for UFO waves are based on concepts which - like mass hallucination, mass hypnosis, or mass hysteria - are untenable in the light of multiple independent witness cases, the global nature of the phenomenon, cases isolated in time, animal reactions, effects on humans, trace cases, radar and photographic cases, electromagnetic interference cases, and the normal psychological make-up of the majority of UFO witnesses.

In our judgment, waves are positively related to the flow of UFOs manifesting themselves in the terrestrial environment (or interacting with the sensorial environment of the percipient). A notable background noise of explainable sightings exists in a wave, as the public is more disposed to share its experiences. The main factor being the higher rate of causal images of UFOs, it is more probable that they can be sighted and reported, and the probability that some of them can become front-page material is much greater. If that happens, other observers overcome their initial reluctance and decide to speak themselves. The wave is in the making.

In summary, an increase in the incidence of UFO phenomena produces a feedback effect between revealed cases and the press. Thus the model of wave formation is partly sociological, since we are dealing with people's reports; but the nature of its components is not.

My conclusions on this subject are these: (1) Waves of UFO cases consist of the abundance of physical stimuli of an anomalous type; and (2) Such a concentration of events is not the product of mental aberrations. Summing up my view, I would say that UFO observation does not depend on the mental state of the informant, but rather on his opportunity to be in the right place at the right time.

#### Relation of Demography to the Incidence of Cases

The excellent research conducted by Jacques Vallée with a catalog of the French Type-I observations of the big wave of 1954 revealed in 1966 that "the geographic repartition of the landing sites in 1954 is inversely correlated with population density." (8) Oscar Galindez showed in a survey of close encounters in Argentina which was concluded in 1972 that, having divided the whole country into four macroregions, the number of cases per region decreased dramatically as the population density increased (9). In a statistical study of 1000 UFO reports published that same year, Claude Poher noted, on the contrary, that the geographic scattering of French cases of all kinds was in direct proportion to population density; the more inhabitants in an area, the more reports it produced (10).

Early last year, during the 13th Aerospace Sciences Meeting of the American Institute of Aeronautics and Astronautics, two papers showed apparently contradictory results in this regard. In "Basic Patterns in UFO Observations" (11), Poher and Vallée unambiguously stated that the geographic location of UFO sightings was incompatible with high population areas. They presented a graph

NON-FRENCH CASES

FRENCH CASES

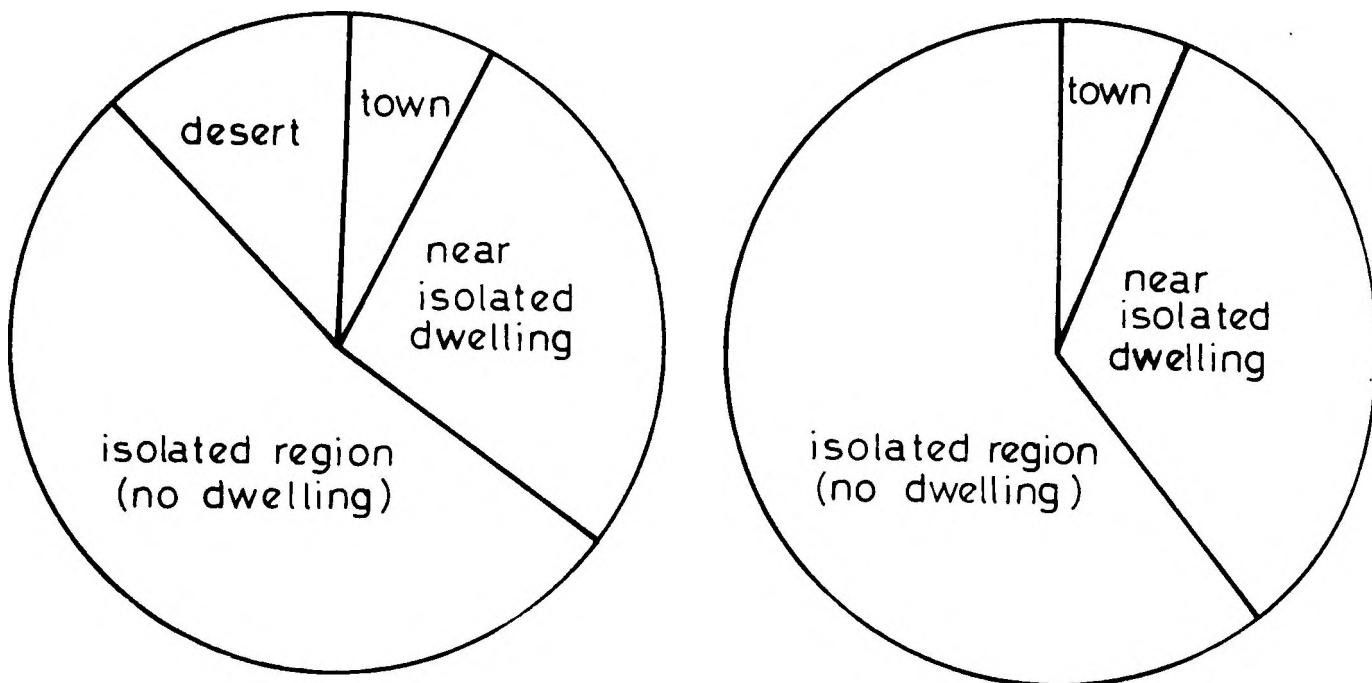


FIGURE 2

DISTRIBUTION OF TYPE-I CASES AS A FUNCTION OF POPULATION DENSITY (AFTER POHLER AND VALLEE)

<u>NUMBER AND TYPE OF REPORTS</u>	<u>MULTIPLE r</u>
TOTAL REPORTS (18,122) :	.72
SIMPLE REPORTS (7,411) :	.66
STRANGE REPORTS (9,142) :	.71
ENCOUNTER REPORTS (1,254) :	.49
INTERACTION REPORTS (315) :	.31

TABLE I

MULTIPLE CORRELATION VALUES FOR TYPES OF REPORTS ACCORDING TO POPULATION (SAUNDERS' UFOCAT)

(Figure 2) which compared landing events from France and the rest of the world, showing that in 70% of the Type-I reports considered, "the site of the close approach is a relatively deserted or isolated area."

In the course of that AIAA meeting, David Saunders, in his paper "Extrinsic Factors in UFO-Reporting" (12), came to the conclusion that a sophisticated correlation analysis of more than 18,000 UFO reports of a variety of classes in the U.S. disclosed that "the counties containing more potential witnesses have produced more reports," and that in general "the number of reports is a positively accelerated function of the population."

Let us examine the data offered by Saunders, from which I have extracted the figures of multiple correlation for the population factor. These values are indicated in Table 1. In spite of the somewhat diffuse classification of reports with respect to the distance between object and observer, it can be seen in this table that the correlation values are lower and lower when the strangest nearby reports are considered.

The preference of close encounters to occur away from dwellings and installations frequented by human beings is so obvious to Hynek and Vallée that they have dared to say, in their joint book The Edge of Reality (13), that "there seems almost to be some sort of an avoidance principle in operation" on the part of UFOs.

More recently, analyzing random-sample data from the 1973 Gallup Poll on UFOs, Ron Westrum has observed (14) that if city size is related, "the relationship seems to reach a maximum for cities 10,000 to 250,000 inhabitants." In other words, for the overall sightings, cities of moderate size have the highest rate of UFO sightings per inhabitant, while for large urban areas and open countryside the rate is lower. Considering that the view of objects in the sky is usually hindered in big metropolises, this is logical to expect. However, the trouble with the Gallup statistics is the nature of the data; they are based on the place of residence of the witness, as opposed to the actual place in which the UFO event occurred. This creates further problems of interpretation; for instance, in a study of UFO landing percipients (15), Vallée and I noted that in most cases the observer was driving at the moment of the observation. The necessity of taking into consideration the sighting's site is evident in this context.

Can all these findings be reconciled? I think so. Two groups of results can be made: researchers who have worked with distant UFO sightings agree on the fact that the relationship between number of reports and population measures is a direct one; on the other hand, analysts who have studied landings and close encounter cases have arrived at just the opposite conclusion - that reports are inversely correlated with population density!

In order to explore the accuracy of the pattern which inversely relates population density to Type-I UFO activity, I subjected my catalog of 200 landing observations to study. For this purpose I grouped the 48 Spanish provinces into 8 consecutive groups, each containing six successive provinces, according to their values of population density. I then computed for each group the arithmetic mean of the corresponding figures of the number of known sightings

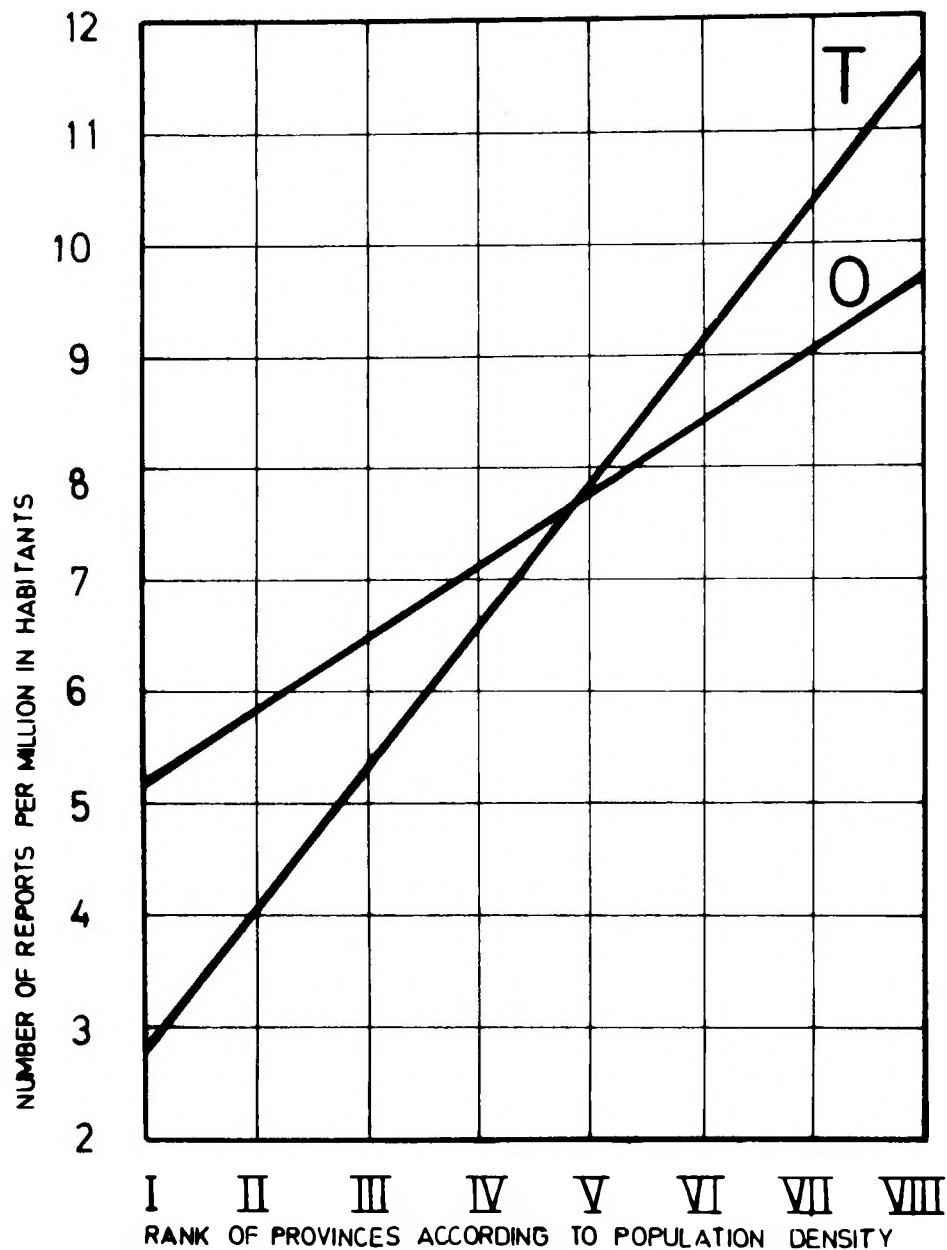


FIGURE 3

FREQUENCY OF TYPE-I UFO REPORTS AS A FUNCTION OF  
POPULATION DENSITY FOR IBERIAN DATA

- T: "Theoretical" line for 6 out of the 8 points (extrapolation)  
O: "Overall" line for all points

per million inhabitants. The eight pairs of values that resulted were graphically depicted in a coordinate system.

The overall regression line obtained from all points is represented in Figure 3 as line O. A previous point-by-point display made evident that six of the eight available points clearly fit a linear structure, and the extrapolation of this is drawn as line T, which I will call theoretical. It is my opinion that this second line denotes the actual correlation between the variables Population Density and Number of Cases. The facts are as follows:

One of the two "abnormal" points on the graph was too high, and the other too low. When I looked at the provinces contributing to these values, I immediately recognized that the group giving rise to an excessively high figure included some provinces which have very active local investigators. When I computed the number of cases again, using the restrictive criterion that only sightings reported to the press were used, I rapidly obtained the value which had appeared on the theoretical line. With regard to the second deviant point, whose numerical value was much lower than the one fixed by the T line, I saw that the provinces in this particular group are characterized by the poverty of their media (the press in particular), indicating that the probability of a researcher being aware of cases taking place there was extremely low. When suitable corrections were made, the adjusted value matched the extrapolation of the six-point straight line.

It is on this basis that I feel that this theoretical line represents the genuine inverse relationship affecting the Spanish landing occurrences. Nevertheless, using units not so elaborate as those of Figure 3, the correlation between the variables seems weaker. Computing the Pearson correlation coefficient for population density and number of cases per million inhabitants, for all Spanish provinces, the figure  $r=-.25$ , significant at the .045 level, is found, meaning that there are only about 5 chances in 100 that chance accounts for the distribution (16). This value seems too low for good evidence of an inverse correlation; but the very fact that no positive correlation arises seems interesting to us. The corollary is that the province very probably is not the relevant unit of analysis here. The coarseness of the geographic unit used is reflected in the rough results obtained, yet the indication of a different behavior or distribution of UFO activity dependent on the proximity can be clearly seen.

To conclude, and without falling into the trap of forgetting the magnitude and quality of the eyewitness reports considered, my opinion is that the distribution of aerial objects is globally random, while close approaches are highly selective, tending to avoid populated areas. I think this opinion is tenable, as it explains the two-fold empirical information the Ufologist contemplates, and prevents any contradiction. If high-altitude UFO phenomena have a random spatial distribution, we will expect to receive more reports from densely populated areas, whereas close encounters and landing events will be more numerous in sparsely populated regions.

At this point I realize I am postulating that UFOs might be intelligently controlled, and I must admit I support this concept, based on the data on hand and the evidence collected over the years.

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ACKNOWLEDGEMENTS

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## THE STONEHENGE INCIDENTS: JANUARY 1975

Ted Bloecher

(Investigations by Ted Bloecher, Budd Hopkins, and Jerry Stoehrer)

### I. THE INVESTIGATIONS

#### Introduction

North Hudson Park in North Bergen, New Jersey, is a pleasant expanse of trees, playing fields and a lake in an otherwise rather drab, densely populated urban area across the Hudson River from New York City. Between this park and the river, on the edge of the Palisades escarpment, is a stark, solitary landmark which towers over the surrounding area - the modern circular high-rise Stonehenge Apartments. This is the setting for a series of strange and unexpected events which - according to a growing number of independent reports by local residents - have taken place since January, 1975. The disclosure of these incidents came about almost by accident.

On the evening of November 20, 1975, I received a telephone call from a New York artist named Budd Hopkins, who had obtained my name and phone number from a mutual acquaintance. Hopkins was calling to report a remarkable story he had just heard from an acquaintance who had witnessed, ten months earlier in North Hudson Park, the near-landing of an unidentified object with sample-gathering occupants. Hopkins said he had known the witness personally for over 15 years and would vouch without reservation for his reliability.

The witness was a 72-year-old widower named George O'Barski. A tee-totaler, he was co-owner of a Manhattan liquor store to which he commuted daily by car from his home in North Bergen. His UFO encounter occurred in January, 1975, but he mentioned it to no one except his son Frank, then a graduate student living at home, later a Rhodes Scholar at Oxford. Frank advised him not to mention it to anyone else, and for ten months - although he was deeply troubled by the experience - he followed his son's advice. The need to discuss the incident with some sympathetic listener finally led to its disclosure.

Had O'Barski known of Budd Hopkins' interest in UFOs, his story might have emerged sooner - for Hopkins lives across the street from O'Barski's store, and the two were on friendly terms, O'Barski frequently obliging his regular customer with little extra services, such as cashing personal checks and the like. For some time, however, Hopkins had noticed that something was bothering O'Barski. He seldom engaged in his customary good-natured banter, and on the night of November 19 he was grumbling about a "cold in the knee" being only one of a number of "the damndest things" that had befallen him recently, among which was "this thing that came out of the sky" and left him "goddam scared."

This fleeting reference caught Hopkins' attention at once, and he pressed the older man for details. As they began to emerge, it was plain that O'Barski

had perceived something remarkable and of considerable potential significance. Hopkins excused himself to go get his tape recorder, and returned to record the story as it came out in bits and pieces, between interruptions as customers came and went. The telling had an undeniably cathartic effect upon the witness, and Hopkins was struck by the force of the man's amazement and fear as he recounted what had happened.

#### Background of the Investigations

The following evening Budd Hopkins telephoned me, and we made immediate plans for further inquiries. I met him at his home the next day and heard the witness' taped statement; we then went across the street where I was introduced to O'Barski, whose perplexity over the experience was unmistakable. We three arranged to meet at the site of the encounter the following Sunday afternoon, November 23, and I asked Jerry Stoehrer, a knowledgeable investigator for MUFON (the Mutual UFO Network) and the Center for UFO Studies, to assist us. The next weekend Hopkins and Stoehrer met at the site a second time to take measurements and photographs of the area, particularly of the ground traces we had found on the first inspection.

On both these occasions the doorman on duty at the nearby Stonehenge Apartments was interviewed, and we learned that a plate glass window in the lobby had been cracked under mysterious circumstances at about the same time as the O'Barski encounter. Inasmuch as the Stonehenge doorman would have been in an ideal position to observe an object in the area designated by O'Barski, we asked who had been on duty the night the window was cracked.

The doorman's name was William Pawlowski, but he had moved and no longer worked at Stonehenge. We eventually managed to track him down, and on December 5 Budd Hopkins spoke to him by telephone and learned that he had indeed seen unusual lights in the park the night the window was broken, and at the same hour as the O'Barski sighting. I arranged to interview Pawlowski in person on December 7, and at that time Jerry Stoehrer and I obtained a detailed statement, as well as a number of drawings (see Appendix C). This information was substantially supportive of the details provided by O'Barski, though Pawlowski had no knowledge of the former's sighting. Pawlowski had seen no figures, but he was approximately ten times further away than O'Barski, and this distance, and the fact that he had been indoors, precluded the kind of detailed observation afforded O'Barski.

The window damage occurred simultaneously with the observation of lights in the park. Suspecting vandalism, Pawlowski summoned the police, who arrived quickly but not before the lights had vanished. Pawlowski said nothing about his sighting, for fear of being disbelieved. He did, however, mention it to Police Lieutenant Al del Gaudio, a resident of the building. He also noticed, when he went off duty at 8:00 a.m. that morning, that a large elm tree just across the boulevard in the park had likewise been mysteriously damaged during the night.

On December 8 Hopkins spoke by phone to Lt. del Gaudio, who confirmed that Pawlowski had reported seeing a lighted object "come down" in the park at the time the window was cracked - although as a UFO skeptic, he saw no connection

between the two events. On December 11 Stoehrer met Pawlowski at the site and obtained additional information regarding sight-lines which matched O'Barski's landing site even more closely than our first interview had indicated.

Efforts to obtain information from other sources met with little success. No blotter report on Pawlowski's complaint could be found at North Bergen Police Headquarters. The glass company which replaced the broken window declined to cooperate. The Stonehenge management wanted nothing to do with our investigation. The building superintendent advised that records of the window accident were no longer available. The park supervisor and his assistant confirmed the unusual nature of the damage to the elm tree, but again, there was no record of the accident and they were uncertain as to the date.

#### Disclosure of Attendant Incidents

On January 18, while we were video-taping on-site statements by George O'Barski and Bill Pawlowski, we were astounded to learn that only three days earlier, on January 15, another Stonehenge doorman, Bill Daliz, had seen a landed object in the field opposite the apartment, at the same hour and in precisely the same location as in the previous year's events. He told us he had seen two oval forms lightly overlapping each other, one red and the other orange, just beyond the crest of the hill. When he went outside to observe more closely, they ascended rapidly into the sky as a single unit, their colors darkening as they went up. At the time he knew nothing of any other reports. We interviewed him at length on January 25.

Also about this time, Budd Hopkins learned from friends living in a Manhattan high-rise that a neighbor's son had seen an orange object across the river in the vicinity of "the round building" on the night of January 23, 1976. On January 25, while we interviewed Bill Daliz, the Stonehenge Superintendent Amaury Perez told us of still another sighting by a second former doorman, Francisco Gonzalez. As well as Perez could recall, the sighting had occurred at about the same time as the window-breaking incident. I phoned Gonzalez, who was also moving away, and arranged a meeting with Hopkins and Stoehrer for February 1.

Coincidences were abounding. On the day I phoned Gonzalez, January 29, an acquaintance of Budd Hopkins' saw a lighted, top-shaped object hovering over the Hudson River several miles south of North Hudson Park, and she reported this to Budd a few days later. The significance of her sighting increased when we learned that on the same evening, within the same hour, a Fairview, New Jersey schoolboy had come home in terror, claiming he had seen a landed UFO on spindly legs near the lake in the park. The boy's mother did not believe him until a month later when other local sightings were disclosed. A brief account of the incident appeared in a local newspaper, but we have been unable to obtain the boy's name.

#### Other Strange Figures Reported

On Thursday, February 19, about 2:00 a.m., still another Stonehenge doorman, who has asked not to be identified, observed not far from the original landing site a figure dressed in a coverall-type garment with a light affixed

to his head. Of normal height, he walked stiffly and bent over repeatedly, as if picking something up from the ground. He appeared to be carrying a bag. The light on his head faintly illuminated the ground as he bent over, although he kept to the darker sections of the park. The doorman observed him for about 20 minutes, both from inside the lobby and from the driveway of the building. The doorman said nothing about the incident at the time.

The following morning, at about the same time, the doorman then on duty, Teofilo Rodriguez, observed a similar figure behaving in much the same manner. Rodriguez watched him on and off for more than two hours, from both inside and out. He said nothing at the time, but when the same figure appeared again the following morning, he notified the Stonehenge Security Guard, Alberto Perez. After some initial skepticism, Perez agreed to go out onto the street to see for himself. He observed the figure moving about near the flagpole (see Appendix B), approximately 500 feet away. His description of the figure and its peculiar behavior essentially matched those of the two doormen, although Perez felt the light was handheld rather than attached. He said the figure walked slowly, as if wearing heavy boots, bent over repeatedly from the waist, and made "screwing" motions in the ground.

When Rodriguez was relieved on Saturday morning by the doorman who had seen the figure on Thursday, he mentioned the incidents and learned for the first time of the figure's earlier appearance. We heard about the incidents on February 25, and two days later Hopkins and Stoehrer interviewed Rodriguez and Perez at length at Stonehenge. The first doorman provided a detailed account of his own observations for Stoehrer and me on March 14. None of the witnesses attached any "other-worldly" significance to the figure's appearances, all having concluded that it must be "some crazy guy" up to no good.

These observations were climaxed on February 22 by a UFO appearance above the park in broad daylight. Shortly before noon, during a heavy rainstorm, doorman Eddy Obertubessing saw a motionless disc-shaped object, round and flat and "shiny, like chrome," remaining stationary in the heavy wind. Alternately obscured and revealed by the swiftly moving dark clouds, it remained for about 20 minutes and then vanished after being hidden by the heavy overcast. The doorman had time to alert George Roque, the assistant superintendent, who also observed the object. Jerry Stoehrer learned of this sighting on February 24, during a television taping.

Six days later a tenant of one of the upper floor apartments overlooking the park was amazed to see, upon glancing out the window at about 9:30 p.m., a small sparkling object darting through the park, near the ground. There were no people in the park, and the object ran wildly in all directions, from the lawn opposite the apartment out as far as the lake, throwing off red and yellow sparks as it skittered back and forth. The witness reported the incident to the doorman, but refused to be identified or give a first-hand interview.

By the end of January we had tied up as many loose ends to the original reports as we could, and Budd Hopkins prepared a written account that was published in the March 1 issue of the Village Voice, a widely-read New York weekly newspaper, which hit the newsstands February 25. The response was immediate and striking. At least four New York television stations, as well as the local radio, reported the O'Barski/Pawlowski observations on their news programs on

February 25 and 26, exciting intense interest throughout the metropolitan area. During the following weeks we received dozens of telephone calls and letters, many referring to UFO incidents in the area, some dating back many years.

The UFO experiences we have investigated from the North Hudson Park area may be grouped into two specific periods - the events of January 1975, and those of approximately one year later, which occurred in the midst of our inquiries into the earlier occurrences. The next section of this report reviews in detail the incidents of January, 1975.

## II. THE INCIDENTS OF JANUARY 1975

The following four UFO experiences all occurred in the same locality and within one week of each other. Two reports are most certainly independent corroborations of the same event. The chronological order in which they occurred presents an excellent example of the escalation of strangeness. The first experience, the observation of a structured object several hundred feet above the site, does not qualify as a close encounter by the strictest definition. On the other hand, the second experience, with multiple witnesses, is a classic example of a Close Encounter, Type I. The third event, in which a near-landed object was seen at the same time that striking physical effects occurred, qualifies as a Close Encounter, Type II. The final event, which appears to involve the same object seen at even closer range, includes a group of small, sample-gathering occupants and is an example of the Close Encounter, Type III. These four observations, of course, did not come to our attention in the order in which they actually occurred and are presented here.

The following narrative accounts by the actual witnesses are excerpts from taped interviews conducted by the investigators, edited and rearranged to present an orderly, sequential description of each incident. Complete transcripts of these interviews are on file with the Center for UFO Studies and MUFON, as well as in the investigators' personal files.

### 1. The Gonzalez Sighting, January 6, 1975

So far as we can determine, the first appearance of a UFO in North Hudson Park in 1975 occurred in the early morning of January 6. The witness was 39-year-old Francisco Gonzalez, a Cuban emigre employed part-time by Stonehenge as their Monday midnight-to-8:00 a.m. doorman. On January 6, at approximately 2:30 a.m., the doorman was on duty in the lobby:

"I was standing at my desk, right? Looking out,...in front of me, when I saw that thing," a sizeable object hovering motionless several hundred feet above the playing field 200 yards west of the building. "I saw something round...It was very bright, with square windows. I was really shocked!" Not believing his eyes, he stepped over to the lobby entrance to examine the object more closely. "I was standing in the door without opening it and I saw this thing very clear--the bottom of the object." It was at approximately 45 degrees elevation, was circular with windows around the perimeter, and had a flat, brightly illuminated bottom. Observing from below, Gonzalez could not see the top. Its angular size he compared to that of the full moon.

After a minute or so, Gonzalez went outside for a better look. "When I

opened the door, I heard that sound...Then I was really shocked!" He compared the sound to the "buzzing or humming" of a bee, unlike any conventional aircraft, and said it went "straight into your ear," creating a vibrating sensation in the inner ear. It was such a "heavy sound" that he thought "it was going to wake up everybody" in the building. After several minutes, the object began to ascend slowly, going straight up, "not like a helicopter, and not like a plane, no-no. Straight up! And I said to myself, 'My God!'"

Disturbed, he returned to the lobby to call the security guard, Alberto Perez, but "He was down in the garage looking at the boiler." The object gradually rose out of the doorman's view, and by the time he reached Perez and persuaded him to go out to look, it had disappeared. The only other person Gonzalez mentioned the sighting to at the time was his wife. But about a week later he mentioned it to Amaury Perez, then assistant building superintendent. Perez later took over as superintendent, and recalled the incident during our January 25 interview with Bill Daliz and referred us to Gonzalez.

The exact date of this sighting was determined by the witness' recollection that it had occurred in early January, before the lobby window was broken, and by the fact that he worked only on Mondays. Perez likewise recalled being told about the sighting at about the time the window was broken, which was a week later.

Gonzalez had been impressed by three things: the bright light on the bottom of the object, the lighted windows, and the penetrating sound. He had detected short sections that separated the windows "like a frame." Six to 8 windows were visible from his angle, each of which emitted a yellowish light. The bottom was a bright white light without any apparent source. His description is similar to those of the object seen by others less than a week later. But Gonzalez knew nothing about these other sightings. Gonzalez did not know of George O'Barski until more than a year later, nor had he heard of the Wamsley family. He was acquainted with Bill Pawlowski, of course, but neither mentioned his UFO experience to the other. While he knew of the broken window, he understood that vandals were believed responsible, and did not associate it with the UFO. There is no reasonable possibility of collusion among the witnesses, a persuasive argument against the possibility of a hoax.

## 2. Close Encounter in West New York, January 11, 1975

The second incident of the January 1975 series did not come to light until March 25, 1976, when Jerry Stoehrer addressed a North Bergen school PTA meeting on the subject of the Stonehenge incidents. In the course of that meeting, Stoehrer learned that Mr. and Mrs. Joseph Wamsley and three of their children had observed an object with rapidly rotating lights outside their home in West New York, just a dozen blocks south of North Hudson Park, and only five hours before the O'Barski/Pawlowski encounter. Twelve-year-old Robert saw the object first:

"It was about 9:30, and I usually look out the window...at the stars, and I saw something...above a three-story building - just almost looked like it was going to land on the building. It stopped above the building and it hovered for about two minutes, and I told my brother, my mother and my father. They saw it, really got a good look at it...it had like a dome on the top of it, lit

up, like a fading white and green light. And then there was the round shape. On the bottom it had like four-by-eight lights, a rectangle shape. We saw there were windows, and the lights were in them, going around. They looked like colors like blue, red, green, all mixed together, and they went around the ship. It hovered for awhile and then it moved...coasted along so - and then it went past the building and you couldn't see it any more, so we ran outside. There was like a humming sound, and when it went away, we couldn't hear it any more...we saw it going down toward the 'round house' and then we lost sight of it."

Robert's mother saw the object next. "My son was looking out of the window ...I thought he was all excited about a star. I go to the window and I couldn't believe what I saw myself. I said, 'Robert,' and he said, 'Mommy, that's a flying saucer,' and I said, 'I know, I know!'" We saw the shape of a saucer and could see the windows and...this thing that's going around. You know what it is right away because the way the lights are revolving...not flying straight, like a plane, this is going - like, up. (It's) doing a funny thing, like a 'hmmmm,'...I couldn't believe what I was seeing! And the lights were gorgeous, and I think there's a dome...the lights came from the ship itself, but the dome ...could have been a reflection from the lights going around. There was a lot of windows, and they were not big - they were like square, oblong. They go right around the whole ship - that was where all the action was, on the top. It kept rotating around, a whole row of lights all different colors, and that's beautiful. I wanted to get a better look...it was not that cold, thank God, as it usually is in January."

Mr. Wamsley got to the window too late to see it from inside. "...We went across the street and I caught the end of it...It was round, say, from a distance, three foot high, maybe five foot high. It had a...round dome, and was all lit up." He described its movement as "very slow, coasting nice and easy." The windows "...were small and...long, they were like longer than they were wide. They went around the whole ship." He added that the rotating lights were of all colors, and revolved around the base of the object. He saw it for only a minute before it disappeared.

Joseph, Jr., 16, saw it only from the window. "...It looked like a flying saucer. It had some lights, red and white, and it was spinning. I seen some windows in front. (They were) square." The spinning lights were "underneath the windows;" the top of the object was "roundish." Debbie, 13, described it as having lights revolving at the bottom, and not square but rectangular windows, taller than they were wide.

These five accounts contain minor ambiguities: three of the five witnesses placed the lights under the windows, one on top of the windows, and one inside the windows. Even so, there is sufficient consistency to conclude than an object with a domed top, rectangular "windows," emitting a humming sound, was seen at close quarters by a family of five. The fact that a very similar object would be seen in the same area only a few hours later lends even greater weight to the Wamsleys' report.

The witnesses all recalled that the sighting occurred just as the "Bob Newhart Show" was about to begin, establishing the time as 9:30 on a Saturday night. They mentioned that it was an unusually mild January night; the temperature on January 11th hit a record high of 63, as opposed to 39 and 42 degrees at 9:30 on the preceding and following Saturdays.

### 3. The Saucer and the Broken Window, January 12

Early on Sunday morning, January 12, William Pawlowski was on doorman duty at the Stonehenge. "Now, around that time - say about 2:30, maybe 3:00 - I'm standing at the desk...looking up at the hill, and I see all these lights up there, and they were so bright that you couldn't look. It was like looking into the sun, you know? It's always dark up there - always dark - and they were so bright that I was wondering, at that time of morning, what the hell's coming off here?"

Pawlowski turned his back to look up a phone number and make a call. "I'm standing there, on the phone, looking up at the hill at all these lights up there and I thought it was a string of cars, you know? But...the lights were too high, I'd say about ten feet off the ground. I was on the phone and I'm thinking to myself, How the devil can that be, so high up in the air? This is impossible - either that or my eyes are tired, or something, you know? I mean, it was ten feet up in the air! This is what I couldn't figure out. Now this is just a guess, but there were eight to ten (lights) and it looked like they were spaced apart about two, maybe three feet, in a round circle. I'll tell you the truth, this thing gave me the idea that it was a flying saucer."

The lights appeared to be fixed around the edge of an object, not clearly seen behind the glare, but definitely round, perhaps 20 feet wide, and not as tall as it was wide. He thought the individual lights were also round, but observed that the glare might have created the illusion of roundness.

"I'm talking to the tenant and thinking to myself 'That looks like a flying saucer!'...all of a sudden, bingo! I hear a noise, it sounded like a 'boom!' I said 'What the hell was that?' Then I looked down and saw the glass, you know? Shattered." He told the tenant he would call him back, and went to check the window. "The lower corner of the window, right in the corner, was shattered. I'd say the cracks were a foot, maybe a foot and a half long. I bent down and looked at it. Then I looked up and the lights were gone. I went outside, and (the window's) got a little nick out of it. It looked like the size of a marble, like a piece was nicked right out, out of the outside. It didn't go all the way through. This is what puzzled me, see? I thought maybe it might be kids outside throwing rocks, or something like that. Then I stopped to figure, how in the heck are they gonna throw (anything) over the wall that high from the street, down below? So I threw that one out. And then I remembered this thing on the top of the hill, so I figured either somebody was up there with a rifle, you know, taking pot-shots ...But then, when I figured the angle - the wall, and the corner of the window - it'd be impossible...it had to be something higher up in the air.

"I searched the area, the whole (driveway). I had a flashlight, and I didn't find anything. So I called the cops...when the cops came, I said, 'Hey, why don't you go up on the top of the hill and check? Maybe there's somebody up there with a rifle or something...I seen a flash of lights up there, maybe there's a bunch of kids up there with cars, or what-not.' But I don't want to tell them the damn thing was ten feet off the ground, 'cause they'd say, 'This guy's either cracking up, or he's drinking the wrong kind of booze.' So the cop says, 'Well, maybe they're gone by now!..just like that! He let it slide and just wrote up the broken glass, cause unknown, and that was that.

The following morning Pawlowski told Police Lt. del Gaudio about seeing the lights. He also noticed the damaged elm tree in the park. "They got a big tree over here...maybe a hundred or a hundred and a half (years). That thing was split right down the middle. I don't know if that happened at the same time, but it was around the same time. Because Sunday morning when I got off work I went across the street to the bus stop, and I noticed this tree was split, split right down the middle, and I was thinking to myself, it would take a lot of lightning to do that, you know? This is the same morning, and I'll never forget that because it was such a nice tree, you know?"

Two significant points stand out in Pawlowski's account. The first concerns the trajectory of a rifle bullet. From the top of the park hill, it is not possible to see the lower half of the lobby window because of the height of the driveway wall. A bullet fired from that spot would have to come from well over six feet above the ground in order to miss the wall and hit the glass near the floor. The second significant point is that the chip was missing from the outside of the window. Any normal physical impact from the outside would drive the fragment in the direction of the impact - in this case, nicking out a chip from the inside.

Pawlowski was certain that the date could not have been later in the month, because he was ill with pneumonia later. An earlier date would conflict with Gonzalez's testimony regarding his sighting. Most importantly, Pawlowski's testimony coincides so well with the details provided by George O'Barski concerning his own sighting that one is compelled to consider these two independent observations of a single occurrence.

#### 4. A Classic Sample-Gathering Operation, January 12

George O'Barski works the graveyard shift at his liquor store, and one day is almost a carbon copy of the next. He goes to work at 6:00 p.m., closes the store around midnight, takes inventory for an hour or so, and then locks up and drives home to North Bergen around 2:00 a.m., stopping at a nearby all-night diner for a late snack on the way. To avoid traffic lights he drives through North Hudson Park.

On the night of his UFO encounter, George had barely turned into the park when his radio began to emit heavy static. He slowed down to fiddle with it, and it cut out altogether. It was a mild night and his window was open:

"I heard this damn noise. I thought, What the hell was that? No trucks (are) allowed in here...and I saw over my (left) shoulder this - thing coming. It looked like a great big pancake that had puffed up, you know? It was flat, I would say maybe six feet high, and the thing landed, right in front of me, in the park!...It landed just the other side of the trees. When I came ahead, there's an opening there, and Jeez! I seen 'em there, you know? I seen 'em, people come right down!...It came in about ten feet off the ground, and that's when they came out, and then it settled to the ground...but the little guys came out before the rest came down.

"It was off the ground, and I seen this thing come down like a stairway, or ladders - I don't know what the hell it was - and I seen all these guys come down...like kids coming down a fire escape. I'd guess, in round figures,

ten - mighta been eight, nine, eleven. They were short! Maybe three and a half feet tall...and they had helmets on, or something. I couldn't see their faces ...but you could see their arms - they had gloves on, I could see that. The whole thing was a uniform, or something...it was dark (in color). And they had feet, legs same as any other person - only they were short. They had these little things...like a handle on, like little bags, and they had these little shovels...mighta been large spoons, or something...and they were working like little beavers, you know? All over the ground...Well, they filled these little bags up...There was light all through there because there were a lot of windows all the way around, like slits...maybe a foot wide, six to eight inches, and spaced apart about a foot, a foot and a half.

"It was three minutes and they must've scooted up. As I say, they got out before it landed, got filled up, and by the time it landed they were able to get back in, right? And they took off. It was that quick. I hear this droning, you know? And I notice this thing...it just took off...and there was no propellors on it, or nothing! It just seemed to float, but boy! It went just like that!...It wasn't a big, loud noise, it was a drone...that quiet hum ...it was just like part of the air; just like something blowing on the wind!

"All I know is to get the hell out of that park. I was goddam scared. I was scared to death! I figured the goddam world had come to an end, or something. I didn't know what to think. I thought, 'Man, either I'm going crazy, or something's awful wrong going on there, you know?...You know, even after I got through the park, (if I'd) seen a cop I wouldn't've said nothing!'

George forgot the late snack and headed straight for home. "I was sweating and I immediately made some tea. I thought, Jeez, I don't even wanna stay up--I'm scared! I went to bed--I was that scared. I pulled the covers over my head! I got up and took two aspirins...And I want back the next day. I thought I was dreaming. I went back there and there were all these little holes in the ground. They were about four inches, five inches wide, and six inches deep. I'll tell you something, I even felt the holes, you know? Because I didn't believe it looking at them...When I saw the holes, I was even more scared! I came home and drank some more tea. Then my son was asking me, several times during the day, 'You look awful upset.' So I told him what happened. He says to me, 'Well, I'll tell you; if anyone else had told me that, I'd figure they were drunk or something. But you don't drink.' He says, 'man, you must've seen something!' I says, 'I sure did!...I went over there and I seen them holes!'"

Intrigued by his father's story, Frank O'Barski went to the park to see the holes for himself. Ten months later, at the site with the witness, we were able to find 12 to 15 small triangular spots in thick, untrampled turf where the sod, roots and all, was missing. Each spot was slightly depressed, exactly what one would expect after ten months; while rain had gradually refilled the holes, the roots still had not grown back into the spots.

On that first visit to the site we obtained many details not covered in O'Barski's first taped interview. For example, O'Barski recalled seeing several antenna-like projections standing straight up above the dome. The object was approximately six feet high, with another two or three feet at the highest point of the dome. The color was dark or black, and there was a "window" or foot-wide band of light that encircled the object where the sides and dome met;

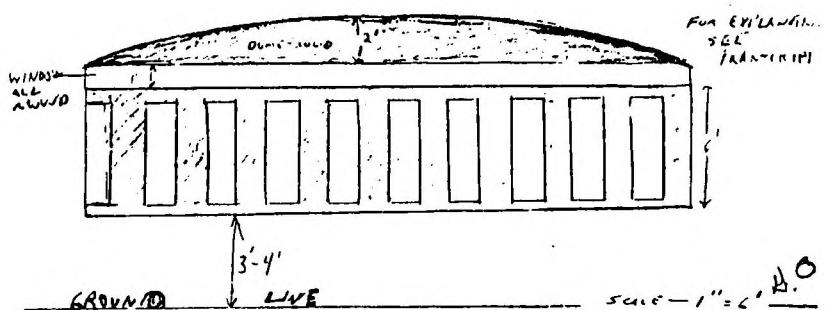
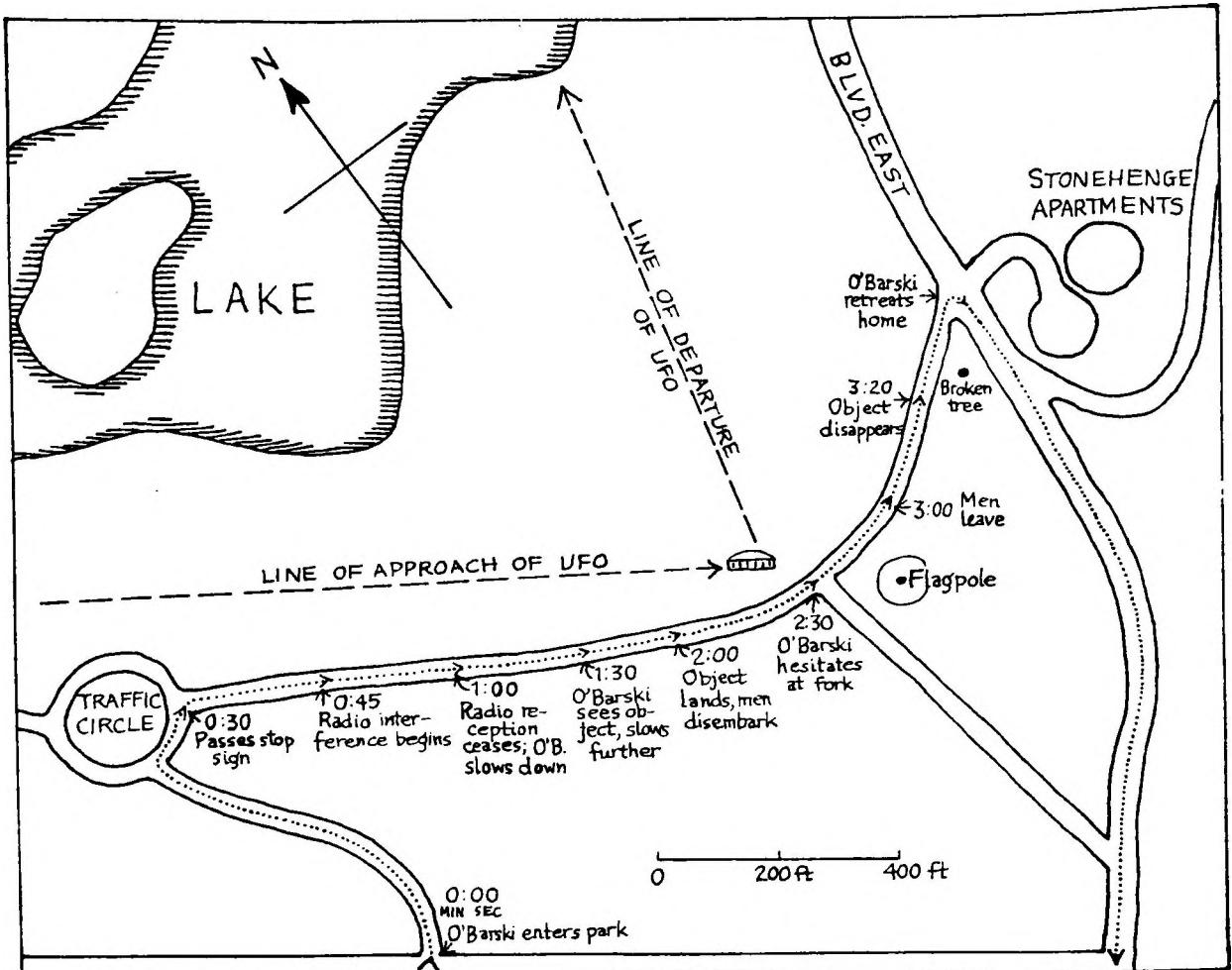
this emitted the same incandescent-colored light as the vertical panels around the sides. The doorway was on the side facing George; it opened inward and was in complete darkness, about as wide as two of the vertical "windows." The object descended to about four feet above the ground, at which time the figures quickly re-entered, in pairs. They looked like "little kids in snowsuits," complete with shoes or boots that appeared not separate from the rest of the uniform. The head covering was more like a ski-hood than an actual helmet. The humming noise was more pronounced during arrival and departure; he compared the sound to "a refrigerator that's starting up."

Although O'Barski could not remember the specific date, he did describe weather conditions consistent with those reported by the New York Times for January 11/12, 1975. Furthermore, the similarity of details with those described independently by Bill Pawlowski concerning time of night, precise locale, height from ground, number and position of windows, general shape and size, and duration of the sighting, all argue persuasively for a single occurrence observed by two separate witnesses. In addition, the description of the weather conditions by O'Barski is consistent with the weather data for January 11/12, 1975, as obtained from the New York Times:

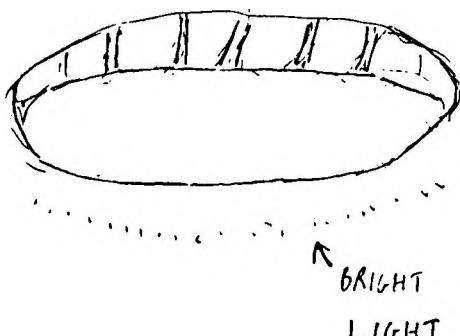
<u>Time</u>	<u>Temp.</u>	<u>Hum.</u>	<u>Winds</u>	<u>Barom.</u>	<u>Data for Jan. 11</u>	<u>Jan. 12</u>
9 P.M.....	63	93	SW 10	29.89	Sunrise: 7:19 A.M.	7:18 A.M.
10 P.M.....	62	93	SW 12	29.92	Sunset: 4:47 P.M.	4:48 P.M.
11 P.M.....	61	87	SW 9	29.94		
Midnight....	58	64	NW 9	29.96	Moonrise: 6:33 A.M.	7:11 A.M.
1 A.M.....	59	46	NW 10	29.99	Moonset: 4:24 P.M.	5:23 P.M.
2 A.M.....	56	38	NW 8	30.04		
3 A.M.....	55	35	NW 10	30.06	The Moon was new on	
4 A.M.....	52	38	NW 7	30.07	January 12, 1975.	

### Conclusions

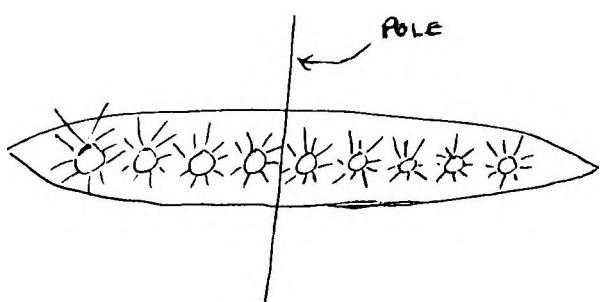
When George O'Barski disclosed the details of his encounter with a UFO and its occupants in November, 1975, we had no idea what a Pandora's Box of surprises was being opened. Five months later, our growing dossier of reported incidents totaled more than a dozen for the area in and around North Hudson Park. This clearly establishes the site as an apparent 'repeater' locale for UFO manifestations. Even so, we have good reason to believe that we have seen only the tip of the iceberg. Additional reports by local residents who refused to be identified continue to come in. The sheer number of unpublicized incidents from such a limited area affirms the problem of the "curtain of invisibility" that obscures the UFO phenomenon. How so many extraordinary events can occur, involving so many different people, and still go unnoticed by authorities and the public at large, begs an interesting question: What sort of outrageous situation must finally occur before alarm bells ring and someone pays attention?



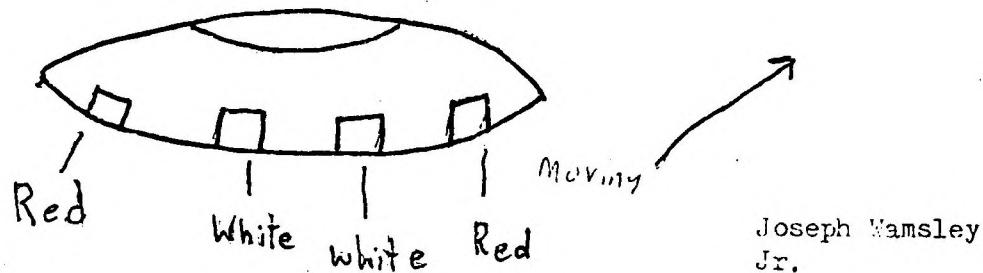
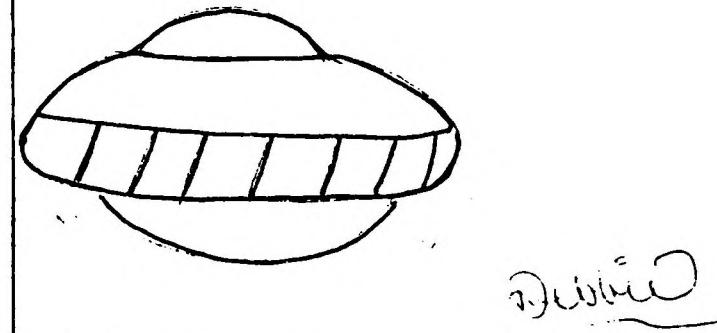
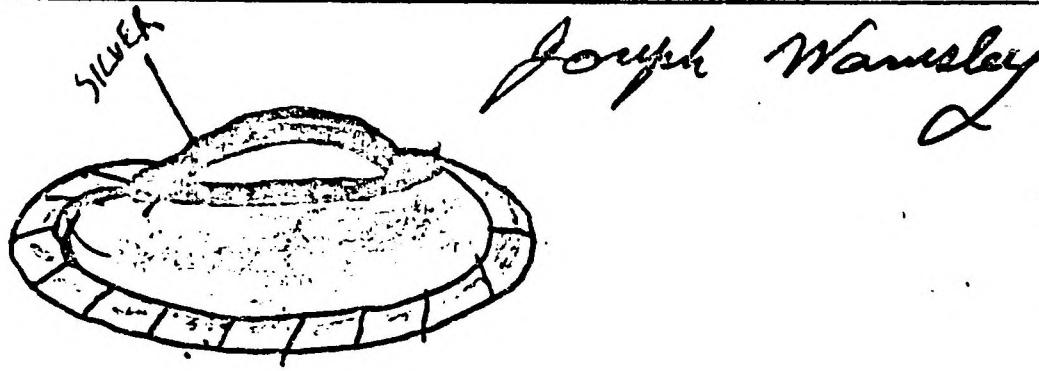
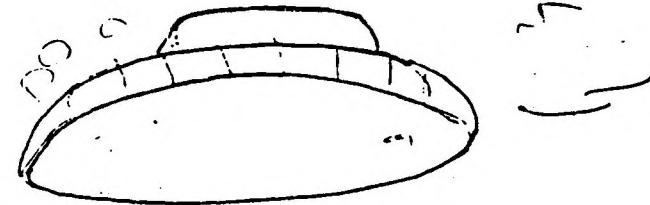
George O'Barski's Drawing, With Budd Hopkins' Assistance



Francisco Gonzalez's Drawing - Sighting January 6, 1975

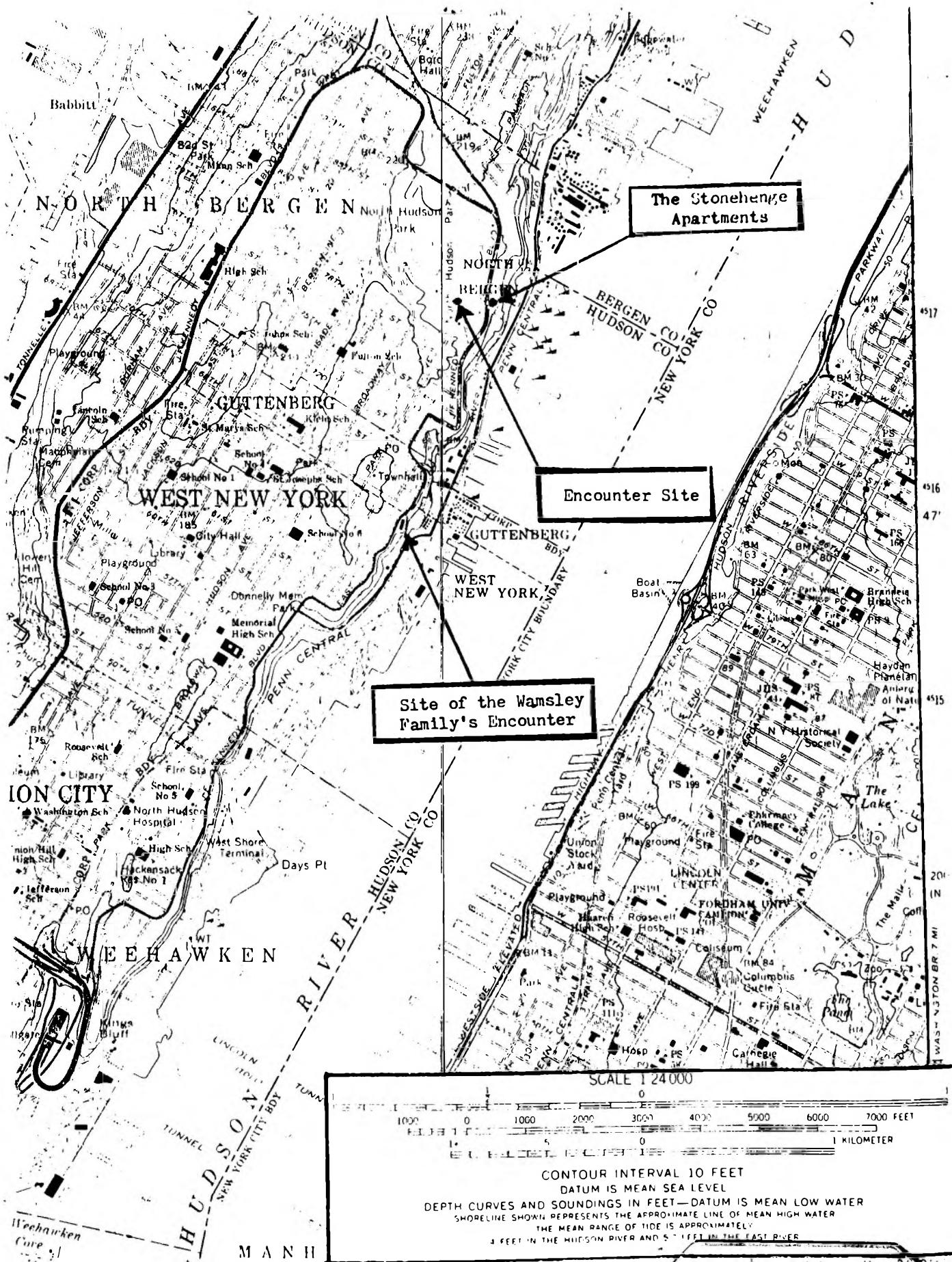


William Pawlowski's Drawing - Sighting January 12, 1975



Sighting by Joseph Wamsley Family  
On Saturday, January 11, 1975, at  
West New York, New Jersey

Upper Left - Drawing by Robert Wamsley  
Upper Right - Drawing by Mrs. Alice Wamsley  
Middle Left - Drawing by Joseph Wamsley, Sr  
Middle Right - Drawing by Debbie Wamsley  
Lower Left - Drawing by Joseph Wamsley, Jr



A PRELIMINARY REPORT OF UFO COVERAGE IN THE KNICKERBOCKER NEWS, ALBANY,  
NEW YORK: 1964-1969

Richard Bonenfant

The following paper summarizes five years of UFO newspaper coverage in an urban, upstate New York newspaper. These results have been labeled preliminary because the main study encompasses a ten year survey. The findings presented here are being released to keep other UFO investigators informed of contemporary research.

The author is unaware of any similar study in the literature. The only exception is Hebert Strentz's doctoral dissertation on the press coverage of UFOs between 1947-1966 (1). However, this study was concerned with the treatment of UFOs by the press in general rather than the subject's coverage by a single newspaper.

Purpose

The main purpose of this survey is to determine the usefulness of newspaper articles as a source of local sighting reports. A systematic search for UFO articles in a selected newspaper during a ten year period would provide data for such a determination. In addition to providing an estimate of the frequency of local sightings, the survey would also define the entire spectrum of UFO coverage during that period.

A further long range purpose is to accumulate local sighting reports for incorporation into a comprehensive historical review of UFO activity in the Albany area.

Source

The final evening edition of the Knickerbocker News (hereafter abbreviated KN) of Albany, New York was chosen for the source of this survey. The KN is a 40 page daily newspaper published Monday through Saturday.\* With a circulation of over 62,000, the KN is the largest and most widely read paper in the Albany area.

Extensive microfilm records of the KN dating back to June, 1927 are maintained by the State University of New York (S.U.N.Y.) Library in Albany.

Method

Monthly microfilm reels from January 1, 1965 to December 31, 1969 were examined by the author. The search consisted of a page by page scan for UFO articles. A UFO article was defined as an article whose main theme was the

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\* Sunday and holiday editions are not published by the KN and therefore are not reflected in the survey.

### Method (cont.)

subject of UFOS. This qualification led to the exclusion of several articles which simply made reference to UFOS. Mysterious electrical blackouts, fire-balls, mothmen and other UFO related subjects were noted but excluded from analysis.\*

UFO articles were chronologically recorded by year of publication. A complete listing of these articles is presented in Appendix A. At the completion of the search, original articles were carefully examined and classified according to the following scheme:

- |                             |      |  |
|-----------------------------|------|--|
| Hoax .....                  | (H)  | a deliberate attempt to generate false<br>UFO reports.                             |
| Denial .....                | (D)  | declaration of the non-existence of UFOS.  |
| Misinterpretation ....      | (M)  | the naive reporting of natural phenomena<br>or human artifacts as UFOS.            |
| Informative .....           | (I)  | general discussion of the UFO phenomenon.  |
| Local Sighting .....        | (LS) | sighting(s) reported from the Albany area.   |
| National Sighting ....      | (NS) | sighting(s) reported from other regions<br>of New York State or from other states. |
| International Sighting (IS) |      | sighting(s) reported from other countries<br>or from other regions of the world.   |
| Other .....                 | (O)  | UFO articles not defined by any of the<br>above categories.                        |

Classified articles were then tabulated by frequency, category and original source of ascertainment in Tables 1-4. Individual sighting reports were also abstracted from LS articles and are listed in Appendix B. A full transcript-ion of original LS articles was compiled in Appendix C.\*\*

### Findings

A total of 72 UFO articles was found. Nine of the 72 (12.5%) articles dealt with local sightings. Twenty separate sighting reports were referred to in the articles. Only 1 of the 20 (5.0%) local sightings is known to have been documented in the literature (2).

Table 1 reflects the frequency distribution of UFO articles by year and month of publication. 1966 alone contributed 2/3 (47/72 = 65.3%) of all articles found during the survey. If 1966 is excluded, the average rate of UFO articles drops to 6 per year.

April, 1966 contributed the highest single monthly total with 13 articles. June is the only month in which no UFO articles were found. March and April exhibited the highest monthly totals with 18.1% (13/72) and 20.8% (15/72) respectively.

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\* A number of interesting UFO related articles will be presented with the results of the completed survey.

\*\* Appendix C has not been included in the present report because of a limitation on space.

Table 1

Number of UFO articles ascertained in the Knickerbocker News  
(Albany, New York) by year and month of publication: 1965-1969.

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1965	0	1	1	0	0	0	1	5	0	0	0	0	8
1966	0	0	9	13	5	0	1	2	2	10	5	0	47
1967	1	0	2	2	0	0	0	1	2	1	0	0	9
1968	1	0	0	0	0	0	2	0	0	0	0	1	4
1969	1	0	1	0	0	0	0	0	1	0	0	1	4
Total	3	1	13	15	5	0	4	8	5	11	5	2	72

Table 2

Comparison of the number of UFO articles found in the Knickerbocker News' clipping file with the total number published: 1965-1969.

	UFO articles in file	Total number of UFO articles published
1965	2	8
1966	2	47
1967	0	9
1968	0	4
1969	0	4
Total	4	72

Table 3

Classification of UFO articles published in the Knickerbocker News (Albany, New York) by year of publication: 1965-1969.

	1965	1966	1967	1968	1969	Total
Hoax	0	3	2	0	0	5
Denial	2	3	0	0	1	6
Misinterpretation	1	6	2	0	0	9
Informative	0	6	1	2	1	10
Local Sighting	1	4	1	1	2	9
National Sighting	2	9	2	1	0	14
International Sighting	2	0	0	0	0	2
Other	0	16	1	0	0	17
Total	8	47	9	4	4	72

Table 4

Classification of UFO articles published in the Knickerbocker News (Albany, New York) by original source of ascertainment: 1965-1969.

	KN	AP	UPI	Other	Total
Hoax	2	2	1	0	5
Denial	0	4	2	0	6
Misinterpretation	5	2	2	0	9
Informative	3	5	2	0	10
Local Sighting	9	0	0	0	9
National Sighting	1	7	5	1	14
International Sightings	0	1	1	0	2
Other	15	1	0	1	17
Total	35	22	13	2	72

### Findings (cont.)

In November, 1974 a search was made of the KN's "UFO - Flying Saucer" clipping files. This search independently ascertained only 4 (5.6%) of the 72 articles found during the period surveyed. Results of this comparison are illustrated in Table 2.

The survey's categorized findings are presented in Table 3. Arrangement of these findings into three nearly equal groupings can facilitate interpretation at this point:

- A. (Positive Bias) The reporting of UFO sightings in itself may be regarded as a positive bias. By so doing we find that sightings of all categories (LS, NS & IS) comprise 34.7% (25/72) of the total number of articles published.
- B. (Negative Bias) A negative bias is here regarded as the publication of articles dealing with hoaxes (H), denials (D) and misinterpretations (M). These categories account for 27.8% (20/72) of the total.
- C. (Neutral Bias) Articles which simply review available information or notify readers of current programs, books and lectures were regarded as being essentially neutral for the purpose of this analysis. Articles classified under the headings of informative (I) and other (O) represent a neutral bias with the final 37.5% (27/72) of the findings.

The interpretation presented above leads to the conclusion that the KN's news coverage of UFOs was fundamentally well balanced.

Final analysis of the data consisted of an examination of the original source of UFO articles. The results of this analysis indicate that the source of UFO articles is about evenly divided between the KN and the national news services. Of these articles, 48.6% (35/72) originated from the KN and 51.4% (37/72) were AP and UPI news releases. Stratification by category revealed that local sightings (LS) and other (O) articles were primarily of local origin while national sightings (NS), international sightings (IS) and denials (D) reflected national press coverage. Table 4 records the categorized findings by source of ascertainment.

### Conclusion

The main purpose of this survey was to determine the number of local sighting reports that could be ascertained through newspaper coverage of UFOs. Preliminary findings indicate that about 12% (9/72) of UFO articles deal with local sightings. It was also found that these articles generally refer to more than one sighting. During the period surveyed, 9 articles on local sightings yielded

### Conclusion (cont.)

20 independent sighting reports. On the basis of the available data, an estimate of about four sighting reports per year can be found through newspaper surveillance. It must be stressed that this estimate is based upon an abbreviated temporal survey.

Historical research of newspaper files is admittedly both tedious and time consuming. One hundred twenty hours of research were required to find the 20 sighting reports mentioned above. This averages out to 6 hours per sighting report. However, this fact must be tempered with an understanding that many of the reports may yield valuable information through retrospective investigation (3).

While this survey of the KN has not provided a wealth of sighting data, it has rewarded the search for local sightings. The study has also outlined UFO activity in the Albany area during the five year period between 1965-1969. Since newspaper records provide the only documented tradition of UFO sightings in most local areas throughout the country, the search of these records deserves our serious attention.

### References

1. Strentz, Hebert. "A Survey of Press Coverage of Unidentified Flying Objects, 1947-1966." Ph.D. dissertation, Northwestern University, 1970.
2. Hall, Richard (ed.). The UFO Evidence. Washington, D.C.: N.I.C.A.P., 1964, p. 36.
3. Bonenfant, Richard. "The Baker Sighting: A Retrospective Investigation." (Submitted to the Flying Saucer Review in September, 1975).

## APPENDIX A

## Chronological Listing of UFO Articles Published in the Knickerbocker News (Albany, New York): 1965-1969

Case No.	Day	Mo./Day	Page	Class.	Author	Source	Title
KN65-01	Wed.	02-10	9C	LS			"Flying objects" report recalls Albany mystery.
KN65-02	Fri.	03-05	2A	D		(AP)	663 unknown objects seen in 18 years, Air Force says.
KN65-03	Thur.	07-08	2A	IS	Eddy Gilmore	(AP)	Flying saucer season opens around the world.
KN65-04	Mon.	08-02	1A	NS		(AP)	The object: objects.
KN65-05	Tues.	08-03	4A	D		(UPI)	Oklahoma, Air Force clash on UFO reports.
KN65-06	Wed.	08-04	6A	NS		(UPI)	New reports of strange sky objects.
KN65-07	Wed.	08-11	3B	M			That 'winged mystery' - it's a plane.
KN65-08	Fri.	08-27	5A	IS			Strange things are happening as noisy 'thing' haunts small town in England.
KN66-01	Mon.	03-21	2A	NS		(UPI)	40 see UFO land in Michigan: U.S. mum on 'flying football.'
KN66-02	Wed.	03-23	7A	NS		(UPI)	Scores quizzed on Michigan flying objects.
KN66-03	Fri.	03-25	4A	NS			*Man sees UFO, shoots, hits it.
KN66-04	Sat.	03-26	2A	M		(UPI)	Swamp gas caused UFOs, experts say.
KN66-05	Mon.	03-28	1A-2A	NS		(AP)	Wisconsin, Ohio areas sight UFOs.
KN66-06	Tues.	03-29	1A	NS	Gene Schroeder	(AP)	More mystery lights: red, white and green.
KN66-07	Tues.	03-29	8A	O	Russell Baker	(NYTNS)	Keep those flying saucers sacrosanct.
KN66-08	Wed.	03-30	12A	LS	Rutledge Carter		Mystery lights, sighted over Albany airport a decade ago.
KN66-09	Wed.	03-30	12A	H		(AP)	Balloon pops on students' high flying saucer hoax.
KN66-10	Tues.	04-05	7C	LS			UFO sighted at Niskayuna.
KN66-11	Wed.	04-06	5B	LS			'A blg disc' reported in sky over Castleton.
KN66-12	Mon.	04-11	3B	LS			'Flying Easter egg' seen over the Hudson.
KN66-13	Fri.	04-15	6A	D		(AP)	Saw lots of saucers ... don't believe in them.
KN66-14	Fri.	04-15	1B	H			Frosh have a ball -- in the sky.
KN66-15	Mon.	04-18	1A	NS		(AP)	2 policemen chase 'too-close' saucer through 2 states.
KN66-16	Mon.	04-18	1A	NS		(UPI)	Blackout linked to strange object over Niagara Falls.
KN66-17	Wed.	04-20	12A	M		(AP)	Ohio deputies 'capture' flying objects.
KN66-18	Thur.	04-21	1A	O		(AP)	LBJ given UFO 'secret.'
KN66-19	Sat.	04-23	3A	M			Meteorite in Albany sky stirs rash of UFO reports.
KN66-20	Wed.	04-27	7A	NS		(AP)	Governor's plane chases, looses UFO.
KN66-21	Thur.	04-28	1A-2A	I	Carol Schlageter		**'Flying lights' often identified.
KN66-22	Fri.	04-29	1A-2A	I	Carol Schlageter		Agencies keep tabs on UFOs.
KN66-23	Wed.	05-04	2D	D		(UPI)	U.S. news play on UFOs 'absurd,' astronomer says.
KN66-24	Tues.	05-10	6A	O			A close look at UFO's.
KN66-25	Wed.	05-11	20A	I	Rick Dubrow	(UPI)	A skeptical view of the UFO problem.
KN66-26	Mon.	05-16	5A	I		(UPI)	Air Force report challenged.
KN66-27	Wed.	05-18	8A	I		(AP)	Astronomer backs reality of UFOs.
KN66-28	Fri.	07-08	8A	I		(AP)	Flying saucer confab.
KN66-29	Tues.	08-02	8A	O			UFO: interesting study.

\* Bangor, Maine.

\*\* 2 part serial.

## APPENDIX A (cont. 2)

## Chronological Listing of UFO Articles Published in the Knickerbocker News (Albany, New York): 1965-1969

Case No.	Day	Mo./Day	Page	Class.	Author	Source	Title
KN66-30	Fri.	08-26	13A	D	Jim Fain	(AP)	Elves, fairies, and goblins gone, be kind to flying saucers.
KN66-31	Tues.	09-13	1B	M			Albany UFO was really a balloon.
KN66-32	Wed.	09-21	13A	M	Gene Foster	(AP)	Some unident. flying objects just flying ants with a 'glow' on.
KN66-33	Fri.	10-21	3A	NS		(UPI)	3 policemen, cameraman view UFO.
KN66-34	Mon.	10-24	1A & 5A	O	John G. Fuller		*Beginning: the interrupted journey.
KN66-35	Tues.	10-25	6A	O	John G. Fuller		A strange-looking crew stares from the enormous disc.
KN66-36	Tues.	10-25	15A	O	Art Buchwald		A professor sees UFOs.
KN66-37	Wed.	10-26	5C	O	John G. Fuller		Betty's vivid dreams give clues for hypnosis.
KN66-38	Wed.	10-26	5C	H		(AP)	Teen-made UFO snared by police.
KN66-39	Thur.	10-27	8A-9A	O	John G. Fuller		Treatment of UFO couple by hypnosis outlined.
KN66-40	Fri.	10-28	18B	O	John G. Fuller		Barney didn't want to disappoint doctor.
KN66-41	Sat.	10-29	2B	O	John G. Fuller		UFO had pale blue operating room.
KN66-42	Mon.	10-31	5A	O	John G. Fuller		Betty's story under hypnosis: they gave me a pregnancy test.
KN66-43	Tues.	11-01	4A	M		(UPI)	UFOs? stars, Air Force says.
KN66-44	Tues.	11-01	8A	O	John G. Fuller		UFO leader gave Betty a strange 'up and down' book.
KN66-45	Wed.	11-02	13B	O	John G. Fuller		'Hills' UFO experience begins to register.
KN66-46	Thur.	11-03	8A	O	John G. Fuller		UFO probable, abduction unlikely, doctor says.
KN66-47	Fri.	11-04	8A	O	John G. Fuller		Final analysis: Betty, Barney think kidnap was real.
KN67-01	Tues.	01-17	11A	NS		(AP)	UFO photos appear authentic to expert.
KN67-02	Thur.	03-16	4A	H		(UPI)	Police seize 'UFO' lighted kite.
KN67-03	Mon.	03-20	3B	O			'Flying saucer' review topic.
KN67-04	Mon.	04-17	8A	NS	Dean Gysel	(CDNS)	Invaders star reports two UFOs.
KN67-05	Wed.	04-19	6F	I		(AP)	Russia admits UFO problem, seeks scientific answers.
KN67-06	Mon.	08-14	1B	LS			'Flying saucers' sighted in area.
KN67-07	Tues.	09-05	7A	H			Bleeping 'saucers.'
KN67-08	Fri.	09-15	2B	M			That saucer was Venus, not a UFO.
KN67-09	Fri.	10-06	1B	M			Those saucers simply aren't.
KN68-01	Thur.	01-04	16A	NS		(AP)	'Bubble-like' saucer seen in Colorado.
KN68-02	Tues.	07-30	5A	I		(AP)	Power blackout linked to UFOs.
KN68-03	Wed.	07-31	5C	I	Joan Lorensen		No guarantee of UFO solution seen.
KN68-04	Wed.	12-11	2B	LS	Carol Schlageter		3 men report pre-dawn UFOs in Clifton Park.
KN69-01	Tues.	01-07	9A	D	Frank Carey	(AP)	Air Force to report no evidence of manned saucers.
KN69-02	Mon.	03-03	5B	LS	George Palaczek		Strange objects over Northway in March, 1967.
KN69-03	Tues.	09-23	8C	LS			Saratogians report UFO sightings.
KN69-04	Thur.	12-18	8A	I		(AP)	Scientist applauds end of UFO probe.

## APPENDIX B

Chronological Listing of Local UFO Sighting Reports Abstracted from the Knickerbocker News (Albany, New York):  
1965-1969

No.	Date	Time	Location	No. - Witness(es)	No. - Description of UFO(s)	Other Details	Reference
1	04-08-56	night	Schenectady	3 Capt. Raymond Ryan 1st Officer Wm. Neff Stewardess Reynolds	1 "a very bright light"	<u>hovered</u> <u>est. speed 800-1000 mph</u> <u>light went out and changed to orange simultaneously observed by control tower personnel</u>	KN65-01 KN66-03
2	unk.	unk.	Albany	1 unidentified federal aviation officer	2 saucers	none	KN66-08
3	unk.	unk.	Ticonderoga	1 unidentified woman	12 "flying saucers"	<u>directly over witness' house</u> <u>smelled smoke</u>	KN66-08
4	08-11-65	unk.	Menands	1 unidentified woman	2 "gleaming silver objects"	<u>shaped like four-leaf clovers</u> <u>rapid speed</u>	KN66-08
5	08-11-65	unk.	Greenville	2 unidentified women	1 "something"	none	KN66-08
6	08-27-65	unk.	E. Greenbush	1 unidentified resident	2 disc-shaped objects	none	KN66-08
7	04-03-66	unk.	Schenectady	1 unidentified man	1 UFO	<u>near his home</u>	KN66-11
8	04-03-66	10:00 - 10:30 pm	Colonie	1 Mrs. Jane Tucci	? red and blue lights	<u>stationary</u>	KN66-11
9	04-04-66	10:40 pm	Niskayuna	1 unidentified man	1 "big orange flash"	<u>hovered</u> <u>flashed on and off</u>	KN66-10

## APPENDIX B (cont. 2)

Chronological Listing of Local UFO Sighting Reports Abstracted from the Knickerbocker News (Albany, New York):  
1965-1969

No.	Date	Time	Location	No. - Witness(es)	No. - Description of UFO(s)	Other Details	Reference
10	04-05-66	06:45 pm	Castleton	2 Mr. Joseph Powers and his son Joe Jr.	1 large disc-shaped object	<ul style="list-style-type: none"> <li>- 100 feet wide</li> <li>- blue and red lights on sides</li> <li>- short tail of blue flame</li> <li>- motionless, noiseless</li> <li>- movement - "sort of coasted"</li> <li>- hovered over electric wires</li> <li>- landed in woods</li> <li>- after 5 minutes a searing red glare moved back and forth and a white light shot out of the object</li> </ul>	KN66-11 KN66-12
11	04-07-66	night	Colonie	2 Mr. & Mrs. Richard Doring	1 "bright red disc"	none	KN66-12
12	04-10-66	night	Albany	3+ John, Michael & Richard Albano and wives	1 bright egg-shaped object	<ul style="list-style-type: none"> <li>- hovered over the Hudson River</li> </ul>	KN66-12 KN66-21
13	04-18-66	unk.	Albany	2 Patrick Olesko and a 15 year old friend	1 a "dense light"	3 feet above road	KN66-21
14	03-26-67	unk.	Clifton Park	1 unidentified woman	1 strange flying object	<ul style="list-style-type: none"> <li>- (suggestion of E-M effects)</li> </ul>	KN69-02
15*	unk.	unk.	Glens Falls	1 unidentified man	1 grey metal craft	<ul style="list-style-type: none"> <li>- noiseless</li> <li>- about 100 feet long</li> <li>- observed crew of four men and a woman</li> </ul>	KN69-02

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\* This occupant report was independently ascertained and verified by the author. A paper on the encounter is currently being prepared for publication.

## APPENDIX B (cont. 3)

Chronological Listing of Local UFO Sighting Reports Abstracted from the Knickerbocker News (Albany, New York):  
1965-1969

No.	Date	Time	Location	No. - Witness(es)	No. - Description of UFO(s)	Other Details	Reference
16	unk.	dusk	Lake George	1+ unidentified man and his family	1 white, domed object	_duration - nearly one hour _observed through binoculars	KN69-02
17	08-12-67	09:45 - 10:30 pm	Colonie Rexford Schenectady Scotia	1+ unidentified observer	1+ red objects	_noiseless _travelled at great speeds _hovered motionless _red to bluish lights	KN67-06
18	12-09-68	dawn	Stillwater	1+ Mr. Richard Snyder	3 "like a falling star"	_stopped, turned and reacted to witness	KN68-04
19	12-11-68	dawn	Clifton Park	3 Mr. Richard Snyder Mr. Daniel O'Malley & Mr. Lanou	3 a. greenish-blue object b. orange object c. brilliant red object	"something like the size of an automobile tire" "sort of transparent" _objects changed altitude and color _reacted to witnesses _photos taken _moved "at a terrific rate of speed"	KN68-04
20.	09-22-69	07:00 pm	Ballston Spa Lake Pleasant Saratoga Lake	3+ Mr. George Volkins Mr. John O'Connell unidentified woman	1 large circle of white light	_noiseless _flashing red, green and orange lights _moved very slowly at low altitude	KN69-03

## PROGRESS ON AN INSTRUMENTED FIELD STUDY

Mario DeSario and Jeffrey L. Kretsch

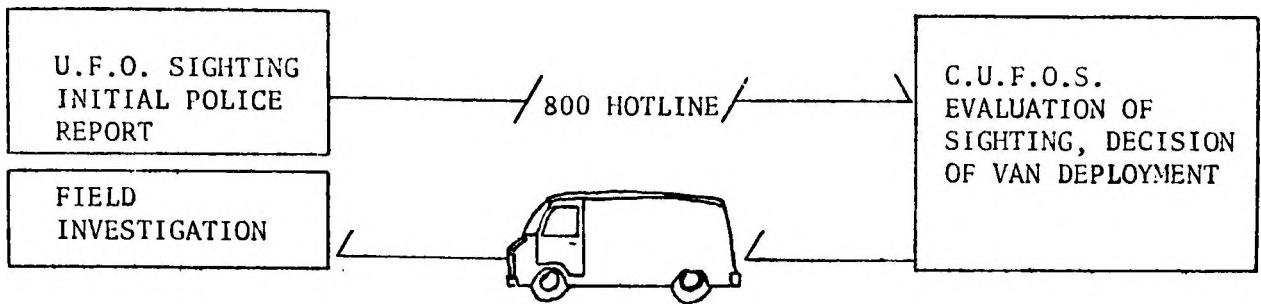
It is generally agreed that more quantitative data is needed in the study of UFO phenomena. Although a great deal of information might be gained from studying eyewitness reports, restriction to this form is limiting the progress which can ultimately be achieved. Instrumentation can assist in obtaining the quantitative data both to open up new avenues of research and to complement existing studies. Recently several instrumented groups have been established with the aim of eventually obtaining quantitative data. This is a report on the progress we have made thus far in setting up an Instrumented Field Study, and the work we hope to complete in the immediate future.

The instrumented field study is an attempt to get instruments out into the field to areas where UFO activity has been recently reported. This might be possible because of two factors: (1) The Center for UFO Studies is able to receive reports quickly from all over the nation, and (2) Often UFO activity takes place in an area over a period of several days. Although our project is an independent one, we intend to work closely with CUFOS because of its network for receiving reports and the aid it can provide in evaluating data. Because of this existing organization and this observed tendency, there seems to be a reasonable chance that over an extended period, opportunities for observing UFO activity might present themselves.

Finding opportunities to observe activity is only the first step; obtaining useful data requires systematic observations. Past experience has shown that instrumentation must be made to fit the phenomenon, and this will require some versatility, as the phenomenon is so little understood.

What is meant in this case by versatility can be seen in the process of designing and utilizing instrumentation. A given theory might be proposed because it explains certain aspects of the UFO phenomenon. However, if it is a good theory it might also include predictions; for example, the intensities in different parts of the electromagnetic spectrum, or aspects of a UFO's magnetic field. Observations could serve to confirm or contradict the theory. Instruments may then have to be designed to carry out the required observations. The new observations obtained might suggest a new theory, whose testing might require new observational techniques. As knowledge of the phenomenon changes, our approach to it must change suitably. It is apparent that an effort such as this will require a great deal of outside support, but if it succeeds, even that may not have been considered enough.

The actual sequence of events occurring in a sighting generally starts when a report is received through the CUFOS "hot line." These are generally received within minutes to hours of the event. If the report is judged to be of merit, the instrumented field study is dispatched to the site. If local investigators are already on the site, it would be possible for us to concentrate on setting up a temporary observing site, and provide aid to the local investigators if necessary. If there are no local investigators on the scene, we are prepared to investigate the case.



Over the period of observation the following conditions will be recorded:

Time: WWV  
WWVB  
Internal Time System  
Background Radiation Count

Weather Conditions: Barograph  
Thermograph  
Hygrograph  
Anemometer (wind speed, direction)  
Winds Aloft (cloud motions)  
National Weather Service Receiver

Sky Conditions: Cloud-Cover (types, areas of sky)  
Transparency  
Scintillation  
Visibility in miles

The above data give vital information on the conditions under which the main measurements and observations have been made. Our primary objective is to survey those areas in which the phenomenon may provide useful information. Knowing the areas in which "activity" from the phenomenon can be measured, we might better be able to decide what direction future studies should take. Our studies lie in four basic areas:

- 1) Geometric Data - Size, distance, and velocity
- 2) Electromagnetic Radiation
  - a. Diffraction Grating
  - b. Light Data Array:- Intensity, polarization, colorimetry
  - c. Camera Systems
- 3) Audio Information - Resonant Frequency Microphone
- 4) Magnetic Field Effects
  - a. Magnetometer from P.M.S.  
In addition we hope to add:
  - b. An electrostatic detector
  - c. A gravimeter

The equipment for measuring observation conditions and the physical parameters of UFO phenomena can be divided into three areas by location, on Tripod 1, Tripod 2, and the Control Panel. In the equipment diagram below, there is a flow chart which lists the instrumentation we are planning, the unshaded listings being the instruments and equipment we either have at present or will shortly have in operation. The shaded blocks contain the instrumentation which either has not been purchased yet or requires more time for development and building.

Tripod 1 will hold the main battery of cameras, the light array, the sound detector and the parallax measurement system. The three cameras are controlled by a trigger mechanism; the basic data of time and exposure are recorded by the auto sequencer and fed into the multiplex of the Control Panel. Telemetry from the light array and the parallax measurement system are also fed into the multiplex. The resonant frequency microphone has its own recorder.

The automatic equipment will consist of a background radiation meter, an electrostatic field measurement system, and a weather station. There is also a magnetometer which records data automatically through the Control Panel.

All the data from Tripod 1 and the automatic equipment, except that from the resonant frequencies microphone and the weather station, are fed into the Control Panel, which consists of a WWV receiver, a recorder, a multiplex (IRIG), and magnetometer control and recorder. The multiplex scans the incoming data at a known frequency, recording bits of each input in an IRIG code, thus storing several channels of information on one tape. These are correlated with WWV as a base, and recorded.

The data from Tripod 2 and the weather station will be manually or self-recorded. Tripod 2 will carry a diffraction grating in front of a 50 mm. wide angle lens on a motorized 35 mm. Nikon camera, a visual photometer, colorimeter, and a range finder. These data will be recorded manually or by voice via a tape recorder.

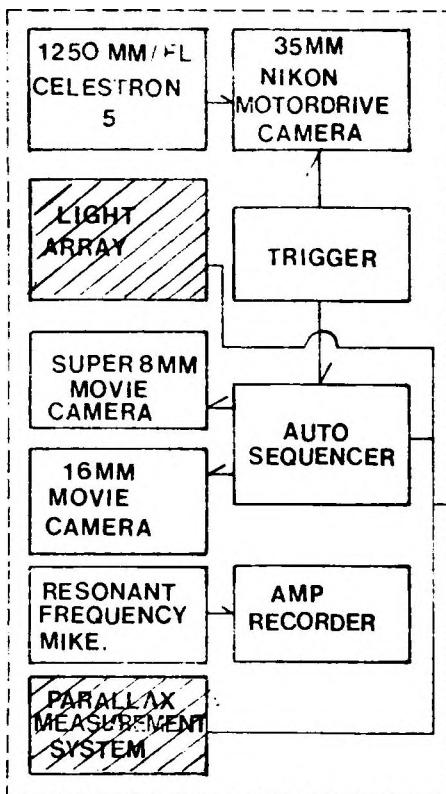
#### The Geometric Data

The term Geometric Data refers to the distance, size and velocity of the object observed. These parameters will be needed in the analysis of the sound and magnetic data, and in the determination of the energy emitted from the surface of the object if it is in a lighted state.

The distance to the object can be found in two ways. A rangefinder can be used visually to obtain the distance directly. To get continuous values for the distance with this system, one would need a full-time observer. Another means of obtaining the distance is with the automatic parallax system, which requires two tripods equipped with cameras. By means of calibrated potentiometers, the altitude and azimuth orientations of each tripod camera can be measured and recorded. Since this data is correlated with time, the distance and velocity of the object throughout the period of observation can be calculated. The size can likewise be calculated if an angular measurement is obtained, either visually or through the analysis of the photographic images.

# EQUIPMENT

TRIPOD 1



CONTROL PANEL

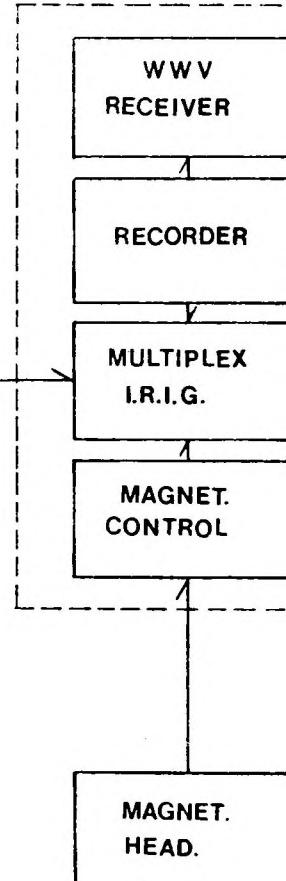
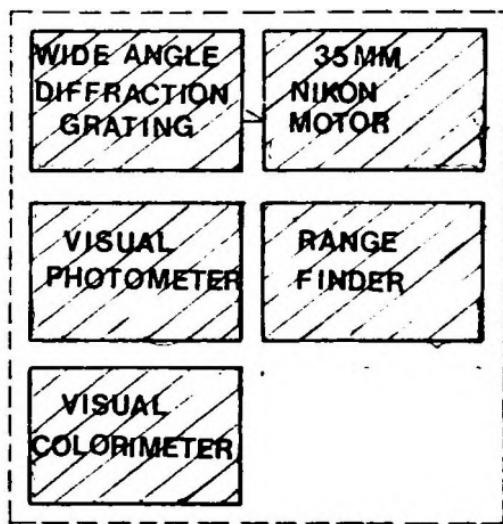
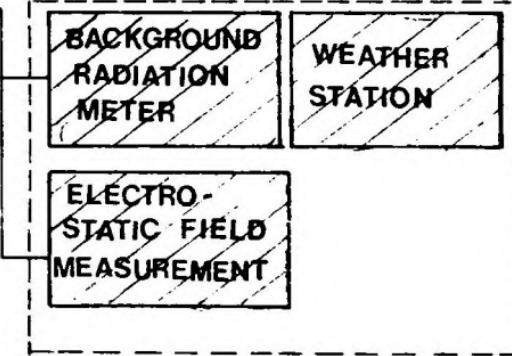


Diagram by S. Atkins

TRIPOD 2



AUTOMATIC EQUIPMENT



AMATEUR  
RADIO STATION

### Electromagnetic Radiation Detection

Electromagnetic radiation consists of light, infrared, ultra-violet, radio waves, etc., all consisting of transverse electromagnetic waves, as opposed to longitudinal sound waves, for example. This type of radiation can be detected visually in the light range, photographically, and with photo-detecting devices. A great deal of information may be carried through this medium, as any astronomer or physicist can testify.

The diffraction grating and prisms separate electromagnetic radiation in the visible region into its component wavelengths (colors). We call this a spectrum (i.e., rainbow). There are several types of spectra: continuous, emission, and absorption. Continuous spectra arise from thermal sources; from the wavelength of maximum intensity one might tell the effective temperature of the source. Emission (absorption) spectra, which consist of bright (dark) lines, can tell one about the constituents of the emitting source, as has been done in the case of meteors.

The diffraction grating is placed before the lens of the camera, in this case a 50 mm. lens. With the diffraction grating we plan to purchase, 60% of the light should go to the first order spectrum. The resolution for a 10,000 lines/inch grating will be between 10 Å - 250 Å between a point source and one the size of the full moon. We will probably use Tri-X Film.

#### Properties of Different Gratings Using 50 mm. Lens (f=50)

b cm.	No. Lines	Linear Dispersion	Linear Distance From Source	
$10^{-3}$	100/cm. 254/in.	2000 Å/mm.	0.2 cm.	0.35 cm.
$5 \times 10^{-4}$	1000/cm. 5080/in.	1000 Å/mm.	0.4 cm.	0.70 cm.
$2.544 \times 10^{-4}$	3940/cm. 10000/in.	518 Å/mm.	0.79 cm.	1.44 cm.
$2 \times 10^{-4}$	5000/cm. 12700/in.	400 Å/mm.	1.02 cm.	1.87

(Table based on calculations by Michael Peck)

The use of the diffraction grating is accorded high priority in our studies; for its relatively small expense and simple use, it is well worth it.

Two important qualities of light are (1) intensity over a given wavelength interval, and (2) polarization, defined as the orientation of the E vector in the light wave. Measuring the apparent intensity and the distance of the object enables one to calculate the total energy an object is emitting.

To measure the intensity, we can use three separate methods: visual estimates, photographic means, and photometric means. Of these three, photographic

methods have attained the highest stage of development at this time, though our efforts in the immediate future will be to complete installation of the equipment needed for the other two means. In addition to intensity, we will wish to measure color and polarization.

Visual estimates may be made with a color wheel and a visual photometer. Using a color wheel, one can change the color of a test light source to reach the closest approximation to the color of the object being observed. Then the intensity of the light source can be varied until it matches that of the object. Then, by noting the color and intensity of the test source, we have a measure for those of the object. In terms of color perception, the human eye is known to be very accurate. For intensity measurements, the human eye responds logarithmically; thus small intensity variations are more easily noted for dim sources than for bright ones. As an example, the difference between a 50 watt bulb and a 100 watt bulb would be more noticeable than the difference between 150 and a 200 watt bulb.

Photographically one can determine light intensity by measuring the density of the image. To be done well, the film must be pre-calibrated by having a small portion of the film exposed to known intensities of light. One of our cameras utilizes photosensitive devices for determining exposure; this is done by assigning weights to different areas of the field, the center being more heavily weighted than the outer regions. An average light intensity is derived which determines the exposure time. If there are wide deviations from the average within the field, then some areas might be over-exposed while others are under-exposed. Where parts of the film are burned out it might prove impossible to determine intensity without knowing the exposure time and the corresponding average required to give this time. Color film might give one an estimate of the color, as would color filters in conjunction with black and white film.

Polarization might be determined both visually and photographically through the use of a rotating polarizing filter. We would want to determine the direction and percentage of polarization. Visually, the polarization experiment might be done in conjunction with the color wheel and visual photometric observations to determine if there are any relations of polarization to color (wavelength). A visual sketch of the polarization would be valuable in collaboration with a photograph using a polarized lens. Such photos could determine areas of polarization.

Finally, for the photometric determinations of intensity, polarization, and color, we are attempting to develop a system called photometric light array. Although these parameters can also be determined visually and photographically, there are several definite advantages to having a photometric system. The first is that the data obtained can be recorded continuously throughout the period of observation, and rapidly changing phenomena - which might be impossible to process manually under the circumstances - can be recorded automatically. Therefore we are trying to build such a system. We are currently exploring the possibility of developing this system using solid state devices, as these require less power than conventional photomultiplier systems.

The system's basic outline is as follows. There will be five separate detectors. The first, with just a lens, will measure the overall intensity of

# GENERAL SCHEMATIC OF THE LIGHT ARRAY

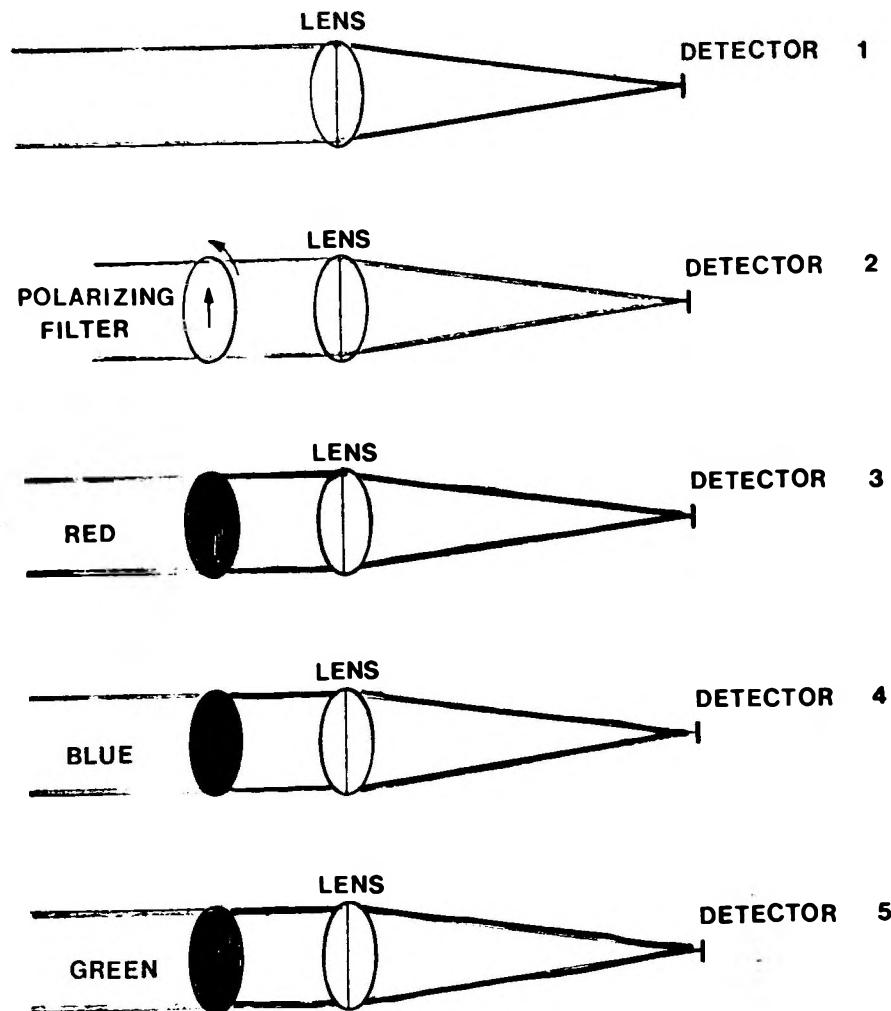
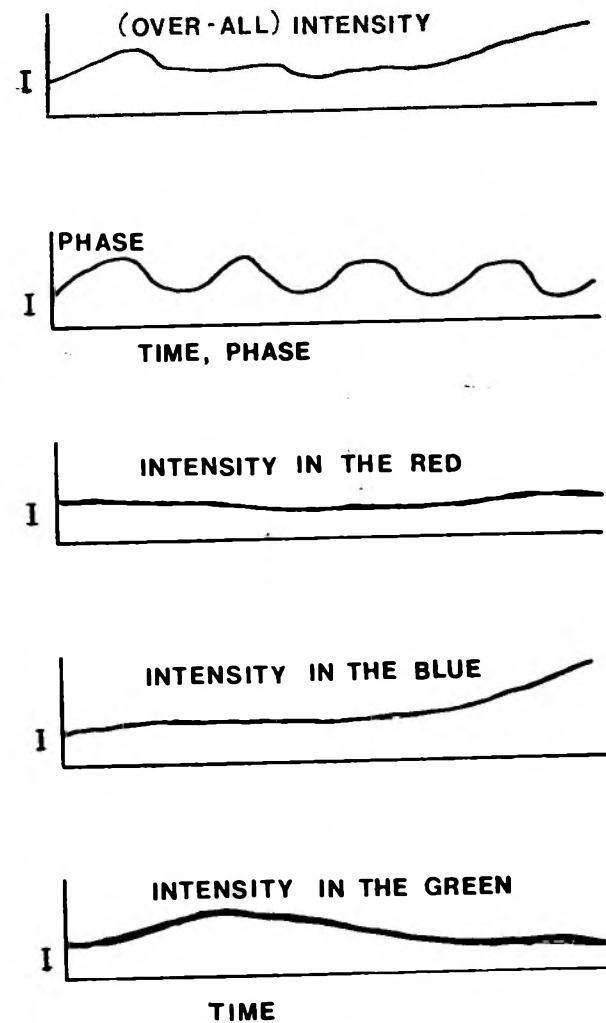


Diagram by S. Molina



# TRANSMITTANCE OF KODAK FILTERS

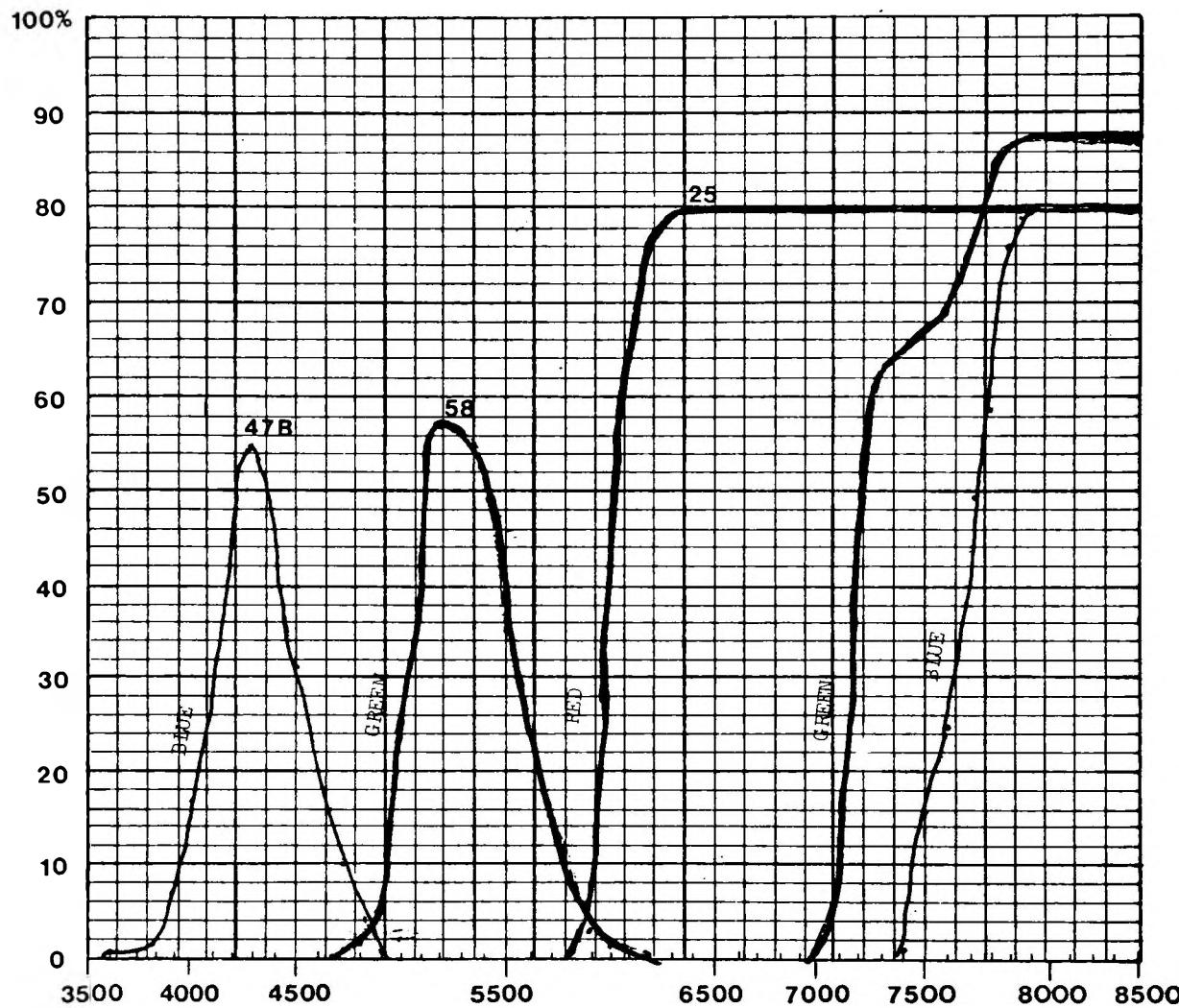


Diagram by S. Molina

the incoming radiation. This device will be able to measure intensity variations of the object with time. The second detector will have in front of its lens a rotating polarizer. Intensity variations which are synchronous with the rotation of the lens, and not comparable to any on the first photometer, will probably be due to polarization. From this device we will be able to determine the direction of polarization from the phase of the light curve, and the percentage of polarization from the amplitude of the curve. The final three detectors will each have a color filter in front of the lens, one for a band in the red, one for the blue, and one for the green. The relative intensities in these bands will give a value for the color, but most important, there will be measures of the light flux over the selected bandwidths with time.

The photometric light array will be more sensitive to the brighter intensities, where the human eye experiences difficulties in close quantitative estimation. Also, such bright intensities will be associated with close approaches, times when automation should be a good back-up for manual efforts.

We have then several methods for obtaining the intensity, polarization and color of an object.

	Visual	Photographic	Photometric
Intensity	Visual Photometer	Density of the Image	Intensiometer
Polarization	Rotated polarizing lens	Photographs with the lens rotated to different positions	Polarization meter (rotating lens)
Color	Visual colorimeter	Color photo estimates (rough), B&W photos with filters	Three intensimeters with color filters

With photographic techniques we will be able to reach very low light levels; considering the system as a whole, we should be able to operate over the 5th to -15th magnitude range.

#### The Magnetometer

Electric and magnetic fields may be associated with UFO phenomena, therefore the field unit will carry instrumentation designed to measure these fields if they exist. One of the finest pieces of equipment in this study is the Magnetometer Model 105, designed for Precision Monitoring Systems by Neal Davis and D. L. Kuzara. The purpose of the magnetometer is two-fold. First, it will serve as a detector and alarm system for the anomalous fields that have been reported with UFOs. Secondly, from the recorded data we might tell something about the form of the field and whether the field vector is largely horizontal or vertical with respect to the ground.

The magnetometer detector is a coil device with a shaft of  $\mu$ -metal inside. About the  $\mu$ -metal core are 90,000 turns of wire, the radius of the coil being about .2 inches and the length 12 inches. The coil generates a current and a potential by the formula:

$$\mathcal{E} = \frac{d\Phi}{dt}$$

where  $\mathcal{E}$  = the potential in the coil

$$\Phi = \text{the magnetic flux} = \oint \mathbf{B} \cdot \mathbf{n} da$$

$$\mathbf{B} = \mu \mathbf{H} + \mathbf{M}$$

$$a = \text{coil radius}$$



$$\mathcal{E} = \frac{d}{dt} \iint B \cos \theta dr d\phi$$

$r$  and  $\phi$  are cylindrical coordinates

From the equation above it is evident that the detector is highly directional along the axis of the coil, and falls off according to the  $\cos \theta$  as  $B$  moves off the axis of the coil. The EMF varies according to the change of flux, which itself varies with intrinsic changes in the field source and with changes at the observer's position due to motion of the source. Of major importance is the nature of the source; i.e., whether it is a dipole, quadrupole, etc. In addition to radial dependences, the field can in general also have angular ones.

Because of the high sensitivity of the device and the specific purpose of observing UFO fields, we will want to screen out those signals which will result from natural and artificial sources of flux variation. If we speak in terms of the frequency of a field's variation, we find that natural variations resulting mainly from geomagnetic variations are generally of low frequencies, while artificial sources are generally at high frequencies. Therefore, in order to have a low noise signal, the system utilizes a bandpass filter which "lets through" variations in the .1 to 10 Hertz range. This signal can then have useful high gain amplification.

In general the magnetometer is automatically triggered when the flux level is above a certain selected level, whereupon the magnetometer automatically starts recording the signal, along with a WWV signal from a receiver built into the unit. The magnetometer can also be triggered manually, and recordings of the magnetic flux taken.

Naval engineers are the sole users of a unit for flux variation called the gamma-Hertz, which specifies the rate of change of the flux with time. The unit is apparently a ratio of the amplitude of the field in gamma to the frequency in Hertz. The sensitivity of the magnetometer varies from .13 gamma-Hertz to 350 gamma-Hertz, depending on the gain setting used.

One has then an instrument which is especially designed for the study of UFO phenomena by screening out natural and artificial sources of "noise." This particular system does have limits on the amount of information one might gain about a magnetic field, because we are measuring the first time derivative of the flux, rather than the flux itself, which depends on variables outside the field itself. Future work with these magnetometers will require more sensor heads, or perhaps Hall Effect probes to measure the field directly.

MAGNETOMETER MODEL 105 SPECIFICATIONS

FEATURES: Induction coil sensor responds only to magnetic field fluctuations  
Sensor is directionally sensitive  
Remotely switched gain  
110 dB suppression of 60 Hz interference  
Output is short-circuit protected.

(From Precision Monitoring Systems, courtesy of Neal Davis)

ELECTRICAL CHARACTERISTICS:

	<u>Output</u>	<u>Temperature Range</u>
Voltage swing	+ 10 V	Operating 0 to +50° C.
Recommended load	≥ 2000 ohms	Storage -65 to +125° C.

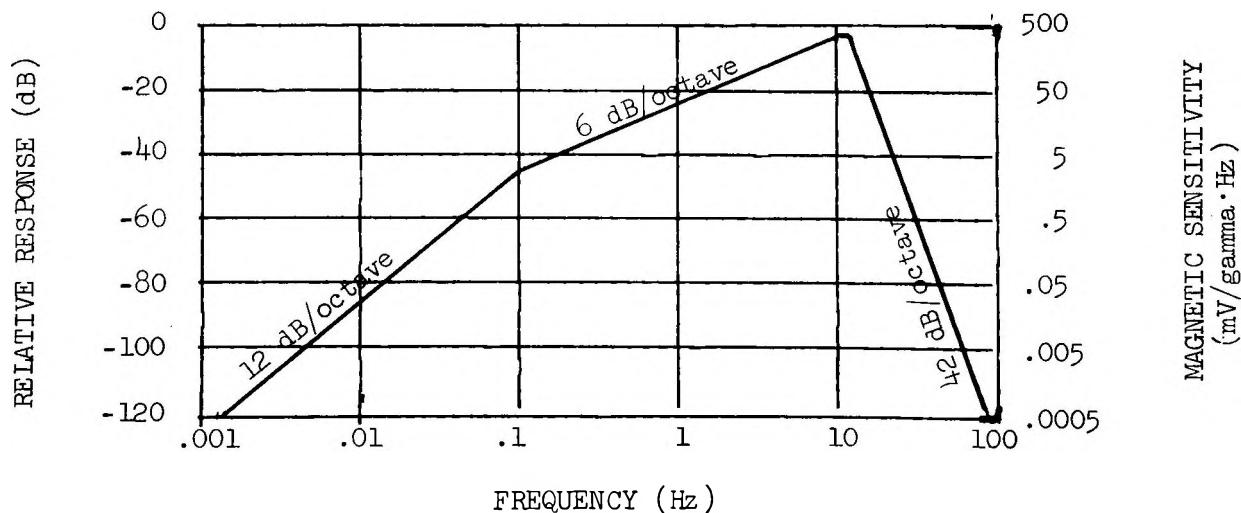
	<u>Power Supply</u>
Nominal voltage	+ 15 V
Operating range	+ 10 to + 18 V
Quiescent current (0 + 15 V)	9 mA

	<u>Mechanical</u>
Case size (including connector)	1.75 x 3.5 x 13.5 inches
Mating socket	Viking Thorkom part TKP12-102

<u>Magnetic Field Sensitivity</u>		
<u>Internal Switch Position</u>	<u>Remote Gain Control Voltage</u>	<u>Sensitivity</u>
Normal	- 15 V or open	50 mV/gamma·Hz
Normal	0 (ground)	1.0 V/gamma·Hz
X 100	no control	5.0 V/gamma·Hz

Output Noise  
Typical noise in 0.1 to 10 Hz bandpass at 50 mV/gamma·Hz sensitivity: 0.7 mV RMS

Frequency Response



### The Resonant Frequency Microphone

The detection of audio frequency signals will be accomplished through the use of the resonant frequency microphone, which consists of 37 tubes varying from 36 inches to .5 inch in length, in 1-inch increments (with the exception of the last, which is a .5-inch increment). The frequency response is determined by the length and number of tubes used. Each tube is cut to a particular length, to resonate over a specific frequency. The longest tube used is 36 inches, with a resonant frequency of 183 Hz and a useable bandwidth of 25% of the resonant frequency, in this case 46 Hz, with the resonant frequency in the contour of the band. The shortest tube used is .5 inch, with a resonant frequency of 13,750 Hz and a bandwidth of 3438 Hz.

The relationship of tube length and frequency can be represented by:

$$f = \frac{V_s}{2L}$$

where     $f$  = frequency  
             $L$  = length of the tube  
 $V_s$  = approximate velocity of sound in air, or  
       ≈ 1100 ft/sec

The apparatus has been found to be highly directional. Its angle of acceptance will vary with the incoming audio signal. The angle of acceptance is approximately 8 degrees.

A signal once detected will be amplified by a voltage amplifier having a gain of 10,000 with a subsequent 5 watt power output stage. The amplifier signal will be automatically recorded on magnetic tape. It may also be monitored through headphones by the investigator at the time of the event. The recorded signal will later be analyzed using a Beckman power level recorder and a Kay frequency spectrograph in an attempt to quantify any changes or patterns in the signal.

### Alternate Activities of the Field Study

In addition to attempts to observe UFOs in the field, investigations of witness reports can be carried out. Video-taped examinations of the site and interviews with the witness can be made. Maps can be made of the sighting area and traces can be investigated, using well-established criminological methods. Investigation of traces would utilize infra-red photographs and measured temperature profiles of the ground, both over the surface and with respect to depth. Soil samples and radiation background counts could be taken as a matter of course.

Finally, the instrumentation might be used for studying natural phenomena during periods of UFO scarcity. Some phenomena, such as airplanes in flight, might be useful for conducting dry runs with our equipment. Meteor photographs and spectra might be taken with our equipment. These are some suggestions from a wide range of areas in which work might be done. However, the goal of our research is and will remain to obtain direct observational data on UFO phenomena.

## SANTA CATALINA CHANNEL "CLOUD-CIGARS"

Ann Druffel

The transitory nature of UFOs dismays researchers. The objects appear unexpectedly to startled witnesses and in most cases are gone before any permanent record of their passage can be obtained.

In rare instances, however, the appearance of UFOs can be predicted by reason of their repeated occurrence in some particular region. One of these regions is over the Pacific Ocean between the coast of Southern California and the off-shore islands, notably Santa Catalina Island, which lies about twenty miles west of the mainland.

We are concerned specifically here with a rectangular area between thirty-three (33) degrees and thirty-four (34) degrees latitude north and between one-hundred-nineteen (119) degrees and one-hundred-seventeen point five (117.5) degrees longitude west. Other "channel" and "basin" areas, named for the cities and islands associated with them are involved here, but the term "Santa Catalina Channel", as applied to the area in question, is more meaningful. In most cases, the objects were viewed between the mainland and the large off-shore island of Santa Catalina.<sup>1</sup> (Also see Appendix, Page A)

The complex sea floor off Southern California is becoming one of the best known submarine areas in the world. Data on the topography, sediments, rock formations and seismic character have been published in several sources.<sup>2</sup>

There has typically always been poor navigational control in this area, but it is difficult to correlate this fact with the numerous magnetic anomalies existing here.<sup>3</sup>

The following material has never been published or, indeed, never collected together before in cogent form. It is necessarily incomplete and speculative. When viewed as a whole, however, it might afford the UFO research field an opportunity to study long-lived UFO phenomena with scientific instrumentation. Hopefully, readers of this paper will offer ideas on

how such instrumentation can be obtained, set up and maintained.

THE 1962 MYSTERY: The first hint that the skies above the Santa Catalina Channel held more than seagulls occurred, to the best of our knowledge, in August 1962. Two women witnesses, of which the author was one, had brought their six small children, ages eight to one year, for a leisurely day at the Long Beach, California seashore. About 2:00 p.m. one of the women (author) noticed a small, white rectangular cloud, which looked exactly like a newly-formed section of vapor trail. It seemed to be neatly sliced off at each end and transplanted in the blue, smogless sky. Its apparent diameter was about four (4) millimeters at arm's length, and its width was one-half its length.

It was positioned at about forty (40) degrees elevation, approximately one hundred ninety-five (195) degrees azimuth (magnetic) high in the sky. It seemed about midway between the shore and the island of Santa Catalina, which was clearly visible to the south and southwest.

There was no evidence of high-flying jets and no other vapor trails or clouds in that quadrant of sky. After about fifteen minutes, the witness became aware that it was not a normal vapor trail. It was too short, too isolated, did not change shape or size in the slightest. Neither did it move in any direction. The witness called her friend, Mrs. James (Aileen) Cummings' attention to it, and the two women continued to observe the small white rectangle. For about thirty more minutes it remained motionless, unchanged in size and shape.

Then something began to occur within the tiny cloud. Its white vapor began to "churn", presenting an impression of internal activity. It enlarged two or three times; it was now about 3:15 p.m.

During the next half hour, it slowly changed into an oval, twenty to thirty (20-30) times its original size. It still hovered at forty (40) degrees elevation at the original azimuth, but now its apparent diameter had blossomed to four (4) centimeters in length and about two (2) centimeters in width at arm's length. It was solid-appearing, unlike a normal cloud. Its vaporous, oval shape was definite, and at no time did the edges dissipate beyond the perimeter. There was a constant churning motion all over the visible surface, somewhat like water boiling in slow motion. The object seemed angled at approximately twenty-five to thirty (25-30) degrees, its longest diameter being positioned to the witnesses' right. (See Appendix, Page B)

The mysterious sight kept the witnesses' attention, mainly because it seemed that "something" was inside its vaporous

exterior. At times it seemed as though the object were about to "open up" to reveal whatever might be lurking within.

About forty-five minutes after the formation of the oval, the witnesses saw flashes of light coming from the object. The flashes were bright white and momentary. They extended about a diameter's length out from the surface. They gave the impression of strong reflections from the bright sun off some metal surface within the cloud or of electric discharges. At no time was any sound heard. The flashes were periodic, separated by minutes, with no regular rhythm.

During the time the flashes were observed, numerous military jet trails were seen in the south, evidently over and beyond Catalina Island. These trails were observed from four to ten (4-10) degrees above the island, which rises about three (3) degrees above the horizon from that viewing position. None of the jet trails appeared within thirty (30) degrees of the churning, flashing cloud. However, these trails indicated the presence of a number of highly active, military jets.

After watching the flashes in the cloud for about fifteen minutes, the witnesses approached a nearby lifeguard, hoping he could lend them binoculars so they could get a closer view of the activity within the cloud. He denied having binoculars, and when the witnesses tried to explain to him about the strange cloud he showed no interest.

About 5:00 p.m. the witnesses collected their small children, preparatory to making the long thirty-five mile drive back to their Pasadena homes. They left reluctantly, pausing several times during the quarter-mile walk to their cars to stare at the object. It still hung motionless high in the sky. They discussed reporting the incident to the Long Beach Press-Telegram but rationalized that the object must have been seen and reported by many others. It had been in view more than three hours.<sup>4</sup>

As awed as the witnesses felt over the cloud's strange exterior, the activity within it was so inexplicable that both felt inadequate to even verbalize it. Consequently, it went unreported until this date. They remained totally unaware of the possible significance of the occurrence until years later. More on the possible significance of this sighting after further correlative material has been presented below.

THE 1968 "CLOUD-CIGAR": The second instance of a "vaporous cloud" over the Catalina Channel occurred on July 9th, 1968. By this time, the Los Angeles NICAP Subcommittee had established SKYNET, a tracking-and-filter center designed to collect and investigate public UFO reports.<sup>5</sup>

On that summer evening, the phones rang off their hooks at the Project Coordinator's home in Pasadena. Thirty air miles south in Long Beach and surrounding communities, citizens began reporting a large, glowing mass positioned high over the Catalina Channel. Accompanying the silent, hovering cloud were several glowing, smaller globes which maneuvered in the same area of sky. (See Appendix, Page C)

The first call came from a group of five teenagers gathered at the home of Kevin Allgreen, three miles north of the shoreline. At 9:35 p.m. they had noticed a gray-white, diamond-shaped haze under the full moon in the south-southeast. At 10:05 it began moving fifty-five (55) degrees in a horizontal line toward the west. By 10:15 it had returned, intact, to its original position near the moon. Maneuvering near the large object were five smaller cloud-like objects, oval-shaped with clearcut edges. Two of these were grayish and three "kind of white".

The boys, aged thirteen to eighteen years, viewed the objects through binoculars and determined that all of the unknown masses looked "solid". They kept their shape and precise edges through subsequent maneuvers. Although the edges of the larger object were "fuzzy", it did not seem to be a normal cloud because it moved too fast during its brief journey westward and back again (fifty-five (55) degrees in three (3) minutes). It was many times the size of the smaller balls, an estimated five to six (5-6) times the diameter of the full moon. The end facing west was long and narrow, and the part facing east was shaped "like a diamond".

The boys were convinced that they were viewing something highly unusual. They estimated the main mass was about ten (10) miles high. About 11:00 p.m. the large object turned reddish-orange in color and began traveling upward at an approximate angle of thirty (30) degrees. By 11:30 it "just faded away", taking five (5) minutes to dissipate out of sight.

Following hard on the teenager's first call, the family of Mr. I. Castano of Compton also called SKYNET. From their home seven miles north of the Long Beach witnesses, his family had viewed a group of four oval, cloud-like objects the size of pinheads at arm's length, or about one-eighth the size of the full moon. First seen at 9:30 p.m. and disappearing at 10:00, they were glowing white with precise edges. They were gathered around the moon when first seen, and then started departing "right and left". They seemed to be far out in space. "The objects spread out and then dashed toward one another," Castano related. "It looked like some kind of a war!" To Mr. Castano, who had never believed in the existence of UFOs before, the event was completely mystifying.

The Castanos did not describe the large cloud, but this is probably because he was much further north than the Long Beach witnesses. Was he seeing the smaller related objects on a mission inward from the Channel?

Another report which seems to validate the above speculation comes from the files of Paul Wilson, another local UFO researcher. He was informed by his neighbors, Michael and Leslie G\_\_\_\_\_, that they had seen a glowing UFO about 9:30 or 10:00 p.m. on the same night. It traveled toward their home in Hawthorne (fifteen air miles northwest of Long Beach), approaching from the east. It was oval and slightly smaller than the full moon. It was shiny white with clearcut edges, seemed to be several miles away, and traveled toward the south away from the moon and back again. It was soundless, spun in an apparent circle "around the moon" and afterwards let off streams of smoke or vapor from its side. Duration of sighting was twenty (20) minutes.<sup>6</sup>

From the similarities in description from the Castano and G\_\_\_\_\_ families, it might be assumed that they were viewing the smaller objects during a foray inland. The Castanos saw four objects, the G\_\_\_\_'s a single one. We might speculate that the five small objects associated with the main cloud-mass had split up into two groups, while the parent object or "cloud-cigar" hovered high over the Pacific.

While all this activity was going on, SKYNET was making frantic efforts to obtain additional witnesses and documentation. The only SKYNET member residing near the coast, Jim Griebel, was contacted. His home was three miles north of the Long Beach witnesses.

Through binoculars he could see a cloud-like conglomeration low on the southerly horizon. Whether composed of one or two masses he was not sure, but the mass(es) seemed diamond-shaped on one end and rounded on the other. The bright light from the moon dissipated Griebel's view, but there is little doubt that he was seeing the primary cloud-object which was being viewed from Long Beach. Including Griebel, twelve (12) witnesses in all, from four (4) independent groups, reported the July 9th, 1968 event.<sup>7</sup>

Nothing about the above cases seemed to click into place at the time of their occurrence. The 1962 case remained an enigma for thirteen years, shoved back into the inner recesses of the two witnesses' minds. That "something" could appear from almost "nothing" and retain shapes, position, and activity for over three hours was inexplicable. The 1968 case, which lasted at least an hour and one-half was considered a possible "cloud-cigar". This UFO-type is described by Aime Michel in his classic

book, Flying Saucers and the Straight-Line Mystery.<sup>8</sup>

THE ENIGMA OF 1973: On December 20, 1973, another mystery occurred over the Pacific Ocean between the mainland and Catalina Island. This sighting was as bizarre and long-lived as the two which had gone before. Although at first glance it appeared unassociated with the vaporous masses in the first two events, further study has convinced the author that all three phenomena have many factors in common. Therefore, the three cases are being presented together in order that opinions can be sought from other researchers.

About 2:15 a.m. on December 20, 1973 Michael Wagner of Pacific Palisades noticed a yellow glowing "blob" hovering in the south-southeast at an elevation of approximately twenty (20) degrees. He called it to the attention of Robert B. Klinn, known in UFO circles as a skilled researcher. Their viewing position was about twenty miles northwest of Long Beach.

The two witnesses took turns studying the light through a 16-power Navy spyglass, which they were able to steady on a ledge at Klinn's residence. As seen through the telescope, the "blob" resolved into a precise arrangement of round, yellow-gold lights. Though the entire mass appeared larger than Venus with the naked eye, through the 'scope the lights encompassed an area of approximately three (3) millimeters. They were arranged in a vertical column bisecting a horizontal column of equal length. Additional columns of light appeared and arranged themselves into a nearly perfect light-studded triangle.

The witnesses adjusted the telescope, and when Klinn again looked through it about three minutes later, the complex of lights had assumed the shape of a huge, cigar-shaped "machine". Its edges were clearcut against the sky. Along its side was a horizontal row of about five huge, fiery round lights along the length of the object. These lights were very much larger and brighter than the ones observed earlier; in fact, the entire object had expanded in size at least twenty times. (See Appendix, Page D)

Each light held tremendous activity within it, "as if looking inside a boiling steel furnace, and even more so". Their primary color was yellow, but many other colors were visible in their teeming mass. As the witnesses watched astounded, the first light ballooned up "like a critical explosion" and smashed through the light directly to its right. That one in turn seemed to flare up, as did each in the entire row, as the first fireball traversed the entire row. At the extreme right, the fiery, explosive light paused and pulsated about twice per second; then the smashing reaction returned along the row of lights from right to left. The entire trip back and forth took an estimated thirteen (13) seconds.

As this was happening, a fin-shaped appendage with a vertical row of smaller yellow lights was moving back and forth along the top of the cigar-shaped object "in a very mechanical way". Meantime, the entire object, which covered more than one and one-half (1½) centimeters in the 'scope's field of view, was moving slowly westward at an estimated five (5) degrees per hour.

Toward the end of the sighting, which lasted about one and one-half hours, the object changed shape once more. The appendage on top widened, the lights flickered out, and the object became a darkened cone-shape with a rounded bottom. One faint red light blinked with regular rhythm on the top. Then the object faded from view at 3:37 a.m.<sup>9</sup>

ATTEMPTS AT CORRELATION: The July 1968 manifestation at least seemed to fit into a recognized UFO class, that of the "cloud-cigar", widely assumed to be a conglomerate of smaller discs-- alternate names are "carrier craft" or "mother ship". But the 1962 and 1973 sightings cannot so easily be categorized.

Both of these objects changed shape, grew larger and more complex, and demonstrated intense internal activity reminiscent of electrical discharges of high intensity. Is it possible that the 1962 sighting, and the 1973 sighting as well, were incidents of "materialization" into our space-time?

In trying to determine with witness Bob Klinn the possibility that what he had seen was related in some way with the 1962 and 1968 objects, Klinn pointed out that there was no cloud or vapor associated with it. He felt that the 1973 object was a metallic structure and that he was viewing the clashing spheres through "holes" of some kind in its side.

In the author's mind, however, in order for the 1973 witnesses to view the activity within in its entirety, the side of the object might have been transparent or otherwise open to view. Is it possible that the object was not metallic, but some sort of solid, though transparent, material? Could they have been viewing a similar type of cigar-shaped solid structure which had been surrounded by thick haze during the summer sightings of 1962 and 1968?

SUGGESTIONS FOR FURTHER STUDY: The purpose of this paper has been to alert researchers to the fact of recurring, long-lived phenomena in the Catalina Channel area. It would be of much value to UFO research if this region could be placed under surveillance with scientific instrumentation.

This paper would not be complete unless it was pointed out that the Channel area has for the past thirty years abounded in UFO reports of all types. Many surface-type and under-water

UFOs have been reported, but compared to the long-lasting "cloud-cigars", they have been unclear and short-lived. Nevertheless, the sightings exist in sufficient numbers to alert us that this area is, for some reason, of constant concern to someone or something unknown.

Space does not permit here to discuss these surface sightings in detail. Suffice it to say that they are reportedly continuing up to the present. They could most probably be perceived by the same type of surveillance net used to detect the high-altitude "cloud-cigars".

It is important to reiterate five points concerning the latter type:

1. The "cloud-cigars" are generally ovoid and huge in size.
2. They are highly energized--- the energy apparently resulting from internal activity or interaction of conglomerate smaller objects held or hidden within.
3. They are long-lived, duration of sightings ranging from one and one-half ( $1\frac{1}{2}$ ) to three (3) hours.
4. They seemingly recur at least every five or six years.
5. In summer, the ovoid shapes are thickly covered with vaporous material; in the single winter sighting known, the vapor was seemingly non-existent.

Consider the value to UFO research if, within the next few years, one of these long-lived UFO phenomena can be detected and studied. Consider, too, the possible spinoff from a surveillance system--- the detection of frequent UFO surface phenomena in the same area.

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APPENDIX  
PAGE A

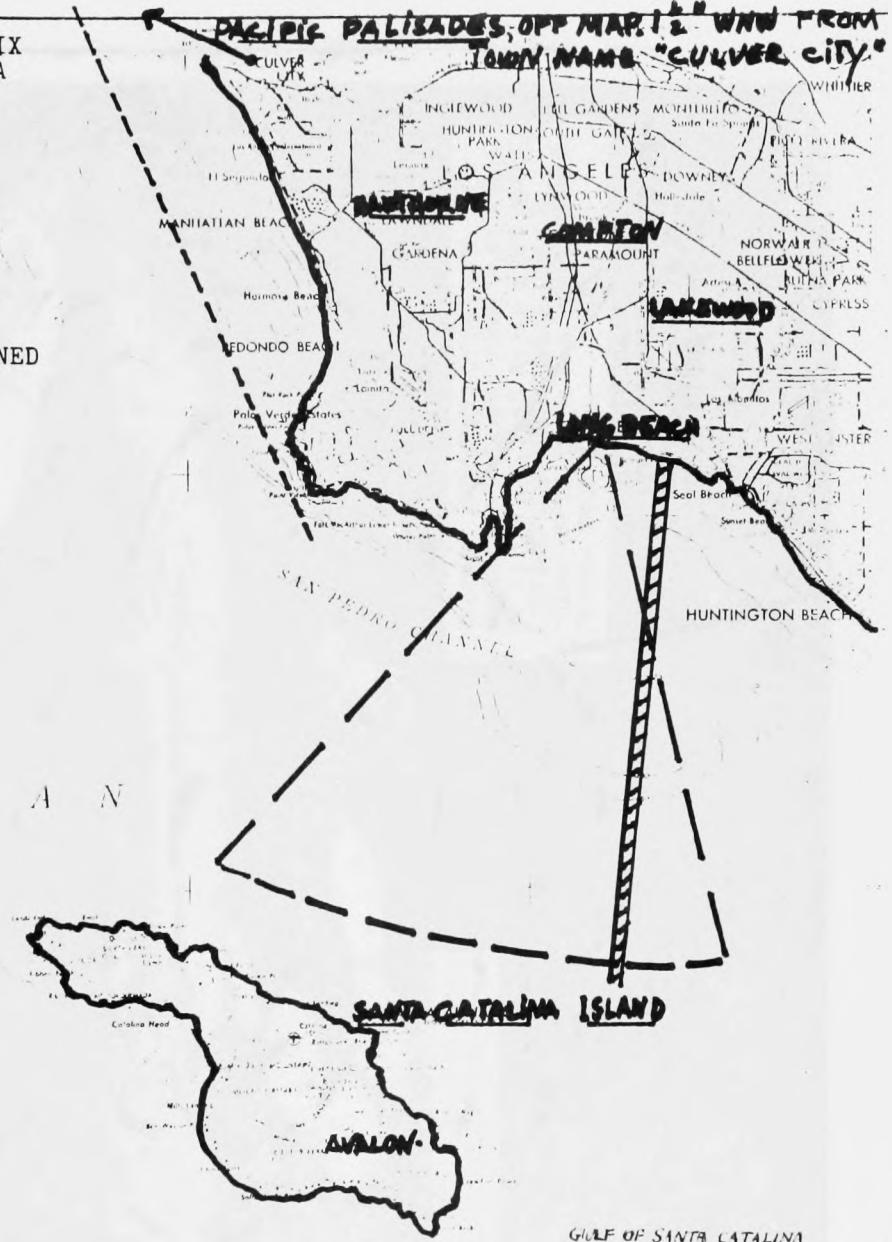


DARKENED PORTIONS OF MAP  
INDICATE COASTLINE, AND  
ISLAND AND CITIES MENTIONED  
IN TEXT.

SCALE: ONE INCH EQUALS  
APPROXIMATELY 4.5 MILES

O C E A N

OPERATIONAL HISTORY PLACES



■■■■■ LINE OF SIGHT, 1962 OBJECT

— — — LINE OF SIGHT, 1968 OBJECT (including 55 degree angle of travel)

— - - - - LINE OF SIGHT, 1972 OBJECT

SIGHT LINES DO NOT INDICATE DISTANCE OF OBJECTS FROM OBSERVERS, AS THIS IS UNKNOWN

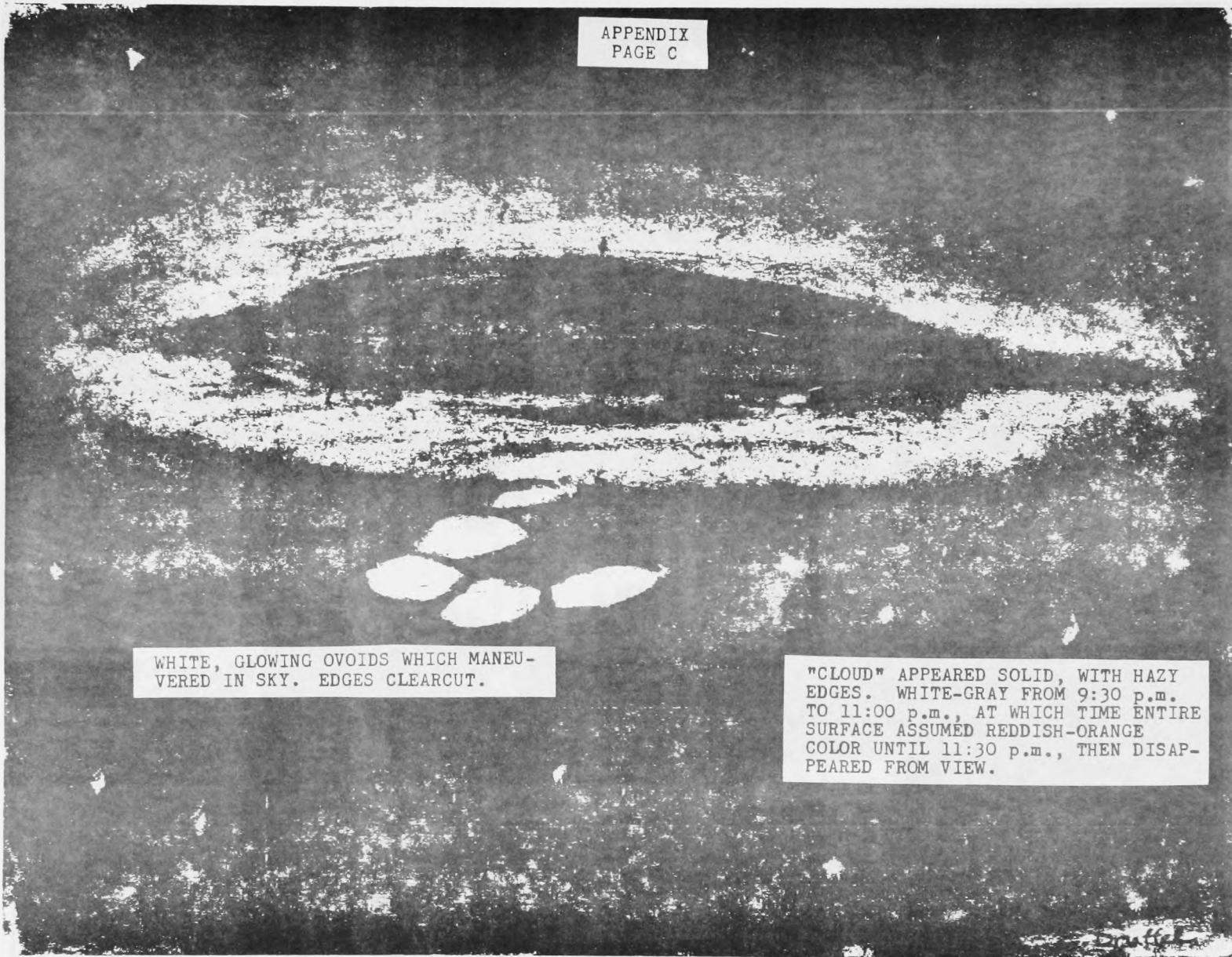
SAFETY OF LIFE IS UNKNOWN

SKY CLOUDLESS AND BLUE



"CHURNING" SURFACE,  
EDGES DID NOT DISSIPATE

WHITE LIGHT FLASHER,  
OCCLUDING ONE AT A TIME,  
FROM DIFFERENT PLACES IN  
THE "CLOUD"



WHITE, GLOWING OVOIDS WHICH MANEUVERED IN SKY. EDGES CLEARCUT.

"CLOUD" APPEARED SOLID, WITH HAZY EDGES. WHITE-GRAY FROM 9:30 p.m. TO 11:00 p.m., AT WHICH TIME ENTIRE SURFACE ASSUMED REDDISH-ORANGE COLOR UNTIL 11:30 p.m., THEN DISAPPEARED FROM VIEW.

APPENDIX  
PAGE D

APPENDAGE TRAVELED BACK AND FORTH  
ALONG TOP.

SEVERAL HUGE, FIERY ROUND LIGHTS  
ALONG SIDE, FIRST OF WHICH EXPANDED,  
"SMASHED" THROUGH OTHERS IN TURN,  
THEN RETURNED TO ORIGINAL POSITION.

EDGES CLEAR-CUT, AS IF OF METAL,  
(OR OTHER SOLID MATERIAL?)

## PUBLIC AWARENESS AND UFOs

Thomas M. Gates

The study of UFOs involves the public in ways almost totally unique. Data comes forth from the public in a random manner which the investigator is unable to predict. It involves stories of such unbelievable proportions as to leave the rational and objective investigator without any basis for approaching understanding, perhaps because the events are too far removed from our perception of reality. Of one thing we can be sure; UFOs capture the public interest and imagination to such fanciful proportions as to generate a phenomenon in itself. For this reason the UFO subject is conceived in the public mind in much the same category as paranormal stories, the Bermuda Triangle, people who spontaneously combust, and other such tales.

The serious investigator may find it frustrating to deal with the public. My role as an educator associated with an institution designed to convey ideas of science to the public has brought both joys and frustrations in presenting the topic of UFOs. Joys, when I see an audience stimulated to question the yet unexplained. Joys, when I see a mind dare to inquire beyond the belief-box of enculturation which society so carefully attempts to preserve. Frustrations, when I find myself trapped hearing the one-way monologue of a mind which has long ceased communicating with others. Frustrations, when I am confronted with the remarks of a closed mind which will not allow itself to admit the existence of events for which we simply have no sufficient explanation.

The greatest single joy I find in presenting the topic of UFOs to the public is in the stimulation of imagination. Young children and adults alike respond to the invitation to speculate on the unknown. Life worth living rests in finding a challenge. To contribute an idea or thought to an unfinished task is a call the public can't resist. And although they may lack the terminology and training of the scientist, they are eager to share in the ideas, and hungry for the information in hand. I would like to delineate some thoughts on approaches to dealing with the public and thoughts on the significance of public awareness.

I think the time has come for those of us in the field of UFO study to stop being on the defensive. We still spend a good deal of our time in justification. An implicit goal of our public effort seems to be that of convincing the listener of the validity of the phenomenon. Not all of us have experienced tornados or earthquakes or hurricanes, yet there seems to be sufficient evidence of their existence, even without the statistical abundance or geographic distribution exhibited by the UFO phenomena. Why do we continue to argue the existence of UFOs?

For example, the perennial question, so beloved of media people, "Do you believe in UFOs?" usually asked by the very junior reporter assigned to cover your talk and totally non-conversant on UFOs. I tell them "NO, I don't BELIEVE in UFOs, I KNOW of their existence." Or often the question is phrased. "Do you

believe in little green men from Mars?" I answer that one, particularly if I'm aggravated, "No, but I believe there are some turkeys asking me questions." If they word it more seriously, "Do you believe in extra-terrestrial visitors?" I answer, "No, I avoid belief in any particular hypothesis, because the word 'believe' implies subscription to a particular conclusion to the exclusion of others which are possible. I find too much excitement in the consideration of all ideas to narrow myself to one."

In some of these questions, the semantic construction is emotionally designed to place the burden of substantiation upon our shoulders. If we accept this psychological ploy, we are placed on the defensive. And if we are experiencing an aggressive questioner, he or she will continue to place us on the defensive. This is sometimes called the "monkey theory" in management circles. It refers to the placing of the burden of a task or duty upon one's shoulders. In management, some managers allow subordinates to place "monkeys" upon them in the form of tasks the manager is going to do for them. The successful manager does not allow employees to do this. He places the next action or task on the employee's shoulders. I used to accept speaking engagements while away from my office. Now, if someone wants me to speak, I insist they call my secretary and schedule it with her, as I generally will not remember it by the time I next find myself in front of my engagement book. Questions or remarks directed to us are often designed to do the same thing. We need to develop techniques of placing the "monkey" back on the questioner.

But let us also look at ourselves in pursuing why we continue to justify UFOs. I would suggest there is a need on the part of the ufologist to feel comfortable with society in pursuing his interest. If we face a potential loss of credibility or reputation, that is a strong deterrent to plunging headlong into the UFO topic without first being convinced of the position of our audience. I, for one, feel that the evidence of UFOs speaks for itself. I do not dwell upon proof of the phenomenon. My answer to the skeptics is to ignore them. I have found in the past that the more I attempt to "prove" something to them, the more they grow in their position. It is not a position of reasoning; it is a purely emotional stance. They usually shout louder and interrupt more frequently as I move closer to exposing the absurdity of their position. Hence I have decided they aren't worth the time and energy. If a skeptic is willing to engage in dialogue and willing to hear my position and I his, I have yet to deal with such a skeptic I can't convince. But the reasoning skeptic just does not exist in any quantity. I am firmly convinced that the skeptical stand on the UFO phenomenon is based in almost all cases upon fear of loss of status and reputation.

Science, as an institution, has demonstrated in the past the ability to selectively pick which phenomena it will examine and which to ignore. What determines the mysteries which are acceptable to study and those not to study? Who determines the acceptable phenomena to study? Recognized, highly institutionalized organizations of science? Governmental bodies? The military? We have thrown our hat into the UFO ring. We authenticate our position not by an outside organization, but by our own authority, for that is what has brought each of us to this position; our own intellectual curiosity. Eventually the shift of public attitude on UFOs will bring about the decision to fund UFO studies.

What, other than funding, are we after in the public acceptance of the UFO phenomenon? We change mankind's cosmic image and we change the ability to obtain sighting information as individuals "relax" on the subject. Our image of ourselves, as members of a space community, must precede our relating to any intelligence elsewhere in the universe. Mankind has consistently demonstrated throughout history the importance of his image of community. He must incorporate a growth in that community image to even attempt dealing with it on a non-violent basis; that is, without fear.

The UFO phenomenon is now conceived less as an astronomer's or physicist's problem and more of a "people phenomenon" for behavioral scientists to study, and indeed, for theologians. The study of UFOs may provide insight into our very connections with the universe at large; that is, man's cosmic perception. Jacques Vallee has suggested that UFOs were regarded as gods of mythology, demons during witchcraft times, fairies of folklore, and as religious miracles. During the late 1800s and early 1900s, the public attitude was that they didn't exist at all. It is also interesting to note that the age of empirical science was at a high point in the public image at this time. In our own time, the interpretation runs to extra-terrestrials. Our modern public concept illustrates a quantum jump in cosmic perception. The public tends to project its emotional constitution into the general interpretation of UFOs. It would seem that fear is the basic guiding emotion for mankind down through history. Our public awareness of UFOs as potential extra-terrestrial vehicles suggests the growth of mankind's image of his place in the cosmos.

We seem then to be in the image business, whether we want to or not. There are many ways in which the image is affected. The news media are, of course, the greatest shapers of image. The media have, unfortunately, become an awesome entity with which to deal. They can present a positive or negative image. Our own emotional posture with media people means much. I feel that our attitude toward the media is of great importance. If we are defensive, negative or abusive with media people, they pick it up and an emotional feedback loop of mutual antagonism may result. I disagree with the statement of some who would suggest that all media information be carefully CONTROLLED. In the first place, media people are likely to be on the scene of a sighting before you are, anyway. If they sense a relaxed, open and candid approach, they usually play a more "heads up" and astute role. The occasional skeptic or closed mind among the press will normally play his cards before you express yourself. I have found the media people in the Bay Area to be very sophisticated. They approach the UFO question in a forthright and credible manner in which ideas can be expressed in an interview and will hold public interest. From reports I receive from other UFO investigators, it seems that media people in other parts of the country aren't so open-minded. I suspect some of this stems from community images on a local level, since the news media tend to reflect very well the local disposition. My own interviews away from the Bay Area have been just as free and easy as those in the Bay Area, however. The Bay Area, if not all California, has long been suspected of being made up of most of the screwballs of the country; maybe I've just confirmed that.

I do a daily radio program of short duration several times every day on KCBS, the CBS network station which is the most well-known all-news station. The program is called "Stargazer" and centers around astronomy as a topic.

I've done a great many UFO presentations by now and have found a very open public; and the media want more.

The number of TV interviews, radio interviews, TV and radio specials, newspaper and periodical interviews is definitely on the increase. Best of all, the disposition of media people is quite serious and there is a swing away from the sensational approach to the topic of UFOs. I attribute this to the continuing presentation of the topic in a credible, non-spectacular approach. Service clubs will beat a path to your door to have a UFO speaker.

Credibility also comes from UFO symposiums such as the workshop and symposium held at DeAnza and Foothill Colleges on April 3rd and 4th, 1976. The colleges, universities and similar organizations of the Bay Area are, for the most part, anxious to hold symposiums. All that is needed is someone to do the managing. I have now conducted six classes in ufology at DeAnza and Foothill Colleges as part of the available curriculum, although we have presented them in lecture style with guest lecturers. The effort toward public awareness along this line is very effective.

The Minolta Planetarium at DeAnza College, one of the major public planetariums of the Bay Area, is presenting a show beginning May 6 and running all summer titled "Encounter With the Aliens," which is the story behind Marjorie Fish's suggestion of Zeta Reticuli as a potential origin for extra-terrestrial visitors. The show follows the experience of Betty and Barney Hill and then takes the audience step by step through the work of Marjorie Fish. A lot of good astronomy is presented in a very exciting and speculative format. The show will be made available to planetariums throughout the world. We recently developed a planetarium show package, which NASA-Ames made available to planetariums at no cost, on the Jupiter-Pioneer effort. Such shows as "Encounter With the Aliens" and other UFO topic shows can be developed and made available through the channels of the International Society of Planetarium Educators.

The Space Science Center is now recognized in the Bay Area as a UFO resource center and is going to function as a coordinating center for a Bay Area and Northern California regional effort, and a sizeable number of persons have indicated interest in participation. We don't want another formal UFO organization; there is simply a lot of UFO activity in Northern California and we want a rapid response team which can operate in cooperation with all interested parties to collect and disseminate information. Jacques Vallee has made a particular point of setting up good rapport with the news media and operating with them in a spirit of camaraderie. I think we will have a good relationship.

In dealing with the public, we must be aware of the psychological impact of our statements. The semantic construction of our ideas conveys much more than mere words alone. The non-verbal communication implicit in our messages is much more powerful than the verbal part. People form their opinions about you and your subject from the images they perceive.

Public awareness may be key to a truly significant break in dealing with UFOs. I suggest it is the public attitude which determines the potential openness with which any extra-human intelligence will deal with humanity. The parallel is noted in the studies funded by National Geographic of chimpanzees,

mountain gorillas and orangutangs. The investigators in all three cases desired to minimize the effect of their investigation on the behavior habits of the study creatures. This was accomplished by engaging in distant observation for some time, then closer observation, then still closer, each time infringing very carefully upon the territorial rights of the subjects. Finally, the subjects and investigators were in close interaction. It certainly appears, at least superficially, that the UFO pattern is similar.

Recent concepts developed by theoretical physicists such as John A. Wheeler suggest that no observer is apart from the observed event; that participation in the event is mandatory in any subject-observer situation. The idea that the physics of consciousness is a natural part of existence is being explored by a number of scientists. I would, therefore, propose that regarding any extra-human intelligence, we are experiencing not culture collision but consciousness interaction, and the public at large is of much more concern than we may realize. It is not only the source of data, but perhaps the most significant variable in the entire phenomenon.

THE UFO WAVE OF 1947

CALIFORNIA: JUNE 25-JULY 16

Loren E. Gross

If a thorough search could be made of all newspapers throughout the country for this period (June-July, 1947) the total number of published sighting reports would at a conservative estimate be more than doubled. It would be enormously helpful if future readers of this report would consult their local libraries to supplement the material already collected.

Ted Bloecher  
Report on the UFO Wave of 1947  
pp. xiii-xiv

An attempt to supplement Ted Bloecher's study of the 1947 UFO wave has been undertaken. A total of 102 local California newspapers were examined with the main emphasis on the period of time from June 25th to July 16th.

No striking patterns emerged when the results of this newspaper search, combined with Bloecher's collection, were plotted on a map of California. Distribution of reports (the reader is referred to Bloecher's definition of a report as compared to a sighting, Report on the UFO Wave of 1947, pp. xiv-I-I) appears to conform to population density, with the possible exception of some UFO activity in the northwestern part of the state on July 7th.

A search of local California newspapers disclosed some 140 undocumented UFO reports not carried in the ten major California newspapers consulted by Bloecher, the number more than doubling Bloecher's California list of 109.

While one would hope that small town newspapers would offer good news coverage of local UFO activity, the generally conservative editorial policies and the limited size of such newspapers greatly inhibit the publication of UFO data. Nevertheless, further such library research is recommended.

Listing of California newspapers consulted by Bloecher:

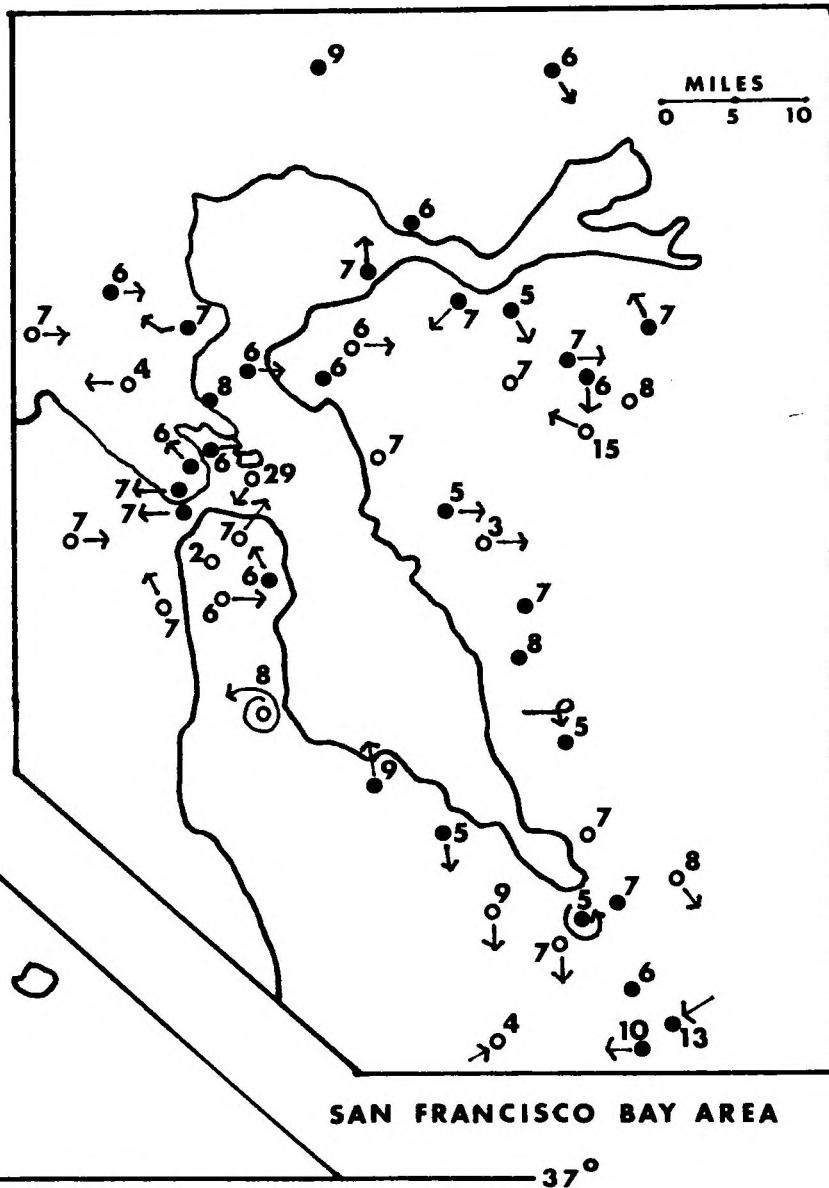
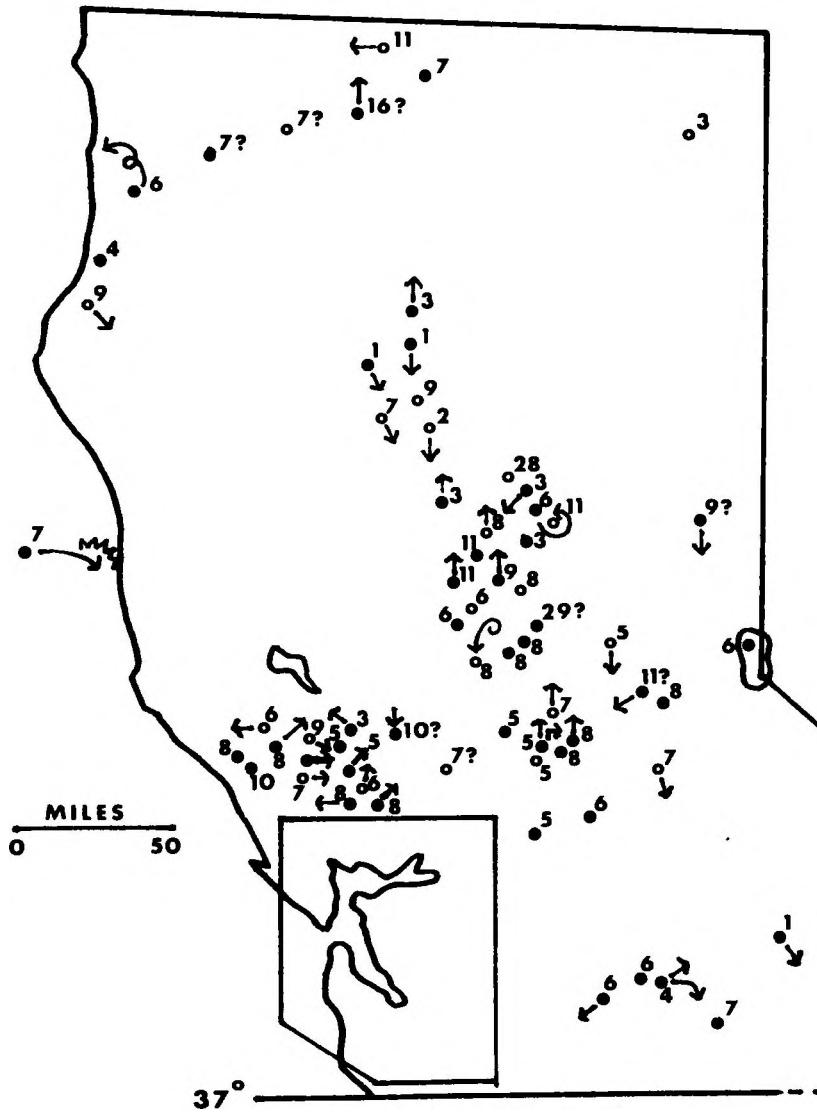
Hollywood <u>Citizen-News</u>	Sacramento <u>Times</u>
Los Angeles <u>Examiner</u>	San Francisco <u>Call-Bulletin</u>
Los Angeles <u>Herald-Express</u>	San Francisco <u>Chronicle</u>
Los Angeles <u>News</u>	San Francisco <u>Examiner</u>
Los Angeles <u>Times</u>	San Francisco <u>News</u>

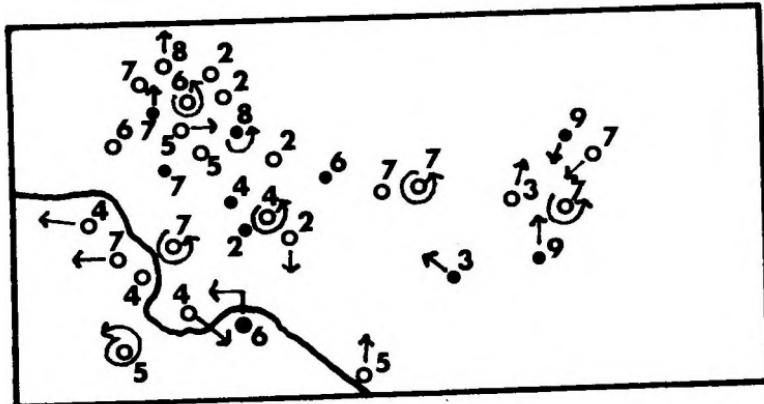
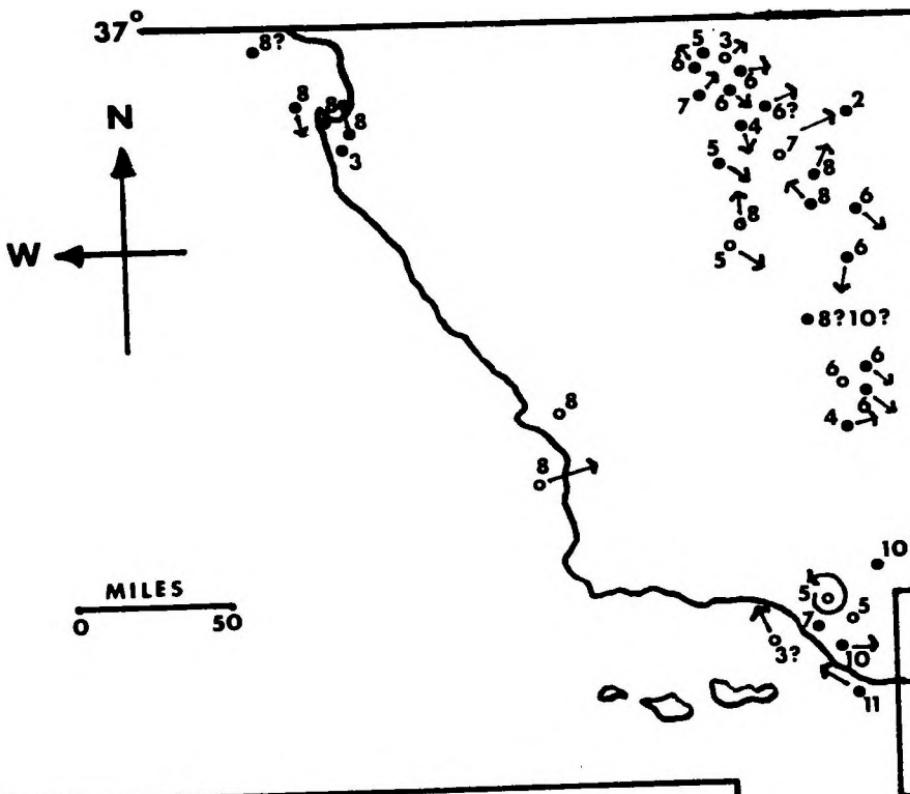
Listing of 102 local California newspapers consulted by Gross  
to supplement Bloecker's study

Bakersfield, Bakersfield Californian  
Chico, Chico Record  
Davis, Davis Enterprise  
Delano, Delano Record  
Dinuba, Sentinel  
Dos Palos, Dos Palos Star  
Downieville, Mountain Messenger  
Eureka, Humbolt Standard  
Exeter, Exeter Sun  
Ferndale, Ferndale Enterprise  
Fort Bragg, Fort Bragg Advocate  
Gilroy, Gilroy Advocate  
Grass Valley, The Union  
Gridley, Gridley Herald  
Hanford, Hanford Journal  
Heraldsgburg, Heraldsgburg Tribune  
Hollister, Evening Free Lance  
Inyo, Inyo Independent  
Jackson, Amador Dispatch  
Jackson, Amador Ledger & Record  
Kerman, Kerman-News  
King City, Rustler-Herald  
La Jolla, La Jolla Light  
Lakeport, Lakeport County Bee  
Lemoore, Lemoore Advance  
Lincoln, News Messenger  
Livingston, Livingston Chronicle  
Los Banos, Los Banos Enterprise  
Mariposa, Mariposa Gazette & Miner  
Merced, Merced Express  
Merced, Merced Sun-Star  
Modesto, Modesto Bee  
Modesto, Modesto Tribune Weekly  
Monterey, Monterey Peninsula Herald  
Morgan Hill, Times  
Oakdale, Leader  
Oakland, Oakland Tribune  
Ojai, Ojai  
Oroville, Mercury  
Oroville, Oroville Weekly Press  
Oxnard, Oxnard Courier  
Pittsburg, Pittsburg Post-Dispatch  
Pixley, Pixley Enterprise  
Placerville, Mountain Democrat  
Placerville, Times  
Port Hueneme, Herald-Express  
Portola, Portola Reporter  
Quincy, Feather River Bulletin  
Randsburg, Randsburg Times  
Red Bluff, Red Bluff Daily News  
Redding, Record-Searchlight  
Redwood City, Tribune

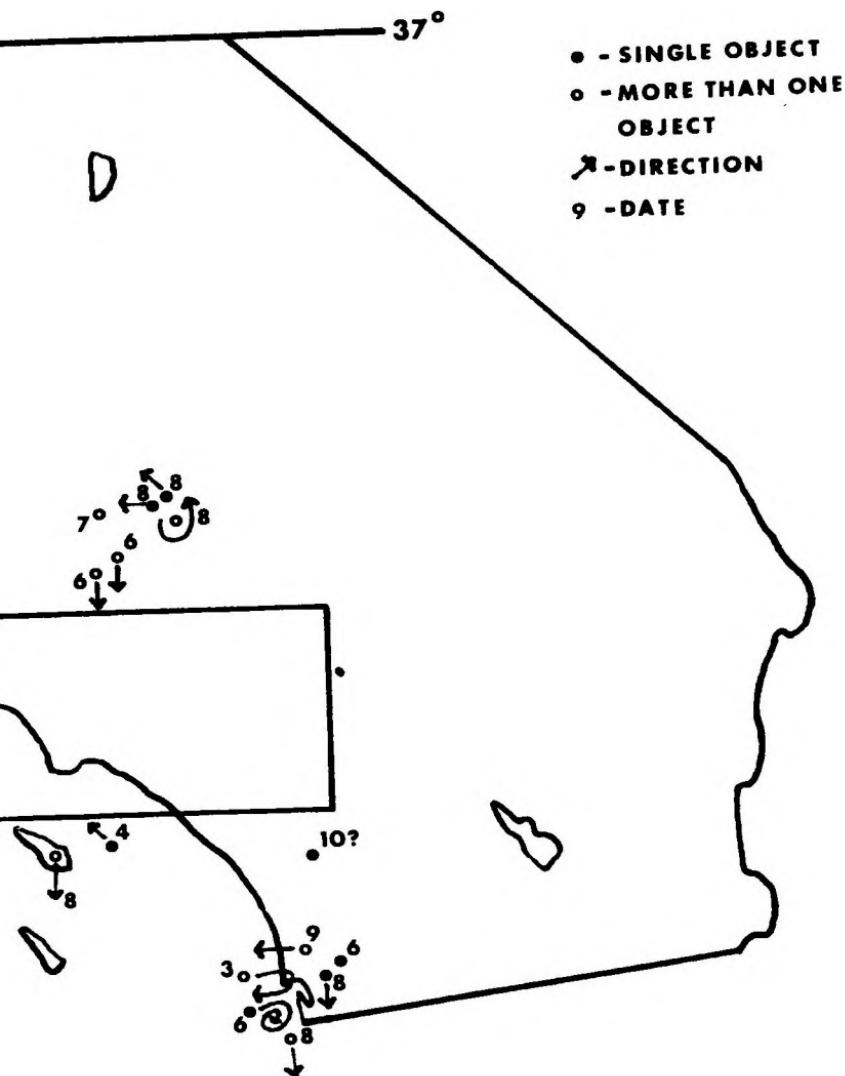
Richmond, Independent  
Richmond, Record-Herald  
Riverbank, Riverbank News  
Riverside, Daily Press  
Roseville, Roseville Press-Tribune  
Salinas, Salinas Californian  
San Andreas, Calaveras Prospect Weekly Citizen  
San Diego, Union  
Sanger, Herald  
San Jose, Mercury-Herald-News  
San Juan, San Juan Mission News  
San Juan, Mission News  
San Leandro, San Leandro Reporter  
San Rafael, Marin County Journal  
San Rafael, San Rafael Daily Journal  
Santa Barbara, News-Press  
Santa Cruz, Santa Cruz Sentinel-News  
Santa Maria, Santa Maria Times  
Santa Rosa, Press-Democrat  
Sausalito, Marin City News  
Sebastopol, Sebastopol Times  
Selma, Selma Enterprise  
Shasta, Courier  
Sonoma, Index-Tribune  
Sonora, Banner  
Sonora, Daily Union Democrat  
St. Helena, Star  
Stockton, Pathfinder-Union  
Stockton, Record  
Susanville, Lassen Advocate  
Tracy, The Tracy Press  
Tulare, The Terra Bella News  
Tuolumne, Tuolumne Prospector Weekly  
Turlock, Turlock Daily Journal  
Ukiah, Redwood Journal  
Ukiah, Ukiah Republican Press  
Vacaville, Solano Republican Courier  
Vallejo, News Chronicle  
Vallejo, Vallejo Times-Herald  
Ventura, Ventura County Star-Free Press  
Visalia, Visalia Times-Delta  
Walnut Creek, Walnut Creek Courier-Journal  
Watsonville, Watsonville Register Pajaronian  
Weaverville, Weekly Journal Trinity  
Willits, Willits News Weekly  
Willows, Willows Journal & Transcript  
Woodland, The Mail of Woodland  
Yreka, Siskiyou Daily News  
Yreka, Yreka Journal  
Yuba City, The Independent Farmer

**U.F.O. REPORTS**  
**CALIFORNIA JUNE 25 - JULY 16, 1947**

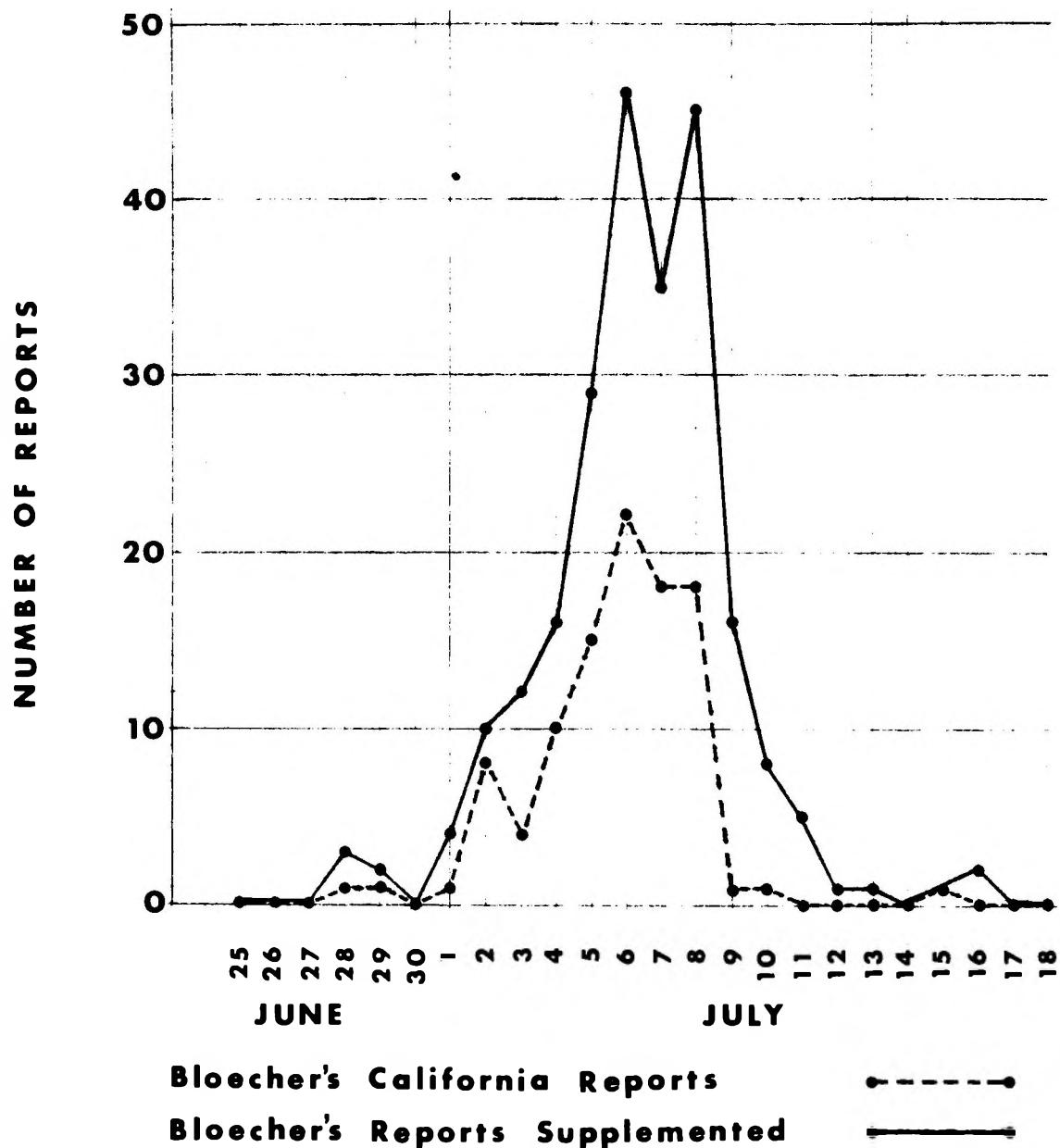




LOS ANGELES AREA



**U. F. O. REPORTS**  
**CALIFORNIA JUNE 25 - JULY 16, 1947**



### Notes on Some UFO Reports of Interest

If the reader is familiar with this writer's recently published monograph, The Mystery of the Ghost Rockets, he will remember that some emphasis was given to the 1957 Ubatuba, Brazil, UFO case, because the episode appeared to have some relationship with the 1946 Ghost Rocket sightings. The Ubatuba case, as described in Coral Lorenzen's book, The Great Flying Saucer Hoax, tells of a Brazilian who, with a friend, was fishing on the coast near the town of Ubatuba when he suddenly spotted a small flying disc diving out of the sky from the direction of the ocean. The witness testified that the object approached at high speed:

...a crash into the sea seemed imminent. At the last moment, however, when it was almost striking the waters, it made a sharp turn upward and climbed rapidly on a fantastic impulse. We followed the spectacle with our eyes, startled, when we saw the disc exploded in flames. (1)

Now compare the foregoing story with a different UFO report in another Lorenzen book, UFOs - The Whole Story, which states:

On the 18th (of January, 1956), lifeguards initiated a hunt for a glowing 'saucer' that had been observed as it glided down from the sky, floated on the water, and then sunk beneath the surface off Redondo Beach, California. The spot where the saucer went down was about twenty-five feet deep. Despite a long search, however, the object was never found. (2)

This writer was intrigued, therefore, when a survey of local California newspapers turned up the following letter to the editor of the San Rafael Independent which was printed in the newspaper's July 10, 1947 edition. The letter read:

We are spending the summer at Fort Bragg (California) and yesterday while surf fishing three miles north of town we observed a flat, glistening object approach us from the ocean. We could not estimate its height as it was dropping rapidly and finally hit the water approximately a quarter of a mile off shore.

The enormity of the splash led us to believe that it was a heavy object. It was traveling at a high rate of speed and just before it hit the water we heard a humming sound.

The object floated for a few minutes and then, as we were unable to see any longer, we assumed that it had sunk. It was about the size of a large truck tire but at that distance we could not swear that it was perfectly round.

This incident occurred at 3:10 p.m. Monday July 8, 1947.  
Don Wisher and Vic Levin (both residents of San Anselmo).

Another famous UFO case (also documented by Coral Lorenzen), the January 1958 Trindade episode, also seems to have something of a 1947 counterpart. A letter to the editor of the Watsonville, California Register-Pajaronian,

published in the July 18, 1947 edition, tells the following story:

Flying saucers have become quite a subject here of late, and not until I have heard so much about these mysterious objects, did I give much thought to an experience that was mine recently.

By re-checking the date I have discovered that at about the same time the mysterious flying saucers were reported by the pilot (Kenneth Arnold) up in Washington. I was driving alone on a business errand from Merced--where my family home is located--to the little town of Le Grand. At a point some four miles northward from Le Grand my attention was taken by some object glistening in the sunlight, forward and to my right. It was very high, was waving, or bouncing up and down in its course, traveling in a direction which would take it across my road further ahead. At first I thought it was some type of aircraft which was having trouble, and was bound for a crash landing. I shut my own motor off. Coasting, I put my head out the window listening for motor sounds. There was none. Next I thought to speed, and if possible be there when it came down, but before I could get my car up to 75 miles per hour the shiny object had disappeared behind the far-away distant clouds. I have never seen anything like it in appearance. The first sight of it suggested Saturn and his rings to me.

I told the incident in my family circle the same evening, but have never mentioned it again until now.

N. M. De Arman

The next report seems impressive. Did the Air Force ever investigate it? The sighting was supposed to have taken place less than 25 miles from Hamilton Air Force Base, Intelligence headquarters for the Western United States. The case was front-paged by the Santa Rosa Press-Democrat on July 8, 1947, when interest in the flying saucer phenomenon reached its peak. The Santa Rosa Press-Democrat should have been available on newsracks at Hamilton Field. The Press-Democrat, like many other newspapers that day, carried the headline: "MORE FLYING DISKS ARE SEEN HERE AND ELSEWHERE IN U.S." The newspaper then printed:

But the most startling development locally was the careful account of a single disk observed for more than a minute at the navy station while at least three private airplanes loafed in the air a few miles north.

The account was related to this newspaper by a trained observer whose business takes him in the vicinity of the airbase for long periods of time. Although he requested that his identity be withheld for fear of ridicule, the expert was positive that he had "seen something in the air that I have never seen before."

"No matter what may happen in relation to the current publicity given to the 'flying disks,' I know that I saw this object, and that I watched it carefully, and that I was sound of mind while I did so," he commented.

"I noticed it first a few minutes before 5 p.m. on Thursday (July 3rd). From my location, it seemed to be about 1,000 feet

above the main north-south runway at the airfield, and I would judge that it was 15 to 20 feet in diameter.

"This estimate of size and distance, I must emphasize, is my own. Actually, it might have been something six inches in diameter and only a few feet away from me, or a very large object located at a much greater distance than I thought.

"It was impossible to judge size and distance accurately, because there was nothing about the object that would enable me to make an accurate approximate of size.

"It was the shape of a giant pocket watch, without the stem, and it was covered by silver material that looked like airplane aluminum. There were no marks of any sort on the surface. It was perfectly smooth.

"The object was moving at about the speed of a glider in normal flight attitude, and indeed on my first glimpse I automatically recorded it in my mind as a glider.

"But an instant later I realized that there was something strange about it and looked back. Then I noted that it had no wings, no apparent projections of any sort.

"It moved smoothly in a northerly direction until it reached the north end of the runway, then turned to the east, banking slightly and headed toward Santa Rosa. I was forced to turn my attention away from it for a moment, and when I looked again it was gone.

"From my observation, I would believe that the object was controlled in its flight, either directly or by gyro-control. Its only deviation from a straight path was for wind currents, and after tipping or rising with a current it would recover its level flying position.

"The recovery was made in much the same manner as a glider appears to recover when a thermal current forces one wing up or down. At the same time, the return to normal was accompanied by an over-compensation effect which is typical of gyro-control."

At the same time that he saw the disc, the observer said he noted at least three private aircraft in the sky to the north of the airbase.

"The fact that these ships apparently did not see the discs led me to believe that my estimate of size and distance were approximately correct," he added.

"Had the object been larger and further from me, it would have been nearer the planes and they would probably have noticed it."

"I'd been scoffing at reports of the discs," he explained. "I didn't believe them. But after what I saw--I don't feel too comfortable."

The following day the Press-Democrat frontpaged more on the case:

Reports of still more 'flying saucers' over Santa Rosa and vicinity persisted yesterday while a prominent professional man dramatically verified the report of another observer that he saw one Thursday afternoon over the Santa Rosa Naval Auxiliary Air

Station.

Confirmation of a report by a trained observer who Monday revealed for the first time the detailed description of one seen hovering over the navy air station came from Dr. R. W. Nelson, a dentist who resides at 800 College Avenue.

His description of the mysterious object tallied closely with that given by the first observer who preferred to remain unidentified.

Dr. Nelson said that he saw the object about 5 p.m. while he was gazing out a window on the second story of his College Avenue residence. He estimated that it was approximately over the navy air station and that it was about 50 feet in diameter.

"There it was," he said, "with a beautiful silvery luminous sheen."

He explained that the object had a 'silver luster' as distinguished from a shiny appearance.

The object fluttered like a leaf, headed northwest and disappeared while he watched, Dr. Nelson said.

The observer who reported earlier that he had seen the object set the time as shortly before 5 p.m. and estimated the size as from 15 to 20 feet in diameter.

Dr. Nelson was considerably farther away than the first observer, who reported seeing it while in the vicinity of the navy field.

A detailed breakdown of all 140 newly documented California UFO cases, which is too extensive to list here, has been forwarded to Ted Bloecher. The form of documentation used is much like that used in his book Report on the UFO Wave of 1947.

#### BIBLIOGRAPHY

- (1) Coral E. Lorenzen, The Great Flying Saucer Hoax (New York: The William Frederick Press, 1962), p. 90.
- (2) Coral and Jim Lorenzen, UFO's: The Whole Story (New York: The New American Library, Inc., June 1969), pp. 69-70.

# PSYCHOPHYSICAL AND BIOLOGICAL ASPECTS OF VIEWING VERY BRIGHT OBJECTS<sup>1</sup>

By

Richard F. Haines, Ph.D.

## ABSTRACT

This paper deals with two interrelated subjects. Part I discusses briefly, the dynamics of visual adaptation, selected characteristics of solar radiation, and various abiotic-ophthalmological effects of UV, visible, and IR radiation sources upon the eye. Part II deals with the following perceptual effects of viewing very bright sources: hue shifts, object size changes (irradiation phenomenon), object shape changes, and afterimage formation and decay. The paper includes suggestions for the UFO field investigator to help him obtain witness data that could be useful in understanding more accurately, the basic nature of the high luminance source.

## PART I

### INTRODUCTION

Anyone who has read the UFO literature in any depth knows that a fairly common feature of many UFO sightings is the reported extreme brightness of the object. Subjective terms as "intense white light," "blindingly bright," and "painfully intense" are used by the witness to describe something about the perceptual character of the luminous source. The use of such terms implies that the source was of an unnatural luminance for the viewing conditions in which it was perceived. As will be discussed below, even though the witness may accept such sweepingly broad generalization of his experience as being adequate, the trained UFO field investigator should not. He should realize that hidden within such generalizations may lie much potentially valuable information concerning the true nature of the source's dominant wavelengths, its actual size and shape, and its emitted or reflected luminous energy.

The perceived brightness of a luminous source is intimately related to the level of ambient scene luminance to which the visual system has already become adapted. The headlights of an oncoming automobile, for instance, appear very different when seen with the eye that is dark-adapted than with the eye that is adapted to sunlight. Since this is such a critical factor it is important to relate the full range of visual adaptation possible to the range of natural luminances found in nature. Figure 1 illustrates the approximately  $10 \log_{10}$  units (100 db) range of photoreceptor adaptation that is possible within the  $15 \log_{10}$  units range of natural luminances found in nature. This (visual) range represents a ratio of luminances equal to about ten billion to one! In order for the eye to perceive the hue (i.e., color) of a reflecting surface or emitting (or transmitting) source it must possess a luminance above about  $1 \times 10^{-6} \text{ ml}$ .

1. Paper presented at UFO conference sponsored by the Center for UFO Studies, April 30-May 2, 1976, Lincolnwood, Illinois. [All rights reserved]

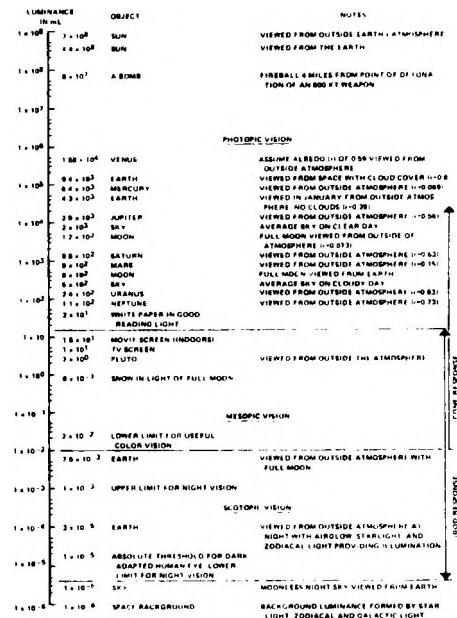


Figure 1. Range of Natural Luminances in Nature.

$-2$   $\text{ml}$ ; the color experience is involved with stimulation of cone receptors which are found primarily within the central  $30^\circ$  arc radius of the line of sight.

In general it may be said that the eye achieves about 98 per cent of the (maximum) sensitivity it is going to achieve by remaining in the dark for about 45 minutes and it light-adapts about four times as fast as it dark-adapts. Nevertheless, the dark-adaptation rate is significantly influenced by the amount of luminous energy the eye received before starting to dark-adapt, as is shown in Figure 2 (adapted from ref. 23). Thus, the rate of dark-adaptation varies within about the first 30 minutes in the dark as a function of the preadapting luminance, after about 30 minutes retinal sensitivity nears its asymptotic slope (becomes flat). These curves relate only to the dark-adaptation process. Regarding the light-

adapting rate, a safe rule of thumb is that about two minutes in the lighted environment will almost completely light-adapt the eye to that environment.

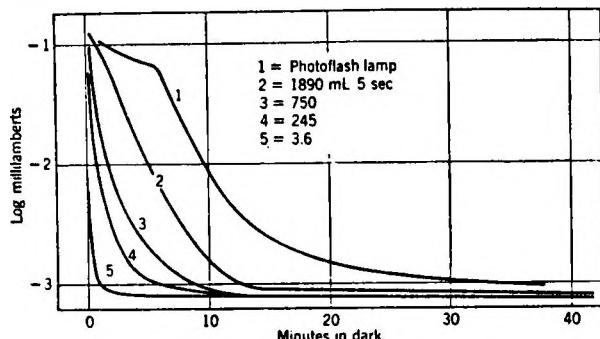


Figure 2. Dark-adaptation Following Short Exposures to Various Preadapting Luminances.

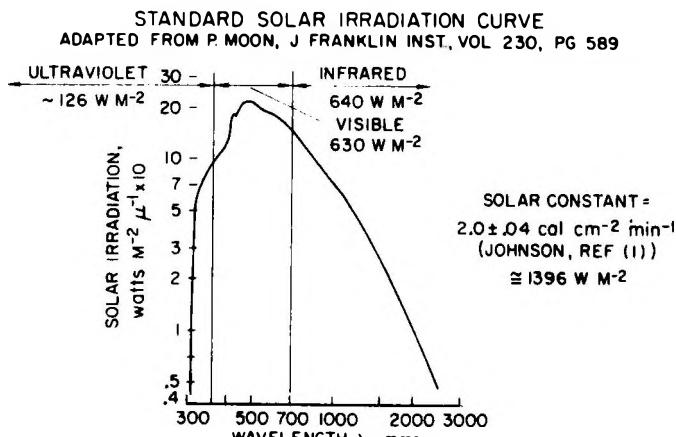
An obvious and important lesson for the UFO field investigator is that he should make a serious attempt to:

**- RECORD THE PRIOR LIGHT-ADAPTING HISTORY OF THE WITNESS FOR AT LEAST THE FIVE-MINUTE PERIOD BEFORE HIS SIGHTING -**

In summary, before one can begin to understand the significance of UFO reports of "blindingly bright lights", etc., one must have some idea about the prior light-adaptation level of the witness's visual system.

#### SOLAR RADIATION CHARACTERISTICS

The sun provides for almost all of man's natural ambient illumination. Mean solar irradiance is about  $2 \text{ cal/cm}^2/\text{min}$  and mean solar illuminance is about  $15 \text{ lumen/cm}^2$  at mean solar distance. Since the eye responds differently to different wavelengths it is important to know how sunlight is distributed by wavelength. This is shown in Figure 3; note that



(1) JOHNSON, F.S., THE SOLAR CONSTANT, J. METEOROL., 11, 431, 1954

Figure 3. Standard Solar Irradiation Curve.

the amount of radiant energy [  $\text{watts}/\text{m}^2/\mu \times 10$  ] (integrated area beneath the curve) within the visible spectrum is almost equal to that found in the infrared region and about 5 times more than is found in the ultra-violet spectral region.

Figure 4 presents a graph of the amount of solar UV as a function of wavelength and altitude. The full column of atmosphere absorbs about 60 per cent of the shorter wavelengths (down to about 290 nm, below which no UV reaches Earth's surface).

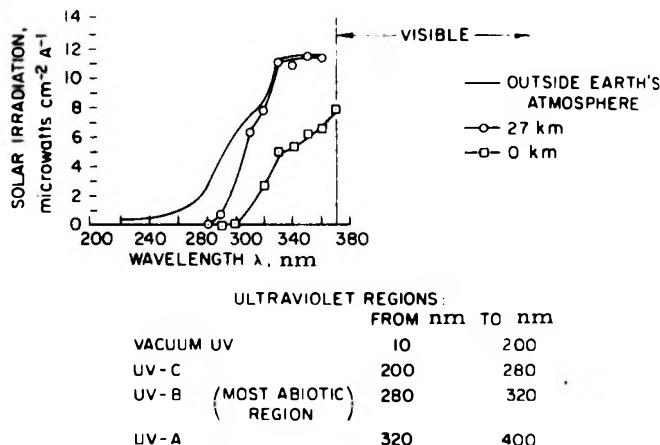


Figure 4. Solar UV as a Function of Wavelength and Altitude.

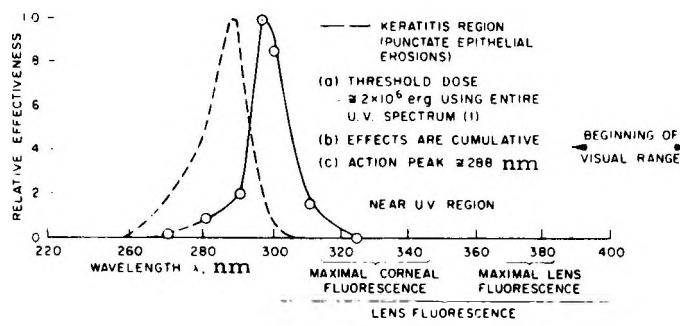
#### SELECTED ABIOTIC-OPTHALMOLOGICAL EFFECTS OF VIEWING HIGH LUMINANCE SOURCES

The large number of scientific reports available and the brevity required of this paper dictate that only a select range of topics be covered. This section will review various abiotic (leading to loss or major reduction of function) effects of UV, visible, and IR radiation upon ocular tissue.

**Ultraviolet Radiation (280 - 390 nm):** In a sense, the eye acts as a crude electromagnetic energy dosimeter. This is important in cases where a UFO witness sustains physiological injury in the eye region or in visual function. A comprehensive ophthalmological exam may suggest not only the predominant wavelength(s) of the radiant source but its dose at the affected site. It is known that a flux density of about  $2 \times 10^6 \text{ ergs}/\text{cm}^2 \cdot \text{sec}$  will produce erythema (inflammation) and edema (swelling) of cytoplasm. The "biological action spectrum" of UV radiation is presented in Figure 5. The physiological effects of UV radiation derive from chemical, thermal, or a combination of both effects. These (usually) detrimental "photophthalmic" effects include: cataract (lens opacity), lesions in ciliary muscle fibers, swelling and inflammation of the eye lids, keratoconjunctivitis (sometimes known as "pink eye"), photophobia (sensation of discomfort,

burning, smarting, sandiness of the lids, severe cramping and pain in the eye region), asthenopia photogena (eye strain, poor sight), minute erosions of corneal tissue, etc. Effects of UV exposure usually require from 6 to 8 hrs to develop. The effects of repeated UV exposure may be cumulative within a 24 hr period.

NOTE EACH POINT BASED ON EQUAL EXPOSURE TIME



(1) VERHOEFF, F.H. & L. BELL, THE PATHOLOGICAL EFFECTS OF RADIANT ENERGY ON THE EYE, PROC. AMER. ACAD. ARTS & SCI., 51, 629, 1916

Figure 5. Biological Action Spectrum for UV Radiation.

The occasional report by UFO witnesses of intense ocular pain, tearing, and inflammation of the conjunctiva may be related to the presence of UV wavelengths impinging the eye-tissue. As is true for other aspects of the medical exam of UFO witnesses, much may be learned about the nature of the stimulus through a careful ophthalmological exam (cf. ref. 24).

Only radiation between about 300 and 1,200 nm wavelength reaches the human retina (cf. Figure 6). Those wavelengths which do reach the retina encounter three primary layers of tissue: retina, choroid, and sclera within each of which varying degrees of reflection, absorption, and transmission take place. The retina is practically transparent but the outermost layers contain a very fine gray-brown pigment in homogeneous distribution. The

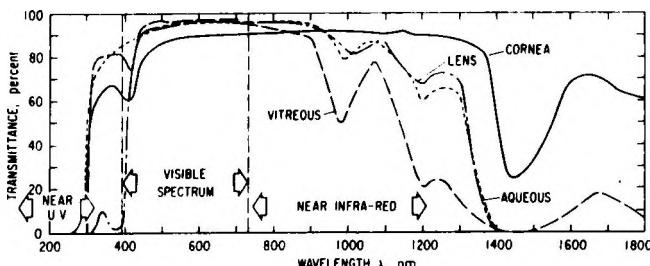


Figure 6. Spectral Transmission Characteristics of the Normal Human Eye.

choroid (about 10 μ thick) is made up of a darker pigment distributed in irregular patches. It is the most absorbant of the three layers. The (white) sclera forms the semi-rigid, thick coat that maintains the approximately spherical shape of the eye

and possesses the greatest reflectance. Other details concerning the radiant energy absorption and damage caused by high energy impingement may be found elsewhere (refs. 4, 22).

**Visible Radiation (390 - 710 nm):** Most of the injurious effects of exposing the eyes to very high luminance sources are related to retinal burn. The burn threshold is a complex subject and is treated in detail elsewhere (cf. refs. 4, 20, 22). One mechanism for producing long-term or permanent damage to retinal tissue from intense visible radiation is the rapid production of small pockets of steam. When the heat concentration, produced by focused luminous energy, cannot be conducted away by the blood and local fluids rapidly enough, cellular fluids literally explode, leaving surrounding tissue unable to function normally.

Some other effects caused by exposure to intense visible radiation include: blepharospasm (an involuntary winking or spasmodic contraction of muscles in the eye region), dazzle, blinding glare, scotomatic glare, and related intense veiling luminance phenomena which inhibit or otherwise disrupt visual function. The "glare" response is discussed later as a psycho-physical effect.

**Infrared Radiation (710 nm - 0.1 cm):** As is shown in Figure 6, a significant proportion of the longer (IR) wavelengths penetrate the eye's transparent media; they are also refracted as are the visible wavelengths and can cause damage through tissue dehydration, biochemical interactions, and/or the production of steam pockets (as above). Skin burns are mitigated by sweating while burns of the anterior (front-most) parts of the eyeball are mitigated by the blink response which lubricates and cleans these tissues with a viscous fluid. Curiously, retinal injury from IR wavelengths is not as prevalent as might be supposed and, for the majority of "typical" environments, can be disregarded. This is so because the observer can take rapid and appropriate protective action to prevent such injury.

Researchers have discovered that a visual sensation can be evoked by IR wavelengths when they are of sufficient energy (cf. ref. 9). Figure 7 (adapted from ref. 9) gives these data. Wavelengths of 1050 nm can be perceived. Beyond about 800 nm the peripheral (rod) receptors are considerably more sensitive than the cone receptors. When the eye is dark-adapted these long wavelengths are seen only with the peripheral retina and are colorless (ref. 2, pg. 935).

## PART II

### PERCEPTUAL EFFECTS

**Hue Shifts:** Some intriguing color changes have been found to occur under certain very high luminance viewing conditions (ref. 7). When two

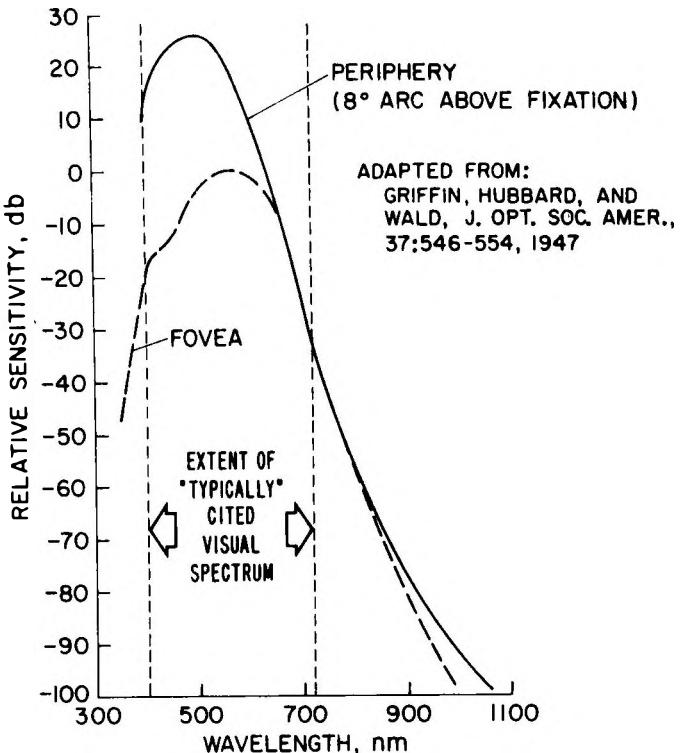


Figure 7. Relative Visual Sensitivity Beyond the Visible Spectrum.

retinal areas are illuminated, one very intensely and the other still more intensely, there is a period of time during which the less intensely illuminated region will appear brighter than the more intensely illuminated one. It was also found that when an observer looks steadily at a visual surface illuminated by long wavelength radiation (e.g., red or orange) and the illumination level is low or of intermediate intensity, the field appears red or orange (as would be expected). If the same field is very intensely illuminated, however, it will appear orange at first, rapidly shifting in hue through yellow to a vivid green. This perceptual effect occurs for monochromatic as well as for "broad spectrum" sources which range from the reds to oranges. If the stimuli presented are in the green region of the spectrum they are seen to be extremely desaturated (i.e., a large proportion of whiteness is present in the hue) but no clear cut changes in hue were found. These findings [also reported by other investigators (refs. 1, 6, 17)], are summarized in Table 1.

**Object Size Changes:** The famous scientist von Helmholtz wrote in 1866 "Highly illuminated areas appear to be larger than they really are...." (ref. 21, pg. 186). Known as the "irradiation phenomenon", this curious and interesting visual effect has received much study since its "discovery." The author has quantified the magnitude of this effect under a variety of sighting conditions. In one of these studies (ref. 10) an optical point source (0.8 cp ≈ 0.3 visual magnitude star; 7'12" arc diam)

High Luminance Source Wavelength Range (nm)				
560	560-580	580-655	655	Color seen at various times after exposure.
"Green"	"Green / Yellow"	"Orange / Red"	"Dark Red"	
[cf. note 1 for 560-620 nm]				
Desaturation to white	Green	Orange	Greenish	First several seconds
Much deeper green				Intermediate stage
Yellow	Yellow			ditto
Orange	Highly saturated green			ditto
White	Yellow or greenish yellow	Orange-yellow	Greenish	Final stage <sup>2</sup>

Notes: 1. At luminances greater than those required to produce the hue changes noted in Table 1 another hue shift seems to occur during the first 15 to 20 sec of viewing. It begins with the same hue change (as cited above) for first several seconds, then changes rapidly to a desaturated pink or violet for as long as 20 sec. Then it changes back to yellow, orange, or green (as indicated above for the final stage).

2. As viewing time lengthens beyond about 150 sec, perceived hue varies greatly.

3. The number of quanta/sec/mm<sup>2</sup> at the retina for all of the above data ranged from  $1.2 \times 10^{12}$  to  $21 \times 10^{12}$ .

Table 1. Perceived Hue Shifts While Viewing Very High Luminance Sources.

was moved (by an observer) slowly toward and then away from the perceived edge of a very bright, small ( $1^{\circ} 12'$  arc diam max.), reflecting mirror surface in a dust-free environment. This travelling test spot was stopped when it just disappeared (and just reappeared from) behind the brighter "target". Target luminance was varied over about a  $3 \log_{10}$  range as indicated in Figure 8 which presents the results of this study. The perceived diameter doubled over this range of luminances. An intense glare halo surrounded the target tapering off in luminance with increased distance from the target's perceived edge. When the intense target was fixated directly (i.e., foveally) the entire visual field was seen to be filled with a veiling luminance which obscured other visible detail.

In an attempt to explain the basic cause of

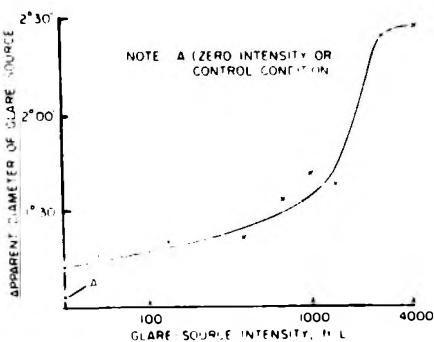


Figure 8. Apparent Increase in Size of a High Luminance Source.

the irradiation phenomenon, the author (ref. 12) speculated upon the manner in which the luminous energy entering the eye would be distributed over the retinal plane. Figure 9 presents this preliminary model; it may contain information that is relevant to some UFO sightings.

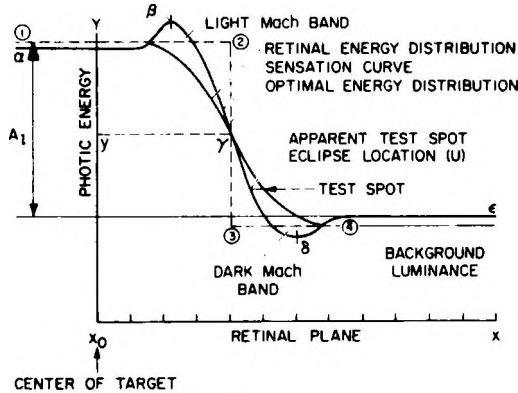


Figure 9. Hypothetical Model of How Luminous Energy is Distributed Over the Retina from a Very High Luminance Source.

Referring to Figure 9, the abscissa represents the spatial dimension of the target's retinal image; the ordinate represents the (likely) amount of luminous energy present at each point. The light dashed contour labelled (1)-(2)-(3) represents the "optimal energy distribution" which the target viewed would produce in a perfect optical system (i.e., with no diffraction, scatter, or other image degrading effects). This dashed line thus represents a vertical slice through the target (as seen from the side). The target's perceived luminance is shown by the plateau height ( $A_1$ ) above the background luminance (labelled  $\epsilon$ ) which is somewhat higher than it would be in the absence of intraocular light scatter. Because the normal human eye's optical system is not perfect, the likely distribution of luminous energy is about as shown by the curve labelled "Retinal Energy Distribution." But the nervous system produces a curious effect here. For it acts to enhance the

otherwise degraded (rounded) perceived edge of the high luminance target something as shown by the curve  $\alpha - \beta - \gamma - \delta - \epsilon$  labelled "Sensation Curve." The plateau to background slope steepens and a "light Mach band" (shaded) is perceived just inside the target's edge. This band is actually brighter than the plateau brightness. Similarly, the nervous system produces a "dark Mach band" just outside the edge of the target which is somewhat darker than the background luminance. Both bands follow the apparent frontal plane outline of the target.

The magnitude of this irradiation phenomenon "sighting error" has been quantified (cf. refs. 12, 13); the trained UFO field investigator should not only become aware of such perceptual effects but should make a serious attempt to have the witness:

-DESCRIBE THE EXACT NATURE OF THE FALL-OFF IN PERCEIVED BRIGHTNESS FROM THE EDGE OF THE BRIGHT UFO -

Figure 10 has been prepared to assist the field investigator in explaining the irradiation phenomenon to a witness and in obtaining a sketch of the approximate luminance distribution surrounding the bright object(s).

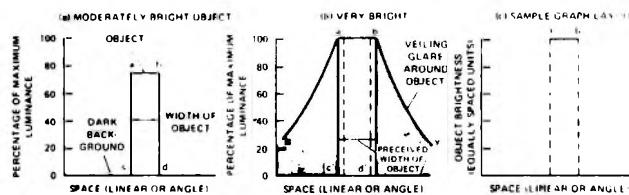


Figure 10. Schematic Diagrams for Use by the UFO Field Investigator (see text).

These diagrams should be shown to the witness and might be introduced as follows: "Part (a) in this diagram shows the outline, in cross-section, (i.e., c-a-b-d) of a moderately bright object as seen against a darker background. Note that the object would appear to your eye as wide as the distance from a to b. Now, if this same object were much brighter, as is shown in part (b), it would, of course, be surrounded by a glare halo, something like an "over-veiling" brightness. This glare is represented by the shaded area underneath the two sloping lines a'-x and b'-y. Now please try to remember how the brightness of the object you saw seemed to merge into the background darkness. For instance, was the object sharply edged (in which case a steeper sloped line a'-x and b'-y would be drawn) or was there an even shading of less and less brightness?"

"Now, I would like you to draw this same sort of thing for me on part (c) of this diagram." It should be obvious how light-rings (e.g., diffraction circles) could be easily plotted using part (c). If radial light rays were seen coming from the bright object, these can be noted by the investigator in a

footnote to the sketch. The field investigator may have to repeat (or otherwise modify) these general instructions until the witness understands what is required. It may be pointed out that much potentially useful information can be obtained from this kind of visually perceived "data." (cf. ref. 18, pp. 344-346).

**Object Shape Changes:** Investigations completed in the author's laboratory have shown that the brighter a source becomes (viewed against an unilluminated background), the rounder it appears. To illustrate this fascinating perceptual phenomenon, Figure 11 shows a photograph of three different shaped, very intense targets, all of the exact same frontal area and all illuminated by an equal amount of luminous energy. On the left is a circle, on the right is an equilateral triangle (right side vertical), and in the middle is a square; all photographed in a dust-free clean room (ref. 11). Reported in ref. 12, the perceptual counterpart of this photographic halation and light-scatter effect is remarkably similar. One might ask how many UFO reports of very bright round objects originated from a perceptual phenomenon such as this? When a rectangle with a 1:4 width to length ratio was presented under these high luminance conditions it appeared as a "hot dog"; of course, a round target merely got larger. Space does not permit any further elaboration of this effect.

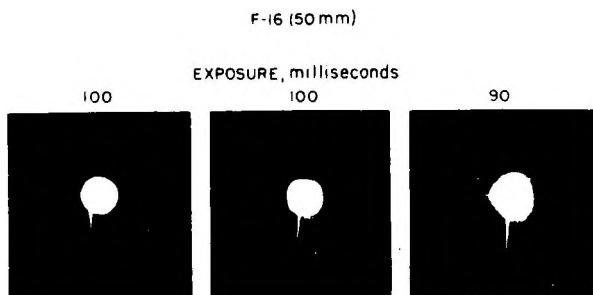


Figure 11. Photographic Illustration of the Change in Perceived Shape of High Luminance Targets.

**Afterimage Formation and Decay:** The subject of the rapid and extreme reduction in visual sensitivity caused by photopigment bleaching from the exposure to high retinal illuminances (hereafter called "afterimages") is a complex subject and has received a great deal of study over the years. If the vision loss is temporary but almost complete (in terms of the inability to see during the effect), the condition is known as "flash blindness." The formation and decay of afterimages should be of interest to the UFO investigator because such knowledge may shed new "light" upon the nature of the high luminance source(s) that caused the afterimage(s).

Everyone knows that, even in a well-lit room, a bluish point-image remains in the visual field after a photographic flash bulb has been fired within sev-

eral meters of the eyes. This afterimage remains for many seconds (even minutes in some cases) and, as it gradually decays, one is likely to perceive various details within the image boundary such as the lamp's outline and filament shape that was previously impossible to perceive just after the exposure. Much the same visual effects occur to the exposure of the solar disc<sup>2</sup>, acetylene or electric welder's arc, or other very intense source. The following statement may be considered to be true in general and should be considered by the UFO field investigator:

- A VISUAL AFTERIMAGE MAY CONTAIN VALUABLE INFORMATION ABOUT THE NATURE OF THE INTENSE SOURCE THAT IS NOT APPARENT IMMEDIATELY AFTER THE EXPOSURE -

The investigator should ask direct questions of the witness in those instances where there may have been an afterimage caused by the "blindingly bright" UFO. If he cannot remember the presence of any afterimage when the viewing conditions were likely to have produced one, caution should be exercised in making further interpretations of the witnesses sighting report.

With regard to studies of flash blindness, brief presentations of light-adapting visual fields possessing over nine million foot Lamberts<sup>3</sup> have been studied (cf. ref. 14). In many of these studies the time is measured between the intense flash and the time the observer can successfully see some acuity pattern at a preset (usually low) luminance level. One set of data indicated recovery times of over 30 sec when the retina was exposed to a 900 msec flash and the retina was pre-light-adapted to a given level; Figure 12 (adapted from ref. 5) presents these data. If either the luminance of a finely patterned target (viewed just after exposure to an intense UFO) or the estimated visual recovery time [from the moment of exposure to the time the witness could visually discriminate the fine detail of a surface nearby], or both can be approximated, it is possible to make some educated guesses about the UFO's luminance. The data of Figure 12 is based upon parallel black - white lines whose orientation had to be discriminated. The mean luminance of these stimulus bars was varied over the  $3.6 \log_{10}$  units shown on the abscissa.

2. Never look directly at the sun (particularly during an eclipse)! Permanent blindness may result from the very high energy that is focused upon the retinal tissue. Special optical filters are available for such viewing.
3. A foot Lambert is a unit of luminance equivalent to a surface emitting or reflecting luminous flux at a rate of 1 lumen/ft<sup>2</sup>. Also equivalent to  $3.426 \times 10^{-4} \text{ cd/cm}^2$  or  $1.076 \text{ ml}$  or  $2.918 \times 10^{-1} \text{ Nit}$ .

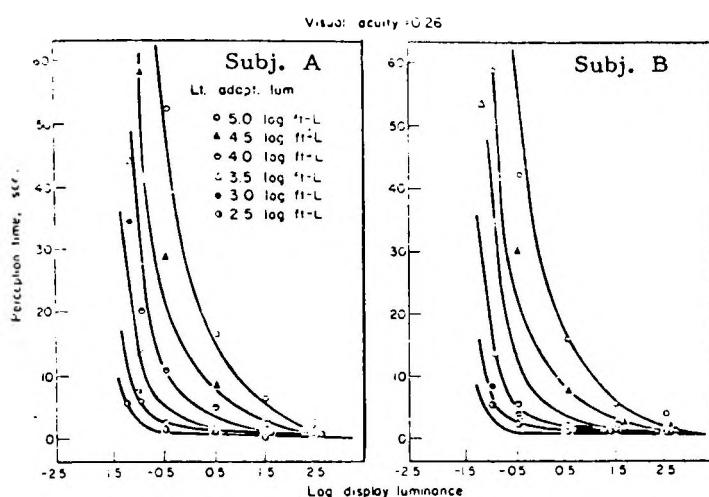


Figure 12. Perception Recovery Time Following each of Six Pre-adapting Flash Luminances (indicated on graph).

The angular separation between the parallel bars was 3.8 min arc (equivalent to about 20:77 acuity).

These recovery time data indicate that: (1) for relatively bright patterns or detail that must be discriminated shortly after a brief, intense light flash, there is little difference in recovery time for different light-adapting luminances, and (2) for relatively dim patterns or detail, visual recovery time increases at an increasing rate down to an acuity pattern luminance which represents the limit of the observer's lower luminance sensitivity threshold for seeing the fine pattern at all. Unfortunately, these curves vary for different acuity patterns used, different luminances of the pre-light-adapting flash, and other variables (cf. ref. 19). Still, these data provide some indication of flash blindness recovery rates for these limited conditions. The interested reader should consult refs. 8, 15, and 16 for further experimental data on this subject.

It is known that two separate afterimages can appear to become fused together. One study (ref. 3) showed that if two sufficiently close and intense xenon flash sources are presented and if the afterimage is viewed against a flickering background, a line will be perceived that joins the two originally separate afterimages. If the intensely bright source is an interrupted (segmented) bar, the afterimage will appear as the original luminous bars connected by thinner lines. If the sources are in the form of four non-collinear dots, several lines connecting some of the dots will be seen in the afterimage. Could some UFO sightings be explained by this same visual phenomenon?

#### CONCLUSIONS

Students of the UFO phenomenon should make themselves more aware of the diverse visual effects

that are produced by exposure to very bright luminous sources. The primary reason for doing this is to be in a better position to make inferences concerning the true nature (e.g., actual size, shape, structural details [if any], luminous energy, and dominant wavelength) of the source. Implicit in this discussion is the belief that although the witness may not be able to extract very much meaningful information about the true nature of the object he perceived, the trained UFO field investigator will, through a knowledge and application of both biological and psychophysical data such as is given in the present paper and in the references given below.

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## SCREENING OUT UFO "NOISE"

Richard Hall

A very important, and relatively simple to accomplish, area of cooperation among UFO research groups could be sponsored by CUFOS to minimize the inclusion in the UFO literature of mistaken observations that contribute to the high "noise" level and detract from studies of good observations.

If information about natural and technological events that commonly cause false UFO reports were pooled at a central location (perhaps CUFOS), it could then be summarized by date, time, location, and brief description, and circulated monthly or bimonthly to UFO groups and publications. A nominal fee might be charged to offset costs, with reduced rate to cooperating groups that contribute data to the pool. UFO groups and newsletters could be encouraged to check current reports against the list before publishing.

The types of event would include:

NORAD satellite re-entry data

NASA launches (including sodium vapor tests)

Large "fireball" meteors

Military tests

Unusual aircraft and Goodyear blimp

Advertising planes

Research balloon flights

Since knowledge of such events would benefit all scientific-minded investigators, this would seem to be a non-controversial area lending itself to full inter-group cooperation. In the long run, such a compilation could also be used to check on historical reports and would be a valuable reference to screen reports against prior to publishing studies or summary reports. It should help to upgrade the general quality of UFO data.

## PRELIMINARY STUDIES OF ANIMAL REACTION TO UFO\*

Harold I. Heaton\*

Animals often exhibit extreme fear and react violently in proximity to UFOs. Rapid mood change to a docile state is frequently reported (1-31). This study attempts to correlate the reacting animal or type of reaction with the dynamic or luminescent behavior of the object. Although domestic animals are reported to react even when in enclosures, it is not clear whether wild animals are similarly affected. If animals do react to UFOs rather than to their owners, who become startled by an object which they expect to be unusual, then they provide an alarm network and a potential source of physical data on the object(s).

Several theories have arisen in explanation of the effect: response to microwave energy, low strength magnetic fields, ultrasonics, electrostatic charge in animal fur, and direct stimulation of the auditory nerve or brain (25,14) by electromagnetic radiation.

Human subjects occasionally are able to "hear" modulated RF signals (25). Instances also are reported where people have "heard" meteors and aurorae (14). In the former case, subjects report a buzzing sound at the rear of their heads. Localization of the source is not possible. However, in the latter circumstance, the direction of arrival was isolated even though the "sound" was similar in nature. The effect seems to bypass the outer and perhaps inner ear mechanisms.

Although little is known about animal reaction to meteors (16) or ball lightning (17), magnetic fields or free charge from the latter are potential sources of disturbance. Some species of animals are known to react to low strength magnetic fields and pigeons derive navigational information from the Earth's lines of force. One marginal case is recorded in Appendix A whereby pigeons were disturbed (4) by UFO.

Ultrasonic activity, engaging the ear structures, would be significant if the simultaneous presence of excited and unexcited species could be demonstrated. Different animals have differing ultrasonic response ranges; for this reason, data on the ultrasonic frequency bandwidth of the UFO could be derived as a function of the dynamics of the object. It has been suggested that human physiological effects from UFOs peak during the UFO ascent (25). At least one case (6) supports this interpretation with regard to animal reaction, but single and marginal cases do not test the statistical significance of these reported patterns.

To search for patterns, a catalog of 232 UFO sightings which involve animal reaction has been compiled from 26 objective texts. Strong criteria for inclusion of a book are that the author(s) be objective and alive, permitting further communication for additional case details. Although a few books

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\*The author is currently employed at EG&G, Inc., Los Alamos, New Mexico. The information contained within this article does not necessarily reflect financial support by, or official interest on the part of, EG&G.

remain to be scanned, the catalog appears here as Appendix A (1-13,15,18,19, 22-31).

This catalog has been compared with an earlier listing by G. Creighton (26). A main purpose of the latter compilation was to demonstrate hypothetical parallels between UFOs and psychic phenomena. For this reason, many cases are included which do not involve UFOs specifically; this seriously weakens the effectiveness of Creighton's catalog. Once these cases are eliminated, the surviving range of affected animals is considerably narrowed; dogs, cows and horses are the principal entries. The universality of affected species implied by McCampbell (25) is based entirely upon Creighton's listing and is an inaccurate generalization. Specifically, no cases survive in Appendix A which involve cats, and it is not clear whether strong cases exist where wild animals are reported to be disturbed. It is difficult to say whether this is because dogs, cows and horses are most likely to be domesticated and able to convey distress, or whether wild animals are not influenced. Lack of reaction in cats, if true, would argue against the former choice.

Two broad groupings of the sightings in Appendix A can be made. The first is comprised of hoaxes and cases in which the animal reacted to an identifiable object, such as a re-entering space vehicle. A good example of the latter can be found in Klass' recent book (28). These cases are used as a control group and provide good insight into the conception of hoaxers of a UFO encounter, and into the subtle influence which humans have over the moods of their domesticated pets. Apparently bonafide sightings in which animals react to unidentified objects constitute the second grouping.

Data quality within these groups is highly variable and the data itself is usually incomplete. Each case is subjected to the same set of standardized questions from the following areas:

1. Details of the sighting - location on Earth, time of day, sun angle, solar cycle phase, lunar phase, and weather;
2. Details of the object(s) - color, color change, dynamics, sound, scent, presence of shafts of light, shape, and presence of occupants;
3. Details of the human observer(s) - whether animal or human reacted first, number of observers, aspect of observer(s) to animal(s) and object(s), occupation, whether prior interest in UFOs had recently been stimulated, and duration of association between animal and human;
4. Details of animal(s) - type of animal, aspect of UFO to animal(s), whether animal(s) was (were) sheltered during onset, type and duration of reaction, and presence of undisturbed animal(s).

Standard responses, developed from case consideration studies, are digitized and analyzed by electronic computer. Digitization has been completed for a subcatalog of 30 of the better documented sightings, based solely on information contained in specified references herein. Additional details from individual authors are necessary before analysis can proceed.

Several options exist for further study. It is quite important to detail

the ultrasonic frequency response of the more common domesticated animals. In addition:

1. A subset of animal reaction cases could be extracted from UFOCAT, the Center for UFO Studies' computer data bank;
2. Animal interaction cases compiled from UFOCAT or independently, which originate from Project Blue Book, could be examined; or
3. A detailed questionnaire specifically designed to gather data appropriate to this study could be designed.

The first two options should await completion of this study before a decision as to their merit is rendered. Progress has been made by the Mutual UFO Network (MUFON) independently on the latter option. Such a questionnaire, tailored to this study, could be mailed by CUFOS to reporters of UFO sightings involving animal reaction and forwarded to this author for digitization.

When the distinct possibility of extracting physical data of UFOs is considered, it is imperative to pursue animal cases, both past and current, as a source of information. It is strongly recommended that the Center for UFO Studies institute such a questionnaire.

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28. Klass, P.J., UFOs Explained, New York, Random House (1974).
29. Menzel, D. Flying Saucers, Cambridge, Ma., Harvard University Press (1953).
30. Keyhoe, D., Flying Saucers: Top Secret, New York, G.P. Putnam's Sons (1960)
31. Keyhoe, D., Aliens from Space, New York, Doubleday (1973)

Appendix A: Catalog\*\*

<u>Catalog Number (date)</u>	<u>Author, page</u>	<u>Location</u>
16630815	19,45 (London) 27,1	Robozero, U.S.S.R.
17490915	26,no.1, 27	Rutland, England
18690115	26,no.1, 27	Swaffham, Norfolk, England
18730000	26,no.1, 27	Bonham, Tex. Ft. Riley, Kan.
18871120	26,no.1, 27	Berkshire, Eng.
18970419	26,no.1, 27 27,3 10,20 18,16 28,257	Leroy, Kan.
18970400	26,no.1, 27	Dallas, Tex.
18970506	26,no.1, 27	Hot Springs, Ark.
18971122	26,no.1, 27	San Francisco, Calif.
19270805	18,22	Mongolia
19281100	9,152 15,129	North Dakota
19290612	26,no.1, 28	Fermeneuve, Quebec
19431000	26,no.13, 25	Dead Mtns., Calif.
19461000	26,no.1, 28	Paterson, New Jersey
19470600	4,38 29,41	Maury Island, Wash.
19470700	4,31 26, no.2, 29	Portland, Oregon
19480201	30,144	Circleville, Ohio
19500115	26,no.13, 25	San Luis, Argentina
19500511	3,397 31,252	McMinnville, Oregon
19500702	10, 167	Ontario, Canada
19510619	26,no.2, 29	Sonderborg, Denmark
19520422	26,no. 13, 25	Ontario, Canada
1952, sum.	9,100	Okla.-Mo. line
19520912	26, no.2, 29 26, no. 13, 25	Flatwoods, West Va.
19520916 0914	9,165 23,159	Florida Belle Glade, Fla.
19521027	26, no.2, 29	Gaillac, France
19530129	26,no.2, 29 10,51	Conway, S. Carolina

\*\* Zeros in locations 5,6 and/or 7,8 under "Catalog Number" mean that information on the month and/or day is not available from citation.

<u>Catalog Number (date)</u>	<u>Author, page</u>	<u>Location</u>
19531013	26, no. 2, 29	Pleasant Hill, Ca.
19531200	26, no. 2, 29 27, 11	Sherbrook, NS, Canada
19540200	26, no. 3, 28 .	Todd River Downs, Australia
19540910	26, no. 3, 28 10, 115 23, 44 27, 12	Quarouble, France
19540924	23, 76	Ussel, Correze, France
19540926	27, 13 23, 82 18, 70 26, no. 3, 28	Chabeuil, Drome, France
19540927	26, no. 3, 28 23, 91 27, 14	Premanon, Jura, France
19540927	23, 88	Lemps, Drome, France
19541001	26, no. 3, 28	Bry, Nord, France
19541002	26, no. 3, 28 23, 109	Poncey-sur-l'Ignon, France
19541004	23, 139	Megrit, Brittany, France
19541011	23, 159 26, no. 3, 28	Beauquay, Calvados, Normandy, France
19541015	26, no. 3, 29	Perpignan, France
19541015	26, no. 3, 29 27, 16	Boaria, Rorigo, Italy
19541016	26, no. 3 18, 72	Cier-de-Riviere, France
19541017	26, no. 3, 29	Cabasson, France
19541021	26, no. 3, 29	Ranton, Staffordshire, England
19541021	26, no. 3, 29	Melito, Italy
19541028	5, 55	Cameroons
19541000	15, 3	New York
19541021	26, no. 13, 25	Puzzuoli, Italy
19541108	26, no. 3, 29	Monza, Italy
19541114	26, no. 3, 30	Isola, La Spezia, Italy
19541209	26, no. 3, 30	Linha Bela Vista, Brazil
19541211	26, no. 3, 30	Linha Bela Vista, Brazil
19540000	26, no. 13, 25	Mato Grosso, Brazil
19550529	26, no. 4, 28	Smithfield, Australia
19550821	1, 150 10, 170 26, no. 13, 25	Kentucky

<u>Catalog Number (date)</u>	<u>Author, page</u>	<u>Location</u>
19560400	26, no. 4, 28	Poole, Dorset, England
19560908	26, no. 4, 28	Twin Falls, Idaho
19560900	26, no. 4, 28	Cabo Frio, Brazil
19570500	26, no. 4, 28	Milford, Pa.
19570500	15, 165	Indiana
19570510	23, 212	Beaucourt-Sur-Ancre, France
19571010	26, no. 4, 28	Schenectady, N.Y.
19571103	15, 98	Nebraska
19571104	23, 241	Spooner, Wisconsin
19571105	23, 245	Wabash, Indiana (See Wabash Plain Dealer, 11/6/57)
19571106	23, 249	Merom, Indiana
19571106	27, 21	Dante, TN
	26, no. 4, 28	
	23, 71	
19571106	23, 273	Everittstown, N.J.
19571106	27, 22	Jonesville, Va.
19571110	15, 98	Ohio
19571100	27, 21	Brazil
	26, no. 13, 26	
19571118	26, no. 4, 29	Maracaja, S. Brazil
19571230	26, no. 4, 29	Drakestown, N.J.
19570000	26, no. 13, 26	Long Island, N.Y.
19580408 &09	26, no. 5, 28	Keta, Ghana
19580527	26, no. 5, 28	Wednesfield, England
19590600	26, no. 5, 28	Rio Pardo, Mato Grosso, Brazil
19590713	5, 25	Blenheim, New Zealand
	26, no. 13, 26	
19591005	18, 140	British Columbia (see Vancouver Sun, 10/5/59)
19591002	26, no. 5, 28	Glenora, Can.
19601119	26, no. 5, 28	Rouen, France (Forest of Lond)
19601209	27, 25	Carignan, France
19610428	26, no. 5, 28	Dundee, S. Africa
19610600	18, 106	Australia
19610919	12, many pgs. 26, no. 5, 28	Franconia Notch, N.H.
19630111	26, no. 5, 28	San Pietro, Italy

<u>Catalog Number (date)</u>	<u>Author, page</u>	<u>Location</u>
19630215	26, no. 5, 29 7, 14 9, 193 15, 140	Moe, Australia
19630400 or 0500	26, no. 5, 29	Boskloof, Cape Province S. Africa
19630807	15, 141	Illinois
19631021	26, no. 5, 29 27, 28	Trancas, Argentina
19631200 or 19640100	26, no. 5, 29	Epping, England
19640821	27, 32 26, no. 6, 27	Moses Lake, Wa.
19640000	26, no. 6, 27	Missoula, Mon.
19641030	26, no. 6, 27	Bridgwater, Somerset England
19641103	26, no. 6, 27	Pescadero, Ca.
19650203	26, no. 6, 27	S. Brighton, New Zealand
19650314	10, 92 31, 31	Florida
19650520	26, no. 6, 27	Leroy, Ohio
19650619	1, 91	Oklahoma
19650715	26, no. 6, 27	Argentina (Loretani Valley)
19650719	26, no. 6, 27	Vaucluse, NSW, Australia
19650719	ibid	Bahia Blanca Argentina
19650730	ibid	Goonumbla, NSW Australia
19650802	9, 25	Oklahoma
1965080?	26, no. 6, 28	Rio Grande do Sul Brazil
19650800	ibid	Mexico City (proximity)
19650806	ibid	Ambleside, England
19650810 & 11	ibid	Parkes, NSW Australia
19650815	ibid	Westmorland, England
19650819	9, 47 1, 113	New York
	listed as 0820	
	27, 37 26, no. 6, 28	
19650825	26, no. 6, 28	Morriston, S.W., U.K.

<u>Catalog Number (date)</u>	<u>Author, page</u>	<u>Location</u>
19650903	6, ch. 1 9,50 10,52 10,299  26, no. 6, 28	New Hampshire
19650909	26, no. 6, 28	Aldershot, England
19651000	6,169	Pennsylvania
19651111	26, no. 6, 28	Mogiguacu, Brazil
19660100	26, no. 7, 28	Tully, Queensland, Australia
19660306	8, xxviii	Missouri
19660316	26, no. 7, 28	Eliot, Me.
19660323	2,52	Colorado
19660329	27,41	Hampton Falls, N.H.
19660331	26, no. 13, 27	White Rock Lake, N.J.
19660401	ibid	Hardyston Twp., N.J.
19660405	26, no. 7, 28	Alto, Tenn.
19660423	ibid 27,41	Yorktown, Ia. Clarinda, Ia.
19660428	26, no. 7, 28	Sawtry, England
19660717	ibid	Rebouillon, France
19660801	ibid	Baltimore, Md.
19660820	26, no. 7, 29	Heraldsburg, Ca.
19661010	8,xxix	Illinois
19661012	26, no. 7, 29	Jonesboro, Tn.
19661014	ibid	Newton, Ill.
19661115	ibid 27,44	Gallipolis, Ohio
19661117	26, no. 7, 29	Cheshire, Ohio
19661118	ibid	Berks, England
19661230	ibid	Haynesville, La.
19660000	26,no.13,26	Aveyron, France
19670110	26,no.8, 26	Pt. Pleasant, W. Va.
19670113	ibid	Baton Rouge, La.
19670100	ibid	Malta, Montana
19670205	ibid	Hilliards, Ohio
19670225	27,46	Choele Choel, Argentina
19670303	26,no.8, 26	Red Hill, N.H.
19670307	ibid	Bartlett, Ill.
19670318	ibid	Lebanon, Ohio

<u>Catalog Number (date)</u>	<u>Author, page</u>	<u>Location</u>
19670326	27, 47	Minitare, Nebraska
19670417	26, no. 8, 26	New Haven, W. Va.
19670400	26, no. 13, 27	Hackettstown, N.J.
19670426	ibid	Toronto, Ont.
1967, spr.	3, 317	Near Winnipeg, Canada
19670528	26, no. 8, 26	Sermerieu, France
19670621	27, 49	Mechanicsville, Va.
19670627	26, no. 8, 27	Surrey, England
19670721	ibid	Jewfish Creek, Fla.
19670725	ibid	Tucson, Arizona
19670725	ibid	Garrison, N.D.
19670700	ibid	Lone Butte, B.C. Canada
19670812	ibid	Ogama, Ws.
19670819	ibid	Hindley, Lancashire, England
19670820	ibid	U.S.A.
19670829	ibid	Cussac Plateau, France
19670922	26, no. 9, 29	Caracas, Venezuela
19671020	27, 53	Ithaca, N.Y.
19671026	26, no. 9, 29	Dorset, England
19671000	ibid	Bo yup Brook, W. Australia
1967, fall	3, 378	N.E. USA
1967, fall	3, 389	mid west Town, USA
19671011	1, 14	Alberta
19670000	26, no. 9, 29	Weston, England
19671102	ibid	Ririe, Idaho
19671122	ibid	Petrila, Romania
19670000	ibid	U.S.A. (Ariz., VA) Canada, India
19680115	1, 53	Alberta
19680100	26, no. 13, 26	Rio Grande Do Sul, Brazil
19680204	2, 23 & 52 26, no. 10, 28	Redlands, CA.
19680219	26, no. 10, 28	Bengough, Sas., Canada
19680303	8, 159 28, 10	Columbus, Ohio
19680403	1, 116	Wisconsin
19680418	26, no. 10, 28	Province of Liege,, Belgium

<u>Catalog Number (date)</u>	<u>Author, page</u>	<u>Location</u>
19680400	ibid	Ohio
19680629	ibid	France
19680702	ibid 27,56	Olavarria, Argentina Argentina (Sierra Chica)
19680702	26, no. 10, 29	Wooler, Ontario
19680730	ibid	Claremont, N.H.
19680800	26, no. 13, 26	Catskill Mts., N.Y.
19680907	26, no. 10, 29	Scarborough, Ont.
19680900	26, no. 13, 27	Woodmansterne, Banstead, England
19680915	26, no. 10, 29	Carora, Venezuela
19681018	ibid	Medulla, Fla.
19681125	ibid	Marcellus, N.Y.
19681130	ibid	Renton, Wa.
19681209	ibid	Lima, Peru
19680000	ibid	France (Brazey-en-Moryan)
19690115	27,61	Los Barros, Villa Franca Spain
19690117	26, no. 11, 26	Childers, Qnsland., Australia
19690209	ibid	Montpellier, France
19690220	ibid	Belo Horizonte, Minas Gerais, Brazil
19690220	ibid	Pirassununga, Brazil
19690310	ibid	Lancaster, Mo.
19690300 & 0400	ibid	Ibiuna, Brazil
19690420	ibid	Itaucu, Brazil
19690422	26, no. 11, 27	Hammond, Ont.
19690428	ibid	Farnsworth, Lancashire, England
19690511	ibid 1, 133	Allumette, Isl., Quebec
19690512	28, 17	Lake Zurich, Illinois
19690524	26, no. 11, 27	Vina, Ca.
19690615	ibid	Birkenhead, England
19690924	ibid	Zellik, Belgium
19691004	26, no. 12, 26	Kaharoa, New Zealand
19691030	ibid 27, 69	Waipukurau Aufield, New Zealand

<u>Catalog Number (date)</u>	<u>Author, page</u>	<u>Location</u>
19691124	26, no. 12, 27	Olavarria, Argentina
19700128	ibid	Pudasjarvi Hospital Finland
19700215	ibid	Birmingham, England
1970, spr.	ibid	Norfolk, England
19700800	ibid	Calgary, Canada
19701017	26, no. 12, 28	Guernsey, England
19710325	ibid	Denton, Sussex, England
19710516	27, 76	Anderson, In.
19710609	27, 77	Alta, Canada
19711102	27, 79 28, 315 & 329	Delphos, Ks.
19720208	27, 81	Charlotte, N.C.
19720225	27, 81	Learned, Ks.
19720818	28, 83	Colby, Ks.
19720914	27, 86	Houston, Mo.
19720928	19, 276	Poseti
19721230	27, 87	Buenos Aires Province Argentina
19730729	27, 91	Irwin, Pa.
19731001	27, 93	Anthony Hill, Tn
19731014	27, 94	Ohio
19731015	27, 94	Berea, TN
19731025	27, 96	Uniontown, PA
19731104	27, 96	Inkster, ND
19741012	27, 105	Connellsville, PA

## UFO'S AND PARAPSYCHOLOGY

Wido Hoville

Recent books of well known UFO researchers, as well as various publications from the US and abroad, discuss the parapsychological or paranormal aspect of the UFO controversy.

In doing so, and probably without any ill will, these writers discredit the physical reality and the hypothesis of the UFO Phenomenon being of extra-terrestrial origin, to the benefit of a parapsychological interpretation of the phenomenon.

At a moment when man has set foot on the moon and continues to explore our solar system, giant radio telescopes probe deep into the visible and invisible universe, and officially science accepts life on other planets, however far distant - at such a moment, the hypothesis of extraterrestrial visitation in the form of UFO's and associated phenomena is the most practical, credible and logical explanation.

But with this new vision which is submitted to us, the astronautical aspect of the Flying Saucer phenomenon disappears more and more into the parapsychological fogginess.

All this may lead the scientific community and the public to the assumption that the UFO Phenomenon has nothing technical about it, besides its appearance. In fact, it suggests that the phenomenon should be considered as a special case of "paranormal" manifestations.

The parapsychological hypothesis rests on some observations that are so strange that they seem to belong to the realm of magic. We should always remember the fact that any technology that is far superior to ours will appear like magic to us. UFO observations suggesting a parapsychological interpretation are relatively rare; most observations suggest a physical reality. It is however true that a number of authors select only those reports that would support the paranormal thesis. Besides the above considerations, we should also recognize that the paranormal explanation of the UFO Phenomenon looks rather like an "easy way out." Actually, in converting the UFO Phenomenon into a parapsychological one, we just convert it into another phenomenon which we do not understand either.

When we try to evaluate and analyse the UFO Phenomenon, according to tested scientific methods, we should use only facts as our starting point, and establish a solid base on the physical reality of the phenomenon. We should try to detect these objects with all technical means possible, such as radar, ultrasonic detection, magnetic detection, photography, etc., on a world-wide basis sponsored by the whole scientific community. We should record their

speed, manoeuvres, trajectories and proceed to the analysis of their propulsion. In short, we must first establish a solid technical investigation method, recognized world-wide by the scientific community, before going into the research on the paranormal aspect of the Flying Saucer Phenomenon.

Even the aspects that now appear to belong to the paranormal and parapsychological field may finally prove to have a technological explanation. For example, many witnesses claim that they receive a message via "telepathy" and that they felt that they were being observed during the sighting. Could this not be the result of a special wave transmission working directly on the brain's nervous system? The fact that some UFOnauts, in pointing at the witness some sort of weapon which emits a light ray, are able to paralyze momentarily the observer, suggests just such a non-acoustic wave transmission system.

Furthermore, the apparent whole absurdity of the UFO phenomenon suggests a broad, world-wide operation of UFOs and UFOnauts having a solely "diabolic" desire to deceive people and create confusion. The behavior of the UFOnauts, especially when they know that they are observed, is rather irrational. In fact, it is hard to imagine UFOnauts travelling to us from distant solar systems to collect rocks and to take grass samples. UFOs landing in rural areas on roads just in front of lonely travelling cars (when there is ample space available in the fields) suggests a luring away method to hide the real reasons of their being here, especially if we take into consideration that this game has already been played for at least 30 years and possibly much longer.

The uprise lately of more and more writers who probe into the parapsychological and paranormal aspects of the UFO controversy (just when UFOlogy emerges from the dark ages of Project Bluebook and Project Condon, and science starts to get organized to try to solve the UFO phenomenon) should give us all the more reason for concern. This direction of UFO research may very well prove to be another lure away tactic either from the UFO intelligences or from some sort of government agency.

This theory is naturally hard to prove, but it would be interesting to find out who manipulates whom.

We should, however, not deny the reality and the importance of the parapsychological phenomena and their possible connection to some observations of Flying Saucers. But to pretend from here on that the whole UFO controversy can be explained by using the parapsychological investigation method is, in my opinion, "too easy a way out." It would be far better to admit that nobody knows the real truth and that we still have a long way to go in this field of research.

## UFO RESEARCH, THE ETH, AND OTHER MURKY PROBLEMS

David M. Jacobs

UFO research has, it seems to me, come to a crossroads. Old and irrelevant questions - about whether the Air Force covered up some immense secret or whether the CIA fabricated a complex ruse to lead researchers off the track - these have finally become relics of battles fought long ago. For the first time a genuine debate has developed within the UFO research community. The debate is not along the lines of older schisms, which have been between "believers" and "nonbelievers," or between supporters of the extraterrestrial hypothesis and supporters of the terrestrial origin of the objects. Rather, the debate now concerns the origins and nature of the objects and is based on the correct assumption that the phenomenon is unique, anomalous, and therefore something that cannot be explained in conventional terms.

I think that this debate is a healthy and normal part of the UFO discipline's growing maturity. In spite of the maturity, however, a continuing problem still plagues UFO researchers and inhibits the discipline's development: although we have been aware of the phenomenon for decades, we know pitifully little about it. In the absence of large grants to study the subject (with the exception of the funding for the inadequate Condon committee), virtually all research has to be done on a volunteer, part-time basis. Moreover, until quite recently there were very few qualified researchers to take up the task.

In the mid-1960s only a handful of serious students of the subject could devote any time to the problem. And the only reports these people could study came from the national UFO organizations or were the reports that they privately investigated. Further, with the notable exception of Flying Saucer Review, there were, as there are now, precious few places to publish any findings and certainly no place to publish findings for academicians and university-associated researchers. The main task of collecting and investigating reports fell to the volunteer national UFO organizations and their reports were only as good as their investigators. Although many investigators did valuable work, the average investigator for the national UFO organizations was only as good as the limited prevailing knowledge of the subject would permit. In other words, many investigators did not know the proper questions to ask. Consequently, much of the data was incomplete or unsatisfactory, although many of the reports were nonetheless excellent and intelligently investigated.

By the mid-1970s, a decade later, knowledge about the scope and complexity of UFOs has increased enormously. The primary reason for this expansion in knowledge is the shift in focus - from lights in the sky and high-level sightings, which yield a modicum of data, to the more puzzling and revealing low-level, trace, and occupant cases. This new focus has helped UFO researchers become more aware of the incredibly complicated aspects of UFO cases, some of which exist on the fringes of comprehension and imagination.

Recently many UFO researchers have turned their attention to serious

studies of some of the stranger aspects of the topic. These researchers have focused on the singular problems of "nonofficial" contact, the sometimes capricious content of messages that entities impart to witnesses, materialization and dematerialization, the meaning of the enormous number of UFO sightings, the possibility of UFO activity throughout human history, and the links between UFO activity and psychic phenomena.

With the focus now on these stranger aspects of UFO research, new theories have emerged that display a movement away from the previously widely accepted "nuts and bolts" extraterrestrial hypothesis - that beings from another planet "fly" here in mechanically constructed spaceships. Instead, three new broad concepts have emerged that have pushed UFO research in new directions. These involve the purpose of the UFO phenomenon, the origin of the phenomenon, and the relation of the phenomenon to humanity's psychic experience. In part, these concepts are linked and overlap.

The problems of nonofficial contact, capricious messages, and sudden materialization have prompted some researchers to suggest that UFOs have, at least in part, a psychic origin. The tenets of this argument are that alien and "ultraterrestrial" UFOs can be "created" by a collective human psyche or unconscious. This theory implies that humans have a need to create these objects and the need might be linked to "societal stress." The new theory shies away from the old debunkers' theories in that it suggests that the objects are indeed "real" and witnesses can observe them. This theory, as it stands, does not take into account trace cases, occupants, abductions, and so forth. Therefore, researchers have added another component: temporally and culturally bound human psychic projection can conjure up a hard, physical object, the appearance and behavior of which are therefore products of societal expectations. Hence, UFOs appear as gods in ancient cultures, flying shields in ancient Rome, airships in the 19th century, etc.

A corollary of this theory states that the psychically linked appearance of the objects and the sometimes capricious information that occupants give to witnesses might be part of deliberate deception by the occupants. This Grand Deception is meant to control the flow of information about the objects, presumably to help us accept the appearance of alien life with a minimum of shock to our own culture.

At the heart of the Grand Deception argument is the idea that the aliens have acted both in rational and irrational ways to lead us off (and on) the path of truth. This behavior also takes the form of erroneous messages, religious visitations (Fatima, Lourdes), and absurd behavior. The fundamental question to ask when thinking about absurd messages and behavior is: Whose purpose are we investigating? Is the appearance of the objects as religious miracles (if, indeed, this is the case), as airships, or as flying saucers a product of the aliens' purposeful design, or is it the product of our own temporally bound perceptions, or both? These are difficult, if not impossible, questions to answer at this time; we obviously do not know enough.

The psychic projection and Grand Deception arguments have serious difficulties. Psychic projection relies on the dubious concept of "collective unconscious." This is a handy but completely unproven idea. Debunkers have

often used this argument to ridicule the UFO phenomenon, and they often coupled it with another idea - "societal stress." While the UFO phenomenon is fleeting, ephemeral, anecdotal, we can measure, test, and study the societal stress and collective unconscious theories. But so far I have found no evidence to suggest their viability or legitimacy in relation to the UFO phenomenon.

A serious problem with the Grand Deception theory is that it tends to erode standards for and blur distinctions between good and poor evidence. The signal and the noise merge into one large signal. Believing in the Grand Deception theory inevitably leads one to the belief that virtually all actions can be part of the deception. Hence, the previously discredited "contactees" of the 1950s can now enjoy a new reputable resurgence. George Adamski's tales can now become "evidence." Their absurd quality just indicates the aliens' purposeful deception. Adamski's critics can easily fit into the scheme of deception because they themselves become party to confusing the public about the reality and purposes of UFOs. Defenders of Adamski will fit into this scheme as well. Bethurum, Menger, Fry and Angellucci might have made outlandish and absurd claims because the aliens compelled them in some way to do so. Everything fits; all facts and all data are assimilated easily. The problem is that this theory leaves no room for hoax or coincidence. If the phone rings and no sound comes from the other end, this becomes evidence of alien behavior.

Obviously, this style of thought is dangerous. Hoaxers do exist. Charlatans do abound. People will try to make a dishonest buck off UFOs. Coincidences will occur. We must have standards. We must be careful. We must allow for the role of hoax, and we must not make the mistake of assuming that the hoax is in itself a part of alien control. We have to draw the line somewhere.

In addition, the Grand Deception theory does not allow for the role of individual initiative in the aliens' behavior. We cannot make the mistake of assuming that the aliens are all acting according to strict sets of orders or regulations as the Grand Deception theory implies. The French "smiling occupant" case of 1954(1), the 1954 Cennina (Italy) case(2), the New Guinea case (3), etc. - all seem to illustrate actions of individual initiative that researchers can place in a general purpose or design only at their peril. Finally, the Grand Deception theory is strikingly similar to the old theory that the Air Force withheld information about the UFOs' extraterrestrial origin to prevent panic, and it assumes that the entities have a moral sense and benevolence that would cause them to "let us down easily" on the great revelations.

While all UFO researchers may not subscribe to the psychic origin or Grand Deception theories, all are puzzled by the seemingly ridiculous idea that thousands and thousands of beings climb into spaceships, fly here over mind-boggling distances, and then cavort about, chase cars, play games with people, and generally act "irrationally." Moreover, even if UFO occupants have "scientific" missions on earth, it does seem rather ludicrous for them to allow us to see them land and pick flora and fauna samples over and over for nearly 30 years. This fact, coupled with the materialization and dematerialization phenomenon, has led to the thought that perhaps UFOs can "jump" from "interpenetrating" universes or the "fourth dimension," or from "other realities."

While these theories about how UFOs arrive here may prove in time to be

true, we must be very careful with them. We really do not know how many objects we are dealing with. We can make fairly good guesses about the number of sightings, but we do not know how many sightings a single object creates. Does an object cause two, 10, 100, or 5000 sightings? We do not know. It is entirely possible that we may be dealing with a smaller number of objects than we think. Furthermore, we do not know enough about the possibility of life in our own galaxy to discount the idea that it could be the home of hundreds or thousands of extremely advanced civilizations. Armed with this lack of knowledge, it seems absurd to have to construct another universe as a home for UFOs. It seems equally absurd to create an alternate reality or fourth dimension when we do not even know exactly how aspirin works, let alone what comprises the nature of reality. Perhaps Hynek's point about our ancestors not being able to understand modern physics applies here. It is certainly possible that the more we learn about the nature of reality and our universe, then the more logical and rational the UFO behavior will seem to us, and the methods that UFOs use to come here will become clear.

Overarching theories to explain the UFO phenomenon are leading us, I believe, into a false sense of movement, a false sense that we are finally getting somewhere - the big breakthrough. While it is true that any or all of the aforementioned theories may be correct in the long run, I think that we must resist the temptation to feel that these theories are contributing to knowledge. These theories are just not based on the knowledge about the UFO phenomenon that we now possess. I think that large theories of this nature have developed because of the frustration that has resulted from having so little knowledge about this subject after so many years of reports.

During the 1950s, UFO researchers expectantly awaited the big breakthrough which they assumed would probably take one or more of various forms: mass landings, a crashed and recovered UFO, an "official" contact with "proper" authorities, or governmental announcement of the reality of the extra-terrestrial origin of UFOs. The big breakthrough did not come. UFO researchers continued compiling thousands of cases. By the 1970s, after years of collecting cases, one central fact has emerged: UFO researchers know less than when they started out. As researchers have become more aware of the complexity of the subject, they also have realized that they know less and less. It has been possible for a UFO researcher to study the subject extensively for many years and then realize that he knows only that something very strange has been going on. Even a definition of exactly what has been going on has proven to be elusive.

How can we study what we do not understand and what seems to defy systematic inquiry? I think that this problem has led UFO researchers to try to place the incomprehensible within a comprehensible framework. By doing this, researchers will be able to control the phenomenon by making it seem humanly accessible and, therefore, understandable. An example of this style of thought is the concept that some people have the powers to psychically project a "hard" object. The object is thrust into the human realm where we can identify it, discuss it, and perhaps even solve the problem. The researcher has devised the human-based frame of reference and placed the object in it. The nuts and bolts extraterrestrial hypothesis has been sidestepped, which leads to the conclusion that UFOs are part of the human psyche and perhaps we can study and

control them eventually. Now we can understand and comprehend the problem; we have decreased our frustration and accomplished a breakthrough.

The purpose of UFO research is not to lessen frustration by playing sophisticated "mind games." The purpose is to discover facts about the phenomenon. We can do this only with a judicious use of the information - however limited - that we have amassed over the years. That information has pointed to many curious and puzzling ideas, but one idea above all remains, I believe, the paramount concept: the nuts and bolts extraterrestrial hypothesis.

I have seen no substantial evidence to suggest that the old-fashioned ETH is untenable. It still seems to explain the vast majority of data we have encountered. The new theories about the origins, purposes, and psychic components of UFOs have tended to place the extraterrestrial theory in disfavor without really offering a shred of evidence to disprove or discount it. I believe that it would be a fundamental mistake to abandon the nuts and bolts ETH without first proving it to be unfeasible.

The time has arrived for UFO researchers to go back to the ETH and examine it from a pluralistic point of view. The old-fashioned ETH is still our best bet for providing a workable framework within which to study UFOs. The idea that the UFO phenomenon is a single, unified phenomenon - either unified with paranormal activity, or displaying a common origin or a common purpose - is too simplistic. It provides, I believe, the least usable frame of reference within which to study the phenomenon.

We must formulate a pluralistic conception of the phenomenon, based on its diversity, rather than try to unify the field. The UFO phenomenon is so varied and complex that the only characteristic all UFO reports have in common is strangeness. We receive reports of unconventional objects flying erratically at great speeds, appearing and disappearing, materializing in the atmosphere, and even "blending" together. Reports reach us that describe objects and occupants abducting people, time compression, teleportation, occupants peering into houses, aliens relating ridiculous messages, occupants talking in unknown languages, occupants talking without sending sound waves, little aliens, big aliens, average-sized aliens, aliens with all manners of facial features, skin, clothes, and so forth. Religious visitation, prophetic messages, non-sense - all come from reports of alien behavior. The list can go on indefinitely. Every sighting, every encounter, every interaction, every abduction that we know of is different.

How can we make sense of all this? I am not sure that we can at this time, and we may not be able to for many years to come. But perhaps we can make sense of selected aspects if we consider them to represent diverse and unrelated alien cultures. I think that the evidence suggests the following: these disparate alien cultures exhibit different levels of technological advancement, different humanoid racial groupings, and perhaps even different reasons for coming. In other words, we are not dealing with the UFO phenomenon, but with UFO phenomena that are not necessarily connected.

This is an extremely complex taxonomical problem because we have no idea of how many cultures we are dealing with. Furthermore, we have no idea of how

many times a culture will appear on earth so that we can study it. It is conceivable that UFO waves represent many different cultures that visit here once and then never return; it is just as possible that many cultures visit here many times. We may be the target of curious aliens from hundreds or even thousands of different locations in the universe or we may be the target of many cultures from the same planet. We must try to identify the various alien cultures so that we can study them without polluting the sample with different populations.

The "purest" sighting wave that we know of is the 1896-1897 airship wave in America, because we can easily classify the objects according to shape, behavior, and time of appearance. Researchers can also group other UFO reports according to various criteria. The occupants' physical appearance or the shapes and characteristics of the objects are obvious categories, and researchers have made attempts to classify objects in this manner before. We might go even further, though, and categorize groups according to what we perceive to be their technological development. Perhaps a measure of this would be "ease of exploration." For instance, manual exploration by beings is the most mundane and easily understandable type of exploration. Using the United States moon landing as a model, we can see that a great body of reports are involved with the concept of an alien landing somewhere, usually in a remote area, exiting from the vehicle, and then collecting samples of dirt, leaves, humans, animals, etc.

We might place the Barney and Betty Hill case(4), the Antonio Villas-Boas case(5), the New Berlin case(6), the New Guinea case(7), the 1897 Alexander Hamilton case(8), and other cases of occupants physically taking flora and fauna samples, which seem to involve simple, rational, and direct action, in a distinct category. If the UFOs were extremely advanced, one would imagine that they would not have to go through the trouble of actually landing, making repairs, abducting individuals, and so forth. Perhaps the next classification might be those cases that involve robots, such as the Cisco Grove case(9) and others where apparent robots instead of living creatures made the abductions. Another category could include the most incomprehensible cases of all - those that defy imagination, such as the Monsieur X case(10), the Bebedouro case(11), and others that involve time compression, instant travel, "blending" objects, materialization, and the like. But it is beyond the scope of this paper to list all possible categories.

I believe that the pluralistic conception of UFOs can go far toward giving us a framework within which to study the great variety of data that we have collected. It allows for **psychical** data, for UFO visitation in ancient times, and for virtually all reliable evidence that we have collected over the years. And most importantly, it stresses the non-unified aspect of the phenomena, which just might be the handle we need to make sense of this most perplexing subject.

Notes

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2. Sergio Conti, "The Cennina Landing of 1954," Flying Saucer Review, September-October 1972, pp. 11-15.
3. N. G. Cruttwell, "Flying Saucers Over Papua," Flying Saucer Review, Special Issue No. 4, August 1971, pp. 3-38.
4. John Fuller, The Interrupted Journey (New York: The Dial Press, 1966).
5. Gordon Creighton, "The Amazing Case of Antonio Villas Boas," in Charles Bowen, ed., The Humanoids (London: Neville Spearman, 1969), pp. 200-238.
6. Ted Bloecher, "UFO Repair Reported," Skylook, July 1975, pp. 3-12.
7. Cruttwell, pp. 3-38.
8. David Jacobs, The UFO Controversy in America (Bloomington: Indiana University Press, 1975), p. 15.
9. Coral and Jim Lorenzen, Flying Saucer Occupants (New York: Signet, 1967), pp. 134-140.
10. Aime Michel, "The Strange Case of Dr. 'X'," Flying Saucer Review, Special Issue No. 3, September 1969, pp. 3-16; and "The Strange Case of Dr. 'X,'" Flying Saucer Review, November/December 1971, pp. 3-9.
11. Hulvio Brant Aleixo, "Abduction at Bebedouro," Flying Saucer Review, November/December 1973, pp. 6-14; and "Bebedouro II," Flying Saucer Review, November 1975, pp. 32-35.

## SOME PROPOSALS: MODEST, IMMODEST, AND (MAYBE) FUNDABLE

Benton Jamison

I think I was selected as one of the speakers here at least partly on the basis of the somewhat catchy title of my talk. It has therefore served its purpose; I now disclaim it. I will discuss only one proposal. I hope it is fundable: if it isn't, I don't see how it can ever be carried out. Judgments as to its modesty or immodesty I leave to the listener (or reader). I won't begin by saying what I hope to have accomplished if what I propose is carried out, or why ufologists should care whether it is carried out or not, or why anyone or any agency should pay to have it carried out. That will be discussed mostly later, but some as we go along. I am going to start by describing the proposal.

I propose that a psychological profile of a non-self-selected sample of UFO sighters be made and compared with a similar profile of a similar sample of UFO non-sighters. Three stages are involved. First, we select a random sample of "n" people living in rural or suburban-rural areas, and send them questionnaires. I will not go into detail on how to select such a random sample - I am neither a sociologist nor a pollster - but as I go along I will mention some considerations involved in determining how big "n" should be.

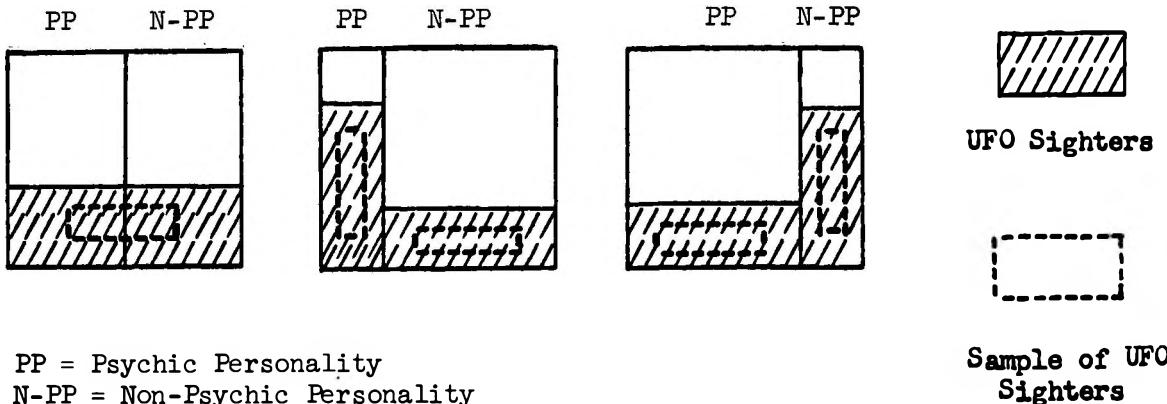
The questionnaire should not be too involved, or most people won't fill it out and send it back. It should, of course, include one or several questions, designed to reveal whether or not the respondent has ever seen what he or she considers a UFO. The questionnaire should also extract certain pieces of psychological, sociological and demographic information, information which by itself may be crucial to some problems of concern to those studying UFOs.

For example, almost all ufologists, no matter what their initial worldview and no matter what their approach to the UFO phenomenon, have been forced, sometimes against their will, to a consideration of the relationship between psychic phenomena and UFOs. I suppose that for some investigators the necessity of such a consideration arises because of their coming across a UFO case with strong parapsychological overtones. For David Moyes and myself, the process was more gradual and less direct. After about a year and a half of investigation we were finding that a good proportion of our sighters were so-called "psychic personalities," a term used by Jan Ehrenwald to describe people with certain beliefs in and attitudes towards psychic phenomena and especially their own psychic abilities, the question of whether or not they (or anyone else) are actually psychic being neatly eluded.

Preliminary to the question of the significance of the presence among our UFO sighters of what seemed a rather large proportion of such people, is the apparently more straightforward question of whether the proportion of psychic personalities who have UFO experiences is significantly higher than the proportion of non-psychic personalities who have them. One should realize that it is impossible to answer this question by studying the population of UFO sighters alone. One might know exactly the proportion of psychic personalities among UFO sighters, but unless he also knows the proportion of both UFO sighters and psychic personalities in the general population, he knows next to nothing about

the proportion of UFO sighters among psychic personalities.

To those with some knowledge of mathematical probability, this is a truism of conditional probability:  $P(A|B)$ , being equal to  $P(B|A)$  ( $P(A)/P(B)$ ), is not a function of  $P(B|A)$  alone. The following diagrams represent three entirely different situations in which a representative sample of UFO sighters will yield a 50-50 split between psychic personalities and non-psychic personalities:



In the first case, psychic personalities are no more likely to see UFOs than are non-psychic personalities. In the second case, psychic personalities are much more likely to see UFOs than are non-psychic personalities, while in the third case the reverse is true. (Those familiar with the work of Ehrenwald, perhaps through the FSR article of Berthold Schwarz, will recognize my psychic personality - non-psychic personality dichotomy as a caricature, but I think it serves to make my point.)

Another peculiarity unearthed by field investigators (in particular, besides myself and David Moyes, John Keel and Stan Gordon) is the large proportion of UFO sighters who live in house trailers. Again, we cannot make any judgment as to the significance of this phenomenon without knowing the proportion of rural families who live in house trailers(1).

At any rate, the first stage, that of random sampling, is intended to provide us with a population of claimed UFO sighters as well as some hopefully relevant information about the population as a whole. Too involved a questionnaire will yield a small percentage of responses, while a shorter one, to which more people will respond, will yield less information per response. Designing a questionnaire which balances these opposing considerations seems to me to be a task of such delicacy and importance as to warrant the help of an expert in sample-survey methods.

The second stage consists in culling from the respondents' sightings those routine misinterpretations and misperceptions which all field investigators find produce a majority, even a vast majority, of UFO reports. This can involve a lot of work. Let us assume that from 20 to 30 percent of those who respond to the questionnaire admit to a possible UFO experience. Moyes and I found

that, of the cases that were reported to us over a two-year period, only about 2% furnished us with strong evidence of some anomalous aerial phenomenon. But our criteria were too stringent for present purposes. If we got a call from a woman who said that in the early 1940's she saw hovering over her back yard a metallic sphere about four feet in diameter with a round window from which peered a humanoid face and which disappeared by the time she got someone else to look at it, we would put her report in the "inactive" file; it happened too long ago, she was in early adolescence, no other witnesses saw the UFO, etc., etc. At that time we were interested in UFOs rather than in UFO experiences. Since it is unlikely that she had misidentified Venus, a sundog, aircraft landing lights or a piece of wind-blown debris, we would, for purposes of this proposal, consider such a report as representing a genuine UFO experience.

Now assume that a quarter of those who respond and admit to a possible UFO experience appear to have had a genuine one. This would amount to about 5 to 8 percent of those in our sample who respond to the questionnaire. Since we would want a minimum of about 30 UFO witnesses to be left after culling, this means that, assuming 100% response to our questionnaire, we should send out around 500 questionnaires; and allowing for non-response, as many as double or quadruple that number. If our assumptions are correct, we would obtain from 100 to 125 returned questionnaires reporting possible UFO experiences. John Musgrave stated in his talk that a random sample of 20 families living in the rural areas near Edmonton, Alberta would probably yield at least one occupant case. An investigator sending out 500 questionnaires might well be swamped with a couple of dozen cases, each of which would warrant 20 or 30 hours of investigation!

Now, anyone who has actually done any field work knows that phoning people about UFOs they might possibly have seen is not as easy as it sounds, taking, as it occasionally does, up to five calls to even reach a person. So it is important that the initial questionnaire have space for the respondent to tell what he or she saw or what happened and when. Responses like "I saw a light bigger than a star hover just above the horizon, then slowly go down out of sight, and the same thing happened for the next two nights" could be culled out without even a phone call; and maybe we have to make only about 50 calls to get down to a sample of 30 people who have had a UFO experience worth analyzing, and who are willing to talk about it, and who are even willing to talk about themselves. (The conditional probability of their being so willing is boosted by the fact that they have bothered to respond to the questionnaire.) This is a small sample, but it will have a rough sort of demographic and socio-economic structure.

The last step in this second stage consists in picking a control group of non-sighters, a group of like structure and size. It is not going to be easy to select from our respondents a suitably stratified group of about 30 people who have never seen anything they thought was a UFO, who may have never had the slightest interest in UFOs, but also are nevertheless willing to talk at some length about themselves for the sake of advancing the cause of ufology. Assume, however, that this has been done. What do we intend to do with these two groups of around 30 people?

It is clear that what we hope to accomplish by such a proposal is to determine whether or not there exist significant sociological and psychological differences between the class of people who have undergone a non-trivial UFO

experience, and the class of those who have not. However, I would like to say something about what a study of the sort I am proposing will not accomplish. Some UFOs are seen, in some cases for extended periods of time, by not only several witnesses but seemingly by everyone looking in the same direction at the same time, their descriptions of what they see jibing with one another. This alone constitutes very strong evidence that all the witnesses are observing in common some sort of objective phenomenon, most likely physical. If it lands, leaving physical traces, if radios go out or cars stop while it is around, or if a radar operator sees blips on his radar screen consistent with the apparent location of the object, the presumption of physical existence becomes overwhelming: whether or not the object existed in a physical sense 5 seconds before it was first seen or 5 seconds after it was last seen, whether or not its behavior, character, or interaction with witnesses stamp it as conventional, anomalous, or even inconsistent with what we understand to be basic physical laws, that something was physically there to be seen becomes almost indubitable. How we go about fitting such incidents into our view of reality would seem to me to be of concern to anyone with the merest dottle of natural curiosity.

When witnesses whose reports are consistent with one another span a spectrum of types - meticulous, scatterbrained, homeowners, trailer-renters, policemen, scofflaws, stable or disturbed - it would not seem very helpful in attempting to determine just what it is they have seen to ask each witness how much he makes, whether she prefers cats to dogs, what this or that ink-blot reminds him of, or whether she would be willing to take a Minnesota Multiphasic. Such cases involving multi-witness and even multi-channel observations of an almost certainly physical and probably anomalous object are not, however, what the investigator runs into every day, or every month, or even every year - at least not this investigator. (I have encountered only three in four years of investigation.) Most of the reports transmitted to me involve a single witness.

Now if, as is indicated by the strong cases just discussed, there are at least intermittently physical objects putting in somewhat furtive aerial appearances, it stands to reason that sometimes they will be observed by one person rather than by a whole contingent, or if by more than one, only two, and for only a few seconds. Although reports of such encounters are almost useless as proof of the existence or physical reality of UFOs, those which constitute observations of real UFOs are probably so much more numerous than the many-witness, hard-data type that we would be losing a lot of information by totally disregarding them. So a major task for the field investigator consists in taking his not-so-good cases and separating ones which might involve real UFOs from those which do not.

What are these latter cases? Some of them are routine misidentifications of natural objects like planets, stars, meteors of the fireball type, and even the moon, or else man-made objects like airplanes (especially their landing lights). Sorting out this sort of sighting from the others is an essential, if sometimes onerous task which I will not go into here. I wish to discuss another class of sighting, some involving misidentifications and some not. Consider the following:

Case I

A young woman, an amateur ornithologist with a master's degree in chemistry,

reports sighting a glowing, cigar-shaped UFO just after sunset. We arrive at her house at about the same time the next day, to be ourselves greeted by a similar cigar-shaped object in the sky. This turns out to be an airplane reflecting the setting sun, its tail apparently obscured by the earth's shadow. She accepts our explanation as also valid for her sighting of the previous night. Subsequent interviewing reveals that several years before she had seen a light hover at the edge of a lake, then take off across the lake at incredible speed.

Case II

A college professor, while on an early evening stroll near his country home, sees what he thinks might possibly be a formation of three cigar-shaped UFOs. My colleague's call to a local military airport later reveals the presence of more than one, possibly three cargo planes in the area at approximately the same time, thus making highly plausible the same sort of explanation as in Case I. Two years previously the sighter had observed a brightly glowing, green disc-shaped light near his house.

Case III

A woman in her early thirties expresses willingness to discuss her UFO sightings provided we are discreet about it, for she fears for her job and reputation. She tells of having had many sightings, some through a telescope. We dismiss most of these as astronomical objects, perhaps viewed through low-quality optical equipment. She also reports close-up sightings of UFOs from which tumbled showers of sparks like those from a Fourth-of-July sparkler. The interview also reveals that she had, as a child, undergone peculiar quasi-religious experiences involving apparitions. She also claims that on at least two occasions she has had vivid dreams which turned out to have described events which occurred many years later.

Case IV

A young man with an extraordinary collection of citizen's band radio apparatus equipped to continually monitor police and aircraft frequencies reports observing three UFOs in flight over the fairly high-density residential area of the city in which he lives. We are unable to believe that such an aerial display would remain unreported and perhaps unseen by anyone else. He relates that some years before he saw on the ground near his summer home a bright white cone-shaped object which then took off, emitting a shower of sparks.

Case V

During the discussion of UFOs and other borderland topics at the apartment of a couple, the young man's brother phones and is easily persuaded to relate to me a UFO experience he underwent in West Virginia in 1966 or 1967. One summer night he awoke and went outside, when he saw a UFO from which poured a beautiful shower of golden sparks. He received mental impressions of an invitation to come up. Expressing willingness to do so, he was instructed to assume a foetal position, which he did, and was floated up into the underside of the craft. Once inside, he noticed that the interior was much larger than he had expected. There were even other rooms. Upon entering one of these, he found a beautiful woman in a bathtub who first engaged him in philosophic discussion, the tenor of which I fail to remember, and then asked him to scrub her back. I also forget the manner by which he eventually took leave of the woman, her tub, and her spaceship. He mentions that at this time he would on occasion

take LSD, and that some of his dreams were so vivid that he had difficulty distinguishing them from reality. It is with some regret that I place this encounter, with its innocent charm so different from the blatant sexuality of the Villas-Boas incident, into the category of dreams.

Case VI

A middle-aged man walking across a bridge in broad daylight looks backward and sees a silver-gray, soundless, torpedo-shaped object which he estimates to be about 150 feet long. Going at about the speed of an automobile alongside the bridge about halfway up the girders, it passes by him at an estimated distance of less than 40 feet and eventually goes out of sight. A number of cars are on the bridge, yet no one else reports this rather spectacular object. We make some fruitless inquiries of people who live or work near the bridge. In spite of the fact that a source at a local newspaper tells us that two years earlier (in 1968) several reports of torpedo-shaped objects near the same bridge were received (but not published) by the paper, we conclude that whatever the explanation of the sighting, it does not involve the presence of a physically-real 15-foot long torpedo-shaped object crossing the river as described. (This case is taken from the Report on Unidentified Aerial Phenomena in Albany, New York and Vicinity, by David Moyes, who ran the now defunct Albany Study Group for Aerial Phenomena and who together with me formed the "we" referred to in these cases. Case VI is the same as Case 13 in Moyes' report.)

Cases I and II represent failures to identify conventional objects seen under admittedly special if not unusual circumstances. Yet both observers were above average intelligence, and one had graduate scientific training and a hobby that demands a certain acuity of vision. Did a long-standing if buried fascination with their earlier, more spectacular sightings prevent them from running through possible conventional explanations for what they saw until they arrived at the not-too-remote and probably correct ones?

Cases III, IV and VI, together with some others we investigated, suggest the possibility that some people, in an apparently waking state, may on occasion see things that are not there to be seen. Do some people go spontaneously into dream states, hypnoid states, or some other altered states of consciousness in which they flagrantly misperceive, or even hallucinate? If so, what sorts of people? Is it significant that some of these cases involve psychic personalities? If there are UFOs which are subjective in the sense we suggest, do they have a special character, resulting in their being described in a systematically different manner than the multiply-witnessed, almost certainly physical UFOs which figure in the "hard" cases? Is it significant, for instance, that the "sparkler" type of UFO in Cases III and IV also occurs in what is almost certainly the dream of Case V? Evidence that the distinction between "subjective" and "objective" UFOs need not be reflected in the configuration of the object reported is provided by Case VI; the silvery torpedo-shaped configuration is classical (see for example pages 16, 132 and 165 of The UFO Evidence(2)).

But such speculation, based solely on a tiny data-base gathered in a completely unsystematic manner, is representative of what we want to avoid. The point I wish to make is the following: The strongest UFO cases provide evidence for the (albeit temporary) physical existence of so-called UFOs. In such cases everyone with a view of the object sees it, and their descriptions jibe with one another. Psychiatric assessment of the witnesses in such cases is of no

more relevance to ufology than would similar assessments of the bird-watchers who en masse sight some rare bird be to ornithology.

Other UFO reports provide us with examples of failure to identify natural or conventional phenomena for what they are. These are cases of misidentification: the phenomenon, although not correctly identified by the witness, is not misperceived, and the witness' description of what he perceived often enables the investigator to provide a conventional explanation. After filtering out the (few) very strong cases in which an anomalous physical object is almost certainly involved, and those (many) cases in which a natural or conventional object is the source of the sighting, we as investigators are left with a substantial number of cases of little probative value in which either (a) an anomalous physical object has been seen, but fleetingly or by too few people, or (b) the explanation lies not in mere misidentification, but misperception, sometimes involving flagrant distortions of what is seen or heard, or even outright hallucination, and we have at hand not a report of a "sighting," but of a vision or a dream.

The sightings in category (b) arise, presumably, by the bringing into play of certain psychological mechanisms, which one assumes are also brought into play in situations not involving UFOs, and which are familiar to psychologists and psychiatrists. Suggestions that some UFO sightings belong to category (b) have arisen from the ranks of psychiatrists. We cite, for example, the article "Psychiatry and UFO Reports" by Grinspoon and Persky in UFO's - A Scientific Debate (3). Of particular interest to ufologists is the material on pages 238-239, in which the authors show how the emotional disturbances affect the mechanisms by which sensory impulses are converted into sensory images, giving rise to illusions, delusions and hallucinations. The mechanisms which are involved in the formation of illusions, and hallucinations, whether UFO-related or not, are, presumably, part of everyone's psychic apparatus, whether he be grossly psychotic, ambulatory schizophrenic, borderline psychopathic, or in that state of almost perfect mental health in which we in this room are so fortunate as to find ourselves. It would not be assumed, therefore, that undergoing a non-veridical UFO experience is a sign of psychosis or neurosis. In fact, Grinspoon and Persky state that:

"...There are certain psychological phenomena which are not truly pathological in and of themselves but which occur under conditions that may be called altered states of consciousness, apperceptive deviance, or altered ego states. They are the hypnagogic phenomena which occur during the state of falling asleep, dreams, and hypnopompic phenomena of the waking state,...eidetic images, ...hypnotic or trancelike states."

Their attempts to relate such "hypnagogic phenomena" to UFOs are flawed by a failure to present acutal UFO cases. I do not feel that their observations of geometric similarities between breasts and discoid UFOs on the one hand, and phalluses and cigar-shaped UFOs on the other, entirely compensate for their lack of specificity. The absence of UFO examples from their paper, however, serves to point up the desirability of a more systematic confrontation between, on the one hand, the brute facts of the UFO phenomenon and, on the other, the various theories of psychic structure and function formulated over the years in an attempt to explain the way people think and behave. What we propose would enable experts in the formulation and application of such theories to make use of the

ongoing and ubiquitous character of the UFO experience to gather data anew and in accordance with established canons of scientific procedure.

Before continuing with a description of the proposal, however, I would like to make a final point in connection with the article of Persky and Grinspoon. They mention that "even healthy people under stress may develop some sort of personality disruption," and by so doing, may become "more susceptible to illusion-formation" due to "the tension, anxiety, and fear that they experience." They also allude to the resulting incapacity for what they call "reality-testing" of their illusory experiences.

Now, we have encountered what seems to be such failure to reality-test: our Cases I and II provide two examples. I do not, however, attribute whatever suspension of reality-testing that may have been exhibited in these two cases to personality disorders on the part of the witnesses. I have already raised the possibility that what may have played a major part in the failure of these two intelligent and experienced observers to identify familiar objects in a not-too-unusual setting was an interaction between a natural fascination with the UFO-as-extraterrestrial-intruder myth and their own earlier UFO experiences - which, I remind you, involved sightings more vivid and of a higher degree of "strangeness" than the ones they reported to us. It is plausible that what one has heard and read over the years may react with what one sees for even a brief instance to produce a partly unconscious set of beliefs, and an attendant reluctance to analyze away what seems to be evidence supporting these beliefs. We must entertain the possibility that such an interaction of myth with experience can result in blatant misidentifications and misperceptions.

It seems to be impossible to gauge the power of what Jung called the "modern myth" of UFOs, a myth generated by our post-WWII encounter with a real phenomenon (made no less real by its failure to be universally recognized as such), sustained not only by years of rumor, denial, newspaper, radio and TV accounts, but by an unending stream of mostly unpublicized UFO incidents, and charged psychically by virtue of its connection with almost universally-held aspirations and fears. If this myth does have the power to somewhat generate perhaps thousands or even tens of thousands of spurious UFO sightings on the part of people who show no apparent signs of malfunction or derangement, then some way must be found to explore the mechanism by which these sightings are generated on the one hand, and on the other to separate them from sightings of physically real objects. The analysis of a systematically gathered sample of about 60 people, all of them exposed to some degree to the myth, but only half of them sighters, would be a beginning in giving us some idea as to the complexity of these problems, if not to their solution.

Let us now finish describing the proposal. Recall that we now have a sample of 30 or so people who have undergone a UFO experience that cannot be explained away in a routine fashion, as well as a sample of 30 or so who have had no UFO experience. We must also have at hand some UFO field investigators. They are to investigate each of the 30 UFO reports, their task being to get a reasonably complete description of exactly what was seen, heard, felt, or otherwise experienced. Of course, some of the respondents may report more than one UFO encounter, and even if they don't, the investigator should ascertain whether or not the respondent has had sightings which he or she did not mention in the form.

We also have at hand a team of psychiatrists and psychologists, at least some of the latter being experts in personality assessment, together with the personnel they require to assist them in interviewing, giving and scoring tests, etc. Their task is to examine and evaluate in a uniform way each of the 60 people in our two groups. Exactly how they go about this depends not only on their psychological interests and convictions but also on more mundane considerations such as the amount of time and money available, to say nothing of how much patience and cooperation we can expect of 60 people who don't want their entire lives given over to being interviewed and tested. Our specialists will probably decide on a mix of interviews and tests such as Rorschach, MMPI's, Wechsler Intelligence, etc. They should end up with some idea of what each person is like, especially with respect to (1) degree of disturbance or non-disturbance, and (2) personality.

We can then put together, for each of the 30 UFO witnesses, the dossier assembled by the field investigator with that assembled by the psychiatrists and psychologists. If our sampling techniques have been adequate, chance has been kind to us, and we have asked the right questions, we are in a position to begin to throw some light on some of the following questions: Is the overall psychological makeup of the group of 30 UFO sighters similar to that of the 30 non-sighter group? Does the group of sighters include a disproportionately high number of people who exhibit some degree of psychological impairment, score high on a scale of hypnotic suggestibility, etc.?

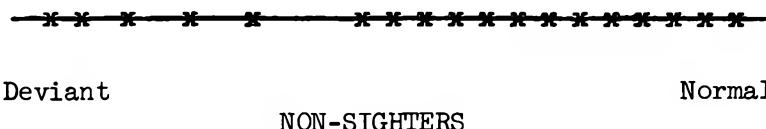
If the psychological makeup of the two groups turns out to be about the same, this may be interpreted as evidence of the non-subjectivity of the majority of UFOs reported by our sample of sighters - or as an indication that our techniques of psychological assessment are too crude. I would expect the psychological makeups of the two groups to be significantly different. Our samples are small, so a substantial part of this difference might arise from statistical variation. The possibility of statistical fluctuation playing a major role in accounting for differences is enhanced by our having to select several categories of non-sighters in order that the control group have a socio-economic profile similar to that of the UFO-sighter group. If, in order to achieve such a similarity, we have to choose, say, two lawyers, four truck drivers, one masseur, three auto mechanics, etc., what we are essentially doing is not comparing two samples of size 30 chosen from one or two populations but, say, 10 pairs of samples of size 2, 3, or 4, each pair chosen from one or two sub-populations.

But let us for the moment abandon these depressing ruminations on sample variability and assume that our results constitute reasonable evidence for the proposition that UFO witnesses whose sightings are non-routine differ as a group from non-sighters of similar background. This would not be the case if the bulk of such non-routine UFO sightings represented chance encounters of a random sample of the population of potential sighters with a random sample of at least intermittently physical objects darting about overhead. What is the explanation for such a difference?

Any explanation would be compound rather than simple. I have suggested one explanation, or one component of the explanation: The UFOs involved are of two types, one physical and apprehended by the sensory apparatus of the witness, the other non-physical and whose "apprehension" requires the assistance of those parts of the brain not solely given over to the processing of sensory impression. It would be reasonable to expect that the sighters whose UFOs are non-physical

would differ as a group from non-sighters and people who have had a fleeting glimpse of a physical UFO.

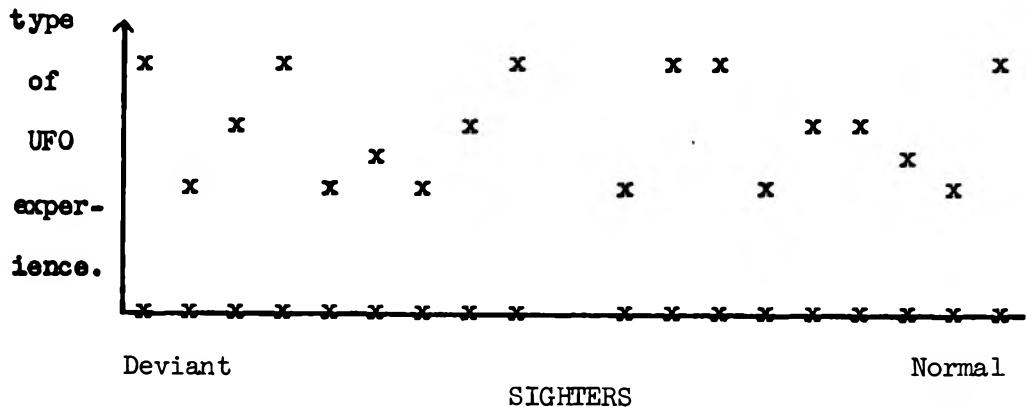
Now suppose that the various types of UFO experience could somehow be arranged on a linear scale, and that the same was true of an individual's psychological makeup, the scale for the latter measuring "normality" or "deviance." Our 30 sighters would then give us a two-dimensional scatter-diagram, our 30 non-sighters, a one-dimensional one. Suppose this is the one-dimensional scatter-diagram of the psychic structure non-sighters (sample size 18, not 30):



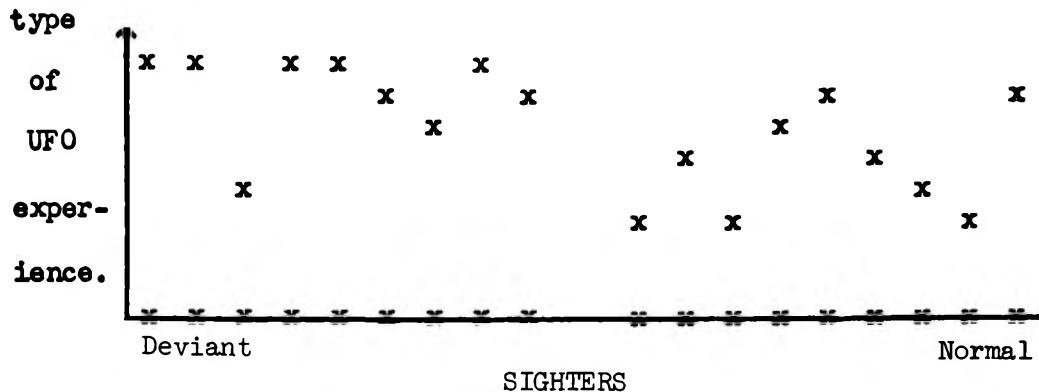
The corresponding one-dimensional scatter-diagram for the sighters might reflect a higher proportion of deviants, and look something like this:



The scatter-diagram below is a projection of a two-dimensional scatter-diagram; the latter could look like this:



This would suggest no correlation between the type of UFO experience and the personality of the witness, and would certainly provide no basis for even a guess as to what distinguishes the physical UFOs from the non-physical ones. On the other hand, the two-dimensional scatter-diagram of the sighters might look something like this:



This would give us something to go on; the types of UFO experience near the top of the scale might tend to involve non-physical UFOs.

Of course, neither "type of UFO experience" or "psychological makeup" are categories representable on a one-dimensional scale. Even fairly simple classifications of UFO encounters - Hynek's, for example - take into account not only what is seen but also when it is seen and whether from close-up or farther away. Also included under "type of UFO experience" should be some sort of probability rating by the UFO investigator, one based on factors like clarity and coherence of account, number of other witnesses, duration of sighting, and degree of susceptibility to conventional explanation.

What should be considered in determining "psychological makeup"? I would want to include some index of the degree to which the witness is a "psychic personality," and David Moyes, my ex-colleague in investigation, has for years urged the inclusion of an index of hypnotic suggestibility. (It would be interesting to know the degree to which two such indices correlate with one another. Has anyone ever tried to find out?) Since the life-style, personality, attitudes, intelligence, and mental impairment or freedom therefrom are all of interest to us, a very difficult part of deciding what to include under "psychological makeup" is going to be to decide what to exclude!

At any rate, the idealized scatter-diagram forming a hopefully revealing two-dimensional pattern has become a collection of too few isolated dots (or smears) in a space of distressingly high dimension. We will not be able to attribute statistical significance to any pattern which may emerge, but we are embarking on a search for hypotheses, not a test of them. Whatever conclusions we come to, surely tentative ones, we stand some sort of chance that we arrived at them without having built those very conclusions into our experimental design. The data points with which we work are not there because they phoned us up for some reason or other, but instead are there by virtue of a somewhat systematic sampling procedure: this surely reduces bias, and certainly gives us a control group. Any conclusions arrived at or hypotheses formulated can be put to the test, perhaps in a similar experiment set up by others, who will have learned from our mistakes.

But talking about the next experiment is premature. Does the first have a chance of being carried out? In other words, can we get the money from somewhere? If enough interested and qualified people can be found under the same academic roof somewhere, such a project might well be supported out of university research funds; with UFO investigators and degreed social scientists volunteering their

time and a supply of interested graduate students available (and even paid), at most a few thousand dollars would be required. Otherwise support must be found in one of those funding agencies which funnel money to the scientific establishment at the behest of (some of) its members. Would the scientific establishment, then, permit or even encourage the funding of such a proposal?

The UFO phenomenon is the source of a continuing supply of raw data not easily digestible, hence mostly ignored, by science as currently formulated and practiced. When noticed, the phenomenon is dismissed as "psychological." I think part of it is. The task of separating the psychological components of this phenomenon from its physical ones, to say nothing of understanding the interaction between these components, would provide the social sciences with an opportunity to test out its theories and techniques in what, for it, is almost virgin territory. Might there not be aspects of human thought and behavior which reveal themselves through study of those thousands who yearly encounter what seem to be objects the possibility of whose existence physical science tends to smugly dismiss? If not, wouldn't it be worthwhile to discover that existing concepts and methods de-mystify a large chunk of this 30-year old puzzle? An effort to do so could not fail to clarify existing theory and technique, and is more than likely to give rise to completely new insights into the working of the human mind. The resulting increase in the understanding of how people think and act would be of not only purely scientific worth but doubtless of practical value as well.

Of course, more than this is probably true. I do not think there is any way current paradigms, either physical or psychological, are going to encompass the entire UFO phenomenon. But those who work within these paradigms are not going to shell out money to support efforts whose announced purpose is to shatter them. Some restraint is necessary in writing up proposals for funding agencies such as NIMH and NSF. My proposal, for example, does not mention thought-transference, healing, communication with or abduction by occupants, or other bizarre phenomena connected with UFOs, nor does it urge upon anyone (like a referee) the desirability or necessity of resorting to concepts outside the borders of establishment psychology (for example, that of a collective unconscious). For a start, let us be modest enough to begin by merely obtaining some non-self-selected samples of UFO sighters and sightings, together with a control group of non-sighters, and then seeing what light is thrown on what we find by currently accepted theories of the behavioral sciences - and immodest enough to ask the scientific powers-that-are to give our effort financial support.

NOTES

1. It is my impression, unchecked by examining whatever has to be examined to check it, that the small towns and rural areas in that part of Upstate New York where I live include a large number of people who have lived where they live, all their lives, with relatives and old friends living nearby. There are a surprising number of families who live on streets bearing the family name. If such a person reports seeing a UFO, he may be less likely to report it than the average person, out of fear of facing ridicule from people he may see just about every day for the rest of his life. On the other hand, people who live in trailer camps, and these probably constitute a large proportion of those who live in house trailers, are transient, and perhaps less concerned about what their neighbors think. For this reason, they may be more likely than the average person to report any UFO experience they might have. Thus a higher incidence of UFO reporters among people who live in house trailers might be explained not so much by the flying habits of UFOs but by the living habits of earth people, and may not reflect a higher incidence of UFO sighters among those who live in trailers, but a higher incidence of UFO reporters. It is difficult to see how one checks on the validity of a hypothesis like this without gathering and analyzing a random, hence non-self-selected, sample of considerable size.
2. Hall, Richard (Ed.), The UFO Evidence, NICAP, Washington, D.C., 1964.
3. Grinspoon, L., and A. Persky, "Psychiatry and UFO Reports," in UFO's - A Scientific Debate, Cornell University Press, 1972.

ADDENDUM

After my talk at the conference, Joan L. Jeffers informed me that she had already carried out a project similar to the one I propose. She used a questionnaire adapted from one made up by Dr. R. Leo Sprinkle. The questionnaire contains four parts: the first seeks information about the subject, the second about his psychic interests and (alleged) abilities, and the third and fourth about his UFO experience. She obtained 50 filled-out questionnaires from people who had reported sightings to the Pennsylvania Center for UFO Research, and 19 from non-sighters enrolled in a non-credit course in Ufology at The Community College of Allegheny County. We denote the former group by "S", the latter by "C" (for Control). The two groups are not stratified similarly with respect to sex, S containing 20 males and 30 females, C containing 12 males and 7 females. This should be kept in mind in the analysis which follows.

On the basis of the responses to the second part of her questionnaire, Ms. Jeffers classified the respondents into two groups: those who believe that they have psychic abilities (B), and those who do not so believe (NB). Another classification was into UFO sighters (S) versus non-UFO-sighters (NS). She obtained the following contingency table:

	B	NB
S	40	10
NS	9	10

She computed the appropriate value of  $\chi^2$ , and it turns out to be 9.66. Were the B-NB and S-NS categories independent, the probability of  $\chi^2$  exceeding 3.84 would be at most one in twenty. Thus her results are suggestive. She is at present working out the statistical significance of her other data. Anyone wishing a copy of her most interesting paper should write her at: 3408 Parkview Avenue, Apartment 19, Pittsburgh, PA 15213, enclosing \$2.00 to cover the cost of duplication.

## PHOTOMICROGRAPHY: A WAY TO SALVAGE FILM IMAGES OF UFOs

Robert B. Klinn, J. D.

A technology has been adopted which makes it possible to obtain visual clarity, reliable measurements, and qualitative information from some UFO negatives and transparencies. Extremely small images of UFOs on films, previously blown up unsuccessfully with photographic enlargers, have been significantly improved in clarity and have yielded increased useful magnification levels by utilizing the precision lenses and techniques of a state-of-the-art photomicrographic system.

Typical past and present procedure in producing UFO film blow-ups involves the use of photographic enlargers, but the resultant blurred, fuzzy, undefined images are almost universally disappointing. Normally satisfactory enlargers cannot cope with the product produced under the adverse, uncontrolled conditions under which UFOs have been photographed.

Often, when an individual witnessing a UFO event snaps a picture, the UFO is at high elevation or has a small angular size, and a zoom- or long-focus lens is not available. A pinhole- or pinpoint-sized image is focussed on the film plane. It is night, the lighting is poor, and the witness may not be able properly to adjust the camera's shutter and diaphragm settings. There is no time to adequately adjust the focus, and in the excitement perhaps the witness moves the camera during the exposure, or the UFO itself is moving.

Too often, when an individual investigating a UFO event gets hold of an original UFO film or transparency, he subjects it to the same blow-up techniques used with non-UFO photos: he uses a photographic enlarger. The 8" X 10" big blur he produces leads him to assume that a small blur exists on the original film. But that is not necessarily what is there!

How many blurred blobs have you seen which have passed as photos of "UFOs"? Photographic enlargers and their lenses are not built to the tolerances necessary to resolve tiny images photographed under the exigencies of

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UFO-event circumstances. The edges of the UFO image often are not defined by the enlarger, and there is practically no resolution of detailed structure.

The task is to magnify all inherent original detail and resolution and not to add to or manufacture non-existing blur in the process.

High resolution is necessary for the making of qualitative and quantitative photometric measurements and for the making of reliable comparisons to establish technical consistency.

If we are not satisfied with unsharp, hazy images or with blurs, if we want to find out what is really on the film that the UFO witness photographed, and to resolve all detail recorded on the film, we must use specialized tools and procedures. Despite the adverse conditions under which a UFO has been photographed, much detail may be inherent in the exposed film, waiting to be discovered.

#### THE TOOLS OF UFO PHOTOMICROGRAPHY: THE ZEISS ULTRAPHOT III

Photography by means of a compound microscope is photomicrography. It involves the coupling of a camera to a microscope and the efficient use of illumination. An understanding of the principles and operation of the microscope is essential to producing good photomicrographs. (See, for example, Gumperty, W. E. 1967. How to get good photomicrographs. Laboratory Management, 5, No. 1, 28, or, Loveland, R. P. 1970. Photomicrography, a comprehensive treatise. New York: John Wiley and Sons, Inc. (2 volumes).

Microphotography involves the making of extremely small photographic images of large objects, whereas photomicrography involves the production of large recorded images of very small objects, such as UFO images on film.

The system used and recommended by the author, the Zeiss Ultraphot III (Carl Zeiss, Inc., 444 Fifth Avenue, New York, N. Y. 10018), is a complete photomicrographic laboratory, an ingenious automatic camera-microscope that accepts 4" X 5" or 35mm film, regular or Polaroid.

A beam splitter allows the operator to direct 1/3 of the light to the eyepiece and 2/3 to the 4 X 5 camera. You can clearly see on the viewing screen exactly what you are photographing -- even in a brightly lit room.

To change magnification for observation, without changing objectives or eyepieces, you turn a ring (the Optovar) to increase the total magnification by the factors of 1.25, 1.6, or 2.

To vary the image size to the camera, and thus

the total magnification for photography, in addition to the factors introduced by the Optovar, the Ultraphot III employs a unique, ingenious, highly accurate and extremely stable moving mirror system instead of a cumbersome bellows. With a calibrated drum at the operator's right hand, he can vary the camera length over a range of 306mm. Magnification is read directly from an illuminated scale, eliminating the need for complicated computations. Continuous magnification over the entire range from 2.5X to the limits of light microscopy gives the effect of "zoom" optics.

The automatic exposure system has an effective range of from 2½ to 8000 ASA. The operator merely selects the film speed on a dial and pushes a button to release the shutter. A highly sensitive photomultiplier integrates the light intensity and determines the correct exposure time.

To vary contrast or light intensity or for color balancing, one clicks into place one or more of six built-in dust-protected filters via the in-base push-buttons.

Any three of five available light sources can be affixed at the same time: CSI, mercury, xenon, quartz iodide, and tungsten.

Significantly, an orderly microscopic scan of a transparency or negative may uncover UFO images not even discernible by the naked eye as images on the film. In this regard, one can with practice readily distinguish chemical flaws and debris from optical images. Using the focus mechanism, for example, one can recognize the different planes in which images and debris exist. Also, one learns to discern images from even very grainy films, through manipulation of lighting, aperture, diaphragm controls, and filters.

Since many images otherwise not useful may be salvaged, a call is proposed for old original films (as well as future films) to be submitted to the Center for re-processing by photomicrography.

#### A CLOSE ENCOUNTER: PHOTOMICROGRAPHY APPLIED

A close encounter of the second kind (Dr. J. Allen Hynek's categorization of an encounter with a UFO at less than 1,000 feet with accompanying physical effects) occurred in Northern California, Thursday, November 6, 1975, at 2:30 am, just nine hours after the reported abduction by a UFO of Travis Walton of Arizona. Because the case is still being investigated, the witnesses having just recently consented to undergo hypnosis, no names are revealed here.

Two twenty-two-year-old hunters, X and Y, reported being chased down the mountain where they had been hunting

Chukar by two multi-colored, spinning objects, one of which hovered approximately 200 yards over their Toyota. They reported that the bottom of the object opened like the petals of a rose, that a chrome, football-shaped object emerged and hung from a cord or a narrow beam of light, and that the witnesses became hysterical, certain that they were about to be captured. (This description would appear to deserve a high "strangeness" rating on Hynek's chart.)

"We were looking at it through 7 X 50 binoculars," X told the author. "I wanted to get out of the truck and get the deer rifle up front.

"'No, don't get the rifle -- they'll zap us! Let's just get out of here!' Y was yelling."

The hunters reported they had trouble trying to accelerate going down the mountain. "We were starting down the hill doing about 70 mph," said X. "I floored it. The truck should have been able to do better. It's in good shape and it was a steep hill. The rpm's went down to about 50 mph. I was hitting the throttle up and down, and I couldn't get any rpm's out of it -- no revolutions or anything. That's when the craft was fairly close. I don't even remember hearing the engine running right then.

"I said, 'It's in control of the truck,' and Y really freaked out. He just went bananas."

At the bottom of the hill the witnesses telephoned the sheriff's office, and with the aid of two sets of binoculars four deputies, a truck driver, and the two hunters observed one of the objects hover for a total time of three hours.

One deputy, a sergeant-detective, quietly took 15 photographs from four sites. Later he gave the undeveloped roll of 35 mm Kodak Tri-X film to the author. The three other deputies had observed him taking the photographs. The sergeant-detective told the author: "In my honest opinion I've never seen anything like it. It was extraordinary. It changed size, shape, and color."

The author watched while a Los Angeles industrial photographic expert developed the film in NACCO Sensidol developer, and then when it became apparent that ordinary enlarging techniques were inadequate, the author proceeded to use the Ultraphot III.

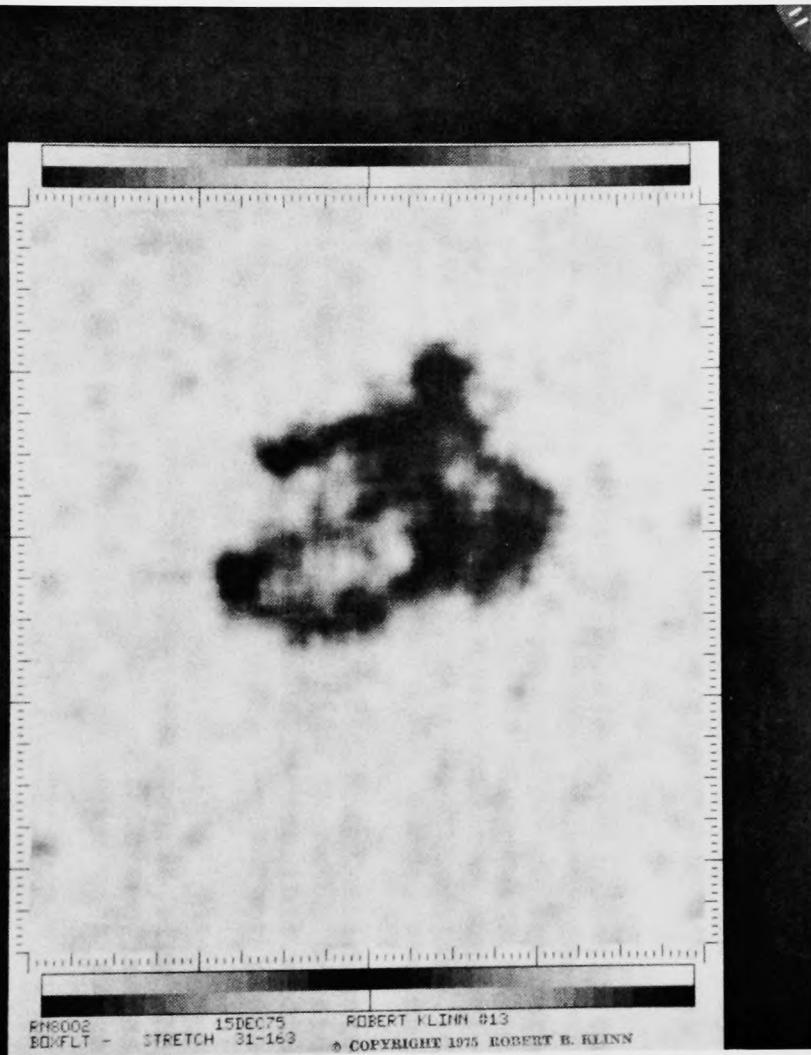
The images on the negatives were so tiny they were just barely visible to the naked eye. Thirteen images were discovered on the processed film, one image to a frame, and

each image appearing in approximately the same relative position on succeeding frames.

Frame 7 reveals significant structure, and it is this frame which shows the most promise for photometric measurements. Computer enhancement on this frame is also being undertaken at a U. S. Government installation as a courtesy to the author.

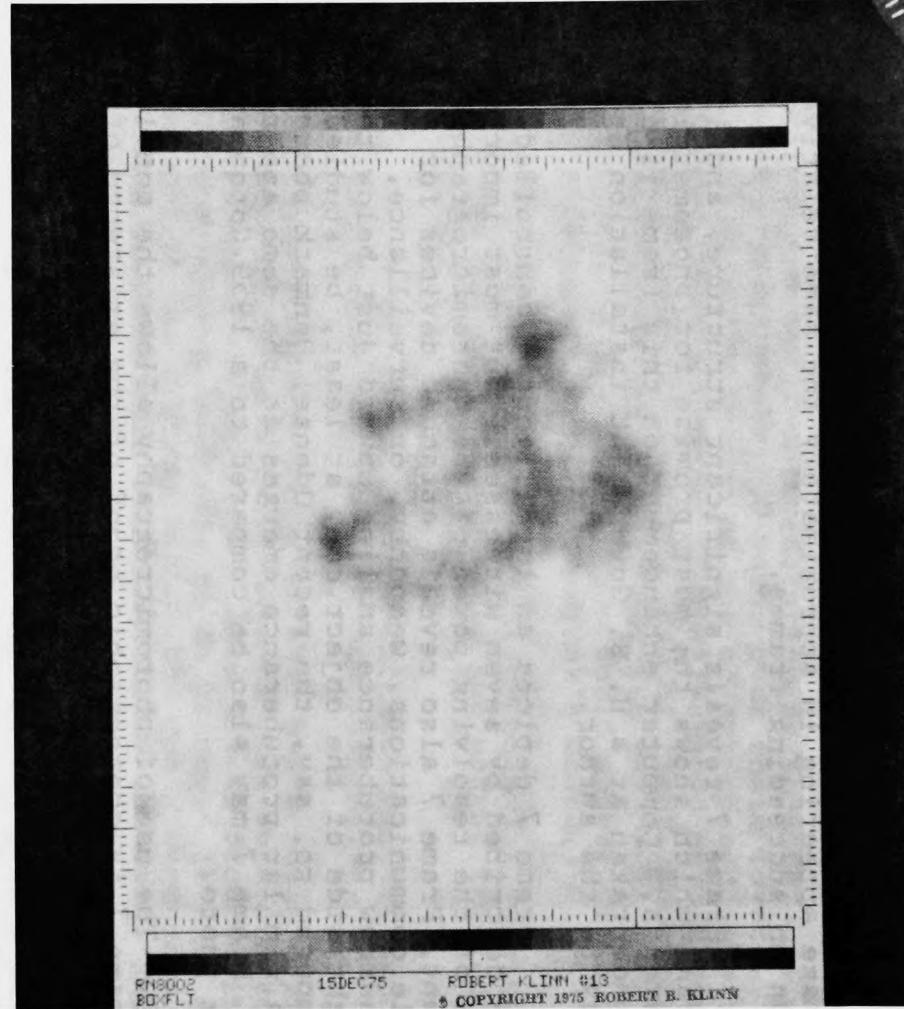
Frame 7 depicts an intelligently-controlled machine described by seven witnesses. But most important, because of the resolving power of the photomicrographic equipment, Frame 7 also reveals attached devices for possible communications, weaponry, or surveillance. The long, narrow protuberance angling upward just below the top right side of the object can, at least, be studied and compared to, say, the recent Odense, Denmark photograph. There a similar protuberance emerges at the same apparent angle. Frame 7 may also be compared to a 1959 Copenhagen, Denmark photo.

The use of photomicrography allows the conclusion that Frame 7 is photographic proof of the existence of a UFO. It is not a blob, not a pingpong ball without form, but an object with a physical, geometric shape. It is hard data which, but for photomicrography, might have been overlooked.



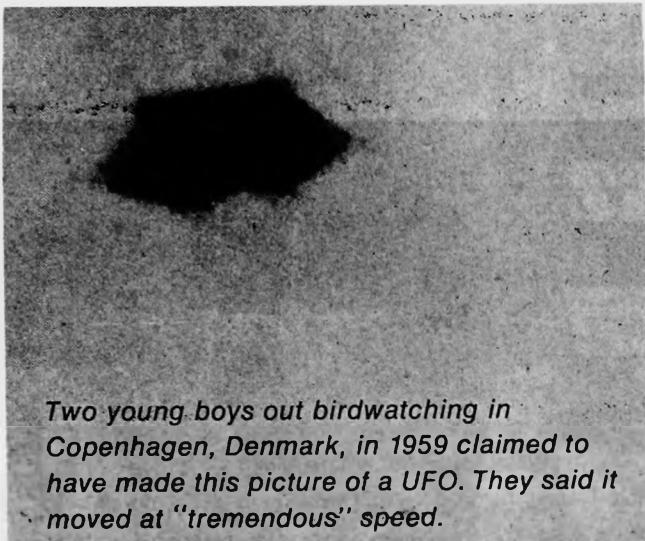
FRAME 7  
ENLARGED FROM PINPOINT SIZE AND COMPUTER CONTRAST STRETCHED

PH6002 15DEC75 ROBERT KLINN #13  
BO/FLT - STRETCH 31-163 © COPYRIGHT 1975 ROBERT B. KLINN



FRAME 7  
ENLARGED FROM PINPOINT SIZE WITH COMPUTER CONTRAST STRETCH  
AND WITH COMPUTER FILTER TO DE-FOCUS GRAIN

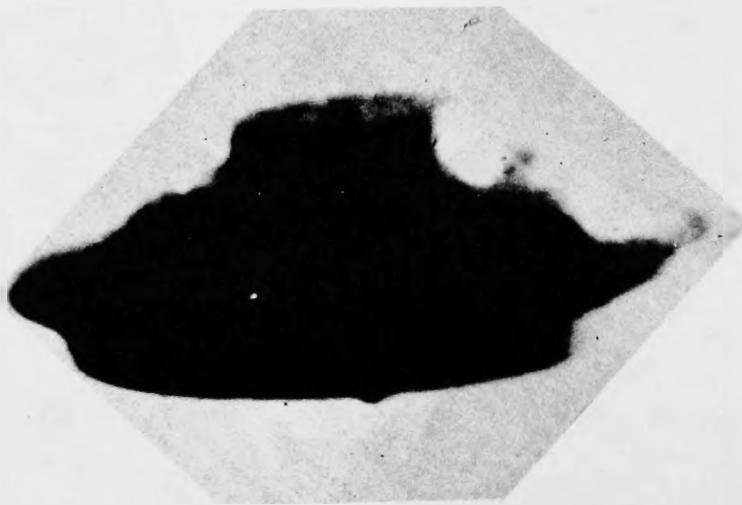
COMPARE ANTENNAE-LIKE PROTUBERANCE TO SAME ON ODENSE,  
DENMARK PHOTOGRAPH, NEXT PAGE



*Two young boys out birdwatching in Copenhagen, Denmark, in 1959 claimed to have made this picture of a UFO. They said it moved at "tremendous" speed.*

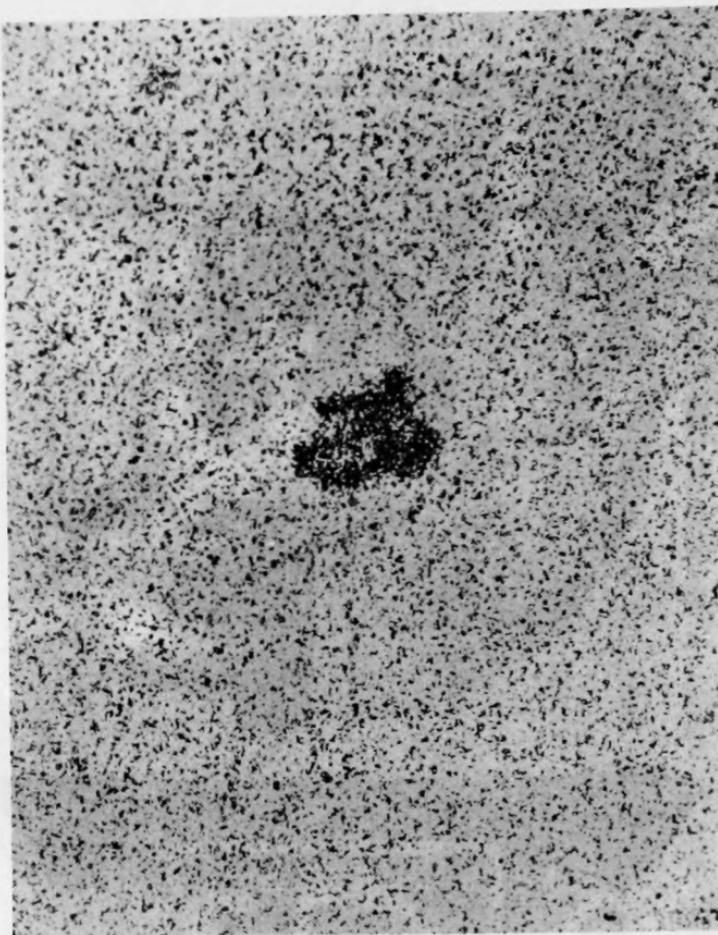
SOURCE: COWLES COMMUNICATIONS, INC.

COMPARE WITH FRAME 7



RECENT ODENSE, DENMARK PHOTOGRAPH

COMPARE WITH FRAME 7

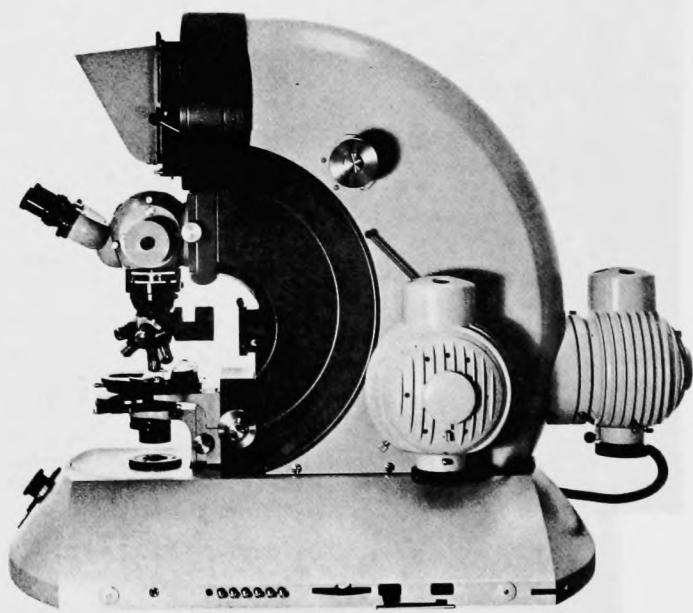
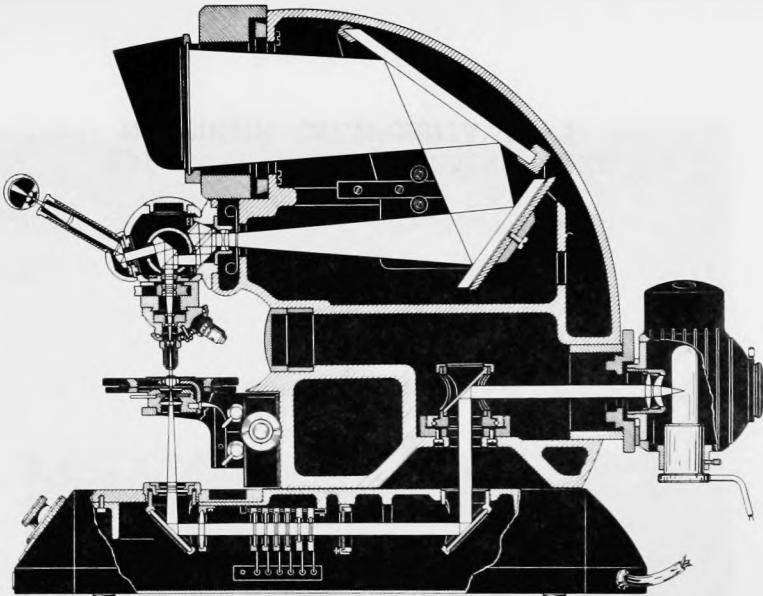


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FRAME 7  
ENLARGED FROM PINPOINT SIZE  
NORTHERN CALIFORNIA, 1975



THE ZEISS ULTRAPHOT III



## HYPNOTIC REGRESSION OF ALLEGED CE-III CASES:

### AMBIGUITIES ON THE ROAD TO UFOs

Alvin H. Lawson

Since October 1975 at least eight individuals allegedly associated with CE-III UFO experiences have been hypnotically regressed by an Anaheim doctor with the help of a number of Southern California ufologists. As shown in Figure 1, two of the cases, #4 and #5, were determined after regression not to

#### CE-III UFO CASES REGRESSED SINCE OCTOBER 1975

<u>Subject Number</u>	<u>Sighting Classification</u>	<u>Before Regr.</u>	<u>After Regr.</u>	<u>Current Status</u>
#1	CE-III/Abd.	Ambiguous	Amb./Cont.	
#2 (witness)	CE-III/Abd.	Ambiguous	Amb./Cont.	
#3 (wife)	CE-I/Para.	Ambiguous	Amb./Cont.	
#4	CE-III/Abd.	CE-II	Amb./Cont.	
#5	CE-III/Hum.	CE-I	Closed	
#6	CE-III/Para.	CE-III/Abd.	Amb./Cont.	
#7	CE-III/Abd.	CE-III/Abd.	Amb./Cont.	
#8	CE-III/Abd.	CE-III/Abd.	Amb./Cont.	

Figure 1

be CE-III's, though one, #6, was judged a possible abduction. The alleged experiences occurred variously from 1952 through 1975 - indeed, one witness insists "things" are still happening to him. The question I wish to emphasize is reflected by the last column: seven of the eight cases were judged to be ambiguous, with investigation continuing. My question is, Why is there so much ambiguity in hypnotic regression of UFO close encounter cases?

There are some obvious responses to the question. First, data from hypnotic regressions are all anecdotal, of course, with few verifiable facts and little unambiguous detail; and the matter of witness reliability is always uncertain. Second, the varying capabilities of the personnel involved - hypnotist, investigators, and of course the subject - determine what success, if any, is achieved.

One could add to the list, but I would like to suggest an answer to my own question, and to explore it with you. The response I propose is this: hypnotic regression as presently practiced is an inconclusive source of UFO data ultimately because the questioning process leaves us no way of dealing with paranormal information.

Of course, hypnosis has traditionally been the richest and most dramatic method of getting data about UFO encounters. One thinks of the Hills, of Schirmer, Travis Walton, and others. Regression, besides providing the only access

to same UFO data, gives us our closest glimpse of certainty, for under regression the subject often reveals the truth. However, the truth he reveals is merely what he believes to be true, not necessarily the absolute and unvarnished Truth. And thereby hangs many a UFO tale, and tale-teller.

There are many areas of real uncertainty in hypnotic regressions. If the subject is an unreliable witness, he may become one of several possible sources of error: he may be a clever hoaxter who outwits the hypnotist; he may sincerely believe his own lies; he may wish to please the questioner so that he fabricates or changes his testimony under repeated questioning; he may be a pathological liar; or he may not even be under hypnotic trance at all.

Even a reliable witness can be a source of error: his objectivity is never certain, for he may filter out bizarre or embarrassing information and so render his narrative incomplete; he may misinterpret physical or paranormal details (more about that later); there may be partial or complete sensory blocks about his experience; and the hypnotist's tactics may either lead the subject to avoid potentially fruitful areas, or encourage a sensational but barren line of responses.

These matters are significant because the Orange County regression conditions were nearly ideal. We had the most professional conditions possible. We had a hospital room and practically unlimited time. The hypnotist (who kindly volunteered his services) was a medical doctor with extensive clinical hypnosis experience who had a necessary fund of information about UFOs, and a healthily skeptical point of view which was deemed appropriate for his function. There had been absolutely no disturbing media attention given the witnesses, although several of the sessions were video-taped for college use. The doctor usually directed the regressions as he saw fit, based on a list of general questions provided beforehand by the investigators, although we wrote many questions during the sessions and on occasion questioned the subjects ourselves. One of these regressees, whose case I am going to relate in some detail, was a good hypnotic patient who went into deep trance easily, articulated well (often correcting the hypnotist about details), and revivified consistently as opposed to the more uncertain use of memory and the past tense. Despite all this, the hypnotic regression experience was judged inconclusive. Why?

The Garden Grove Case, as I call it, is complex, but my brief outline will help clarify it. The subject's UFO story is intriguing because he alleges not only multiple CE-III experiences, but on two occasions that he had separate witnesses. There is also a paranormal aspect to the case. Other details help make it uniquely interesting.

<u>Garden Grove Case, Alleged UFO Experiences</u>		<u>Type</u>	<u>Witnesses</u>
#1 - Oct. 12, 1959 (2:10.4 am)	Garden Grove, CA	CE-I/Para.	None
#2 - Mar. 14, 1971 (9:06.3 pm)	Apache Junction, AZ	CE-III	One (?)
#3 - Mar. 21, 1973 (9:07.4 pm)	Apache Junction, AZ	CE-III	None
#4 - Oct. 25, 1973 (7:02.3 pm)	Buena Park, CA	CE-III	One (?)
#5 - Nov. 21, 1975 (c. 3:00 am)	Garden Grove, CA	CE-III	None
#6 - Dec. 22, 1975 (time unkn.)	Garden Grove, CA	CE-III	None

Figure 2

The dates and places of six alleged UFO encounters are given in Figure 2. The subject is a 33-year-old male from Garden Grove, California, who is a draftsman for a computer firm. He is a high-school dropout of high natural intelligence. He is also extremely glib.

This UFO encounter time-table emerged only after the hypnosis sessions ended. Before that, the chronology was consistently contradictory. The subject's remarkable time precision here (derived from a self-induced trance) may represent his apology for the previous confusion. It should be noted that the subject made many drawings of the encounter, including detailed "blueprints" of the craft's interior. These need additional study to determine if their professional appearance signifies anything more than the subject's drafting skills and his stimulated imagination.

The Garden Grove Case hypnotic regressions occurred weekly, according to the calendar in Figure 3.

Garden Grove Case Hypnotic Regressions

- #1 - Oct. 8, 1975
- #2 - Oct. 15
- #3 - Oct. 22
- #4 - Oct. 29
- #5 - Nov. 5
- #6 - Nov. 12 (Witness regressed)
- #7 - Nov. 19 (Subject and wife regressed)

Figure 3

I wish to include a full review of the first alleged abduction in order to provide context for my remarks:

The March 14, 1971 "Abduction"

While camping on the Arizona desert around 9:00 pm, the subject and a friend are levitated into a 200-foot diameter, saucer-shaped UFO.

The subject finds himself and witness in a small room, paralyzed and unable to resist. Suddenly several 7-foot tall beings enter and undress them both, then take them in opposite directions down a curving hallway. The beings are ugly, with sloping shoulders, crocodile-scaled skin, elephant-like feet, and hands with three fingers and a recessed thumb. Supported by two beings, the subject seems to glide rather than walk. Heavy fog or mist is everywhere.

They stop at a door with an insignia on it. There are blinking lights at the top and sides. When touched by one of the beings, the door seems to explode, and the subject moves into a very bright room. After actually walking some distance, he is placed against a curving wall, from which he is unable to move. The wall lights up, and he feels pleasant.

Two of the 7-foot beings station themselves at consoles of some kind, and a third stands beside a pole on which there is a movable box with many tiny colored blinking lights, and two large intense lights. One of these large

lights holds the subject's eyes in a fixed gaze; the other is apparently some sort of biological probe. The subject experiences a series of uncomfortable if painless sensations from his feet upward: he senses he is bleeding; he urinates; he feels water run from his stomach; he feels his chest opened and thinks his heart has left his body briefly; finally his head feels "pulled" violently. Then everything stops, and shortly the lights on the box go off.

The subject senses that the intense lights on the box are connected with blinking lights which seem to traverse a clear cable leading from the moving box to the pole, and perhaps up the pole to another level.

The subject detects a distinct, unpleasant odor. Then from across the room out of the fog comes a 9-foot being, like the others only larger. He approaches the subject, who is frightened but calms suddenly when the being places his huge hand on the subject's head. Then the 9-footer apparently communicates telepathically with the subject, without moving his mouth. A message is communicated to the subject. Then the subject experiences an out-of-the-body trip.

The message is a combination of vague philosophical statements, general information about the aliens' origin and purpose, and a promise that they will return. The aliens seem to the subject to be clones of a central host intelligence in the form of a vast on-board computer. The host once had humanoid form, but now can inhabit either the computer or materialize as a humanoid. There is a large lab on the second floor of the UFO where young clones are grown in cylinders. The ship is "checking the original biological plantation" on earth.

The subject's telepathic trip is through future time to the aliens' home, a harsh, purplish world, domed, with two suns. However rugged its geography, the subject senses that it is a very happy place.

On the way to the aliens' home, the subject views earth during a future war - bright flashes apparently signifying total atomic destruction. (Dates given for this "doomsday" range from 4/3/85 to 12/24/2011, but settle on June 7, 1985 at high noon exactly.)

The subject is taken from the wall and returned down the curving hall to the small room where he meets his friend, who looks weak and ashen. They dress and then are floated to the ground. They stumble around in the darkness until they find their camp. About two hours have passed. Neither remembers what has happened, but, frightened and disoriented, they frantically throw all their gear into their truck and race home.

In judging the credibility of the Garden Grove Case, I can mention only a few details. Certainly there are parallels and differences in the case which, when compared to other UFO narratives, tend to strengthen it. Also, I found the subject's emotional intensity during some of the narrative simply stunning, as did two professional hypnotists, an M.D. and a Ph.D. not connected with the case. There was a surprise factor in the subject's narrative which consistently electrified the investigators, who felt the subject's responses to be beyond his powers of invention. For instance, he would answer some questions eagerly, with a rush of words, then trail off in confusion with a mumbled, "I don't understand ... ", as if there were two channels of information, his own and another. His

observational powers were sharp: asked what his alien attendants did during his physical exam, he said they shifted their weight occasionally from side to side. (We thought this perhaps the first description of alien boredom in all UFO literature, as if the beings were saying, "Oh, wow! Another human, another physical!") When asked if Christ were known to the aliens, or whether they were angels or demons, this marginally literate, unchurchly man answered, "Not related to the images man projects." Or another question, "How many people have been abducted (by this particular UFO)?" and his off-hand but time-independent response; "Twenty....Nineteen, one to come..."

Some hard information was secured: the name and location of his fellow "abductee" in the 1971 case. This second witness was flown to Anaheim and regressed. He had absolutely no conscious recollection of the alleged encounter, but during regression he manifested great fear and a severe head pain which seemed associated with releasing any information about a possible abduction. This reaction was interpreted as a possible data block, although final judgment was indeterminate.

On the negative side, it must be emphasized that the subject's background and behavior are not reassuring. He had spent time in jail for fraud in 1971. His behavior during the investigation and hypnosis sessions became increasingly unstable, including daytime trances, a 24-hour "disappearance," and frenzied phone calls to ufologists nationwide. In addition, the "contactee" or messianic dimension of the case began to dominate the regressions. After the fourth session, the investigators were faced with acute credibility problems: the subject began to report seeing "balls of light" in and around his house. These lights, which were reportedly seen by four of the subject's friends and family members, were tentatively classified as paranormal phenomena. The subject's by now seemingly very dubious credibility was climaxed when he was caught in an apparent hoax activity, after which the investigators ceased working with him. In the next few months he was able to interest at least three other groups in active investigation of his case, which activities are continuing at the present time.

I chose to speak of this case not only because of its richness, complexity, and resounding ambiguity, but also for the reason that since it is an on-going case, it symbolizes the inconclusiveness of the whole immense UFO problem, which is still "there" - as mysterious and impenetrable as ever. The Garden Grove Case is also interesting because it shows, I feel, that the investigators did not know how to respond to the data they found. This investigator, at least, was initially embarrassed by the "contactee" shape the case gradually assumed; later, I became rigorously apathetic about the supposedly paranormal "lights" the subject reported, and turned off by his stupid hoax (which, incidentally, I don't think negates his case). My point is that through his inability to deal with the "contactee" and paranormal aspects of this case, the investigator himself may have become a source of error. Let's look at Figure 4.

As anyone familiar with the literature knows, hypnotic regression often reveals individual experiences which involve events ranging from the very mundane to the most exotic imaginable, and past that to the paranormal. Similarly, there were "reasonable," "exotic," and "paranormal" aspects to the Garden Grove subject's physical examination as well as to his telepathic trip.

The "reasonable" part of the exam may include his being undressed and

INCREASING STRANGENESS OF UFO EXPERIENCE

	"REASONABLE" DATA	"EXOTIC" DATA	"PARANORMAL" DATA
	(LOGICAL OBJECTS, EVENTS) (DATA PUZZLING BUT RATIONAL)	(ODD OBJECTS, EVENTS) (SENSORY RESPONSE QUESTIONABLE)	(DATA INCOMPREHENSIBLE) (UNCONSCIOUS DATA EMERGE LATER)
PHYSICAL EXAMINATION	<ul style="list-style-type: none"> <li>-UNDRESSED</li> <li>-EXAMINATION APPARATUS</li> <li>-"ATTENDANTS"</li> <li>-RATIONAL, THOROUGH FEET-TO-HEAD PROCEDURE</li> </ul>	<ul style="list-style-type: none"> <li>-EFFECT OF PROBE</li> <li>-APPARENT HIGH TECHNOLOGY</li> <li>-BLINKING LIGHTS PATTERN</li> <li>-RAPIDITY OF EXAMINATION</li> <li>-TEMPORARY PARALYSIS</li> </ul>	<ul style="list-style-type: none"> <li>-DISSECTION (HEART LEAVES BODY)</li> <li>-SEES BODY IN "BEAM OF LIGHT"</li> <li>-RESTORATION OF HEART</li> <li>-TRANQUILIZED BY 9-FOOTER</li> </ul>
9-FOOTER'S TELEPATHY	<ul style="list-style-type: none"> <li>-CHIEF ALIEN BIGGEST</li> <li>-ONLY CHIEF ALIEN "TALKS"</li> <li>-DOESN'T SPEAK ENGLISH</li> </ul>	<ul style="list-style-type: none"> <li>-PHYSICAL CONTACT W/ALIEN</li> <li>-"GOD! BUT HE FEELS UGLY!"</li> <li>-BREATH OF VAPOR</li> <li>-FOG/MIST EVERYWHERE</li> </ul>	<ul style="list-style-type: none"> <li>-TELEPATHIC COMMUNICATION</li> <li>-MESSAGE CONTENT RAMBLING</li> <li>-OUT-OF-BODY TRIP</li> <li>-TRAVELS "FORWARD IN TIME"</li> </ul>

(Figure 4)

placed in front of an apparatus which, while tended by several personnel, examined him in orderly, rational fashion from his feet up to his head, and then was turned off. The "exotic" part of the experience might include the apparently painless though uncomfortable probing, the evidently near-automated technology, and the patterned blinking of colored lights in the moving box and up the clear cable. The "paranormal" might include the reported dissection of his heart from his chest, seeing his body in a beam of light, and his heart's restoration.

Regarding the telepathic communication with the 9-footer, the "reasonable" assumption perhaps is that the chief alien would not only be larger than the others, but would be the one to communicate with directly, just as it might be expected that he does not speak English but rather, as the subject put it, "all languages." In the "exotic" category, there is the remarkably intense emotional response at the alien's touch: "God! But he feels ugly!" The "paranormal" segment is implicit in the reported telepathic communication, the time-related out-of-body trip, and in the largely absurd content of the message from the 9-footer.

Are we able to say that data from each of these categories are equally reliable? The problem is complex. Obviously, no clear division between "reasonable" and "exotic" information is possible, due to differences in witnesses' experiential judgments and perceptual capabilities. Determining the reliability of differing categories is challenging, and one should not generalize. A good example is provided by Figure 5, which compares the subject's regression response to two different types of data.

Comparably Reliable Regression Responses to "Reasonable" and "Exotic" Data

"Reasonable" Data  
(Dr. J. A. Hynek)

"See him before at a house...A shorter man of...face bewhisker. A grayish, (sic) distinctive voice of authority and comprehension. Aged...would be 50's to 60's. Sitting in a chair, talking to other people...Other people responding to conversation of past voyage to South America, and something of nature of angel of...night? Same as other usual sightings..."  
(Oct. 15 regression)

"Exotic" Data  
(Humanoid Report)

"He is bald-headed, half-way, from the center of his head. White hair flowing straightly (sic) down towards his neck. His face is not wrinkled. He is old...yet his skin is rather fair and not blemished... He has normal features but he is shorter than I, much shorter. He has a collar that hits about his ears and cuts straight down to his neckline. It is apparently all one piece...His hands are fair, uh... five fingers, small hands, thumbs, uh...There is a slenderness about him: he does not weigh very much."  
(Oct. 29 regression)

Figure 5

In this case, the "exotic" information is a description of a 5-foot

humanoid which allegedly visited the subject in his garage about 3:00 am on the morning of October 26. The "reasonable" data, as it happens, is an account of Dr. J. Allen Hynek at a social gathering last fall. It was the first and only time the subject had seen Dr. Hynek, though the description is detailed and relatively accurate. While one should expect the humanoid visitation to be nothing less than exotic - to say the least - his description (excerpted here) is detailed and, though we can't match it with the original just yet, the subject's observational accuracy in the one case suggests a similarly high reliability potential in the other. Note that, whether the subject is hallucinating or whatever, he is describing what he sees in orderly fashion, from concrete detail to more generalized observation, etc.

If this is a fair example, "exotic" details from regression narratives may be, at best, just as reliable as more rational information. Investigators thus need not filter out data as their strangeness increases - at least, not until encountering paranormal details. Naturally, not all "exotic" data can be given a high reliability; the subject's description of complexities such as the patterned blinking of colored lights and the operations of the moving box are perhaps too vague to carry very high hard data value.

The reliability of paranormal data is very uncertain, but one can speculate on some interesting possibilities. Recent work by specialists in the human brain seems to bear out a long-held theory, that the two hemispheres of the brain have diverse functions. An excellent study of paranormal activities such as remote viewing and precognition by SRI scientists Harold Puthoff and Russell Targ (1) argues persuasively that paranormal experiences are received by the right side of the brain, which has to do with intuitive, synthetic experiences, among others; while the left hemisphere governs logical, analytical processes. The matter is extremely complex and I oversimplify it shamefully here, but if this right-left diversity thesis has validity, it may help explain why UFO regression testimony in the paranormal area seems so unsatisfactory.

For instance, the message that the Garden Grove subject recounted is as platitudinous and absurd as that from any "contactee;" but since speech and verbalization are left-hemisphere functions, the apparent meaninglessness of that and other of the subject's messages may not be as it seems. The very effort of bringing into language and articulation (a left-side function) the paranormal experience of telepathic communication with the alien (a right-side function) may distort the communication into the nonsense we know and loathe so thoroughly. This distortion may be inherent - if Puthoff and Targ are correct - in most or all paranormal data from UFO regression narratives. But rather than reject the puzzling or bizarre component of many CE-III cases, we should develop ways to separate a witness' paranormal data from his analytical or interpretive impulses. Regression is usually a verbal exercise, but there are non-verbal means by which some data can be secured and interpreted without distortion or fragmentation. Qualified clinical professionals may be able to develop means to retrieve paranormal data (2).

There are apparently at least two additional categories of information involved in CE-III regression data retrieval. Some data may be received by the witness' unconscious and emerge later, as in the common temporary amnesia following UFO close encounters. Other data may never be uncovered, due either

to self-imposed or other permanent blocks. Just that kind of permanent block may have been evidenced by the second witness to the Arizona encounter.

### Summary

As we see in Figure 6, an encounter as complex as the Garden Grove case may expose a subject to experiences ranging in degrees of strangeness from the "reasonable" through the "exotic" to the "paranormal;" and his unconscious may receive some input which makes itself known later; while other information may be blocked from conscious awareness indefinitely.

It has been my inference that "exotic" data from hypnotic regressions are not necessarily less reliable than "reasonable" information. However, I have no certain guidance to share with you about "paranormal" and unconscious data. I have merely guessed that, while unconscious material may emerge in any of the three categories when it is released, "paranormal" data can never exceed 50% reliability in the form we observe during regressions; it may average closer to 1% reliability. In addition, we have no means as yet of determining the relative proportions of each data category within a single CE-III report. Thus, if the proportion of "paranormal" and/or unconscious data from a given close encounter approaches 99% (i.e., the ultimate in strangeness), it is no wonder that we have problems.

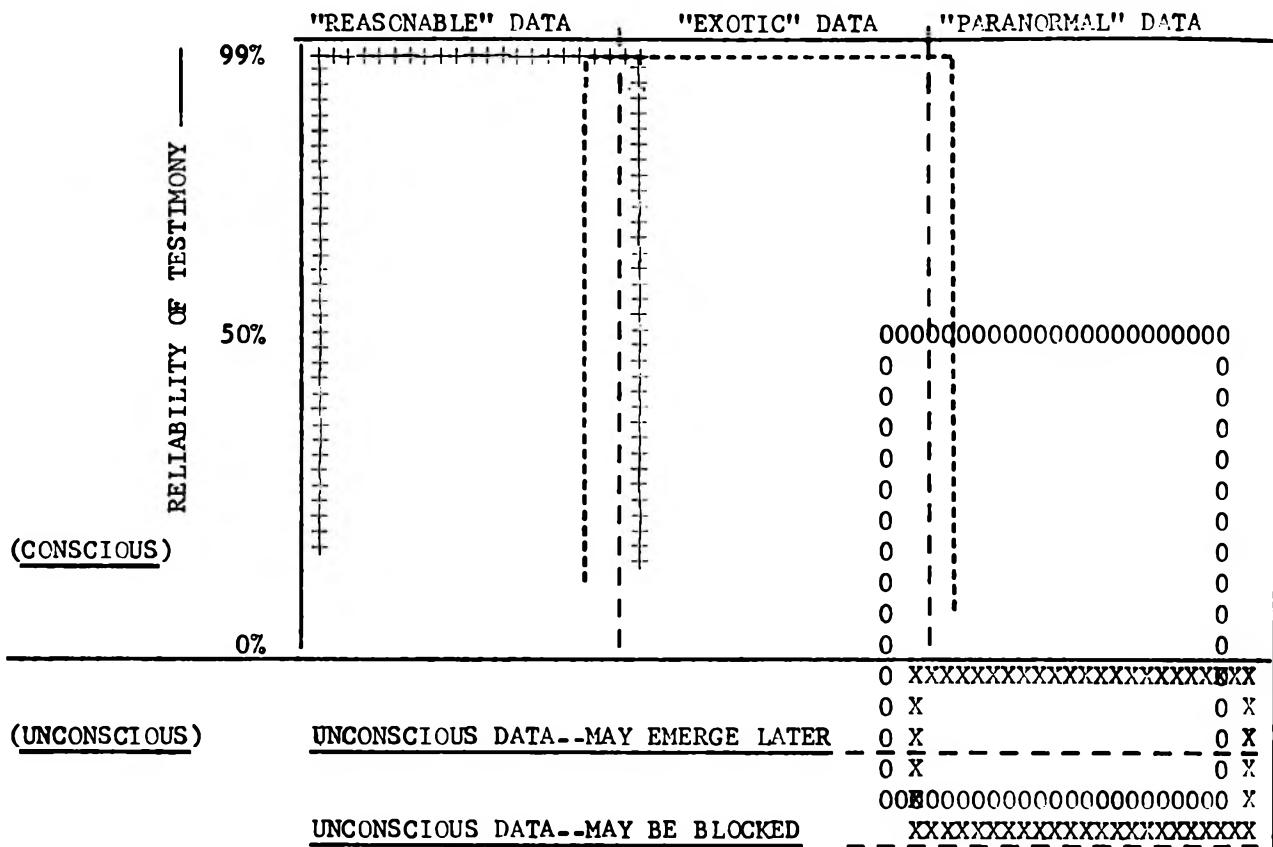
To return to the original question and answer - most regressions are now ambiguous at least in part because we have no obvious way of reckoning with paranormal data. How will we ever fathom the UFO question? If the experiences described in CE-III hypnotic regressions are true - that is, if witnesses are not lying, being tricked, or in error, and if our limited senses can respond to whatever stimuli are there - then, clearly, those experiences are among the most sensationnally mysterious of any in the whole of human history. It seems to me that the UFO problem will be resolved only when we understand enough about an even greater mystery: the nature of human consciousness. I refer not merely to the vast, Melvillean metaphysics concerning the limitations of human knowledge and the ultimate nature of reality. Rather, I look for questions such as the following: How does the brain work? How is paranormal information processed by the brain's two hemispheres? What physical or other decipherable processes govern the reliability and extent of our perceptions? Then, I suppose, the largest question of all: Can these processes be controlled?

In the last eight months I have learned of more than a dozen alleged "abductee" cases in southern California, with many others already reported. I suspect strongly that there are thousands of closet CE-III's in the United States alone. If ufologists nationwide working with hypnotists, psychologists, or other students of human consciousness could confirm this suspicion, we might sooner expect professional funding of long-range studies to answer some of these questions, and to develop menas of interpreting paranormal aspects of narratives, as well as determining the social implications of such a vast body of underground occult experience.

The good folk at Giant Rock have been very influential. For too long we have dismissed the "contactee" and his bizarre narrative of paranormal events. But we may also have been victimized by limitations in human understanding and

RELIABILITY-STRANGENESS RANGES OF 5 DATA CATEGORIES

INCREASING STRANGENESS OF UFO EXPERIENCES



(Figure 6)

communication which are inherent in the right-left functional diversity of our brains. Thus in two ways does it seem that the fault, dear friends, is not in the UFO reports, but quite literally within ourselves. About that matter, unlike everything else in this frustrating, fascinating UFO enigma, about that there is no ambiguity!

Well - at least, not very much (see Figure 7).

Range of Possible Conclusions About a Hypnotic Regression Story

1. Subject's story all lies
2. Believes his own lies
3. Is being lied to
4. Misinterpretation
5. Part true/part lies
6. Part true/part believes own lies
7. Part true/part being lied to
8. Part true/part misinterpretation
9. Part true/lies/believes lies/being lied to/misinterpretation
10. Story all true
11. Inconclusive
12. Other

Figure 7

NOTES

1. Proceedings of the IEEE, vol. 64, no. 3 (March 1976), pp. 329-35<sup>4</sup>.
2. Linguistic research indicates that most languages have left-hemisphere (analytical, logical) dominance, including Chinese and English, which are among the most extreme. Some American Indian and Eskimo dialects, however, are much more "synthetic" (right-hemisphere). CE-III reports from such language areas could provide a higher reliability of paranormal UFO data.

ON THE POSSIBILITY THAT THE  
McMINNVILLE PHOTOS SHOW A  
DISTANT UNIDENTIFIED OBJECT (UO)

by

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A B S T R A C T

As part of the Air Force funded investigation of UFO reports, (the Condon Report), W. Hartmann studied in detail photographic and verbal evidence presented by two former residents of McMinnville, Oregon. He concluded, mainly on the basis of a simplified photometric analysis, that "all factors investigated....appear to be consistent with the assertion that an extraordinary flying object....flew within sight of two witnesses." His conclusion has been criticized by Klass and Sheaffer who argue that veiling glare (lens surface dirt and imperfections scatter light from bright areas of the image into all other areas of the image) could have increased the brightness of the image of the UO, making it appear distant. This investigation has utilized Hartmann's method with the following modifications: (a) the bottom of the UO has been assumed to be as intrinsically bright as possible without being a source of light (i.e., assumed to be white); (b) laboratory measurements have been used to estimate the magnitudes of veiling glare on the various images of interest; (c) a film exposure curve has been used to determine relative image illuminances; and (d) a surface brightness ratio, determined by field measurements, has been included. The results of the new photometric analysis suggest that the bottom of the UO is too bright for it to have been a non-self-luminous white (paper) surface of a nearby object.

I. Introduction

In June 1950, four weeks after they were taken, the photos illustrated in Figures 1 and 2 appeared in a small newspaper in McMinnville, Oregon. Subsequently, they appeared in Life Magazine and in many publications devoted to UFO reports. Although they clearly depict an unusual object, they were never treated as scientifically valuable because it was always considered probable that they were photos of a hoax object (e.g., "a garbage can lid"). Nevertheless they did gain a large measure of scientific "stature" when in 1969 Hartmann<sup>1</sup> concluded that the object may have been distant and, therefore, large (i.e., not a hoax). Since the publication of Hartmann's conclusion in the CR,<sup>1</sup> these photos and the verbal evidence associated with them have been the subject of a continuing controversy.

A brief history of the analysis of the photos is given in Figure 3. The initial analysis was carried out by a photographer working for the McMinnville Telephone-Register (now the News Register). Hartmann confirmed the original analysis and went on to conclude that the object was asymmetric and that it was probably not rotating about a (nearly) vertical axis (i.e., was not thrown into the air). Hartmann pointed out that the possibility for a simple hoax existed since the photos show the UO as "underneath" two nearby power wires. However, he carried out a simplified photometric analysis which

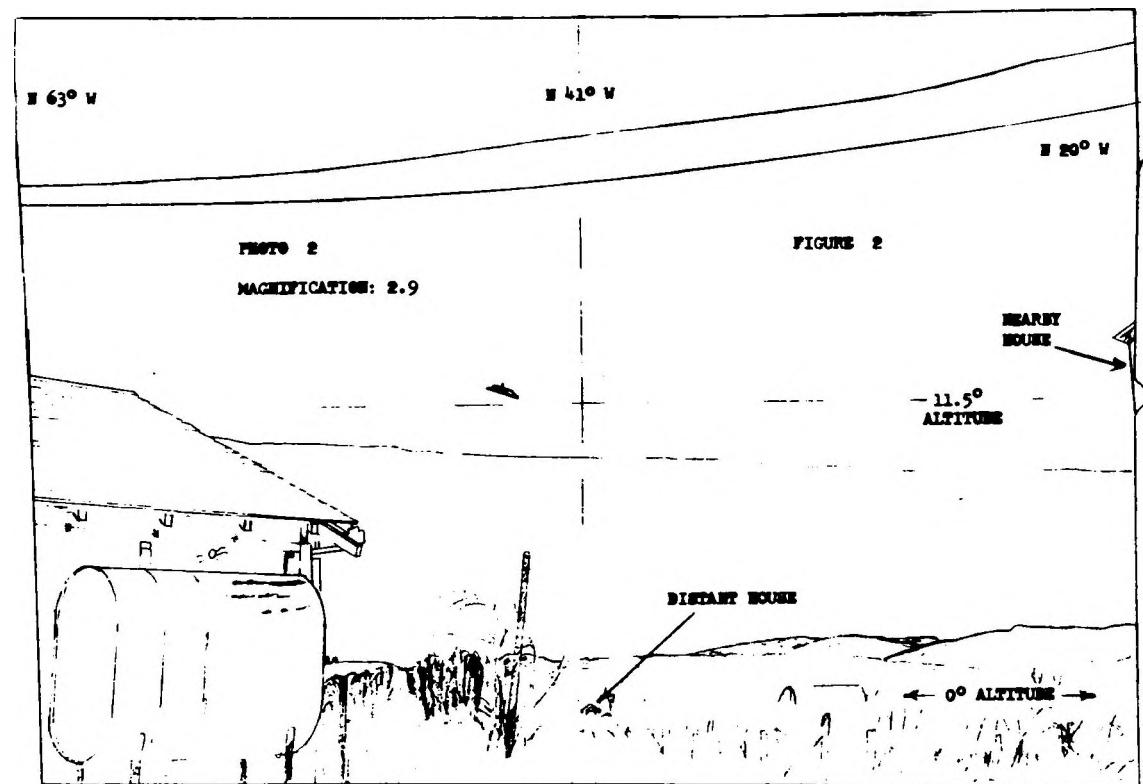
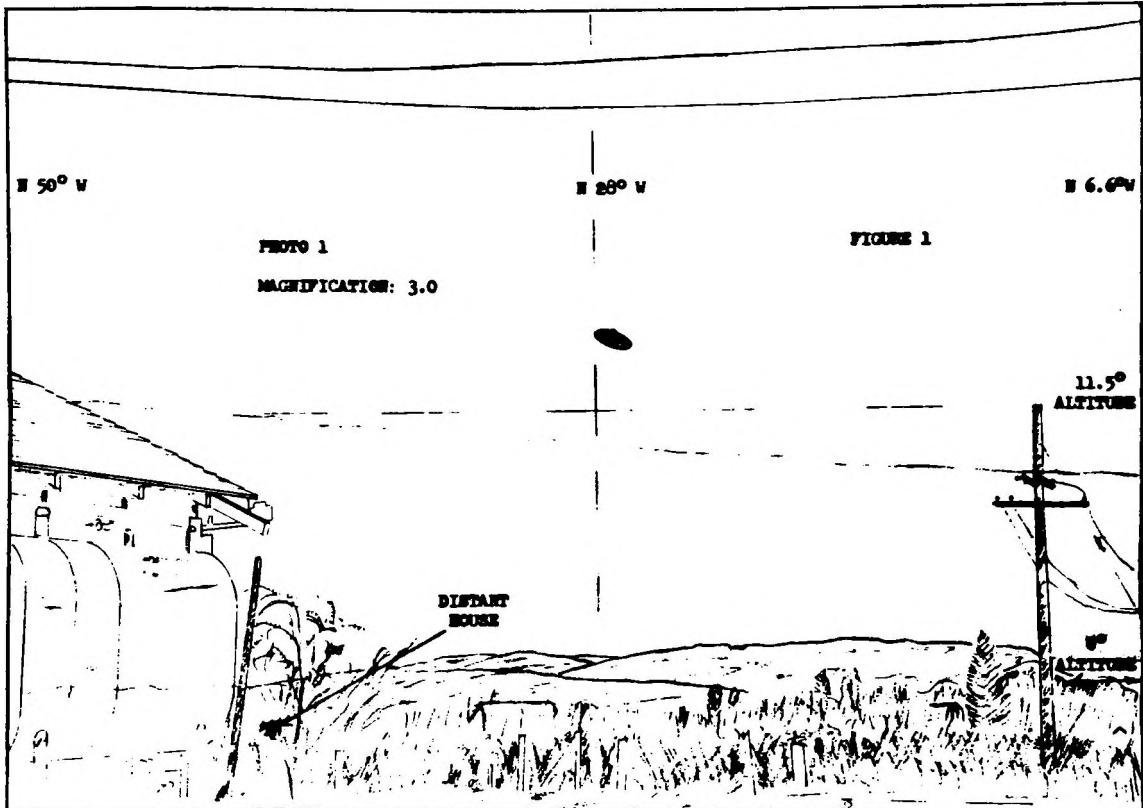


Figure 3

A Brief History of the McMinnville Photos

Publication: 8 June 1950 (The Editor stated that "expert photographers declared there has been no tampering with the negatives. (The) original photos were developed by a local firm. After careful consideration, there appears to be no possibility of hoax or hallucination connected with the pictures. Therefore, the Telephone-Register believes them authentic.")

- The Telephone Register (now the News-Register), McMinnville, Oregon

Subsequent Immediate Publications

- The Portland Oregonian, Portland, Oregon, 10 June 1950 (contains further verbal information)
- The Los Angeles Examiner, Los Angeles, California, 11 June 1950 (contains further verbal information)
- Life, June 1950 (contains further verbal information)

The photos were "lost" in the files of the International News Photo Service and subsequently in the files of UPI until they were "found" by the Colorado project.

Condon Report Conclusion: Certain physical evidence, specifically relative densities of images in the photographs, suggests that the object was distant; if the objects were truly distant, a hoax could be ruled out as beyond the capabilities of the photographer. (NOTE: Hartmann's report contains a good summary of the verbal evidence available up to 1967.)

Sheaffer-Klass Conclusion: There are some possible inconsistencies in the verbal evidence and several important discrepancies between the verbal report and the photographic evidence; Hartmann's photometric analysis was incomplete. Specifically, (a) shadows on the garage wall (facing east) suggest that the pictures were taken in the morning, not in the evening as claimed; (b) the apparent shrinkage of the shadow nearest the edge of the garage suggests that there were many minutes between photo 1 and photo 2; and (c) veiling glare could have made the image of the bottom of the UO excessively bright; this would have led Hartmann to erroneously conclude that the object was distant.

Present Investigation: New verbal data (to be published elsewhere) have been obtained; the original negatives have been studied photogrammetrically as well as photometrically. The present investigation has confirmed the shadows on the garage wall (agree with (a) above), but has found that, to within the resolution of the measurements (using a travelling microscope), the shadows other than the one at the edge of the garage did not move with respect to the garage wall between photos (the shadow at the edge of the garage does appear narrower in photo 2; disagree with (b) above). The present investigation has reviewed and confirmed the general validity of Hartmann's analysis. However, the effects of veiling glare and the ratio of brightnesses of vertical and horizontal surfaces have been accounted for (disagree with (c) above).

led him to conclude that the object was distant and that "the simplest, most direct interpretation of the photographs confirms precisely what the witnesses said they saw." A modified version of Hartmann's analysis will be presented in the next section to illustrate the use of photometry.

In 1974 Philip Klass<sup>2</sup> published an analysis of the verbal evidence by himself and of the photographic evidence by Robert Sheaffer.<sup>2,3</sup> They found an important inconsistency between the photos and the verbal description: the photos show clear shadows on the east wall of the nearby garage, which implies that the pictures were taken in the morning, while the witnesses claimed that the pictures were taken in the evening. Sheaffer argued, on the basis of careful measurements of the width of the shadow of the eave rafter at the corner of the garage, that there was a considerable time lag between photos rather than "less than 30 seconds" as claimed (see Figure 3). However, Sheaffer's most important "discovery" was that dirt on the camera lens, or a poor quality lens, could have caused light from the bright sky surrounding the image of the UO to "spill over" onto the image of the UO, thus making the UO image excessively bright. In Hartmann's analysis the excessive brightness was attributed to the effect of the atmosphere on the apparent brightness of an object if it were distant. By attributing the excess brightness to a camera defect, Sheaffer was able to argue (qualitatively) that the distance calculation was in error and that "in reality" the object was close to the camera. He was, thus, able to remove the main inconsistency with the simple hoax hypothesis that the object was hanging from wires that were less than twenty feet from the camera.

In late 1973, unaware of the work of Sheaffer and Klass, I decided to undertake an investigation of the McMinnville case because (a) the pictures are so clear the object is either a hoax device or an unusual object (no misinterpretation seems possible; e.g., it's not a plane at an odd angle), and (b) Hartmann had devoted considerable effort and analytical research to the photos and had concluded on the basis of this physical evidence that the object was distant (not a hoax). Considering the general tone of the CR (skeptical), I felt that Hartmann must have been quite confident to publish the conclusion he drew from his analysis. He could have decided to do no photometric study and then he would have been "safe" in saying that the case provided "no probative evidence" and that, furthermore, it was probably a hoax. Or, he could have reported the photometric study with such disclaimers as "the photos are so poor (scratched, worn, etc.) that the photometric study is probably in error by a considerable amount." (NOTE: According to Condon, Everitt Merritt had already "thrown out" the photos as being too fuzzy for worthwhile photogrammetric analysis.) Hartmann did point out that his analysis might only be correct to within a factor of four, but, even with an error bar this large, several hundred meters was the closest distance compatible with his analysis. Therefore, since Hartmann had essentially endorsed the photos as probably genuine, I decided to try to either confirm or refute his result in a study of my own. Since I was somewhat skeptical myself, I fully expected to be able to show that either the atmospheric theory he used or the photometric measurements were wrong (or incorrectly applied).

After a several year study, I have concluded that the general form of Hartmann's analysis is valid. However, I have found that he ignored or was unaware of several "details" of the necessary photographic analysis which will be outlined in the following section. Also, I was not able to confirm the specific numbers which he gave as relative brightnesses of various images on the photos. At least part (perhaps a major part) of this dis-

crepancy is due to a difference in technique: Hartmann measured transmission values of small portions of the images of interest and then divided by the transmission "somewhere" along the horizon; he thus did not have good estimates of average brightnesses of the images. I used a scanning densitometer with a very small aperture and averaged over many scans across an image of interest. However, despite the (not large) differences in the relative brightnesses obtained in the two independent investigations, the conclusions have turned out to be essentially the same, as will be seen.

## II. Photometric Analysis of the McMinnville Photos

In the spring of 1975 I was able to locate, with the incidental help of Mr. Klass, the original negatives. Consequently, all density values given in this paper are from those negatives. They were measured on a densitometer that was repeatedly calibrated with a Kodak standard diffuse neutral density "wedge." Although many areas of both photos have been scanned to establish consistency between the exposures, etc., only the density values pertinent to the range calculation will be listed here. These values along with other pertinent photographic data are listed in Table I.

The analysis is based on Hartmann's method with the following modifications: (i) I have used an exposure curve relation for the negatives based on a published D-LogE' curve for Verichrome film whereas Hartmann implicitly assumed  $\gamma = 1$  (NOTE: Other possible film types are Plus-X and Plus-XX, both Kodak films, but the exposure curves of these are similar to that of Verichrome; measures of the fog density suggest that only Plus-XX and Verichrome are compatible with densities recorded in unexposed regions; Verichrome was the least expensive); (ii) Since the negatives are pale,<sup>1,4</sup> that is the density range starting from the fog level is not as large as expected for a sunlit day, I have assumed that the negatives were slightly underdeveloped and have, therefore, used an exposure curve for  $\gamma = 0.6$ , even though it was standard procedure to develop to a  $\gamma$  of about<sup>4</sup> 1; (iii) I have used a photographic formula to relate image illuminance to object brightness; (iv) I have incorporated laboratory derived estimates of veiling glare; and (v) I have incorporated a surface brightness ratio that was obtained from field measurements. This brightness ratio was ignored by both Sheaffer and Hartmann.

The first step in the analysis is to determine the relative illuminance on the film plane which produced the image densities. Simple photographic theory corrected for the effects of veiling glare predicts that

$$E' = \text{image illuminance} = K(B + G) \cos^4(\theta) \quad (1)$$

where  $K$  is a constant for a particular picture (and is assumed to be the same for both photos here),  $B$  is the brightness of the object being photographed,  $G$  is the amount of veiling glare added to the image, and  $\theta$  is the angle between the lens axis and the direction to the object. Defining  $E_i = E'/\cos^4(\theta)$ , and substituting the empirical exposure curve relation between measured image densities and their causative illuminances, yields the total image "brightness" given in Eq. 2 (Table I). The object brightness is then found by subtracting the glare on the image, as in Eq. 3 (Table I).

To illustrate the photometric method I shall first summarize Hartmann's analysis, and then I shall present a range calculation based upon the simplified analysis. Hartmann pointed out that the upper bright side of the object appears brighter than the side of the nearby tank and that the elliptical shaded bottom is the brightest shadow in either photo. He attributed the excessive brightness to atmospheric brightening (specifically, the contrast between the brightness of an object and that of the sky approaches zero as

TABLE I

<u>Image</u>	<u>Density, D</u>	<u>Angle from lens axis, <math>\theta</math></u>
Shadow on wall of distant white house, photo 1	$0.25 \pm 0.03$ (weighting factor = 1)	$17.6^\circ$
Same as above, photo 2	$0.24 \pm 0.01$ (weighting factor = 2)	$12.5^\circ$
Sky near and above UO in each photo	$0.61 \pm 0.01$	$0^\circ$
Horizon in each photo	$0.43 - 0.46$ (use 0.445 as an average value)	$10.0^\circ$
Bottom of UO in photo 1	$0.315 \pm 0.001$	$3.0^\circ$

Atmospheric Extinction Coefficient (12 mile visibility) =  $\sigma^- = 0.2/\text{km}$ .

Distance to white house  $\approx 360$  meters

Focal length of lens =  $103 \pm 5$  mm; f# was probably about f/11

Relative exposures have been calculated from

$$E_i = E_0 \cos^{-4}(\theta) \exp \left[ 2.303 \left( D_i / \gamma - k / D_i^3 \right) \right] \quad (2)$$

for  $D_i \geq 0.1$ , where  $E_i$  is the image exposure,  $D_i$  is the measured density, and  $E_0$  and  $k$  are constants that depend upon the film development "constant,"  $\gamma$ . Table IV contains a listing of values of  $E_0$  and  $k$  for various values of  $\gamma$ .

Relation between object brightness,  $B$ , image exposure,  $E_i$ , and veiling glare on the image,  $G_i$ :

$$B = E_i - G_i \quad (3)$$

The amount of veiling glare added to an image is proportional to the brightness surrounding the image:  $G_i = g_i B_s$ , where values of  $g_i$  for particular sizes and shapes of images in particular surrounding brightness distributions have been measured in the laboratory. With a brightness distribution similar to that of the photos (bright above the horizon, dark below the horizon), a laboratory simulation has shown that, when a lens is sufficiently dirty to produce  $g_{UO} \approx 0.12$ ,  $g_{distant\ house} \approx 0.035$  and  $g_{horizon} \approx 0.05$ .

(the brightness of a vertical, white, shaded surface (house wall)) =  $R_B$   
 (the brightness of a horizontal white surface seen from below)

Field measurements show  $2.4 \lesssim R_B \lesssim 4.7$ . In the calculations done here  $R_B = 2.4$ .

Atmospheric brightening formulas:

$$(a) \quad B_{(r=0)} = \text{intrinsic brightness} = B_H + (B_{(r)} - B_H) e^{\sigma r} \quad (4)$$

$$(b) \quad r = \text{range} = (1/\sigma) \ln \left[ (B_{(r=0)} - B_H) / (B_{(r)} - B_H) \right] \quad (5)$$

where  $B_H$  = horizon brightness,  $B_{(r)}$  = measured brightness at range  $r$ , and  $\sigma$  = the atmospheric coefficient (see above).

the distance to the object increases). By assuming that the intrinsic, i.e., nearby, brightness of the bottom was the same as that of the shaded bottom of the tank, he estimated that the range to the object was about 1.3 km. using Eq. 5 (Table I) and his estimate of  $\sigma$  (0.289/km.). (NOTE: Since all his brightnesses were normalized to the horizon brightness,  $B_H = 1$  in his version of Eq. 5). He then pointed out that if the UO were nearby under the wires, the bottom must have been very white, even brighter than the shaded white surface of the distant house which appears near the bottom of the photos.

I have modified Hartmann's analysis by assuming at the outset that the bottom is as bright a surface as would have been available to the photographers (white paper) without being itself a source of light. This assumption has led me to compare the relative brightness of the bottom of the UO with the relative brightness of a nearby horizontal shaded white surface as seen from below. The brightness of a horizontal white surface has been estimated from the relative brightness of the shaded white surface of the distant house (and also from the shaded white surface of the nearby house). If, in a naive way, the intrinsic brightness of a vertical white shaded surface (house wall) is equated to the intrinsic brightness of a horizontal white surface as seen from below (actually the vertical surface may be somewhat more than twice as bright), and if the effects of veiling glare are ignored (G in Eq. 3 is set equal to zero), then the range of the UO can be calculated from Eq. 5 using as  $B(r=0)$  the brightness of a nearby vertical shaded white surface. The shaded wall of the distant house has been used to estimate the relative brightness of a nearby vertical surface by correcting the relative brightness of the wall for atmospheric brightening using Eq. 4 (Table I). If the object were hanging under the wires then, by this (naive) reasoning, the brightness of the nearby vertical surface should equal the brightness of the bottom of the UO, and Eq. 5 would yield  $r = 0$ . Such a result would be consistent with the hoax hypothesis.

Table II lists the pertinent relative "brightnesses,"  $E_i$  (uncorrected for glare), the correction of the distant house wall "brightness" for atmospheric brightening, and the range calculated from Eq. 5. The range, 1.4 km., is clearly inconsistent with the nearby UO hypothesis.

Accurate calculations of object brightnesses require corrections for veiling glare, as proposed by Sheaffer. Since, in the first approximation, the phenomenon (scattering) which produces veiling glare simply adds light (from the brighter areas) to the darker areas, it is only necessary to subtract the amount of glare from an image to find the object brightness (Eq. 3). The problem is to find the amount of glare on an image. In order to estimate amounts of glare on the images of interest in these photos, I have conducted laboratory experiments with several camera lenses, one of which was comparable (but not identical) to the lens on the camera that took the photos. I simulated the brightness distribution of the sky with a large screen which was illuminated from behind. Below the simulated "horizon" (the bottom of the bright area) there were no sources of light. I then measured brightness distributions in the bright and dark areas when there were varying amounts of grease on the lens. The light that "turned up" in the dark areas was the glare light,  $G_i$ , which would have appeared on any images that might have been present in the dark areas (although no such images were present in the laboratory simulation). Values of  $G_i$  were proportional to the "sky" brightness,  $B_s$ , so that at each point on the image plane a glare index,  $g_i$ , could be defined as  $g_i = G_i/B_s$ . For the present work it was important to have values of  $g_i$  for images  $2^\circ$  below the horizon (the angular height of the image of the distant house) and for images at (or just below) the horizon, when the glare index

T A B L E    I I

Modified Hartmann method: (Assume the bottom is white and use  $\gamma = 0.6$ ):

$E_{\text{horizon}} = 0.039 \pm 0.002$ ;  $E_{\text{distant house shadow}} = 0.018 \pm 0.001$ ;  $E_{U0} = 0.022 \pm 0.001$ ;  $E_{\text{sky}} = 0.070 \pm 0.001$ . Atmospheric correction to obtain the brightness of the nearby surface (Eq. 4 of Table I):  $0.039 + (0.018 - 0.039)e^{0.2(0.36)} = 0.0164 \pm 0.001$  ( $0.0164$  is assumed to be the intrinsic "brightness" of the bottom of the UO). Range =  $r = [1/(0.2/\text{km.})] \ln \left[ \frac{0.0164 - 0.039}{0.022 - 0.039} \right] = 1.42 \pm 0.6 \text{ km.}$

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for an image of the angular size and shape of the elliptical bottom of the UO was a particular value. In order to select the "proper" amount of grease and dirt on the lens, brightness variations of other images were measured. Of particular interest was the image of the large telephone pole in Photo 1. Measurements of the brightness variation of the image of the pole showed that below the horizon the image was of a nearly constant brightness, and that above the horizon the image increased in brightness as the angular altitude increased. I attributed this increase in brightness to an increase in the glare light added to the pole image (thus implicitly assuming that the brightness of the pole was intrinsically constant from its bottom to its top; however, many wooden telephone poles increase in intrinsic brightness with increased height along the pole). I simulated the pole image in the laboratory setup and measured the glare light in the image above the simulated horizon. By changing the amount of dirt and grease on the lens, I was able to adjust the amount of glare light increase on the simulated pole image. Thus, a distribution of values of  $g_p$  were determined for the simulated pole image for each amount of grease. The laboratory determined values of  $g_p$  were multiplied by a value of  $B_s$  determined from the sky brightness of Photo 1 to obtain the amounts of glare,  $G_p$ , that would have been added to the actual pole image in Photo 1. By adjusting the amount of dirt and grease on the lens, I was able to obtain a set of values of  $g_p$  which, when multiplied by the sky brightness of Photo 1, yielded the measured amount of increase in brightness of the actual pole image, i.e., I fitted the laboratory data to the measured increase in pole brightness. The amount of dirt and grease which yielded the correct set of values of  $g_p$  for the pole image also yielded  $g_{U0} = 0.12$  for the image of the UO, and the other values of  $g_i$  given in Table I. These values have been used in the following analysis, even though other measurements have strongly suggested that  $g_{U0} = 0.12$  is an upper bound on the glare index for the UO. (Typical values of veiling glare in an image the angular size of the UO in Photo 1 would be less than 6 - 9%). Moreover, measurements of the brightness variations in certain other images in the photos suggest that  $g_{U0} = 12\%$  may be too high (7% might be better), although none of the laboratory measured glare distribution curves exactly matched the brightness variations of the actual photographic images.

The effect of the inclusion of veiling glare is readily apparent when it is applied to the image illuminances,  $E_i$ , shown in Table II. For example, the horizon brightness is found to be  $E_h - G_h = E_h - g_h B_s$  (where, from Table I,  $g_h = 0.05$ ) =  $0.039 - (0.05)(0.07) = 0.0355$ . Similar calculations yield the relative brightnesses given in Table III. Note that in this first order theory the small loss of brightness from the bright areas is ignored, so  $E_{\text{sky}} = B_{\text{sky}}$ .

TABLE III

Relative Object Brightnesses with  $E_{sky} = B_{sky} = 0.07$ :

$$B_{horizon} = E_h - G_h = E_h - g_h B_s = 0.039 - (0.05)(0.07) = 0.0355;$$

$B_{distant\ house\ shadow} = 0.018 - (0.035)(0.07) = 0.0155$ ; after atmospheric distance correction,  $B_{nearby\ vertical\ shadow} = 0.014$ ;  $B_{UO} = 0.0136$

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From Table III one can observe that a major effect of the inclusion of veiling glare is to make the brightness of the bottom of the UO equal to (or slightly less than) the brightness of a vertical shaded white surface. Naive use of Eq. 5 with  $B(r=0) = 0.014$  and  $B(r) = B_{UO} = 0.0136$  would yield a range of zero (negative numbers are not allowed), so Sheaffer's conjecture that the apparent distance of the UO could be explained by veiling glare has merit. (NOTE: If  $g_{UO}$  were 7% and the other values of  $g_i$  were proportionately lower, the range would not be zero but about 400 meters.) However, field measurements with a spot photometer have shown that it is incorrect to equate the brightness of a vertical wall with the brightness of a horizontal surface as seen from below.

A shaded vertical wall which is on the order of ten feet above the ground and which is not closely surrounded by trees is illuminated by direct skylight as well as by light reflected from the ground. On the other hand, the horizontal bottom surface of a body which is less than ten feet above the ground is illuminated only by light reflected from the ground. Since the ground reflectivity is not particularly high (15-30% for grassy ground), one would expect the illumination on the horizontal (or nearly horizontal) bottom of an object to be less than that on the vertical surface. Thus, from a priori reasoning one should not equate the relative intrinsic brightness of a white shaded vertical surface to the relative intrinsic brightness of a white shaded horizontal surface seen from below. To provide a quantitative estimate of the ratio of brightness of a vertical surface to a horizontal surface,  $R_B$ , (see Table I) I made field measurements with a calibrated panchromatic  $3.5^\circ$  spot photometer. I measured the brightness of the white wall of a house when the wall was shaded by the eave and when the sun angle and sky conditions were similar to those at the time of the UO photos. Under the same environmental conditions, I measured the brightness of an opaque white paper surface held about seven feet above the ground. Many measurements of the surfaces were made with the result that the house wall was found to be 1.5 to 2 "stops" brighter than the bottom of the white surface, depending upon the exact nature of the ground (grassy, dirt, etc.) and upon the sky brightness distribution. Allowing a 1/4 stop possible error in the readings, the brightness ratio lay within the range  $2^{1.25} = 2.4$  to  $2^{2.5} = 4.7$  (see Table I). To be "conservative" I have used  $R_B = 2.4$  in these calculations. (NOTE: This ratio was measured with a panchromatic meter. If a red excluding filter had been used to simulate the orthochromatic Verichrome spectral response, the measured ratio might have been as much as 30% greater.) The measured brightness of the bottom of the horizontal surface did not change noticeably when the surface was tilted by as much as  $20^\circ$ .

From Table III the relative brightness of a nearby vertical white shaded surface was 0.014. From the field measurements this value should be divided by a number at least as great as 2.4 to obtain the relative brightness of a nearby horizontal white shaded surface, which is assumed to be the brightness of the bottom of the nearby UO. With  $B_H = 0.0355$ ,  $B_{UO} = B(r=0) = 0.0136$  (see Table III), with  $B(r=0) = 0.014/2.4 = 0.0058$ , and with  $\sigma = 0.2$  (Table I) the range calculation yields about 1.5 km. Variations in the calculated range with variations in the parameters of the range equation are as follows: (a) the calculated range increases as the glare decreases--with no glare the range is calculated from  $B_{UO} = B(r) = 0.022$ ,  $B_H = 0.039$ , and  $B(r=0) = 0.0164$  (Table I)/2.4 = 0.0068 and Eq. 5 yields about 3.2 km.; (b) the calculated range increases with the ratio  $R_B$ --if  $R_B = 3$ , using the brightnesses in Table III and  $B(r=0) = 0.014/3 = 0.00467$ , Eq. 5 yields a range of about 1.7 km.; (c) the calculated range increases with  $\gamma$  as indicated in Table IV. Note that it is possible to reduce the range to zero by assuming an extremely low  $\gamma$  of 0.3, provided that the glare is not reduced and/or the brightness ratio is not increased.<sup>5,11</sup>

Table IV also contains a list of ratios of the brightnesses of the bottom of the UO to the expected brightnesses (the brightnesses of a nearby horizontal shaded white surface). Since the expected relative brightnesses were calculated using a white surface (the distant house wall) as a reference, the ratios imply that the bottom of the UO was "brighter than white" whenever reasonable values of  $\gamma$ ,  $\gamma \geq 0.6$ , were used in the calculation. White surfaces reflect most of the incident light (both white paint and white paper have reflectivities in the range<sup>6</sup> 60-80%). If we assume, for example, that the white paint on the distant house reflected only 60% of the incident light, then a brightness ratio greater than  $1/0.6 = 1.67$  would imply that the bottom of the UO was a source of light (it could not reflect more light than 100% of what was incident on it;  $1.67 \times 60\% = 100\%$ ). As shown in Table IV, for reasonable values of  $\gamma$  the calculated ratio  $B_{UO}/B(r=0)$  exceeds 1.67 by a considerable margin. Actually 1.67 is an upper bound on the ratio if the distant house reflects 60% of the light because any white surface which the witnesses would have available to place on the bottom of their hypothetical nearby UO would have a reflectivity lower than 100%. If the bottom were white paper, the reflectivity would be, at maximum, about 80%, in which case the maximum expected ratio of the brightness of the bottom to the expected brightness would be  $0.8/0.6 = 1.33$ . (NOTE: If the white painted surface were known or assumed to be dirty, the reflectivity would be decreased and the brightness ratio increased. For example, to obtain the brightness ratio 2.34 which is obtained when  $\gamma = 0.6$  (see Table IV) with 80% reflective paper on the bottom of the object, the distant wall reflectivity would have to be as low as  $0.8/2.34 = 0.34$ . On the other hand, measurements of the image density of the shaded wall of the nearby house, after correction for veiling glare, yielded an upper bound on the relative brightness of a shaded white vertical surface of 0.0171, which is only 0.0031 units higher than the value 0.014 in Table III. This house was reportedly painted in the year previous to the sighting date, so the paint must have approached its maximum reflectivity. Use of this value, after dividing by 2.4, with the other brightnesses in Table III yields a distance of about 1.3 km. and a brightness ratio of 1.9, which is still larger than 1.67 and 1.33.)

The implication of the brightness ratios for reasonable values of  $\gamma$  is that the bottom of the UO was itself a source of light if it were nearby (e.g., within 20 feet under the wires). To be a source of light it would have to have (a) contained a source of light, or (b) been made of translucent materials so that light could filter from the sky above through the bottom

surface. Requirement (a) is considered beyond the capabilities of the photographer because a very small illumination apparatus would have been required and because the illumination mechanism would have had to produce a very even distribution of light over the bottom surface (there are no "hot spots" of brightness in the image of the bottom). Requirement (b) above is considered a possibility if the upper body of the UO were a translucent material.<sup>7</sup> Any holes through the upper body would allow direct sunlight through, and these would cause brightness "hot spots" on the bottom surface. On the other hand, a translucent or transparent material such as glass would probably not "look" the same in a side view as the object appears in photo 2 (apparently shiny like the nearby tank, but not a specular surface). Any hypothetical translucent UO must appear, in a side view, as bright and "shiny" as does the object in photo 2 (also, it must be shown that an appropriately translucent or transparent material in the proper shape was available to the photographers).

Independent tests of the density distributions of the images of the object and its surround and of the density distributions of nearby objects in the photos have been made.<sup>8</sup> Color contouring (using a computer to assign specific colors to specific density ranges) has shown that (a) the "back" end (left hand end in photo 1) of the object appears slightly non-circular, and (b) the edges of the image are rough or jagged (the color contour boundaries are not smooth curves), whereas the edges of the images of nearby objects, and particularly of the wires "above" the UO, are relatively smooth. Observation (b) may be related to an atmospheric effect on images: the distortion of an image increases quite rapidly as the object distance increases up to about a kilometer, and then the distortion increases very slowly or not at all with further increases in range. The atmospheric conditions (sunny morning, no wind) may have been conducive to the production of image distortion.<sup>9</sup> Thus, the jaggedness of the edge of the UO image may be an indication that it was more than several hundred meters away.

In conclusion, to echo Hartmann,<sup>1</sup> the simplest interpretation of these photos is that they, indeed, show a distant object. However, simplicity does not necessarily imply truth. Further research will be necessary to resolve this case "once and for all."<sup>10</sup>

TABLE IV

$\gamma$	$E_0$	k	$B_{UO}/B(r=0)$	Range	Diameter*	Thickness**
1.0	0.00436	0.0025	2.75	2.4 km.	68 m.	9.6 m.
0.7	0.0063	0.0017	2.60	1.54 km.	44 m.	6.2 m.
0.6	0.0068	0.00055	2.34	1.52 km.	43 m.	6.1 m.
0.5#	0.0076	0.0002	2.18	1.06 km.	30 m.	4.2 m.
0.4#	0.0084	0.0001	1.85	0.46 km.	13 m.	1.9 m.
0.3#	0.0093	0.00009	<1	0 km.	0 m.	0 m.
---if nearby under wires---						
				5 meters	14 cm.	2 cm.

\*angular diameter in photo 1 is 0.0283 radians (in photo 2, 0.0248 radians)

\*\*angular thickness excluding "UO pole" in photo 2 is 0.004 rad.; # curves for these values of  $\gamma$  were synthesized by extrapolation from published curves with  $\gamma$  in the range 0.6 to 1.0.

#### Bibliography

1. Scientific Study of Unidentified Flying Objects, E.U. Condon, Ed. (Bantam, 1969, pg. 396)
2. P.J. Klass, UFO's Explained, Random House, New York (1974)
3. R. Sheaffer, private communication
4. C. Grover, private communication

5. Note that the range increases with assumed darkness of the bottom of the UO. If the bottom were black,  $B(r=0) = 0$ , the range would be about 2.4 km. with  $\gamma = 0.6$ .
6. Handbook of Chemistry and Physics, Forty-first Edition, (Chemical Rubber Publishing Company, Cleveland, Ohio 1960)
7. Measurements have been made of the brightnesses of the bottoms of several model UO's made of uniformly translucent materials. The models were oriented with respect to the sun in the same way as was the UO in photo 1. The brightness of the bottom of each model was measured as a function of position, with the "front" part being that part closest to the sun (in photo 1 the front part of the elliptical image is at the right hand side). The front part of the bottom was found to be from 20% to 40% brighter than the back part for each model. However, the brightness variation of the image of the bottom of the UO in photo 1 is only  $\pm 5\%$  with the back somewhat brighter than the front. These experiments, and the comparison with the image of the UO, suggest that if the UO were nearby it was not made of a uniformly translucent material.
8. W. Spaulding, GSW Inc., Phoenix, Arizona, private communication. An electron microscope test of the negatives has shown that the grain structure is consistent with that of known Verichrome film, but not with Plus X.
9. However, experiments (e.g. R. S. Laurence and J. W. Strohbehn, A Survey of Clear Air Propagation Effects Relevant to Optical Communications, Proc. IEEE 58, 1523 (1970)) have shown that there is a period of time just after sunrise when the turbulence is quite low. The pictures may have been taken during this period. If this were so, even a very small amount of atmospheric edge distortion would correspond to a rather large distance to the object.
10. I thank Charles Grover, William Hartmann, and Robert Sheaffer for instructive comments on earlier versions of this paper. I also thank NICAP for free access to their files and for assistance in obtaining the negatives.
11. Note added in proof: the fog density of the negatives is consistent with the range of values expected when  $\gamma = 0.5$  to 0.6, but is larger than expected when  $\gamma = 0.3$ . The brightness of the illuminated part of the distant white wall and the brightness of the shaded part of the same wall have been calculated for  $\gamma = 0.3$ , 0.4, and 0.6. The calculated brightness ratios, (illuminated/shaded), are, respectively,  $10 \pm 2$ ,  $3 \pm 5$ , and  $2 \pm 2$ . A field measurement of the same ratio under conditions similar to those when the pictures were taken yielded 1.5 to 2. Thus, both the fog density measurement and this brightness ratio measurement suggest that is not as low as 0.3.

# UFO INTERFERENCE WITH AUTOMOBILE ELECTRICAL SYSTEMS

## Part 1: Headlights

James McCampbell

### INTRODUCTION

The purpose of this paper is to illustrate how physically meaningful information may be sorted out of qualitative and general testimony from UFO witnesses. An essential step is to notice the elements that are common to a large number of independent sightings. Then the significance of each detail of the reports must be deciphered in terms of current knowledge of the physical world. Many other details that are inherent in the episodes, while appearing to be trivial, must be examined carefully before they are discarded as meaningless. A common lament in ufology is the lack of so-called hard, or instrumental, data. Such information is generally lacking in the sighting reports. But it should be observed that an automobile is merely an assemblage of components and circuitry that is reportedly responding to changes in the environment. In other words, the automobile functions as an instrument notwithstanding its design for other purposes. In cases of automobile interference, the analyst does not lean heavily upon qualitative descriptions given by the witnesses. It is not necessary for a citizen to have advanced training in order to report accurately that his headlights went out. As the response of the electrical circuits is a purely physical phenomenon, distinguished from any kind of psychic manifestation or psychological reaction of the witness, a full understanding of the event should be available within the realm of modern science. That expectation, however, must not exclude the possibility that an attempt to solve the problem might turn up something new. The paper is also intended to illustrate the potential value of simple experiments that may be performed with inexpensive equipment.

### ELECTRICAL CONDUCTION

Because the present study must delve into some technical aspects of electricity, the necessary basic information is provided here for the non-specialists. One may be sure that nature has adequately challenged the intelligence of mankind by providing sufficient complexity in the solid state. And the conduction of electricity is no exception. By omitting refinements that are available in elegant, but abstruse, mathematical treatments of the subject, the process may be visualized rather simply. A metal conductor may be thought of as a crystalline structure composed of a matrix of metallic ions with a gas of electrons swarming through the interstitial spaces. These mobile electrons are constantly moving in all directions, are very numerous, and have all energies from zero up to a few electron volts. Their speed may be very great. At an energy of a few electron volts, an electron would be traveling roughly 2,000,000 mph. This situation is only slightly perturbed by imposing an electrical field through the conductor. Interaction between the electronic charge and the field produces a general, net drift of the electron gas that constitutes an electrical current. It is known that the resulting current density,  $I_x$ , is proportional to, and in the opposite direction to, the strength of the electric field,  $E_x$ , acting in the x-direction, so that

$$I_x = -\sigma E_x$$

where the proportionality constant,  $\sigma$ , is a property of the material known as the conductivity. Considered on the microscopic scale, it is obvious that this current density may be expressed in terms of the drifting electron gas, or

$$I_x = -ne\langle v_x \rangle$$

where  $n$  is the number of electrons per unit volume,  $-e$  is the electronic charge, and  $\langle v_x \rangle$  is the average velocity of the electrons in the x-direction. Equating these two expressions for the current density leads to a definition of conductivity,

$$\sigma = \frac{ne\langle v_x \rangle}{E_x}$$

whose reciprocal, the resistivity, becomes

$$\rho = \frac{Ex}{ne\langle n_x \rangle}$$

As the ratio  $\frac{Ex}{\langle n_x \rangle}$  is constant, it is clear that the resistivity of a conductor is inversely proportional to  $n$ , the number of conduction electrons per unit volume. Application of this equation to conductors, however, has carried an implied assumption that the value remains constant for any given material. But its variation for any reason would certainly show up as a change in the resistivity. A reduction in the number of conduction electrons would produce a proportional increase in the resistivity, and vice versa.

It will prove to be more convenient in later sections to think in terms of the number of conduction electrons per atom instead of per unit volume. The following conversion is consequently used

$$n \left[ \frac{\text{electrons}}{\text{cm}^3} \right] = n_0 \left[ \frac{\text{electrons}}{\text{atom}} \right] \frac{A \left[ \text{atoms/mole} \right]}{V \left[ \text{cm}^3/\text{mole} \right]}$$

in which  $A$  is Avogadro's number and  $V$  is the mole volume that, for a pure metal, equals the atomic weight divided by the density. Substituting into the previous expression yields,

$$\rho = \frac{VE_x}{n_0 A e \langle n_x \rangle}$$

that similarly shows the resistivity is inversely proportional to the number of conduction electrons per atom.

It is essential to the following analysis that the meaning of  $\langle n_x \rangle$  be examined more closely. The relevant concepts are presented here but the complete derivations are left to the standard textbooks on solid state physics.<sup>1</sup> Suppose a current is flowing through a wire such that the value of the drift velocity is  $\langle v_x(0) \rangle$  at  $t = 0$ , when the circuit is broken. The drift velocity will then gradually diminish toward zero as an exponential function of time according to

$$\langle n_x(t) \rangle = \langle n_x(0) \rangle e^{-t/\tau}$$

in which the parameter  $\tau$  is a measure of the rate and is known as the relaxation time. It is the time required for the drift velocity to drop to  $1/e$ , or about 37%, of its initial value. Being typically on the order of  $10^{-14}$  seconds illustrates the extreme rapidity with which electrical changes take place. The actual value of  $\tau$  for a given material may be computed from

$$\tau = \frac{\sigma m}{e^2 N m_0}$$

where  $m$  is the mass of the electron and  $N$  is the number of atoms per unit volume.<sup>2</sup>

#### ELECTROMAGNETIC RADIATION

Previous investigations have led the author to suspect that electromagnetic radiation of high frequency is emitted by UFOs as an adjunct to their propulsion system.<sup>3,4,5</sup> Virtually all the interactions between UFOs and the environment may be understood as radiation effects except, of course, the purely mechanical damage and artifacts that have been left at several hundred landing sites. Colored halos and dazzling plasmas that reportedly surround UFOs or cling tightly to their surfaces must be sustained by a continued input of energy. Otherwise, their radiant losses would quickly dissipate the displays. Adequate amounts of energy to produce these effects can not be delivered into the atmosphere throughout most of the electromagnetic spectrum because the atmosphere is virtually transparent. For wavelengths between about 1.5 cm and 0.1 mm, however, resonance absorption in the quantized, rotational states of the water molecule can be quite strong.<sup>6</sup> Only in this region can sufficient radiant energy be transferred into the atmosphere through the water molecule to stimulate the noble gases to luminesce in their characteristic colors or to sustain a highly-ionized, white plasma.<sup>7</sup> Because of the implied prominence of electromagnetic

radiation in the vicinity of UFOs, it is only natural to suspect that radiation may be responsible for the interference with automobile circuits. Also, specific circumstances of the individual case histories themselves suggest that radiation be explored as the causative agent.

#### HEADLIGHT FAILURES

One of the seemingly trivial details that quickly takes on meaning under scrutiny is the design of the headlamp itself. Its internal surface is a smooth parabola with a highly reflective, metallic coating. Light emitted from a filament near the focal point is reflected, in large measure, into paths that are parallel to the lamp axis. A small, auxiliary reflector is commonly mounted in front of the filament to prevent light from emerging at too wide an angle by redirecting it toward the main reflector. This design is highly efficient in confining most of the light into a narrow beam. Placement of the filament a small distance from the focal point provides for aiming the beam and spreading the desired amount of light for general illumination. The headlamp projects electromagnetic radiation of high frequency, namely light, into a concentrated beam in the same way that a parabolic dish antenna projects microwave radiation in point-to-point communication systems. From a reciprocity theorem, it is known that the characteristics of an antenna when receiving are the same as when it is transmitting. The reflector will function as a high-gain, receiving antenna when incident radiation is collimated along its axis. Such incoming radiation would be focused upon the filament, or nearly so. Radiation approaching from even small angles would not be so well focused and the effectiveness as an antenna would be diminished. At large angles, the focus becomes very poor and the effective opening of the lamp becomes significantly reduced as the angle of incidence approaches  $90^\circ$  and its cosine approaches zero. Radiation directed toward the lamp from any point behind the plane of the opening will be reflected away by any metal surface, such as, parts of the car body, or the back side of the metallic lamp lining. Should radiation from UFOs be the cause of lamp failures, such directional sensitivity must be consistently reported. One should turn to the literature with a specific question in mind -- "At the time of headlamp failure, exactly where was the UFO with respect to the car?"

The earliest rash of UFO sightings involving failure of headlamps (along with simultaneous failure of engines) occurred during a well-known French wave of sightings in 1954. They were first described by Michel<sup>8</sup> and subsequently included in extensive tabulations of electrical interference cases by Hall.<sup>9</sup> The question of directional sensitivity of headlamps is quickly settled by scanning the work of Hall and noting the location of the UFOs. Table I below summarizes the French cases from which a few examples will illustrate the point.

On October 11 at Chateauneuf-Sur-Charente, a car motor and headlights failed at the same time that two UFOs were observed at low altitude ahead of the car. Ten days later at La Rochelle, a motorist and child felt shock and heat as the motor and headlights failed and a luminous UFO became visible ahead of the car. The motor and headlights of another car failed as a UFO passed in front and two passengers felt an electric shock. The simultaneous occurrence of physiological responses, such as, feeling heat, numbness, shock, and paralysis is most significant. These effects are known to be produced by high-frequency radiation and a considerable amount of information is available concerning the requisite frequencies, pulse rates, and thresholds. Such data may furnish invaluable clues to understanding the radiation environment during interference with electrical systems and should not be overlooked. In only one instance in the French cases is the present thesis in doubt, that is, that radiation from the UFO entering the headlamps at small angles to the axis is responsible for the lamp failure. In that instance, (October 11, Clamecy) the UFO "took off from a field" at the time of a failure but its exact location is not specified in the available record.

Table I. Electrical Interference in the French Wave of October 1954.

Day	Location	Lights		Engine		Vehicle	UFO Location	Directivity	
		Dim	Out	Miss	Fail			Lamps	Engine
7	St.-Jean-d'Asse		x		x	Car	Over the road	x	x
9	Cuisy		x		x	"	Above		
11	Fronfrede		x		x	"	Crossed road ahead	x	x
11 <sup>a</sup>	Clamecy		x		x	"	Took off from field		
11	Chateaunent ....		x		x	"	Low altitude ahead	x	x
14 <sup>b</sup>	Brosses-Thillet				x	Motorcycle	Ahead (50 yd)		x
16 <sup>a</sup>	Baillolet		x		x	Car	Descended toward road	x	x
18 <sup>ab</sup>	Coheix			x		Light truck	Nearby field		
21 <sup>ab</sup>	Schirmeck				x	Car	On road		x
21 <sup>a</sup>	La Rochelle		x		x	"	Ahead	x	x
27 <sup>a</sup>	Linzeux		x		x	"	Passed ahead	x	x

Table II. Electrical Interference at Levelland, Texas, November 2-3, 1957.

Hour	Location	Lights		Engine		Vehicle	UFO Location	Directivity	
		Dim	Out	Miss	Fail			Lamps	Engine
11:00 pm <sup>a</sup>	4 mi west		x		x	Truck	Approach from right front	?	?
12:00 pm	4 mi east		x		x	Car	On the road	x	x
12:05 am	9 mi east	x	x	x	x	"	On the road	x	x
12:15 am	11 mi north		x		x	"	On the road	x	x
12:15 am	9 mi north		x		x	"	Sitting on road	x	x
12:45 am	4 mi west		x		x	Truck	On highway ( $\frac{1}{2}$ mi)	x	x
1:15 am	2 mi northeast	x		x		Car	?	?	?

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- a. In these cases the witnesses reported physiological effects such as heating, shock, numbness, and paralysis. All these responses are known to be produced by high-frequency radiation and this aspect of the sighting is likely to provide clues to the intensity and frequency.
  - b. The absence of comment concerning headlights may not be interpreted to mean that they remained on. The event may have taken place during the day time with lights turned off. The requisite details for a complete understanding of these cases are not available.

A second series of sightings that was noted for automobile interference occurred around midnight on November 2, 1957. During a period of about  $2\frac{1}{2}$  hours, at least seven apparently independent events near Levelland, Texas were reported to the police. The locations of the UFOs in these cases, based upon recent descriptions, are evaluated in Table II.<sup>10</sup> The typical event in this series begins when a driver on a lonely road at night notices something in the road up ahead at some distance. Upon approaching cautiously, the driver is startled by the failure of his headlights, engine, and radio when the car has closed to within a few hundred feet of an object that is sitting right on the highway directly in the headlight beams.

These circumstances are not at all unique as similar experiences continue to be reported throughout the world, including a case involving a business executive in the South Pacific area that was studied at the University of Colorado.<sup>11</sup> A UFO passed over his convertible then hovered over the highway when the headlights, engine, and radio failed. During a reenactment of this sighting for investigators, the witness sketched a football shape 4 inches long on the inside of the windshield with a wax pencil. The object had covered the roadway (33 ft) and his eyes were normally 18 to 20 inches from the windshield. The UFO had clearly been at a range of about 160 ft. at the time of the interference. Similar situations continue to be reported up to the present. Eight of them were included in a survey in England of UFO reports that were published world-wide during 1973.<sup>12</sup> It seems safe to say that the record supports a correlation between headlight failures and the position of the UFO at the time, namely, it is within the headlight beam or not far displaced from it. Also, a number of instances illustrate the reverse argument. UFOs hovering directly overhead, standing or maneuvering off to the side, or chasing cars seldom, if ever, have killed the lights although other electrical problems may have been reported.

Microwave antennas must be designed to transmit a signal in a narrow beam and to provide high gain in the receiving mode. These functions impose an important condition upon the size of the antenna. For effective performance, the diameter of a parabolic dish must be roughly 10 times greater than the wavelength of the radiation it is designed to handle. Much larger waves will be focused poorly or will pass by without noticing the antenna. Consequently, the strong directional sensitivity of automobile headlamps in the presence of UFOs, functioning as miniature antennas, implies an upper limit to the wavelength of the radiation involved. For a typical lamp diameter of 16 cm, the wavelength would have to be about 1.6 cm or smaller. This conclusion compares favorably with results from an entirely different line of inquiry relating to resonant absorption by water molecules in the atmosphere.

#### POOR BOY EXPERIMENTS

Incandescence of a lamp filament is the direct result of an elevated temperature due to energy delivered to it by the passage of electrons. Reduction in the current will reduce the filament temperature and its luminosity. But the current is a dependent variable, determined exclusively by the filament resistance and the applied voltage. Either the resistance or the voltage must be changed to effect a dimming or extinction of the light. Fortunately, numerous sighting reports provide ample indication of which change takes place. It is not uncommon for some electrical circuit in an automobile to be defeated while others remain in normal operation. In other words, the power supply is not disrupted hence the dimming must be caused by a change in resistance of the filament. The question of how much change is required to produce a noticeable dimming or extinction may be answered quite readily by measurement.

A standard replacement headlamp, GE 6014, 12-volt, "Plus 25", was purchased for testing. Power was supplied by an old but serviceable 12-volt battery, Delco Energizer E-3000 Y81, backed up by a Sure 600 Fire, Woodward-Schumaker battery charger rated at 6 amp. The voltage drop across the filament was monitored with

a Mura Meter Model NH-65 while the current through the circuit was determined with a Shurite Model 750, 10-amp DC meter. The filament resistance at operating temperature was found to be

$$R = \frac{V}{I} = \frac{12.0}{4.2} = 2.86 \text{ ohm}$$

and the power dissipation was

$$P = Vi = 50.2 \text{ watts}$$

Next, a 10-ohm rheostat, Ohmite, Model E, Stock 0106,  $12\frac{1}{2}$  watt, was inserted into the circuit. The projected beam of the lamp on a white wall was watched carefully by one person while another slowly increased the extraneous resistance in the circuit by turning the rheostat. Upon first noticing the white spot to dim, readings of the voltage and current were taken. Typical results were 11.0 volts and 4.0 amps. The corresponding resistance of the filament was lowered due to a decrease in its temperature and found to be

$$R = \frac{V}{I} = \frac{11.0}{4.0} = 2.75 \text{ ohm}$$

while the power dissipation was

$$P = Vi = 44.0 \text{ watts}$$

In other words, dimming became noticeable at a reduced power level of about  $(50.4 - 44.0)/50.4 = 0.127$  or when the lamp was operating at about 87.5% of its normal value. One may now ask what increase in resistance of the filament itself would be required to produce the same drop in power level. Letting  $P_2 = 0.875P_1$ ,

$$P_1/P_2 = P_1/0.875P_1 = (V^2/R_1)(V^2/R_2)^{-1} = R_2/R_1$$

and canceling  $P_1$  gives

$$R_2 = 1.143 R_1$$

or an increase of resistance by 14.3%. In view of the definition previously developed for resistivity, such a change in the filament resistance would require a corresponding change in the number of conduction electrons per atom as there is no other degree of freedom in this problem.

In a similar manner, it was found that extinction of the light was observed at circuit values of 4.0 volts and 2.1 amps, or a power level of 8.4 watts. At this point the filament temperature had fallen to about  $500^\circ \text{C}$  where all the radiative loss was in the infrared and it produced no visible light.<sup>13</sup>

It is of considerable interest to establish some quantitative estimates of the spread of a typical headlight beam as such data may be used in the reciprocal sense as a measure of the headlamp performance as a receiver. A large sheet of drawing paper was, therefore, ruled with a long horizontal and a vertical line. Small holes were cut at 2" intervals along the lines then the paper was mounted in a rigid, moveable frame. From a distance of about 7 ft, one high-beam lamp of a 4-lamp system on a 1966 Lincoln was shone onto the paper whose position was adjusted to place the origin at the center of the bright spot. The intensity of light shining through the holes was then measured with an inexpensive light meter, Sekonic Micro-Leader, set at ASA 12. Readings of the correct photographic exposure times were made arbitrarily at f 2.8, interpolating on the time scale as required. The reciprocal of the readings gives an indication of the relative intensities at the various locations. Measurement of all relevant distances provided data for calculating the appropriate angles. The results, plotted in Fig.1, show the relative intensities as a function of the angle away from the axis both in the horizontal and vertical directions. There is a rather broad, horizontal coverage amounting to a total width of about  $13^\circ$  in which the beam intensity is

greater than 10% of its maximum value. The spread is considerably more restricted in the vertical direction, with the maximum being only about  $6^\circ$ . Above the axis, there is a very sharp cut-off at about  $3^\circ$ . Viewed as a receiving antenna, the lamp would function reasonably well if the transmitting source were within a horizontal range of about plus-or-minus  $7^\circ$  of the axis and elevated not more than about  $3^\circ$  above it. Especially interesting in these measurements is the sudden blackout above the axis that is undoubtedly designed to prevent blinding approaching motorists. By way of example, the maximum altitude of a radiation source within the  $3^\circ$  limit would be about 5 ft at 100-ft range, 10 ft at 200-ft, and so on. These restrictions may not be applied indiscriminately as no consideration has been given to an intentional misalignment between the headlamp beam and the axis of the automobile. But they provide some insight into why headlight failures are produced by UFOs that are directly ahead of the car at low altitude or are sitting on the roadway.

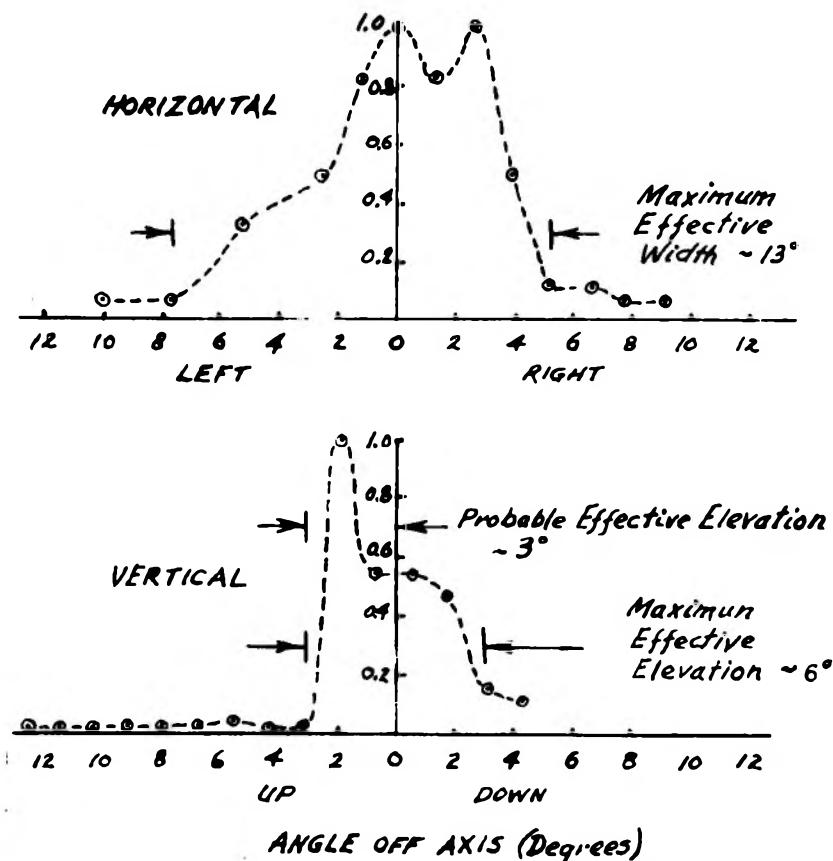


Fig.1. Headlamp Beam Width

Upon destroying the glass envelope of the GE 6014, the dimensions of one of the filaments (high- and low-beam filaments are separate) were estimated with an optical comparator, a mounted magnifying glass having a built-in scale. It was found to be a tight helix having 21 turns of tungsten wire about 0.0190 cm in diameter. The coil itself was about 0.591 cm long and 0.0619 cm radius. Short pig-tails of the wire leading to mounting posts were each 0.152 cm long.

General Electric Company kindly provided the engineering drawing and technical specifications for the lamp, including a spectral transmissivity curve from 0.26 to 5.0 microns. "The reflector is a parabola of revolution of  $1\frac{1}{2}$ "

focal length with a maximum diameter of the open end of 6.319". It is made of G.E. #725 (Corning #7250) borosilicate glass with a wall thickness of about 0.130". ... The low beam filament (passing beam) is centered on the focal point but 0.010" ahead of focus. This filament is a tungsten wire helix of 0.055" diameter by 0.226" length. The upper beam filament (driving beam) is centered 0.085" down, 0.090" right, and 0.015" ahead of the focal point. This filament is approximately 0.055" in diameter and 0.249" long."<sup>14</sup>

#### SPECTRAL TRANSMISSIVITY

In order for electromagnetic radiation to exert any influence upon the filament, it must penetrate the glass lens. This requirement introduces a significant complication as the ability of glass to transmit radiation varies wildly across the spectrum, varying considerably for different types of glass. All the common glasses, of course, are highly transparent between the ultraviolet and the infrared, becoming completely opaque at about 5 microns. Deep into the far infrared and beyond, however, they again begin to transmit but detailed data is limited. An inquiry to the Corning Glass Works produced a most courteous response forwarding what information is known concerning their Code 7250 borosilicate glass or judged to be relevant to it.<sup>15</sup> "At 1 mm thickness transmittance of fused silica glass is about 8% at  $80\mu$ , 30% at  $130\mu$ , 60% at  $275\mu$ . Crystalline quartz,  $\text{SiO}_2$ , is better. At 1 mm, T = 20% at  $40\mu$ , 75% at  $100\mu$ , up to 80% at longer wavelengths. Multi-component glass, such as Code 7250, will have higher absorption in this far-infrared region...." although specific data was not available. It was expected to remain opaque out to about 100 microns for 1 mm thickness. Dielectric properties at microwave frequencies have not been measured although at 1 MHz the dielectric constant is 4.7 and  $\tan \delta$  is 0.0027.

Even though transmission through borosilicate glass may be generally limited in this region of the spectrum, a unique physical phenomenon will have a pronounced influence. The process, known as resonant transmission, occurs when the wavelength in the glass is equal to half the wavelength in air. At that point, the internally reflected wave is canceled by the incident wave and all the energy, excepting small internal losses, is transmitted. This theory and the experimental verification were worked out during the development of design criteria for radomes that, naturally, must be constructed of dielectric materials.<sup>16</sup> The fall-off on both sides of the half-wavelength transmission peak of essentially 100% drops almost linearly to 67% when the ratio of material thickness to internal wavelength is either 0.3 or 0.7, for materials whose dielectric constant equals 4. The wavelength inside glass,  $\lambda_g$ , depends upon its index of refraction,  $n$ , such that

$$\lambda_g = \lambda_0 / n$$

where  $\lambda$  is the wavelength in air. The index of refraction equals the square root of the ratio of dielectric constants

$$n \approx \sqrt{\epsilon / \epsilon_0}$$

where the value for air,  $\epsilon_0$ , is taken as unity. The condition for resonance transmission through glass of thickness,  $t$ , is

$$t / \lambda_g = \frac{t}{\lambda_0} \sqrt{\epsilon} = 0.5$$

from which, the wavelength in air, utilizing specific values previously noted, becomes

$$\lambda_0 = \frac{t}{0.5} \sqrt{\epsilon} = \frac{0.33}{0.5} (4.7)^{\frac{1}{2}} = 1.43 \text{ cm}$$

There will also be subharmonic resonances at integral fractions of  $\lambda_0$ , such as, 0.72, 0.48, 0.36 cm, etc. This analysis simply treats the lens as a flat plate whereas, in fact, it is curved and has numerous irregularities on its surface. Yet here again, it is clear that the circumstances admit of transmitting radia-

tion through the glass to the filament in a range of wavelengths whose role is under suspicion.

#### CONDUCTION AND ATOMIC STRUCTURE

Atoms of the noble metals - copper, silver, and gold - have a single valence electron that is loosely coupled to a stable, ionic core. When these atoms are assembled into a crystalline structure of the pure metal, it is expected that their valence electrons would serve as mobile transporters of electrical charge, a supposition that is approximately correct. More precise knowledge on this point is available from measurements of the Hall effect, the polarization in a current carrying conductor by a transverse magnetic field. The reciprocal of the Hall constant gives the number of conduction electrons per atom which, for the noble metals, instead of simply 1.00 as expected, ranges from 1.25 to 1.40.<sup>17</sup> It is seen that the valence electrons are augmented from 25 to 40% by a certain degree of mobility of other electrons that are normally associated with fixed orbits in the individual ions.

Tungsten, on the other hand, behaves quite differently. It has six valence electrons of which two are in its outer, most weakly coupled orbits. Should these two electrons become conduction electrons in the tungsten crystal, then its conductivity should be roughly twice that of copper. In truth, its conductivity is only about one-third that of copper. Its inverse Hall constant of 0.82 indicates a net loss of 1.18 electrons per atom that is clearly related to the low conductivity of tungsten. (A positive sign of the Hall constant for tungsten, indicating hole-type transport of charge, is not considered to be significant in the present context.) A theoretical explanation for these facts was first published by Mott in 1935 and the status of that work was summarized by him in 1964.<sup>18</sup> In essence, the Mott theory says that mobile electrons are frequently scattered into states that are associated with individual ions. Such scattering of a transient electron into an orbital of a particular ion would remove it from the conduction band, at least temporarily.

The use of tungsten in lamp filaments, therefore, appears to be another one of those details whose full implication must be explored. In the build-up of elements in the periodic table, nature most frequently fills up electronic shells in a simple sequence from the lighter to the heavier elements. Under certain circumstances, some levels are skipped over and left vacant because the forces within the atom make those assignments the most economical in terms of energy requirements. Elements having such gaps in their structure are known as transition elements. They are quite numerous, falling into five series<sup>19</sup>

Iron	Sc(21) - Ni(28)
Palladium	Y(39) - Pd(46)
Platinum	La(57), Hf(72) - Pt(78)
Actinide	Ac(89) - U(92)
Rare Earth	Ce(58) - Lu(71)

Tungsten is the fourth member in the platinum group and some details of its internal structure are revealing. Nowadays it is common knowledge, or should be, that an atom is composed of an extremely tiny core, called the nucleus, that is surrounded by a cloud of electrons. Due to the presence in the nucleus of a certain number of protons that are positively charged, electrical forces will assemble negatively charged electrons in its vicinity. Because the unit charge of the protons and electrons is equal but opposite in sign, the stable atom will have the same number of electrons in the cloud as there are protons in the nucleus. The cloud of electrons, however, is not merely a disorganized cluster. It is highly structured. Nature arranges the electrons into specific shells and subshells according to some very specific, but unfortunately complex, rules.<sup>20</sup> Table III shows the atomic structure of tungsten with emphasis upon its outer

two shells corresponding to principle quantum numbers of 5 and 6. The subshell 5d contains 4 electrons whereas the rules allow 10. In other words, there are 6 vacancies in the 5d subshell that are actually occupied in other elements. Fourteen orbits of the 5f subshell are similarly unfilled. Counting other subshells indicates a total of 26 vacancies per atom in the atomic structure whose energy levels are close to or slightly higher than that of the 2 loosely bound valence electrons in 6s.

Table III. Atomic Structure of Tungsten

Principle Quantum Number	1	2	3	4	5					6	
Shell Designation					0					P	
Angular Momentum Quantum Number		0	1	2	3	4	5	6	7	0	1
Subshell Designation		5s	5p	5d	5f	5g	6s	6p			
Allowed Number of Electrons		2	6	10	14	18	2	6			
Number of Electrons Present	Filled	2	6	4	0	0	2	0			
Ground State Designation					5d <sup>4</sup>		6s <sup>2</sup>				
Number of Vacancies	None	0	0	6	14	18*	0	6		Total	
										26*	

\* As the energy levels of the 5g states are probably too high to be easily occupied, they are omitted from the summation.

Now consider the changes that take place in the crystalline lattice of tungsten ions surrounded by a 'gas' of conduction electrons, or s-type electrons. When an s-electron is scattered into one of the unoccupied d-states, it is taken out of service as a conduction electron and temporarily entrapped in an orbit associated with a particular ion. There is such a surplus of unoccupied states in tungsten that it should be relatively easy to deplete the entire supply of its conduction electrons by this mechanism. As the energy levels of some of the unoccupied states are higher than the s-states, such entrapment represents an excited state of the atom for which the mean lifetime is usually quite small, on the order of  $10^{-8}$  sec. But this amount of time must be viewed from the perspective of electronic processes. The mean time between scattering collisions by the conduction electrons is their relaxation time,  $\tau$ , previously indicated to be on the order of  $10^{-14}$  sec. Consequently, entrapment in a d-orbital would last about 1 million times longer than the average time between collisions when the conduction electron is in free flight among the host ions. This process is quite effective in keeping conduction electrons off the street and stored in parking spaces. By restuffing a vacant state at a rate equal to the reciprocal of its mean lifetime, on the order of  $10^8$  times per second, one would effectively remove one conduction electron per atom from service. An equivalent effect that is more easily achieved would utilize the numerous vacancies given in Table III. Because tungsten is a transition element, it is uniquely capable of swallowing its own conduction electrons.

Conduction electrons, like their cousins within the ionic cores, are subject to certain quantum restrictions. Their resulting energies are given by the Fermi-Dirac distribution in the electron gas model. The number of allowable energy states starts at zero, increases in a parabolic fashion up to a maximum value, known as the Fermi level. At absolute zero, all states below the Fermi level are filled. The electron gas is in a state of equilibrium with the host lattice that, even at absolute zero, retains a certain amount of vibrational energy, known as the zeropoint energy in quantum mechanics. At elevated temperatures, the Fermi level decreases slightly. Also a limited number of electrons just below the Fermi level are bounced into states that are slightly above that level, having an exponential decrease according to Boltzmann. These minor

changes leave the vast majority of the electrons occupying states essentially the same as they would at absolute zero. Hence, the energy distribution of conduction electrons is virtually independent of the temperature.<sup>21</sup> At any temperature, electrons are continually being scattered into the orbitals having  $\ell \neq 0$  and exiting again into the conduction band. This process can obtain for all unfilled states whose energies lie below the Fermi level, or slightly higher. Meanwhile, the system remains in equilibrium without any net gain or loss of energy.

It is necessary to expand upon these concepts by taking into account more recent work that is highly sophisticated. Extensive research has been done in treating the valence electrons in a crystal as waves. One must solve Schroedinger's equation for electrons within the ions and the wave-like propagation of the conduction electrons, then match the solutions at the spherical interface. Applying a method known as the Augmented Plane Wave (APW) with extensive computer assistance, Petroff calculated the density of energy states of conduction electrons in tungsten. Three sharp peaks were found, lying roughly below the Fermi level of 5.25 ev at 3.50, 2.35, and 1.25 ev.<sup>22</sup> More electrons should be found to have velocities corresponding to these peaks. That this result and the underlying theoretical model correspond to physical reality could be checked if one could devise a way of measuring the velocity distribution of the conduction electrons. In a clever but difficult experiment, conduction electrons were literally popped out of tungsten using the photoelectric effect of ultraviolet light and their energies were measured. After accounting for the work function at the metal surface, the energy distribution was found to correspond well with the predicted peaks, although the inherent precision of the method appears somewhat limited.<sup>23</sup> Kmetko at Los Alamos Scientific Laboratory utilized the APW method in an extensive study of the compressibility of metals.<sup>24</sup> The method must account for electrons occupying all energy states, including those that are distinguished by having different values of the angular momentum quantum number,  $\ell$ . It is capable, therefore, of resolving the charge associated with valence electrons into components of different  $\ell$ -like characteristics. The results for tungsten are given in Table IV. In assessing small changes in the calculated charges between the normal lattice spacing of 3.15 Å and a lattice compressed to 2.84 Å, it was found that the total d-character of tungsten was very stable.

Table IV. Charge Distribution in Tungsten Lattice

Angular Momentum Quantum Number, $\ell$	0	1	2	3	Total
Character Designation	s	p	d	f	
Charge Inside APW Sphere	0.350	0.352	3.914	0.069	4.685
Plane Wave Charge Outside Sphere	0.232	0.247	0.816	0.069	1.364
Total Charge Per Atom	0.582	0.600	4.730	0.138	6.049

Comparison with Table III clearly reveals the location of the four valence electrons in the 5d state that are inside the sphere. The remaining two valence electrons, which in the isolated atom occupy 6s, are seen to spread out among the other states. Considering the total charge by states, it appears that these two electrons are distributed so that only 0.582, on the average, remains s-like.

In combining the concepts of Mott scattering and the density of states, Shimizu analysed the change of electrical resistivity of tungsten as a function of temperature. Also its magnetic susceptibility and spin susceptibility. Favorable comparison of calculated values and experimental data lead to a conclusion that Mott scattering is a satisfactory approximation.<sup>25</sup> A recent text on electronic processes in metals also confirms the usefulness of the Mott perspective that considers the transport of electrical charge to be provided largely by electrons in states of s/p symmetry while those in states of d symmetry are assumed to be quite immobile, being strongly localized on the ions.<sup>26</sup>

A natural extension of that concept is to consider that all electrons in

states having non-zero values of the angular momentum quantum number to be immobilized. The data of Table IV is consequently adopted for that purpose. (It is emphasized that the work by Kmetko had nothing to do with the conductivity of tungsten so that any misapplication of the data in that regard is solely the responsibility of the author.) The effective number of conduction electrons per atom is taken as the fraction in the s-state, namely, 0.582. And the remainder of the original two outer valence electrons per atom is taken as distributed according to 0.600 in p, 0.730 in d, and 0.138 in f. Adopting the notation of  $n_e$  to designate the number of electrons per atom from the original two in 6s, the number on the average entrapped in an orbital of a particular ion is

$$\sum_{\ell \neq 0} n_\ell$$

from which the conservation equation may be written as

$$n_0 + \sum_{\ell \neq 0} n_\ell = 2$$

where  $n_0$  is the number of conduction electrons per atom. This relationship, it will be noted, is quite different from one requiring that the value of  $n_0$  be fixed. It admits of a change in the balance between the number of electrons remaining free and the number entrapped.

#### LOCAL EQUILIBRIUM

It is evident that the ejection of an electron from entrapment in an orbital is compensated by the introduction of a replacement following a scattering event. In the free atom, the lifetime of the excited states can be calculated from the transition probabilities. When the sum of transition probabilities to all lower states is high, the mean lifetime will be small and vice versa. Specific energy levels of the states are available from the known spectrum of tungsten.<sup>28</sup> Circumstances in the crystal lattice, however, are much different. The balance between the number of electrons, on the average, remaining in orbital states versus those in the conduction band reflects a minimum energy of the system. And the transition of an orbital electron back into the conduction band is not governed by the mean lifetime of the state in the free atom. It may occur only when the receiving state is unoccupied. The process is not a typical rate-balance problem but one that is governed by quantum mechanical restrictions. In order to describe this situation in reasonably simple terms, it is assumed that the number of electrons remaining in orbitals due to scattering is essentially independent of the number of conduction electrons. That number will be treated as a constant even though the number of conduction electrons may be substantially depleted, or

$$\sum_{\ell \neq 0} (n_\ell)_{scat} = 1.418$$

#### RADIATION PENETRATION INTO TUNGSTEN

For radiation density of  $I$  ( $\text{W/m}^2$ ) incident along the axis of a headlamp, the energy focused upon the filament, assuming 100% efficiency, would be simply proportional to the area of the lens,  $A(\text{m}^2)$ , or

$$E_0 = IA$$

Due to the fineness of the filament and its helical shape, the radiation may be considered as impinging perpendicular to its surface. As the radiation is distributed over the projected area of the filament, the density on the surface becomes

$$I_0 = IA/a$$

and the projected area,  $\alpha$ , is the filament length times its diameter. The strength of the electric vector,  $E$ , in the electromagnetic wave can be established from the Poynting relation

$$I_0 = 2.65 \times 10^{-3} E^2$$

expressing the field strength in volts per meter.<sup>29</sup> Most of the energy, however, will be reflected off the tungsten surface, with only a fraction penetrating into the interior as given by the transmission coefficient, approximately

$$R_t \approx \frac{2\omega\delta}{c}$$

typically amounting to about 1% for 1-cm waves in copper.<sup>30</sup> The phase angle velocity is denoted by  $\omega$ ,  $c$  is the velocity of light, and  $\delta$  is the skin depth as defined below. Radiation within the metal will be absorbed such that the density decreases exponentially with the depth,  $x$ , according to

$$I(x) = R_t I_0 e^{-x/\delta}$$

Thus,  $\delta$  is the thickness of a layer through which the radiation density is reduced by 1/e. The skin depth may be computed from the electrical properties of the conductor<sup>31</sup> and it is approximately  $3 \times 10^{-4}$  cm for tungsten in the range of wavelengths of interest.

As the classical model of an electrical charge being accelerated by the electric field of an electromagnetic wave has proven to be most satisfactory under similar circumstances, it is selected here to analyse the absorption of radiant energy inside the metal. It was previously shown that the time of flight of an electron between collisions was very short in comparison with the period for radiation on the order of 1-cm wavelength so that the electric vector would not change appreciably during the time required to execute one mean free path. The average effective field then becomes

$$\bar{E} = \frac{E}{\pi} \int_0^\pi \sin x dx = \frac{2}{\pi} E$$

acting upon a conduction electron. The equation of motion of the electron shows its acceleration to be

$$a_y = \frac{e}{m} \bar{E}_y$$

in the direction of the electric field which is considered to be randomly distributed with respect to the x-direction. Starting from rest, the electron will pick up a certain velocity during its transit of a mean free path in time,  $\tau$ , of

$$v_y = a_y \tau = \frac{e \bar{E}}{m} \tau$$

and will have acquired kinetic energy from the field during this period amounting to

$$\frac{1}{2} m v^2 = \frac{1}{2m} (e\tau)^2 E^2$$

or, taking into account the averaging process above,

$$\frac{1}{2} \left( \frac{2e\tau}{\pi} \right)^2 E^2$$

Substituting from the Poynting relation gives this energy as

$$76.4 \frac{e\tau}{m} I$$

that is seen to be proportional to the radiation density. Consequently, the energy absorbed by the conduction electrons will follow the exponential decrease of the radiation density as it penetrates into the conductor. In absolute practical units, the energy pickup per electron between scattering collisions is

$$0.215 \times 10^{-39} \text{ watt sec} = 1.34 \times 10^{-21} \text{ ev}$$

per unit of local radiation density,  $I(\text{W/m}^2)$ .

The amount of energy absorbed by an electron during a mean free path is so small that any change of its behavior in the classical sense would be undetectable. But some quantum effect is not ruled out. In absorbing energy from radiation, the electron must move up the energy ladder. It may not readily do so and remain in the conduction band. That option is largely foreclosed by the Pauli exclusion principle that will not allow additional conduction electrons into energy states that are already occupied. It is postulated that the small energy pickup, in effect, acts as a lever to pry the electrons out of the conduction band. The first opportunity to make an adjustment occurs at the next collision where the electron and target ion must amalgamate their energies and angular momenta to insert the electron into a vacant orbital. Proof that such a mechanism is operating may not be possible but it appears to be worthwhile to see if the concept is compatible with the knotty facts being explored. Especially so, as a survey of the numerous processes in which the behavior of conduction electrons is known to be modified by radiation revealed no hints to the author of a mechanism that would explain the present problem.<sup>32</sup>

A new parameter is defined as the coefficient of radiation-induced entrapment,  $r$ , being the number of electrons per atom that are maintained in orbitals per unit of radiation density in watts per square meter. Symbolically,

$$\sum_{\ell \neq 0} (n_\ell)_{\text{rad}} = rI$$

It does not appear likely that a value for  $r$  can be calculated from fundamental principles but it should be possible to evaluate it from empirical data. Hopefully, the UFO sighting reports provide such information. Combining the entrapment due to radiation and scattering give the local balance expression as

$$\sum_{\ell \neq 0} [(n_\ell)_{\text{scat}} + (n_\ell)_{\text{rad}}] = 1.418 + rI$$

#### MIGRATION OF CONDUCTION ELECTRONS

As conduction electrons are removed from the conduction band by radiation near the surface of the filament, the electron gas will expand to evenly fill the 'container'. The density of conduction electrons throughout the wire will then be less than the initial value. Imbalances in the internal electric field will also occur. Ionic cores that formerly carried a single positive charge would become neutral upon gaining an extra electron. The addition of more electrons would make them progressively more negative. The resulting electrical field will oppose the flow of electrons toward the periphery of the wire. But ordinary electric fields in conductors have been seen to be secondary to the basic behavior of the electron gas. The local supply of conduction electrons, being depleted by entrapment, is partially replenished by diffusion from a large but limited reservoir in the interior. Consequently, the previous conservation equation is no longer valid. The conservation concept must be expanded to account for all the electrons in the wire.

The wire may be visualized in terms of annular layers, as the rings of a tree trunk, each having a thickness of  $\delta$ . Recalling the values being used indicates that the number of such layers would be

$$\frac{0.055 \text{ in}}{2} \frac{2.54 \text{ cm/in}}{(3 \times 10^{-4})} = 233$$

Let these layers be numbered sequentially starting with zero on the wire surface and let the average radiation density in a layer be represented by the

value at its midpoint. If the intensity just penetrating the surface is  $I'$ , then the effective value for the zero-th layer is

$$I_0 = I' e^{-0.5\delta/\delta} = 0.607 I'$$

and all other such values are given by

$$I_n = I' e^{-(\frac{2n+1}{2})\delta}$$

for the  $n^{\text{th}}$  layer. The influence of radiation is neglected at depths greater than the seventh layer because its value at that point will have fallen to nearly  $10^{-3}$  of the inner-surface value. Based upon the radius to the midpoint of each layer and its thickness, the volume per unit length may be closely approximated by

$$V_n = 2\pi [R - (\frac{2n+1}{2})\delta]\delta$$

Under the specific circumstances here, this volume for each of the seven annuli is, to within 2%,  $1.30 \times 10^{-4} \text{ cm}^2$ . Letting  $N$  be the number of atoms per cubic centimeter, one can calculate in general terms the total number of electrons entrapped in each region of the wire as in Table V. The total number of electrons entrapped by radiation in the  $n^{\text{th}}$  layer becomes

$$1.3 \times 10^{-4} N n I' e^{-(\frac{2n+1}{2})}$$

The original supply of conduction electrons per unit length was

$$\pi R^2 0.582 N = 0.00896 N$$

whereas the final supply must be

$$\pi R^2 N n'_0 = 0.0154 n'_0$$

Now overall conservation requires that

Increased Entrapment = Decreased Conduction

$$1.25 \times 10^{-4} N n I' = 0.00896 N - 0.0154 N n'_0$$

which upon factoring  $N$  and regrouping gives

$$n'_0 = 0.582 - 0.00812 \pi I'$$

Unfortunately, further pursuit of a final answer must be temporarily suspended at this point to bring forth information from independent sources.

#### CALIBRATION

It will be recalled that some witnesses reported feeling heat while sitting in their cars during the electrical failures. The necessary energy to produce that sensation was quite likely delivered by radiation from the UFO that penetrated the windshield and flooded the face of the witness. Any information concerning the ability of radiation of the appropriate wavelength to produce such heating would be useful and some experiments along these lines were conducted at the Naval Air Development Center. A microwave generator was arranged to project 3-cm waves upon the foreheads of human, test subjects. The forehead was selected as the target because it is relatively flat and, having a high concentration of subcutaneous heat sensors, it has a low threshold. The radiation was pulsed at  $2,500 \text{ sec}^{-1}$  with a pulse width of 0.4 microseconds. It was directed through a shield to expose  $37 \text{ cm}^2$  of the forehead. The subjects were asked to actuate a switch signaling the onset of feeling warm under a variety of conditions. Their responses were analysed and compared to similar data that had been obtained previously by the same team for radiation in the far infrared. Fig. 3 summarizes the results of these experiments.<sup>33</sup> The threshold of warmth is slightly dependent upon the period of irradiation, higher intensities being

required for the subject to respond within a second or two. But this effect fades out very quickly. After exposure for a few seconds, the threshold has stabilized at a radiation flux of about 3.5 mcal/sec/cm<sup>2</sup> for 3-cm waves compared to about 0.6 for far infrared. The 1/e depth for 3-cm waves in tissue is only about 2mm. So these waves are absorbed close to the surface and are nearly as effective in producing the sensation as far infrared. It is possible to interpolate between the experimental curves to obtain the expected threshold for wavelengths in the range of 1.5 cm and smaller. It appears from Fig. 2 that a suitable value would be about 2 mcal/sec/cm<sup>2</sup>. Had the UFO witnesses been exposed to intensities more than an order of magnitude greater, they would have suffered burns that were not reported. Thus, one may estimate that radiation flooding the scene during the electrical failures was on the order of 10 mcal/sec/cm<sup>2</sup>, or converting to preferred units,

$$10 \frac{\text{mcal}}{\text{sec cm}^2} \left( \frac{1\text{mW}}{0.2388 \text{ mcal/sec}} \right) = 41.9 \frac{\text{mW}}{\text{cm}^2}$$

Focusing such a flux by the headlamp would produce a radiation density just inside the filament of

$$I' = R_i \frac{A}{\alpha} I_0 = \frac{10^{-2} 2.04 \cdot 10^{+2} 41.9}{0.140 \cdot 0.574} = 1,063 \frac{\text{mW}}{\text{cm}^2} = 1.06 \times 10^4 \frac{\text{W}}{\text{m}^2}$$

A second piece of useful data is derived from the simple experiments with a typical headlamp. It was found that the operating power at extinction was 8.4 W compared to a normal rating of 50.4 W. Consequently the power output had fallen to 0.167, or 16.7%. The resistance change within the filament itself that would produce the same effect is simply the reciprocal according to

$$\frac{P_1}{P_2} = \left( \frac{V^2}{R_1} \right) \left( \frac{V^2}{R_2} \right)^{-1} = \frac{R_2}{R_1}$$

and it was previously shown that resistance is inversely proportional to the number of conduction electrons per atom. Therefore, at extinction, the number of conduction electrons per atom becomes

$$n'_e = 0.167 n_e = 0.167(0.582) = 0.0972$$

Utilizing these values of  $I'$  and  $n'_e$  provides a rough estimate of the parameter,  $r$ , as follows from the previous expression for  $n'_e$

$$0.0972 = 0.582 - 0.00812 r (1.06 \times 10^4)$$

so that

$$r = (0.582 - 0.0972)/130 = 3.73 \times 10^{-3}$$

from which one may calculate the corresponding number of electrons that are stored in orbitals in the several annular regions. On a per atom basis, for

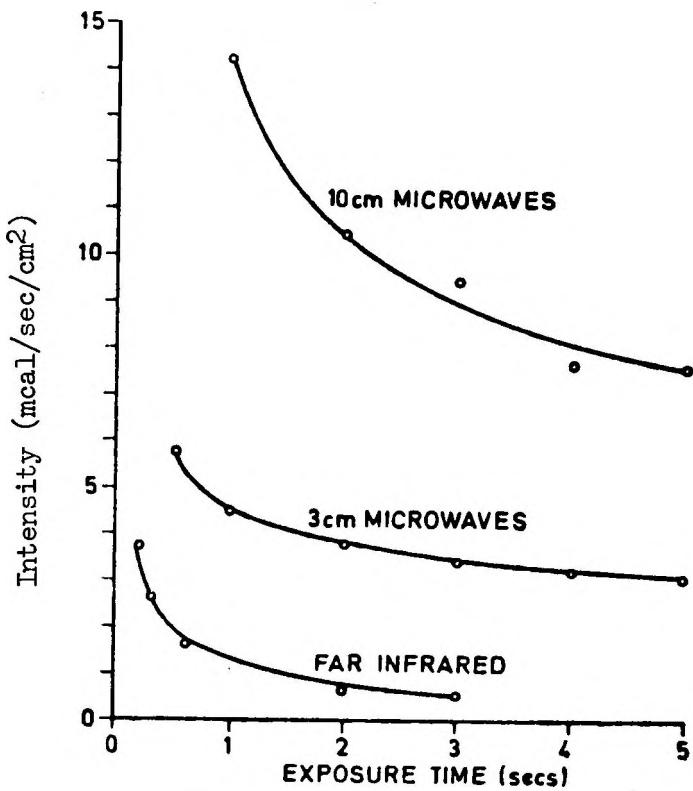


Fig. 2. Thresholds of Warmth Sensation

example, storage in the zero-th layer becomes

$$\text{Storage per atom} = \frac{\text{Storage per layer}}{\text{Atoms per layer}} = \frac{0.789 \times 10^{-4} N r I'}{1.3 \times 10^{-4} N} = 24.0$$

Corresponding values for the succeeding layers are 8.82, 3.25, 1.19, etc as shown in Table V.

Table V. Distribution of Electrons Per Unit Length at Filament Extinction.

Layer No. n	$\frac{-2n+1}{e^2}$	Entrapped by		Entrapment Per Atom Due To:		
		Radiation		Radiation	Scattering	Total
0	0.607	$0.789 \times 10^{-4} N r I'$	"	24.0	1.418	25.4
1	0.223	0.290	"	8.82	"	10.2
2	0.0821	0.107	"	3.25	"	4.67
3	0.0302	0.0393	"	1.19	"	2.61
4	0.0111	0.0144	"	0.44	"	1.86
5	0.00409	0.00532	"	0.162	"	1.58
6	0.00150	0.00195	"	0.0593	"	1.48
		Subtotal	1.25	"		
Core			0	0	"	1.42

#### CONCLUSION

Because of the overly simplified, theoretical treatment and the many, gross approximations that have been necessary, too great significance should not be attached to the final calculations. Yet the answers provide for an accounting of conduction electrons and they meet all the physical constraints that were imposed. It appears that a mechanism has been identified that can plausibly explain the reported failure of automobile headlights when they are exposed to UFOs within a narrow region directly ahead at close range. Radiation on the order of 1-cm wavelength emitted by the UFOs, presumably related to their propulsion systems, apparently forces conduction electrons into orbital entrapment in vacant states of the tungsten ions. This effect is largely confined to a thin region immediately under the surface of the filament. Diffusion of the remaining electrons from the interior of the filament depletes the density of conduction electrons, thereby causing an increase in electrical resistance. The resulting loss of electrical heating then provokes dimming of the lamp or its temporary failure.

Lamp failures have typically occurred at ranges of about 200 ft. Using that figure and the measured threshold for feeling warmth from 3-cm waves, one may estimate the total radiant energy being emitted from a glowing UFO, assuming that it is emitted isotropically. This simple calculation leads to a minimum value of 0.68 megawatts (MW). A similar result was previously obtained by the author based upon the known threshold for 'hearing' pulsed microwaves, that is, the energy output from the UFO was on the order of 1 MW.

Perhaps the present analysis will stimulate experts in several fields to review the suggestions that have been made. It is also hoped that some organization with access to a source of 1-cm and shorter waves will be motivated to conduct a simple test of the fundamental concept of this paper, that is, radiation from UFOs causes interference with headlights.

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## A PRELIMINARY CLASSIFICATION OF SOME REPORTS OF UNIDENTIFIED FLYING OBJECTS BASED ON SHAPE AND DIMENSIONS OF IMPRINT PATTERNS

- Fred Merritt -

Physical trace reports are relatively rare in the UFO literature. Specialist Ted Phillips has published a catalog<sup>1</sup> of 833 physical trace reports. Reports specifying imprints, which are often taken to be marks left by landing gear, are even less common. UFOCAT, Dr. David R. Saunders' computer file of some 80,000 UFO reports, is aware of only 110 imprint cases. Since imprint reports tend to be highly detailed as well as high in strangeness, and because of the unique kind of physical evidence reported, they deserve further study as a sub-class.

The original intent of this study was to determine whether there was any consistency in the reported size and shape of individual imprints. An initial sample of 65 imprint reports, gathered from a major cross-section of the literature, showed no apparent consistencies in description of individual imprints.

However, reports in which multiple imprints formed similar (but not identical) geometrical patterns were found to have strikingly similar report characteristics: object shape and size, occupant description, etc. Reports lacking the overall shape and dimensions of the imprint pattern were set aside, and most of the remaining reports were found to sort rather easily in 5 distinct groups or catenas, based on imprint pattern shape and size (expressed as length in meters of the longest side of the pattern).

After the addition of other available reports, the characteristics of each catena were determined intuitively from recurring report details. Reports within each catena are surprisingly similar in detail and fall within limited ranges of imprint pattern size and shape. A simple rating system was devised to determine how well each report fit the characteristics of the catena. Some adjustments in ranges of pattern size for the catenas were made on the basis of this indicated degree of fit for individual cases.

Reports have been traced to the best available sources, and each report and its investigation have been taken at face value. All 68 reports with pattern dimensions that have come to my attention have been considered, and each has been rated for fit on all 5 sets of characteristics. As would be expected from the nature of UFO reports, not every case taken at face value falls neatly into a classification. Of 68 reports, 49 fall within the established imprint pattern dimension ranges for the catenas, and 37 of these qualify for inclusion in their respective catena with a net fit rating of at least +3 based on the characteristics of the catena. Ratings of reports outside each catena's range indicate relatively poor or even negative fit with the catena's characteristics.

This study is severely limited by the small number of available reports with imprint pattern dimensions. But the observed correlations appear to be strong enough to make some preliminary determinations from the reports at hand.

### CATENA II "Classic Discs"

Triangular imprint patterns, generally equilateral, with major sides measuring from 4.7 to 7.9 meters. Of 12 reports in this range, 8 appear to fit this composite: 10-11 m. (average) domed or thick discs, often seen in multiples, exhibiting "falling leaf" motion, producing sound. Heat effects are present in the physical traces, and artifacts are often recovered. Both occupant cases specify large groups of normal appearing or tall people engaged in "repair" activity.

#### Catena II cases:

Nov. 25, 1964 (0045 to 0455) New Berlin, N. Y. Two brightly lighted 7.6-9.1 m. round objects. Nine to 11 human appearing occupants, 2-2.4 m. tall engaged in repair. Humming or droning sound. Artifact. Two equilateral imprint triangles 4.6-6.1 m. on a side. (2)

May, 1946 (evening) Angelholm, Sweden. Domed disc 16 m. wide 4 m. thick. Eleven normal-appearing occupants, including 2 engaged in repair. Whining sound. Artifact. Two imprints and a fin mark in 5 m. equilateral triangle. Grass burned. (3)

July 1, 1968 (1150) Botucatu, Brazil. Disc 8 m. wide with cupolas top and bottom. "Tinging sound". Imprint triangle 7 m. x 6.80 m. x 5.45 m. Ladder marks. Smell of gunpowder. (4)

Feb. 6, 1966 (2000) Aluche, Spain. Brightly luminous disc 10-12 m. wide. Muffled hum. Six meter equilateral imprint triangle within a burned area. (5)

Sept. 13, 1966 (0730) Stirum, N. D. Disc "like 2 bowls lip to lip", 11 m. wide, with transparent bubble on top. Falling leaf motion. High pitched whine. Imprint triangle 7.9 m. x 6.5 m. x 6.5 m. (6)

June 1, 1967 (2030) San Jose de Valderas, Spain. Disc 12-13 m. wide, 5 m. thick. Falling leaf motion. Artifacts. Equilateral imprint triangle a little over 6 m. (7)

Feb. 8, 1974 (Sunset, dawn) Al-Mukalla, Yemen. Three large white discs. Three equilateral 5.3 m. imprint triangles, extensive heat damage. (8)

Nov. 29, 1970 (1830) Kone (Tatebayasi City) Japan. Five or 6 discs flying in formation. One landed, leaving imprint triangle 4.7 m. x 3.9 m. x 4.2 m., burns. (9)

### CATENA III "Elusive Lights"

Triangular imprint patterns with major sides measuring from 2.44 to 4 meters. Of 11 reports in this range, 8 appear to fit this composite: occurrence in darkness, with no solid object seen; light only (often flashes or beams) or no object. Widespread irregular physical traces with occasional radioactivity. EM effects. No occupants or indications of occupants (footprints, ladder marks, etc.) In 2 cases, investigators express doubt that the marks were caused by a solid UFO. I would like to bring Catena III to the attention at atmospheric physicists for evaluation

as a natural phenomenon.

Catena III cases:

Sept. 14, 1972 (2200, 0300) Houston, Mo. Unusual TV interference, manouvering light seen at 2200. At 0300, a single bright flash of light on or near the ground. Triangular imprint pattern 2.44 m. x 2.38 m. x 82 cm. in a "large oily, scorched" depressed oval area. Tree damaged. (10)

Prior to Sept. 4, 1969 Ngatea, N. Z. No object seen. Plants "cooked", radioactivity. Imprint pattern 2.75 m. x 3 m. x 3 m. within 17 m. circle of standing dead scrub in area of normal vegetation. Investigator doubts UFO cause, as no objects had been seen to rise from any of 9 similar locations. (11)

Aug. 29-30, 1970 (2330 to 0200) Enebacken, Sweden. Bright round red light manouvering near the ground, emitting beams of yellow-white light. Slightly radioactive burn marks in triangle 2.55 m. x 2.60 m. x 2.60 m. Investigator's comment: "Did not seem as if something had been standing there, but rather as if 3 jet-beams had been used". (12)

Sept. 20, 1967 (2230) Winsted, Conn. Unusual persistent glow on or near the ground. Tree-tops broken, trunks scraped. Three meter imprint triangle within 10.7 m. burned area. (13)

June 17, 1969 (0200) Ibiuna, Brazil. Lighted object with "curved lighted window" 8-10 m. wide, 2½-3 m. high. "Searchlight" beam. Occurred after series of sightings of orange nocturnal lights on or near the ground. U shaped pattern of 6 imprints, which may be 2 overlapping triangles with major sides of 3.4 m., within 8 m. circle of flattened grass. (14)

May 25, 1971 (0200) Lynchford, Tasmania. Witness awakened by barking dogs, saw nothing. Similar patterns in 4 spots: imprint triangle 90 cm. x 2.75 m. within 3 m. area of flattened grass. Dogs acted "dopey"; kitten died 2 days later. (15)

April 20, 1975 (night) Jachal (Pachimoco) Argentina. Stationary beams of light seen. In a desolate area, 3 imprints formed a 4 m. equilateral triangle, containing a big smoke blot. Nearby plants burnt, stones blackened. Footprints found. 7 mushrooms, as large as 20 cm. wide were found growing there the next day. (16)

Jan. 3, 1971 (0600 in darkness) Saapunki, Finland. Bright light, 10 m. wide, at altitude of 8 m. moving in a heavy snowstorm. Electrical power in 2 houses failed. Area 3.7 m. x 3.7 m. x 2.3 m. with apex of triangle cut off in snow refrozen to green ice with soot, later changing to dark blue-grey. (17)

CATENA IV "Mob from Magonia" (18)

Triangular imprint patterns with major sides of 2 meters and less. Of 11 reports in this range, 10 appear to fit this composite: Male below the age of 20 among the primary witnesses (specified in 8 of 10 Catena IV cases, but in only 19 of the 58 other pattern dimension cases). Occurrence

frequently in daylight, with an unusual (other than disc, sphere, cigar, light mass) UFO shape, 4 m. or less in major dimension, which is first seen on or near the ground. In the 2 occupant cases, occupants are described as 1.45-1.7 m. tall unusual humanoids. Both objects and occupants exhibit absurd, apparently purposeless, nonsensical or capricious behavior which seems inconsistent with the apparently technological sophistication of the object. Additional aggressive, threatening, or destructive behavior in some cases. Heat effects usually absent from physical traces. Some reports include an apparently related subsequent UFO event.

Catena IV cases:

July 2, 1968 (1130) Sierra Chica, Argentina. A 15 year old boy saw a disc 2 m. wide, 60 cm. thick resting on 3 legs. Two men 1.7 m. tall with semi-transparent legs gave him an envelope, directed him to dip it in a puddle. Neither the envelope, which was later found to contain a non-sense message, nor the boy's hand got wet. Horse and dog temporarily paralyzed. At 2315 the same day, 5 men examined the traces, which formed a triangle 2 m. x 1.58 m. x 1.58 m. and had just declared them a hoax, when a luminous object slowly zig-zagged toward them forcing them to throw themselves to the ground and flee. (19)

Feb. 7, 1969 (0730) Pirassununga, Brazil. Nineteen year old male saw a thin, 4 m. wide disc with a narrow dome making a total thickness of only 1.5 m. Two occupants in "diver's suits" with black teeth and one eye lower than the other floated to the ground, while 2 more were visible inside the disc. Occupant caused witness' pack of cigarettes to rise 20 cm. from the ground to meet his outstretched palm, then caused the pack to disappear. On departing, occupant "floated a flame" from a "gun" at the witness, causing paralysis and fainting, leaving a red welt on his leg. Three imprints in 63 cm. equilateral triangle. Investigators saw a hazy, bluish white object low in the sky after completing their investigation. (20)

June 26, 1972 (0800) Fort Beaufort, South Africa. Black laborer saw smoke in the brush, then a shiny object, later described as 3 m. x 1 m. egg shaped, blue-black, later turning red, with a star-like appendage. The object ducked in and out of the brush while a farmer and 2 police officers fired 15 shots at it. Three laborers acted as "beaters", trying to flush the object out of the brush for a clean shot. At least one shot hit the object with a solid metallic sound. Sighting lasted over 4 hours. Imprints in triangular pattern 30 cm. x 30 cm. x 45 cm. On the morning of July 6, the farmer again saw the object. He heard two explosions, which ruined a brick and cement reservoir. (21)

March 29, 1966 (1615) Hampton Falls, N. H. Ten year old boy saw an angular brownish box-like object, shaped in profile like a squat letter "L" with windows. Object 1.5 m. long, 75 cm. wide, 75 cm. high with dome underneath, resting on tripod legs. Antenna lowered, object released a blast of air, emitted a short sound, lifted 30 cm. off the ground, spun around clockwise, and settled to the ground. After intermittent "electric" sounds, the object released another blast of air, with sound increasing as the object rose 3 m. vertically, stopped, moved 7 m. horizontally, stopped, spun clockwise 90 degrees, then accelerated

straight up and out of sight. Three elongated imprints formed an triangle between 1.5 and 2 m. on a side. (22)

May 18, 1964 (0730) Hubbard, Oregon. A young boy saw a silver colored square object 1.2 m. high resting on 4 shiny legs. With a soft beeping sound, it rose slowly to the height of a telephone pole, then "shot up - like a rocket". Three imprints formed 90 cm. equilateral triangle within a 1-1.2 m. area of wheat flattened from center. Odor of gas fumes. (23)

Nov. 16, 1973 (1900) Lemon Grove, Calif. Two boys about 11 years old approached a landed object and tapped on it with a flashlight. Object described as 6 m. wide 3 m. high, with dome on top. Boys' sketch shows 4 legs. Dome illuminated the area bright red, object rose 45-75 cm., a row of green lights around the rim began to blink in sequence, object began to rotate, making a sound like "wooo-shoooo-wooo-shooo". Rate of rotation became very high, red light blinked on and off, went out, came back on, and the object rose, still making the sound. Frightened boys began to run, felt chills and a tingly feeling, weak; "like they were running in slow motion". TV interference. Three marks formed 2 m. equilateral triangle within an area of grass swirled in counter-clockwise pattern. (24)

June 18-19, 1966 (0000 to 0500) Mt. Mitchell, N. C. Four Boy Scouts saw 3 pulsating red lights approach and hover for 5 hours over the trail 180 m. from their camp. Lights blinked at different speeds, with the center one turning white every fifth pulsation. At sunrise the object rose above the trees, appearing through binoculars as a red bell with 6 smaller objects which formed a succession of geometrical formations before they disappeared behind a mountain. Imprint triangle 1.5 m. on each side. Some tree branches broken. (25)

June 14, 1964 (2100) Dale, Ind. Eighteen year old male saw a flash of light, house power failed. As he approached the basketball sized light just above the ground 15 m. away, he found he could not move, and had a tingling sensation. The light rose and disappeared. Odor of sulfur or burning rubber. Three imprints formed triangle 60 cm. x 1.37 m. x 1.37 m. (26)

April 8, 1967 Banner Elk, N. C. Two couples of college students saw a greenish florescent flow on the ground about 55 m. from their car. The car motor stopped, could not be restarted, the radio was flooded with static. Witnesses panicked, then pushed the car to a main road, where they were able to restart it. Object suddenly moved toward the car, veered away, and disappeared into a nearby valley. (27)

Aug. 12, 1974 (1130) Brousse (nr. Matha) France. A 15 year old boy saw a disc manouvering near a hedgerow. He described it as the size of a medium car, dull lead color, with a green highly reflective dome. One of 3 apertures opened "exactly like the shutter of a vanishing headlight on a sports car". The lower part of the object rotated, but the dome did not. Three sharply defined circles of burnt straw formed a triangle 95 cm. x 95 cm. x 80 cm. within an oval area of crushed straw. The investigator was surprised that the burn marks could be made without setting fire to the entire field. Within each imprint were 2 small pieces of lead. (28)

#### CATENA I "Flaming Ovals"

Irregular 4 sided imprint patterns with major sides from 3.66 m. to 4.51 m. Of 4 cases in this range, 3 appear to fit this composite: oval shaped object whose major dimension is 5-7 meters, with flame reported. Burn marks are found among the physical traces. The single occupant case specifies small humanoids.

These cases all occurred in the U. S., and all in the last part of the month of April. This is the only catena that seems to be tied to a single flap. (April 1964).

With only 3 reports, Catena I is the least compelling of the 5 catenas.

#### Catena I cases:

April 24, 1964 (1745) Socorro, N. M. Police officer saw a landed oval object, the size of an auto, resting on legs. Red insignia or structural feature. Two small humanoids. Object flew away with roar and flame. Imprints formed irregular figure 2.93 m. x 3.62 m. x 4.51 m. x 4.03 m. Ladder marks, small footprints, 4 burn marks. (29)

April 26, 1964 (0100) LaMadera, N. M. Landed object the shape of a butane tank, as long as a telephone pole, 4.3 m. diameter, shooting blue flames out the sides near the bottom. Witness went inside to tell his family, but when he returned, the object was gone. Four imprints in pattern "like Socorro" within 11-12 m. scorched circle, still warm and smoking 20 hours later. Bits of melted glass; 9-10 cm. circular foot-prints. (30)

April 21, 1967 (2100) South Hill, Va. Pewter colored object shaped like a storage tank, 3.7 m. diameter, 4.6 - 4.9 m. high including 90 cm. to 1.1 m. legs. Object emitted a white burst of flame from the lower part, rose, was "gone in a flash". 4 marks form irregular figure with sides 3.35 m. to 3.66 m. on asphalt road. 90 cm. spot of road in flames. (31)

#### CATENA V "Pumpkin Heads"

Four sided imprint patterns, generally squares and rectangles, with major sides of 3 meters and below; also square patterns to 4 meters. Of 11 cases in this range, 8 appear to fit this composite: object shape domed disc or sphere, luminous, except in daylight, with a major dimension of 5 meters (average). Humming or whistling sounds almost always reported; some reports have indications of exhaust. Occupant height 1 meter or less, outsized heads or helmets, seen singly or in small groups. Heat effects in physical traces. Threatening action by object, or object or occupant use force on the witness, usually in an apparent attempt to keep the witness at bay.

The object description above is remarkably similar to Dr. Jacques Vallee's composite object description from a study of the 1954 wave: "The reported 'craft' are observed under two 'phases': a dark phase, during which they are observed as dull, metallic 'machines' with solid bodies .... and a bright phase during which they look like 'fiery spheres' .... the phenomena had a symmetry of revolution and an actual diameter of about five meters." (32)

Catena V cases:

Feb. 5, 1971 (1500) Kinnula, Finland. Five meter domed disc landed on 4 legs. One 90 cm. tall occupant with large helmet glided to the ground; 3 more forms seen inside object. One of the witnesses started his chain saw, chased the occupant, and received burns when he tried to grab its boot. Object rose vertically with a humming noise. Four imprints formed a 2 m. square in area of slightly melted snow. Circular footprints, 15 cm. wide. (33)

July 1, 1965 (0530) Valensole, France. Thick domed disc the size of a Dauphine car resting on 6 legs. Two occupants, human appearance, the size of an 8 year old child, but with enormous heads; one pointed a tube at the witness and he found himself unable to move. Object rose with a whistling sound at an angle of 45 degrees and vanished, leaving the lavender crop damaged for 100 m. under its path. Four shallow imprints formed a 4 m. square. (34)

Sept. 10, 1954 (2230) Quarouble, France. Object seen as dark mass with lights on railroad tracks. Two occupants 1 m. tall with enormous helmets. Bright light like magnesium flare paralyzed witness. Object rose vertically 30 m. with a low whistling sound, then flew East, beginning to glow. Imprints on railroad ties formed a 4 sided figure with diagonals 90 cm. and 1.4 m. Stones brittle as if from heat. (35)

Dec. 6, 1973 (1845) Fabreques, Monpellier, France. Domed disc on legs with brightly lighted "blister" on top, flashing red and white lights around rim, humming sound. Door opened, ladder unrolled. Witnesses fled, and the craft, seen as an orange glow, chased them. Four imprints in 1.30 m. square, with ladder marks. Area appeared "swept" as if by a blast. (36)

Mar. 19, 1972 (2200) Acuescoma, Mexico. Glowing blue sphere landed, rose giving off blue sparks and a humming sound. Four imprints formed 2.5 m. square with central burn mark. (37)

July 25, 1970 (1730) Jabreilles-les-Bordes (Hte-Vienne) France. Landed domed disc 6 m. diameter, 3 m. high on 4 legs. Witness blinded by yellow-orange light beam; paralyzed by beam or fright. As object rose with whistling sound, witness felt wave of heat. At 100 m. altitude, object "jumped" vertically and disappeared behind a mountain. Four imprints formed irregular figure 2.66 m. x 2.64 m. x 2.25 m. x 1.47 m. on hillside. (38)

Sept. 27, 1954 (2030) Premanon, France. Hovering object seen as big red luminous ball, swaying gently. Two occupants described as rectangular beings "like sugar lumps". Child threw pebbles at occupant, was thrown to ground by an "ice-cold invisible force". Four imprints formed square within 3.66 m. circular area of grass flattened counter-clockwise. (39)

July 2, 1953 (1300) Villares des Saz, Spain. Landed "metallic water jug" 1.3 m. high, 30 cm. diameter, glowing slightly. Whistling sound. Three occupants 65 cm. tall emerged, one of which slapped the young witness' face, reentered machine, which rose vertically, glowing brightly. Others reported grey spherical object. Four imprints in 36 cm. square; small footprints. (40)

## OBSERVED CHARACTERISTICS AND RATINGS

Characteristics have been determined intuitively in an effort to describe the catena as completely as possible. Different catenas may have in common an identical, or very similar individual characteristic, but each catena's assembled characteristics describe an unique kind of UFO report. Certain characteristics are found to be sorting items, either by virtue of plus or minus ratings.

Primary characteristics are found in almost all of the most detailed reports in the catena. A fit is scored with a plus, a negative fit with a minus, and data missing with a zero.

Secondary characteristics are occupant features found in most or all detailed occupant cases in the catena. A fit is scored with a plus, negative fit with a minus, and data missing or no occupant with a zero.

Special characteristics are report details which appear in the catena two or more times, and seem to be frequent but not inviolate features of the catena, even though they are not noticed, tested for, reported, or even present in every case. A fit is scored with a plus; all others are scored zero.

Case rating is, therefore, a rough indication of degree of fit with the observed characteristics of the catena. Numerical rating is count of plus ratings less count of minus ratings.

## OBSERVED CHARACTERISTICS OF CATENA I REPORTS

### Primary Characteristics

- 1A. Oval shaped object
- 1B. Object's major dimension estimated at 5-7 m.
- 1C. Flame associated with object\*
- 1D. Burns among physical traces

### Secondary Characteristic

- 1E. Occupants small humanoids

\* Flame is such a dramatic feature that, if present, it is assumed to have been noted and reported. Therefore all cases that do not clearly specify flame are given a minus, rather than a zero rating on this characteristic.

## OBSERVED CHARACTERISTICS OF CATENA II REPORTS

### Primary Characteristics

- 2A. Object shape thick or domed disc
- 2B. Object's major dimension estimated at 7.6 to 13 m. (average 10-11 m.)
- 2C. Heat effects present in physical traces

### Secondary Characteristics

- 2D. Occupants normal appearance, human size range
- 2E. Four or more occupants seen per object

#### Special Characteristics

- 2F. Sound associated with object motion
- 2G. Oscillating or "falling leaf" object motion
- 2H. Multiple identical objects
- 2I. Artifact recovered
- 2J. Occupants engaged in "repair" activity

#### OBSERVED CHARACTERISTICS OF CATENA III REPORTS

##### Primary Characteristics

- 3A. Occurrence in darkness
- 3B. No solid object seen - light only or no object
- 3C. Wide-spread irregular physical trace effects beyond limits of imprint pattern
- 3D. No occupant or indication of occupant (ladder, footprints etc.)

##### Special Characteristics

- 3E. Electro-magnetic effects
- 3F. Radioactivity in traces
- 3G. Light flash or beam
- 3H. Investigator's expressed doubt that imprints caused by solid UFO

#### OBSERVED CHARACTERISTICS OF CATENA IV REPORTS

##### Primary Chcharacteristics

- 4A. Object first seen on or near the ground
- 4B. Object's major dimension estimated at 4 m. or less
- 4C. Male below the age of 20 among primary witnesses
- 4D. Object prank
  - or
  - 4E. Occupant prank
    - (Both 4D and 4E are subjective evaluations of the report, a "prank" is an absurd, apparently purposeless, nonsensical or capricious activity inconsistent with the apparent sophisticated technological nature of the object and its occupants. May appear as low grade or slap-stick comedy).

##### Secondary Characteristic

- 4F. Occupant height 1.45 to 1.7 m.

##### Special Characteristics

- 4G. Daylight occurrence
- 4H. Object shape other than disc, sphere, cigar, or light mass; unusual UFO shape.
- 4I. Aggressive, threatening or destructive behavior other than that in 4D or 4E above.
- 4J. Subsequent apparently related UFO event.

#### OBSERVED CHARACTERISTICS OF CATENA V REPORTS

##### Primary Characteristics

- 5A. Object luminous or glowing, except in daylight

- 5B. Object shape domed disc or sphere
- 5C. Object's major dimension estimated at 4-6 m. (average 5 m.)
- 5D. Humming or whistling sound

#### Secondary Characteristics

- 5E. Occupants seen singly or in small groups
- 5F. Occupant height 1 m. or less
- 5G. Occupants have disproportionately large heads or helmets

#### Special Characteristics

- 5H. Heat effects in physical traces
- 5I. Indication of exhaust
- 5J. Threatening action by object, or object or occupant uses force on the witness, usually in an apparent attempt to keep witness at bay.

### RATING RESULTS SUMMARY

#### All cases rated on Catena I characteristics

<u>Imprint Pattern</u>	<u>CASES</u>	<u>TOTAL NET RATING</u>	<u>AVERAGE NET RATING</u>
Catena I range	4	+ 14	+ 3.50
(Catena I cases)	( 3)	(+ 13)	(+ 4.33)
All other 4 sided	15	- 12	- 0.80
All 2 mark, 3, 5, 6 sided	<u>49</u>	<u>- 96</u>	<u>- 1.96</u>
<b>TOTAL</b>	<b>68</b>	<b>- 94</b>	<b>- 1.38</b>

#### All cases rated on Catena II characteristics

<u>Imprint Pattern</u>	<u>CASES</u>	<u>TOTAL NET RATING</u>	<u>AVERAGE NET RATING</u>
Catena II range	12	+ 38	+ 3.17
(Catena II cases)	( 8)	(+ 33)	(+ 4.13)
All other triangular	33	+ 11	+ 0.33
All 2 mark, 4, 5, 6 sided	<u>23</u>	<u>- 11</u>	<u>- 0.48</u>
<b>TOTAL</b>	<b>68</b>	<b>+ 38</b>	<b>+ 0.56</b>

#### All cases rated on Catena III characteristics

<u>Imprint Pattern</u>	<u>CASES</u>	<u>TOTAL NET RATING</u>	<u>AVERAGE NET RATING</u>
Catena III range	11	+ 32	+ 2.91
(Catena III cases)	( 8)	(+ 34)	(+ 4.25)
All other triangular	34	- 25	- 0.74
All 2 mark, 4, 5, 6 sided	<u>23</u>	<u>- 16</u>	<u>- 0.70</u>
<b>TOTAL</b>	<b>68</b>	<b>- 9</b>	<b>- 0.13</b>

All cases rated on Catena IV characteristics

IMPRINT PATTERN	CASES	TOTAL NET RATING	AVERAGE NET RATING
Catena IV range	11	+ 49	+ 4.45
(Catena IV cases)	(10)	(+ 49)	(+ 4.90)
All other triangular	34	- 14	- 0.41
All 2 mark, 4, 5, 6 sided	<u>23</u>	<u>+ 18</u>	<u>+ 0.78</u>
TOTAL	68	+ 53	+ 0.78

All cases rated on Catena V characteristics

IMPRINT PATTERN	CASES	TOTAL NET RATING	AVERAGE NET RATING
Catena V range	11	+ 48	+ 4.36
(Catena V cases)	( 8)	(+ 43)	(+ 5.38)
All other 4 sided	8	+ 5	+ 0.63
All 2 mark, 3, 5, 6 sided	<u>49</u>	<u>+ 20</u>	<u>+ 0.41</u>
TOTAL	68	+ 73	+ 1.07

Although characteristics for each catena were chosen as descriptive, rather than sorting items, the aggregate effect appears to be a reasonably useful sorting process.

ACKNOWLEDGEMENT

Without the material help and constant encouragement of a number of individuals associated with the Center for UFO Studies, this study would not have been completed.

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## THE GRISONNE PARADOX

Aimé Michel

Yesterday was one of those edifying occasions when my cat, Grisonne, condescended to favor me with her opinion.

"Till now" she said, "you ufologists have behaved like nuts when dealing with astronomers and other scientists. For a quarter of a century you have tried to make them acknowledge impossible statements such as, 'There are flying things from elsewhere in our atmosphere,' or 'There are flying things which produce huge and impossible phenomena.' Why in heaven's name should sensible folk want to admit to such foolish ideas?"

"Then you would propose an alternative strategy?" I asked.

"Yes," she said. "I propose that you ask scientists why there are no flying saucers, granted that according to their own teaching there might in fact be plenty of flying saucers elsewhere in the skies."

"Please explain yourself," I asked.

"To be sure," she said. "First, let us look at the General and Logical Theory of Automata by John van Neumann\*, in which the author demonstrates the following proposition: 'Every automaton that can produce other automata will only be able to produce less complicated ones. There is, however, a certain minimum level where these degenerative characteristics cease to be universal. At this point, automata which can reproduce themselves, or even construct higher entities, become possible.' Let us give the name 'von Neumann's threshold' to that point where automata begin to construct entities higher than themselves."

"Secondly," she continued, "it is asserted by specialists in computer science that its performance doubles every four or five years. Then I conclude that whatever von Neumann's threshold can be, as soon as it is crossed, it will initiate a self-directed, exponentially augmenting evolution of intelligent automata."

"Perhaps so," I replied thoughtfully, and then continued: "But since that is all speculation on the future, I would call it science fiction, and scientists don't care much for science fiction."

"They don't care much for the future, I agree. But what if I show that their present statements are in contradiction with either von Neumann's theorem, or the data of computer science, or indeed, both? Let me continue," she said.

"A viewpoint of present-day scientists is that life and intelligence are natural, and not miraculous phenomena. But such a belief is impossible. In effect, if life and intelligence were natural phenomena, then von Neumann's threshold would have been crossed, and repeatedly, at an unknown number of points in space, and this may have been going on over an unknown span of time,

and space might well be stuffed to bursting with ubiquitous and almighty artifacts and contraptions. It is not, and I ask, why not?"

"But perhaps it is," I muttered.

"Perhaps so, but if it is not, then, as I said, I ask myself, why not? Do you know of Olbers' Paradox?"

"Of course," I said. "A century ago the German astronomer Olbers calculated that if the current laws of thermodynamics were true, then the night sky might be white, and the temperature of space infinite. But they are not, and he asked, 'why not?'"

"To supply an answer to that simple question, physicists had to discover Relativity and the Red Shift phenomenon."

"Well," purred Grisonne, "I too must put my question: 'Why are there no flying saucers, granted that according to the teaching of scientists there might in fact be plenty of them everywhere in the skies?' Let's call it the Grisonne Paradox. I want an answer."

\*von Neumann, John, "The General and Logical Theory of Automata," in Newman, James R., ed., The World of Mathematics, vol. IV, pp. 2070-2098, London: George Allen and Unwin, 1956.

About von Neumann: born in Budapest in 1903; training at the University of Berlin, the Zurich Polytechnical Institute and the University of Budapest; Professor of Mathematics at Princeton in 1930, then in 1933 a professor at the Institute for Advanced Studies. His main works are on mathematical logic, theory of continuous groups, ergodic theory, quantum theory, high-speed computing devices. A member of the National Academy of Sciences, he has won many awards for his mathematical discoveries.

## A FEW REMARKS CONCERNING THE UFO INVESTIGATOR AS COUNSELOR AND HEALER

John Brent Musgrave

UFO field investigators are more than scientific detectives. They also fulfill an important social function as counselors, and in some cases as healers, in the sense of helping people to cope with extremely stressful and staggering experiences. Like it or not, it is a role that each conscientious field investigator is forced into by the nature of how people react to the UFO phenomenon. Because of this fact, more attention should be paid to this role when choosing and training investigators - without ignoring the importance of keeping to scientific method while carrying on UFO investigation.

By now it is commonplace that whatever may be behind the UFO phenomenon, UFO percipients have gone through a real experience which in general they try to describe as best they can. The intensity and genuineness of this experience has even been the main factor in convincing some skeptical investigators that the UFO phenomenon is both real and worthy of serious attention. For better or worse, our main source of information about the phenomenon (up to this point in time at least) is the UFO percipient. Because of this fact, attention has been paid to discover just how reliable and accurate such information is, and what kind of detective work brings out the most complete and accurate account of what was experienced and what really happened.

Attention has focused on the UFO percipient as a source of information. But at the field investigator level little attention has been paid to the UFO percipient as a person who has experienced something that potentially is the most traumatic and/or "meaningful" experience of life. In a growing number of cases I've investigated there appears to be almost a direct relationship between the "meaningfulness" of the experience to the person and the strangeness of the event. "Meaningful" UFO experiences make up a small percentage of UFO cases, but both stress and meaning are factors that play an important part in the UFO phenomenon. In addition to uncovering valuable data, attention must be paid to the well-being of the person who has experienced the phenomenon. Lack of attention to this on the part of some UFO investigators has meant that investigations sometimes have heightened the anxiety associated with a UFO event. It may even turn out that the investigators' role as healer or counselor outweighs their role as data gatherers. UFO investigation has to be concerned about ethics as well as scientific method.

To my knowledge, no extensive quantitative study has been made on what motivates a UFO percipient to become a UFO reporter (or what motivates a person to become a UFO investigator for that matter). To UFO investigators what may be taking place is purely a matter of scientific inquiry. But the attempt to alleviate the stress associated with a very strange experience is a large factor, if not ultimately the only factor, that brings people to report their UFO experiences. This seems particularly true of UFO events of high strangeness (and, need it be said, of potentially high information). Some excellent field investigators' manuals are now available. In addition to the matters of

technique and data gathering they deal with, future editions should pay attention to the methods of dealing with such stress as now exists, and on methods which at the least avoid increasing stress, if they don't actually help alleviate it.

Not enough attention has been paid to the uniqueness of UFO research. It is the only area of scientific inquiry in the non-communist world in which the major contributions are being made by "amateurs" - it is truly a people's science (which explains in part the reluctance of academic institutions to accept it). The fact that UFO research is carried on by amateurs has been both its strength and weakness. Anyone can be a UFO investigator or UFO expert. One corollary of this is the unfortunate fact that there is little or no adequate training or supervision of field investigators other than on a local basis or by means of field investigators' manuals which are the best that can be done under present circumstances. This has contributed to the harm that can be and has been done by unthinking or unconcerned investigators. Regrettably I've come across more than one UFO sighting where investigators have increased already existing tensions, or even created tensions that didn't previously exist. A recent example centered on an occupant report that came from the eastern slopes of the Canadian Rockies during autumn, 1975. The main witness, a young woman, observed two silver-suited occupants standing on the platform of a disc-shaped object by the side of the road. She made the mistake of reporting her sighting to the local news media and was deluged by hundreds of sightseers and dozens of UFO investigators from all across North America. She was informed by some UFO investigators that she definitely saw a spaceship, that the occupants sometimes abduct people, and that UFOs often return to the same spot. The experiences after the sighting convinced her never to report a sighting again, and was a factor in her decision to move out of town.

Unfortunately, this case is neither unique nor uncommon. Although it may be a bit extreme, even an experienced field investigator may say something that seems innocent enough but which will upset the UFO percipient. Investigators must pay careful attention to their use of language, and be aware that much more than scientific observation is taking place as they talk with the witness.

As a footnote, this and similar cases have convinced me that witnesses' names should never be made public without careful thought. Part of the UFO investigators' obligation is to protect percipients from the publicity and harassment that comes with making a UFO sighting a public event.

In addition to the kinds of stress associated with almost all UFO experiences, there is an even more profound stress associated with at least some kinds of UFO experience. The stress experienced by some UFO percipients may be at an even deeper level than commonly imagined. In an increasing number of cases I've been involved with (particularly close encounter, occupant and potential abduction cases), the investigator-percipient interaction is subsumed under that of the healer-patient. The percipient comes not only to tell a story and to understand, but also to "cure" or work through an experience. It is in part for this reason that unconscious communication of percipient and investigator can sometimes play a crucial role, not only for the uncovering and understanding of the totality of what occurred, but also for the working

out of the experience for the percipient (and also in some cases for the investigator as well).

This is a heavy burden. Some field investigators solve it by not paying attention to it. For this working out may be a hazard for the investigator as well as for the UFO percipient. In these kinds of cases it may become an occupational hazard, if you will, for the field investigator to become psychically involved and even controlled by the psychological projections of the witness. In such cases he is not only working with the percipient to find out more about the UFO experience, but ultimately he is working on himself as well. It should be kept in mind that investigators may encounter cases where they have a block in pursuing and uncovering the UFO story - blocks created by fear of working out the experience with the percipients. Any investigator who is working with these kinds of UFO reports should be well aware of his own instinctive disposition as to why he became a UFO investigator in the first place. It may be that a UFO investigator sits on a case, or doesn't uncover the full story, because the full story would force him to confront his own psyche.

Another consequence of looking at the UFO percipient as a person rather than as a subject is that healing considerations outweigh scientific considerations. For instance, I have a few potential abduction cases for which I believe this to be true. The latest one occurred in January of this year when at least 10 independent witnesses observed a light dancing about in rural Alberta for about an hour. The closest witness, a boy of 10, reported that he could see portholes and legs as it landed near him. Subsequent to the episode, the boy has had a recurrent nightmare in which he is taken aboard the object by "spacepeople" from Saturn. I learned of this case only three weeks after the event. But by this time the boy was no longer experiencing the nightmare, and had difficulty in remembering the sighting. He now slept well, and seemed uninterested in the UFO sighting. His parents reported a number of changes in his behavior. I've elected not to rush in with the hope of learning more about a possible "real" abduction. My decision to monitor how he copes with this experience is based on the obligation to do what I believe is best for the person rather than the obligation to learn as much as possible about the UFO phenomenon.

While the field investigator has an immediate concern for the well-being of the UFO percipient, it would be potentially fruitful for those in position to do so to investigate the consequences of the hypothesis that at least some abnormal behaviors, psychoses and neuroses are in fact generated by "real" UFO incidents. Developments of the last few years have demonstrated that the Hills' experience is not unique. Others have undergone an abduction experience, be it real or otherwise, and others have become conscious of the experience only because they needed and sought professional psychological assistance. Even at a low stress level I know of more than one case of multiple amnesia episodes combined with a deep feeling of dread; it is at least possible that these were caused by a UFO encounter. Some abnormal personality changes may be the result of UFO encounters, whether they be abductions or less esoteric meetings. Without detracting from the physical aspects of the UFO phenomenon, there may be a typology of behavior changes and disorders that are generated by UFO events.

# MAGNETOHYDRODYNAMIC (MHD) AERODYNES

Jean-Pierre Petit  
Claude Poher  
Maurice Viton

## Magnetohydrodynamics

Magnetohydrodynamic (MHD) devices have been studied extensively during the past 15 years. Such devices can function either as a generator or as an accelerator. The MHD generators are known to deliver high power densities. With MHD accelerators one can obtain high specific impulses. But there are very difficult basic problems connected with MHD processes.

First, the low electrical conductivity of gases requires either seeding or the use of quite a large electronic temperature. Secondly, strong interactions require a high magnetic field. These two factors create severe technological difficulties. At present, magnets of several Teslas strength can be built, using the techniques of superconductivity. Another problem is the production of electrodes which can carry large current densities. In the following discourse we will assume that such technological problems can be solved.

Suppose now that very powerful electrical generators are available; could MHD flight be possible?

## MHD Propulsion

Faraday-type MHD accelerators are well-known. In such devices (Figure 1), a linear channel is combined with a magnet and a series of electrodes, segmented

in order to obtain a more homogeneous electric discharge in the channel. In such accelerators, air is moved through the channel by Lorentz forces. Thus it would be possible to substitute MHD accelerators for the four engines of the supersonic "Concorde." This would require a total electric power of 200 megawatts. If one can design light but powerful electrical generators, then MHD

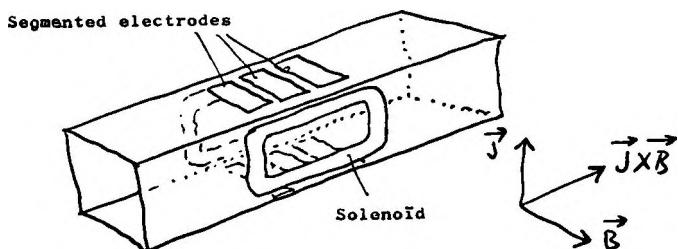


Figure 1. Classical Faraday-type Constant Area Linear Accelerator

flight becomes possible. Let us suppose that an electrical generator weighing 10 tons and generating 400 to 4000 megawatts is available.

## Cylindrical MHD Aerodyne

If a large amount of energy is available, Lorentz forces can be used to produce both thrust and lift. Consider a cylinder, made of an insulating material, in which a solenoid produces a dipolar magnetic field (Figure 2). Pairs of electrodes are located on each side of the cylinder and connected to the electrical generator, creating a glow discharge in the surrounding air (Figure 3). As one can see, the current density vector  $\vec{J}$  is perpendicular to the magnetic field  $\vec{B}$ . Hence, in the vicinity of the electrodes, where the current density is greatest,

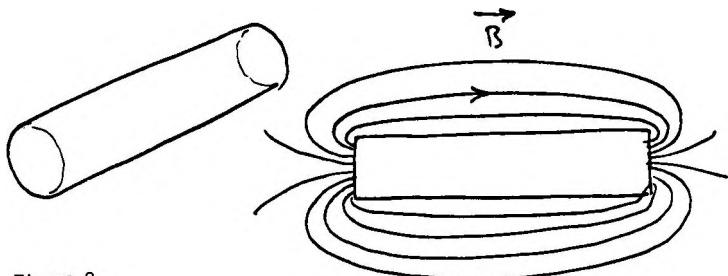


Figure 2.

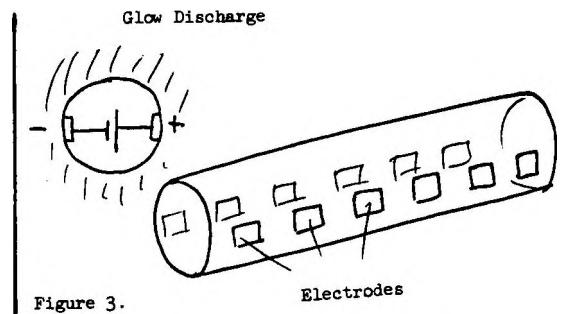


Figure 3.

the Lorentz force is tangential (Figures 4 and 5). This in turn induces a flow in the surrounding medium (Figure 6). We have obtained experimental verification

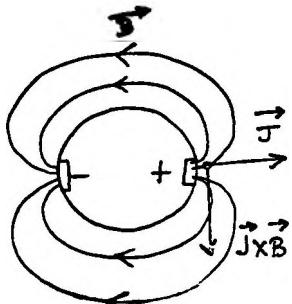


Figure 4.

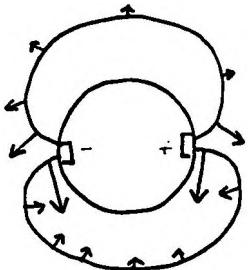


Figure 5. Distribution of Lorentz forces

of these effects using a model of 35 mm. diameter in an electrolytic solution of water and HCl, with a 200 Gauss magnetic field and a 0.8 ampere electric current (Photo 1).

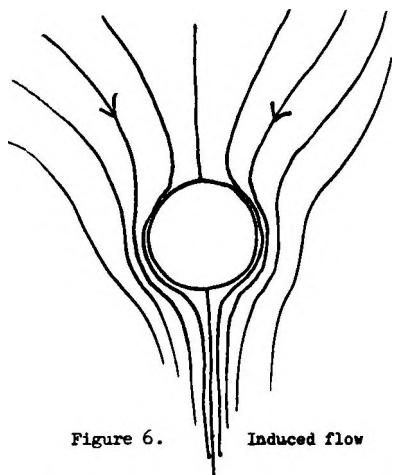


Figure 6. Induced flow

As one can see, the Lorentz forces tend to produce a realignment of the flow behind the model. As a matter of fact, there is no wake observed, and the flow appears to be liminar everywhere. There is no disturbance behind the model. Checking this, we see that the trihedra ( $\vec{J}$ ,  $\vec{B}$ , and  $\vec{J} \times \vec{B}$ ) rotates so as to maintain the tangential force in the desired direction (Figure 7).

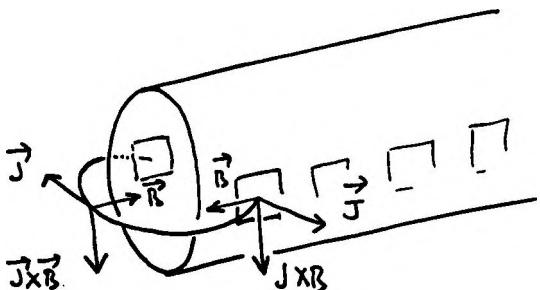


Figure 7.

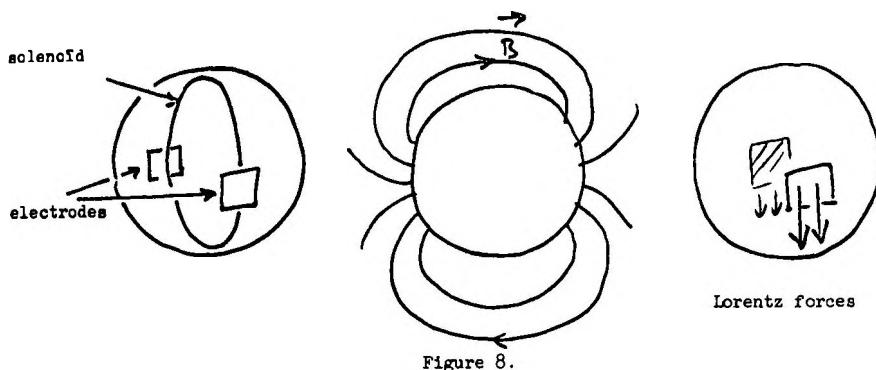
#### Spherical MHD Aerodyne

Now it seems logical to shift to a spherical aerodyne. We shall use a pair of electrodes and again, a dipolar magnetic field (Figure 8). Here again the Lorentz forces produce a lift. If we want a more symmetrical system, we can place the electrodes in a circular belt around the sphere, each half of a pair being placed diametrically opposite the other half. The electric generator is connected

to only one pair of electrodes at a time, in sequence. To complete this sequential operation, an internal series of solenoids provides a rotating magnetic field.

It is high probable that the flow of the surrounding medium will be similar to the flow associated with the cylindrical model (Figure 9). Here the air flow

modifies the distribution of the static pressure on the surface of the sphere.



Lorentz forces depend upon both  $\vec{J}$  (the current density) and  $B$  (the magnetic field). The following equations show that creation of a glow discharge in air requires high voltages and high current densities, resulting in high losses from the Joule effect and radiation. If we try to increase the magnetic field, we approach a critical value at which the Hall effect becomes important.

We know that Lorentz forces can act very powerfully in a fluid. Experiments have been carried out in which these forces have produced very strong shock waves. With sufficient magnetic field and electric current, one can expect a large amount of lift.

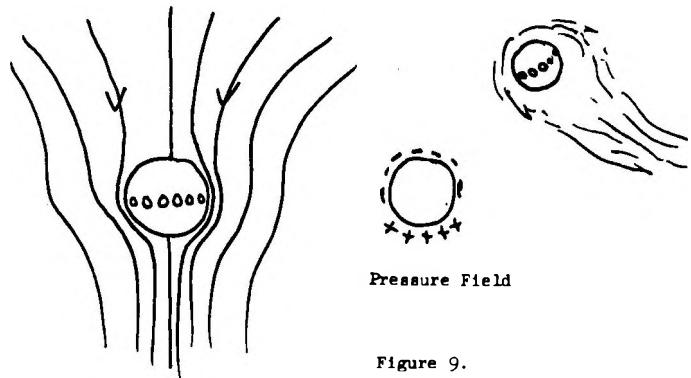


Figure 9.

### The Hall Effect

The gyrofrequency is defined as:

$$\omega_e = \frac{eB}{m_e} \quad \text{with } e^-$$

where  $e$  = charge of the electron  
 $B$  = intensity of the magnetic field  
 $m_e$  = mass of the electron

The collision frequency for the electron species can be defined as:

$$v_e = \sum_{s \neq e} n_s Q_{es} \langle \ell \rangle$$

where  $n_s$  = density number of a heavy species, ion or neutral  
 $Q_{es}$  = collision cross section  $e \times s$

$$\langle \ell \rangle = \text{thermal velocity} = \sqrt{\frac{8k T_e}{\pi m_e}}$$

$k$  = Boltzmann constant

$T_e$  = electronic temperature

The electric field  $E$  acts on electrons. If the gyrofrequency is small compared to the collision frequency, the average movement of the electron will be linear and parallel to  $E$ . In  $e \times s$  collisions we can consider that all the drift velocity of the electron is annihilated. In effect, in such collisions the velocity of the electron is randomly distributed over all directions of space.

If the gyrofrequency reaches the order of magnitude of the collision frequency, there is a transverse drift motion of the electrons (see Figure 10). The preceding is very well described in Sutton and Sherman, ENGINEERING MHD, MacGraw Hill, 1967.

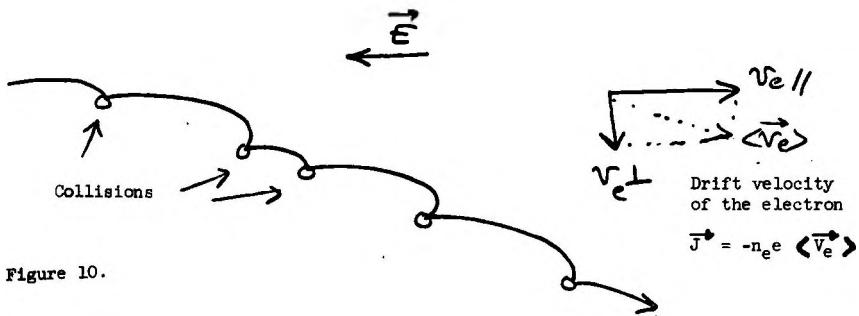
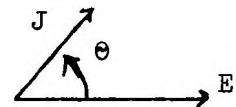


Figure 10.

We can define a critical, non-dimensional parameter, called the Hall parameter, as follows:

$$\beta = \frac{w_e}{v_e} = \text{tangent } \theta$$



The relationship between  $J$  and the field  $E$  is no longer scalar:

$$\vec{J} = \vec{\sigma} \cdot \vec{E}$$

The electrical conductivity becomes tensorial, as shown in the matrix below:

$$\vec{\sigma} = \sigma_s \begin{vmatrix} \frac{1}{1+\beta^2} & \frac{-\beta}{1+\beta^2} & 0 \\ \frac{\beta}{1+\beta^2} & \frac{1}{1+\beta^2} & 0 \\ 0 & 0 & 1 \end{vmatrix}$$

where  $\sigma_s$  = the "scalar" electrical conductivity (i.e., the conductivity with a zero magnetic field)

Let us return to the cylindrical and spherical aerodynamics. These are no longer practical. As a matter of fact, a component of the Lorentz force, normal to a surface, appears in the vicinity of the electrodes. We must seek other configurations for our model, namely, a disc (see Figure 11).

### MHD Aerodynes with Large Hall Effect

In Figure 11 we have a disc-shaped model made of insulating material, with two belts of electrodes, one around the top, the other around the bottom. An electric discharge is produced in the surrounding air. An equatorial solenoid produces an axial magnetic field (Figure 12).

As will be shown later, the geometry of the model must be modified somewhat, for electrodynamic considerations. For the moment, we will consider it to be a flat ellipsoid, in two sections, with the electrodes perpendicular to the flow of electricity. If we put this model into a test chamber, a reddish-colored plasma appears. The luminosity is strongest at the electrodes, where the current density is greatest, and the electrodes have the appearance of "windows." When the magnetic field is introduced, we get a spiral current pattern. The electric current lines are twisted (Figure 13), as experiments have confirmed.

Now let us check the Lorentz forces. As we see in Figure 14, if the Hall effect is strong, the Lorentz forces become quite radial. Their direction is reversed at the bottom of the model, because the direction of the current  $J$  is also reversed. Thus we get the pattern of Lorentz forces shown in Figure 15.

The probable induced flow is indicated schematically. It is very similar to that around a helicopter. If such a MHD device could operate properly, it would show some aspects very similar to those of a helicopter (Figure 16).

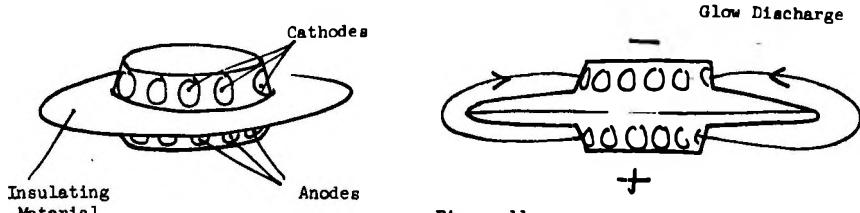


Figure 11.

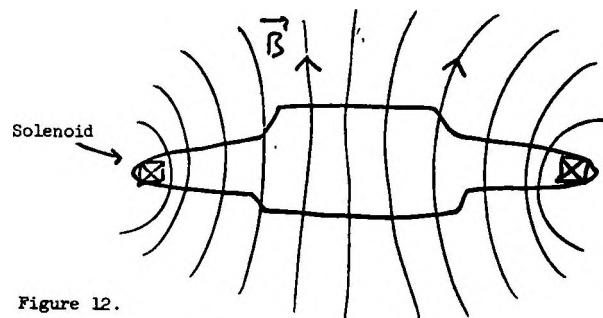
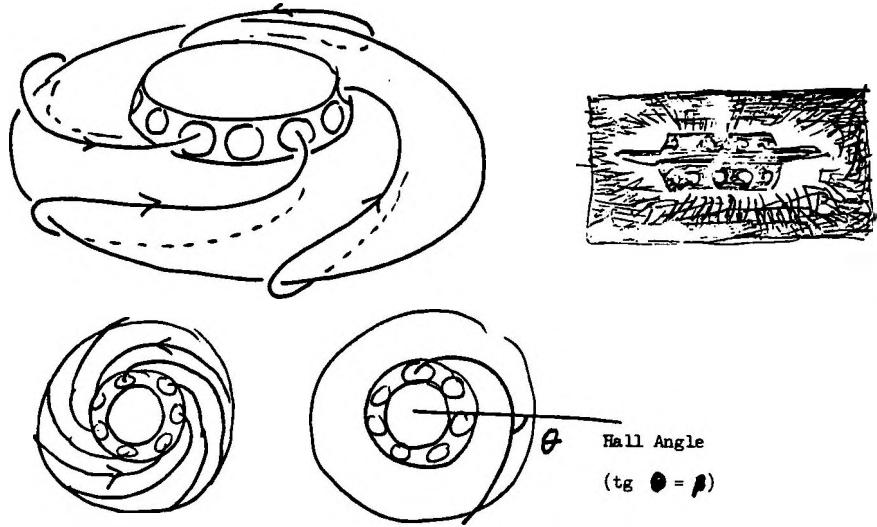


Figure 12.



Spiral current pattern

Figure 13.

We have conducted some preliminary experiments in our laboratory. In atmospheric air the value of the magnetic field  $B$  required to produce the Hall effect is quite high. Therefore we used a rarefied gas, which lowers the collision

frequency. With air pressure of 1 Torr, the Hall effect is obtained with a magnetic field of 200 Gauss. This low pressure has the added advantage of making glow discharges possible with low electrical potential (100 V.). See Figure 17 for the design of the experiment.

### Some Computational Elements

Can we now try to determine the parameters for such an aerodyne? The first task is to compute the electron density ( $n_e$ ). During discharge, the plasma is far from thermodynamic equilibrium; i.e., the electron temperature ( $T_e$ ) is considerably higher than the gas temperature ( $T_g$ ). Determination of the electron temperature is delicate. In effect, the classical Saha's Law corresponds to thermodynamic equilibrium. It has been shown that this law can give a good indication if the temperature is greater than about  $4000^\circ$  K, when the total particle density is greater than  $10^{14}/\text{cc}$ , and the dimensions are greater than 1 cm. (1). It then becomes possible to compute the electron density by:

$$n_e = f(T_e, T_g, P_g)$$

Figure 18 gives the values for different gas pressures. The gas temperature is fixed at  $300^\circ$  K., but should be elevated by Ohmic heating as the gas passes through the discharge zone. This heating should be evaluated. In this computation it is assumed that a resonant radiation is trapped so that none escapes from the gas. From these values we can compute the collision frequency, in order to determine the Hall parameter and the scalar electrical conductivity. These values are given in Figure 19.

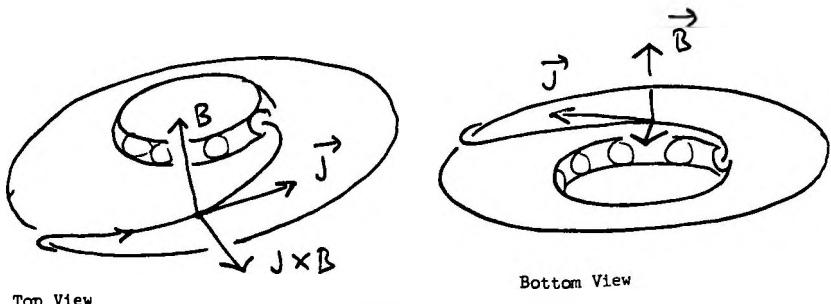


Figure 14.

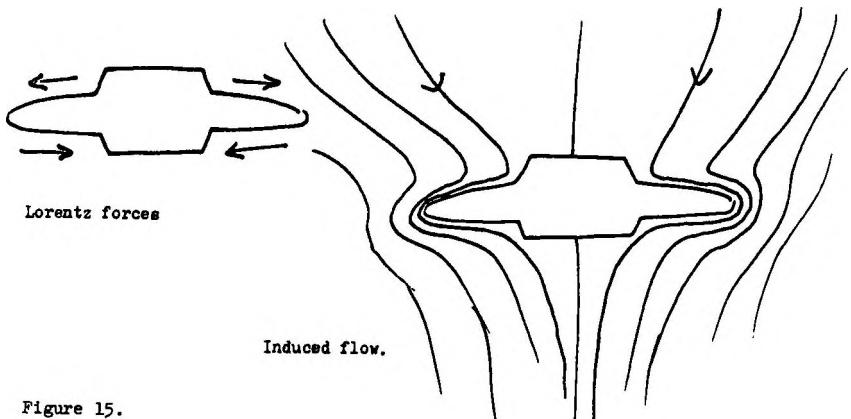


Figure 15.

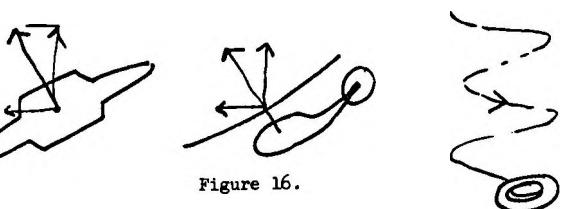


Figure 16.

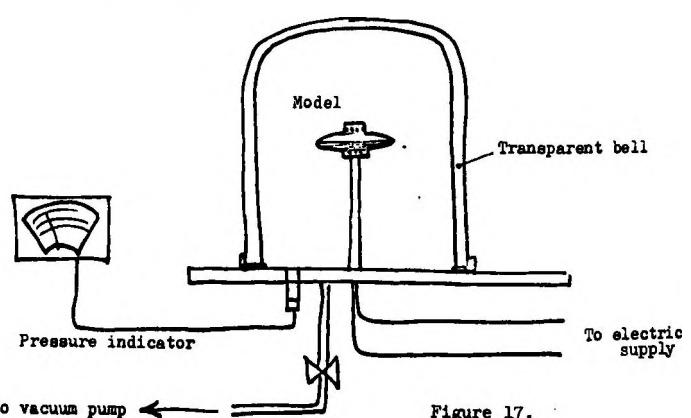


Figure 17.

Non-Equilibrium Electron Densities Per Cubic Meter ( $e/m^3$ )

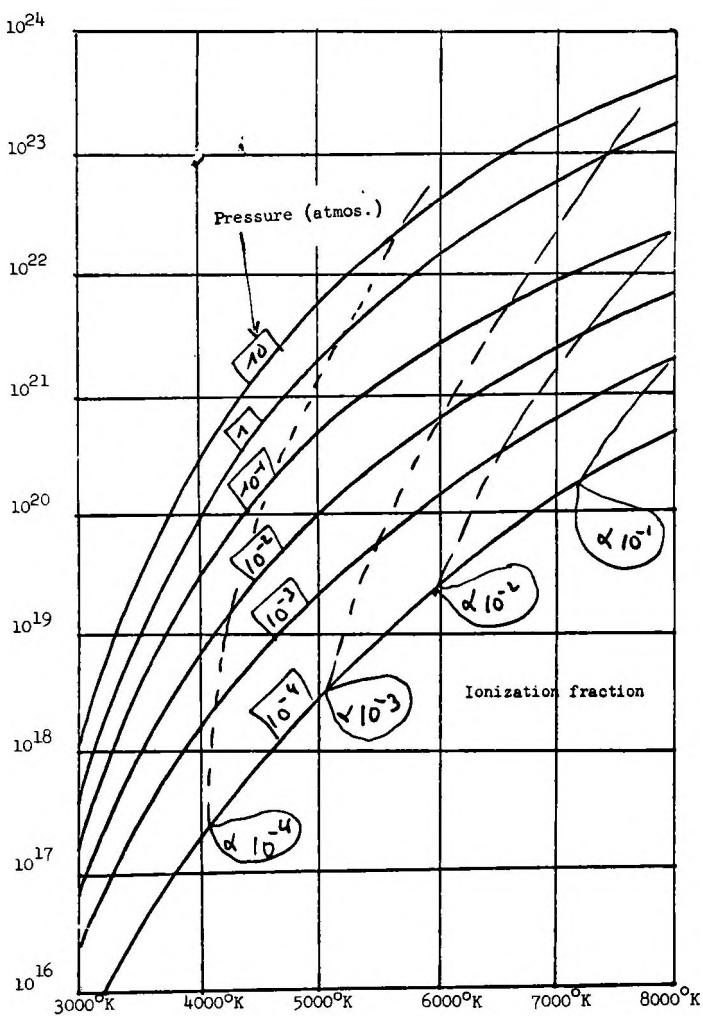


Figure 18.

Electron Temperature

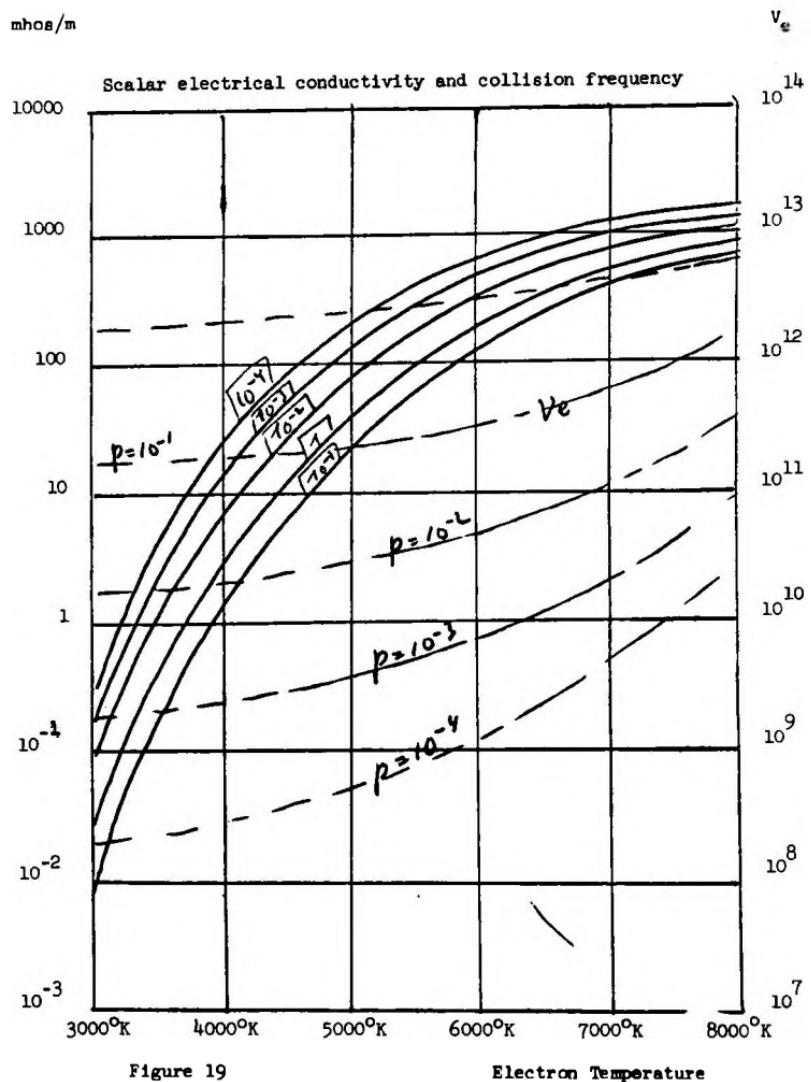


Figure 19

For an aerodyne employing the Hall effect, a minimum Hall parameter is required - say, 3. Corresponding values of the magnetic field are indicated in Figure 20. This shows that for atmospheric air, the values are quite high. And this suggests a pulsed operation. In our experiments, using a 200 Gauss magnetic field, the Hall effect could be observed only when the electron temperature was low. When the electron temperature was increased, by increasing the electric intensity, the Hall effect tended toward zero, because the coulomb collision raised the collision cross section, as predicted by theory. In atmospheric air, the strength of the magnetic field  $B$  must be between  $10^5$  and  $10^6$  Gauss, which is quite high.

To create a discharge, one must spend a certain amount of electrical energy. This amount can be determined through the energy equation of the electron gas. The electric field gives kinetic energy to the electrons. Part of this energy is converted into heavy-particle kinetic energy, the remainder is transferred to inelastic processes (rotation, vibration, electronic modes), and finally converted into radiation effects. It is possible to take these inelastic effects into account through the introduction of a loss coefficient  $\delta$ . Figure 21 gives the value of this loss coefficient for air and hydrogen (2). The transferred energy is:

$$\frac{3}{2} k (T_e - T_g) n_e \sum_{s \neq e} \frac{m_e}{2V_{es}} \frac{m_s}{m_s} \delta_s$$

This power, in watts/cubic meters, must be equated with the electrical power:

$$P_e = \vec{J} \cdot \vec{E} = \frac{\sigma_s E^2}{1 + B^2}$$

For high Hall effect machines we have retained the value  $B = 3$ . For spherical and cylindrical devices, the value of  $P_e$  must be divided by 10. Figures 22, 23 and 24 give the computed values for the electric power density and the corresponding values of  $J$  and  $E$ . It seems evident that such high values make a continuous operation impossible. Therefore, both the electric power and the magnetic field will operate only for a time "t" at intervals "T" (see Figure 25).

Let us now take an aerodyne with a ten-meter span, and a distance of three meters between the electrodes (this will be justified later on). With a flat

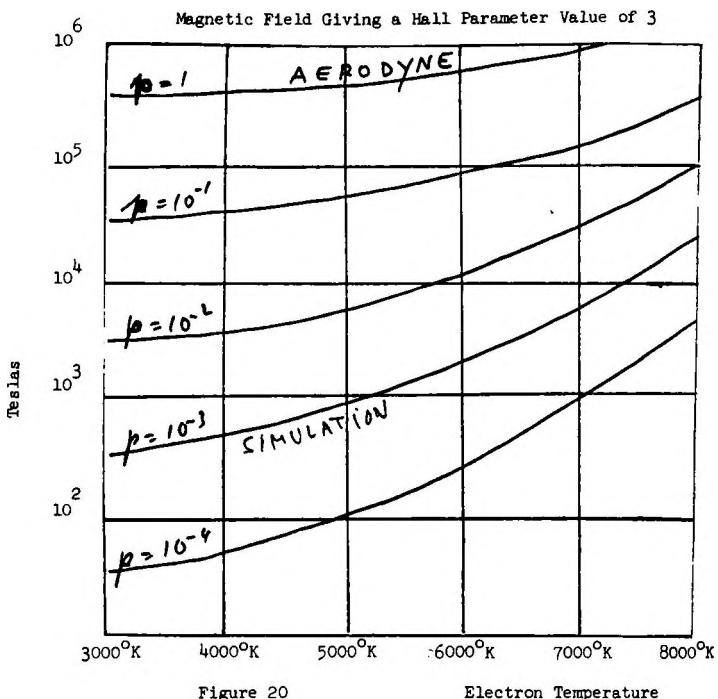


Figure 20 Electron Temperature

$\delta_s$

Energy Loss Factor

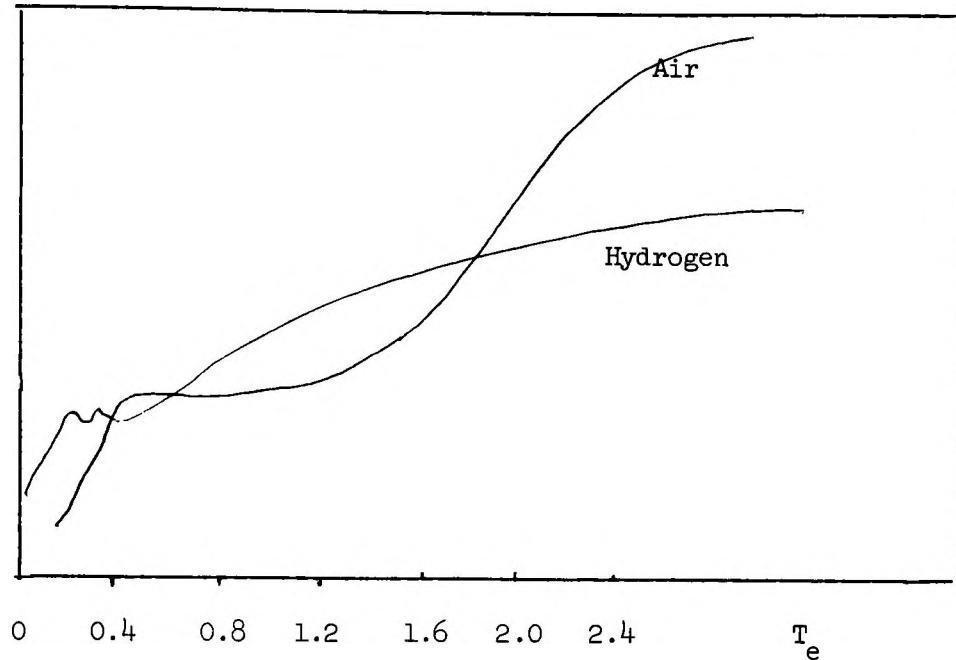


Figure 21

Electric Power Density

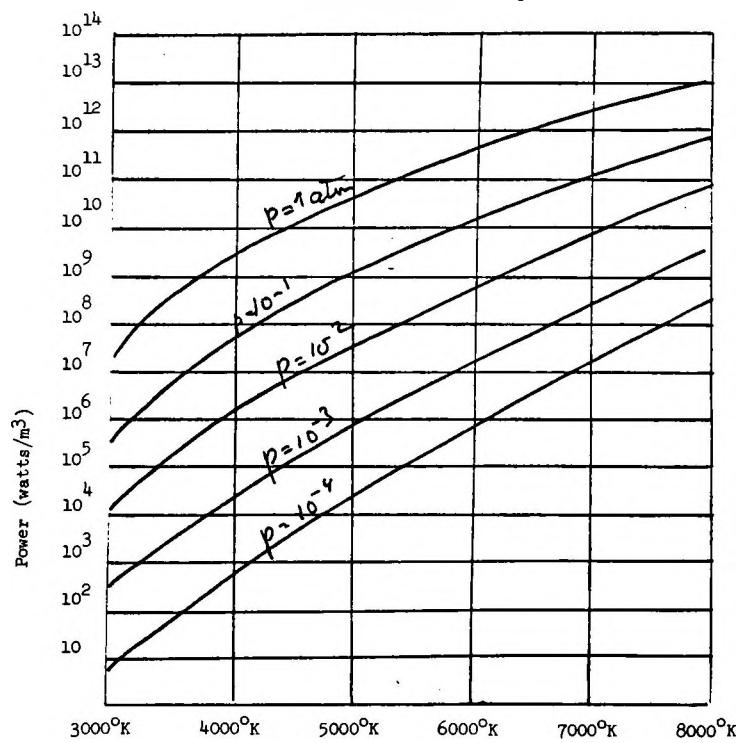


Figure 22

Electron Temperature

Current (amps/m<sup>2</sup>)

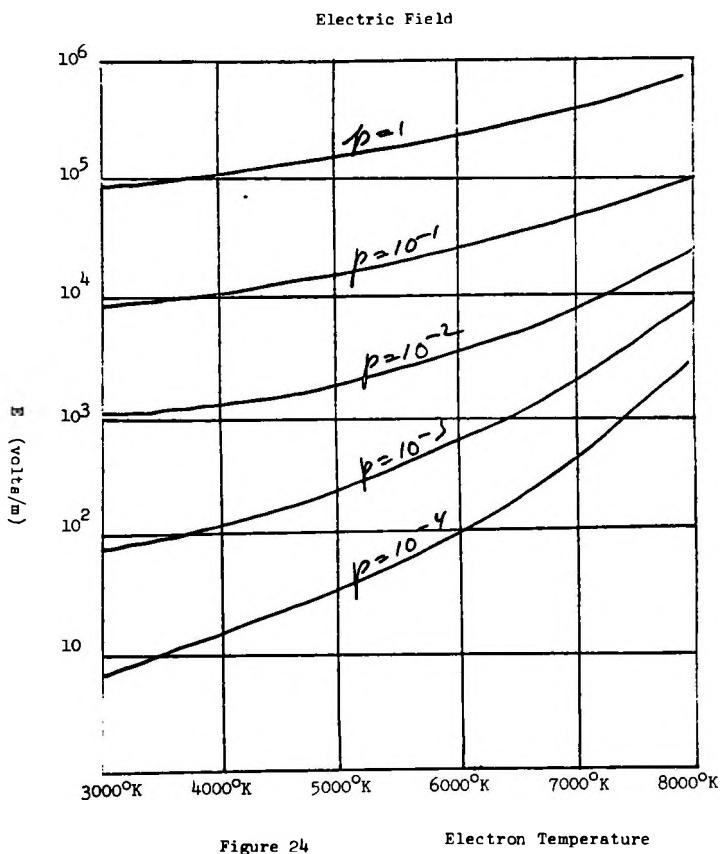


Figure 24

Electron Temperature

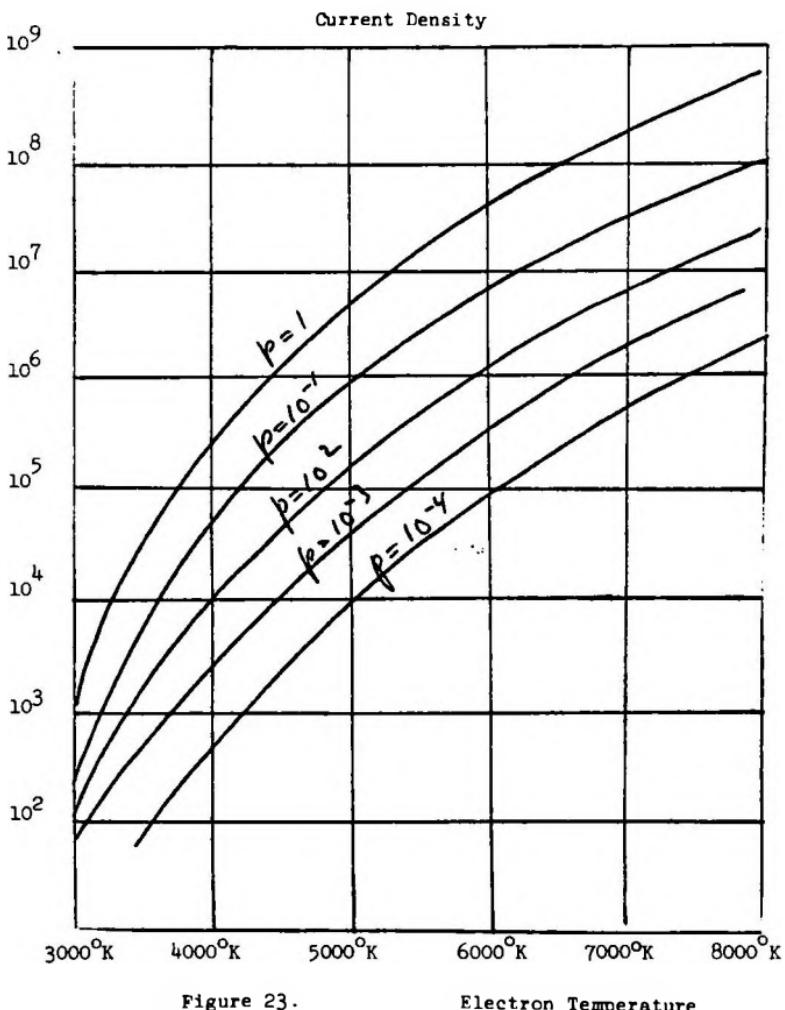


Figure 23.

Electron Temperature

discharge, the volume of plasma created is 20 cubic meters. For an electron temperature between  $5000^{\circ}$  K and  $6000^{\circ}$  K, the electrical power must be between  $4 \times 10^{11}$  and  $4 \times 10^{12}$  watts.

Using a pulse of about  $10^{-6}$  duration and an interval of about  $10^{-3}$  units, we get an average ( $t/T$ ) of  $10^{-3}$  or a value about 1000 times lower than the peak values (see Figure 25). This gives the operating parameters given in Figure 26.

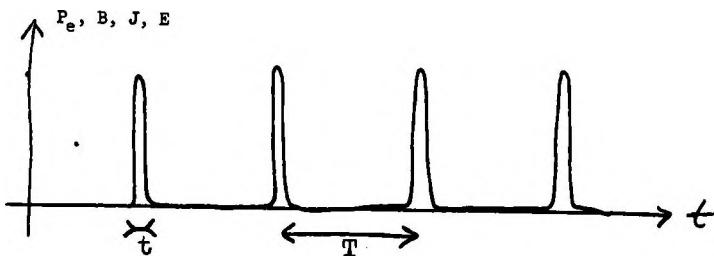


Figure 25. Pulsed operation; average value = peak value  $\times \frac{t}{T}$

$T_e$	$5000^{\circ}$ K	$6000^{\circ}$ K
$\bar{P}_e$	400 MW	4000 MW
$V_{max}$	$4.5 \times 10^5$ V	$6 \times 10^5$ V
$I_{max}$	$10^7$ Amp	$10^8$ Amp
$\bar{I}$	$10^4$ Amp.	$10^5$ Amp
$B_{max}$	$4 \times 10^5$ G	$5 \times 10^5$ G
$\bar{B}$	$4 \times 10^2$	$5 \times 10^2$

Figure 26

### The Induced Field

We have a rapidly varying, high intensity magnetic field, which generates a strong induced field  $E'$ . The Maxwell equation gives:

$B$  is close to 100 Teslas and "t" can be about  $10^{-6}$  seconds. This gives an enormous induced field (about  $10^8$  volts/meter). This field is azimuthal. Because of the Hall effect, we get a somewhat paradoxical situation (Figure 27). The induced current is radial. This induced current could possibly be used to create ionization in the air. We plan to check this possibility through experimentation.

### Geometry of the Discharge

When we undertook the first experiments in our low pressure chamber, we expected the discharge to stay close to the edges of the model, following the shortest path.

It was a surprise to find that the discharge extended a considerable distance from the model (Figure 28). The explanation is as follows: In this MHD model, the magnetic pressure,  $B^2/2\mu_0$  appears to be higher than the static pressure of the electron gas,  $P_e = n_e k T_e$ . This explains why the discharge was blown away by magnetic pressure. This effect increased when the air pressure was decreased, for example, to  $10^{-4}$  atmospheres. For a magnetic field of 100 Teslas, the magnetic pressure is  $4 \times 10^4$  atmospheres!

This means that the geometry of the discharge is mainly determined by the magnetic geometry. As we will see, other magnetic configurations can be imagined. In MHD aerodynamics, the air flow is determined by the field of the Lorentz forces;

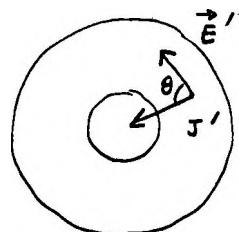


Figure 27

the field of Lorentz forces is determined by the discharge shape; and the discharge depends on the geometry of the magnetic field. As a consequence, we no longer have to think in terms of classical fluid dynamics. The design of the MHD aerodyne is determined by electromagnetic considerations and not by ordinary fluid dynamics.

As we can see, the effect of the discharge can be felt at considerable distance from the model. A MHD aerodyne can pump a much greater volume of air than its own volume. Thus the lift of a 20-ton machine could be accomplished using only small induced velocities.

Once we discovered this factor, we tried to find an appropriate solution. The first suggestion was to operate at high electron temperatures, in which case electric conductivity would be higher in the core of the discharge. This resulted in a return of the discharge toward the edges of the model. But Maurice Viton had a better idea: he suggested defining a more elaborate magnetic configuration, in order to maintain the discharge in a well-defined location, close to the model walls. Accordingly, we put two solenoids in the aerodyne, with the electric current flowing in opposite directions (Figure 29). This figure shows a two-solenoid configuration, as given by machine computation (3). The surface of maximum magnetic field is roughly a portion of a cone. The design of the wall is obtained by choosing a surface conforming to the magnetic lines. The location of the discharge is shown on the figure. Figures 30, 31, and 32 show other configurations for 2 and 3 solenoids (in the latter case, the configuration is symmetrical).

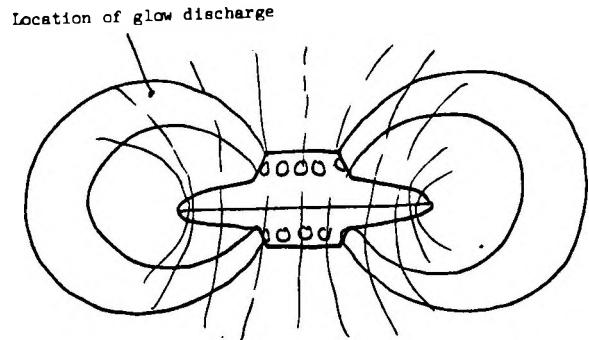


Figure 28.

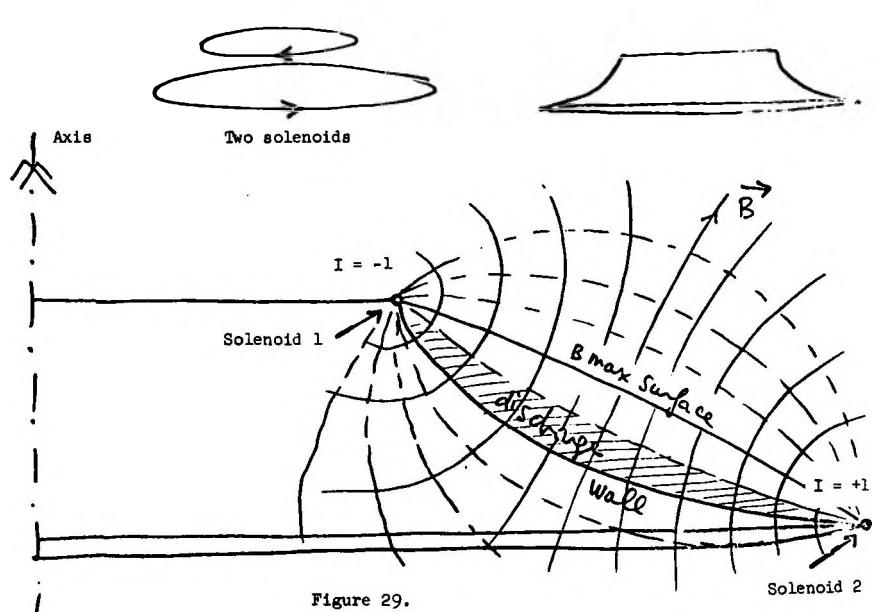


Figure 29.

#### The Problem of the Front Shock Wave

Let us return to a simple configuration, the spherical aerodyne. When a body moves in a gas at a transsonic speed, a supersonic region appears (Figure 33). A small shock wave appears where the compression waves accumulate. As the velocity increases, the shock migrates towards the front of the machine. When

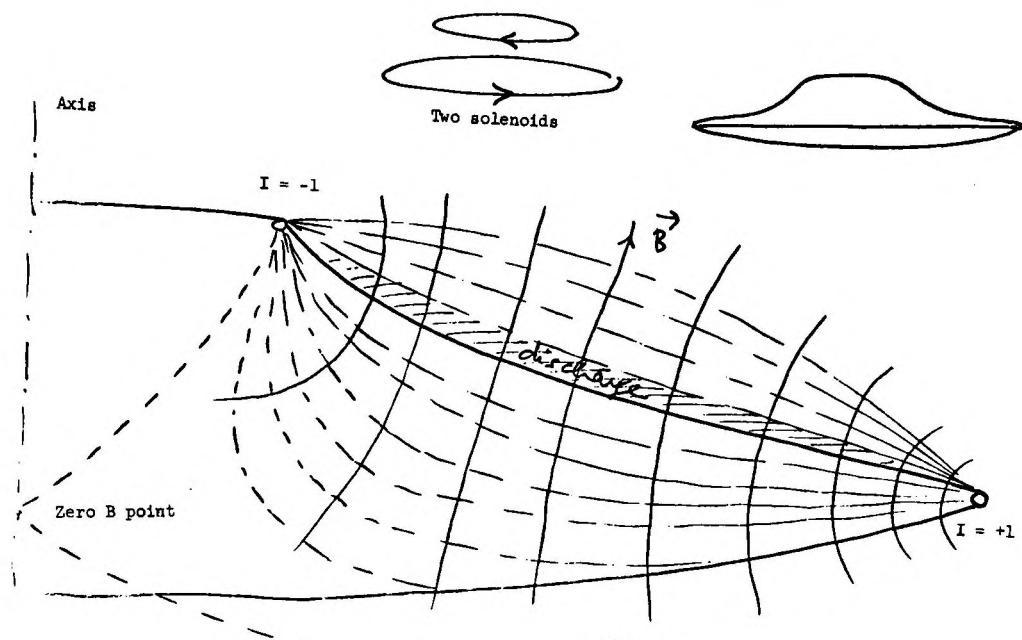


Figure 30

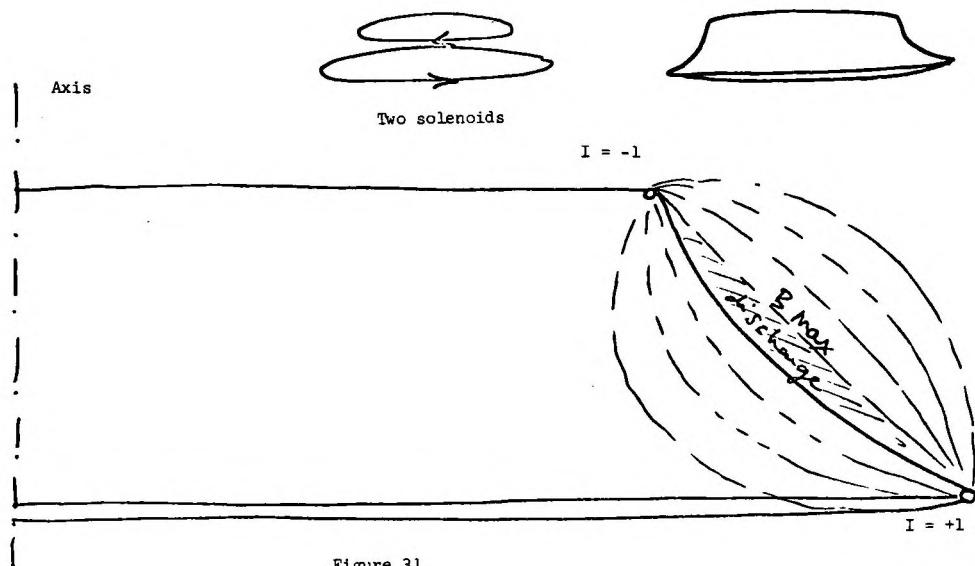


Figure 31

supersonic speeds are reached, the shock wave is found in front of the machine, as shown in the figure. This effect is well known. What we must explore is what could happen in the presence of strong MHD interaction. To this end we have undertaken some experiments in an analogous stream (hydraulic analogy). These show that Lorentz forces act on the "shock," but our field was not strong enough to get a sufficiently significant result. The experimental apparatus is shown in Figure 34.

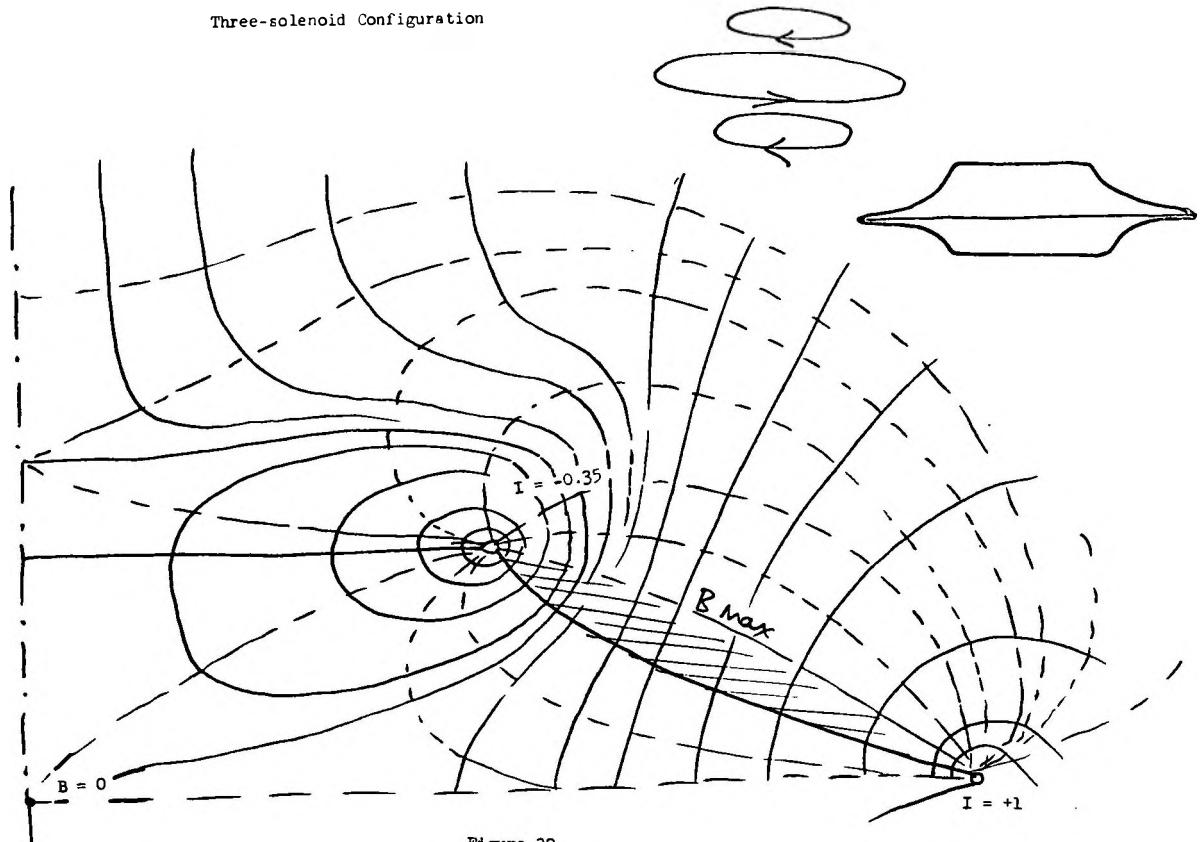


Figure 32.

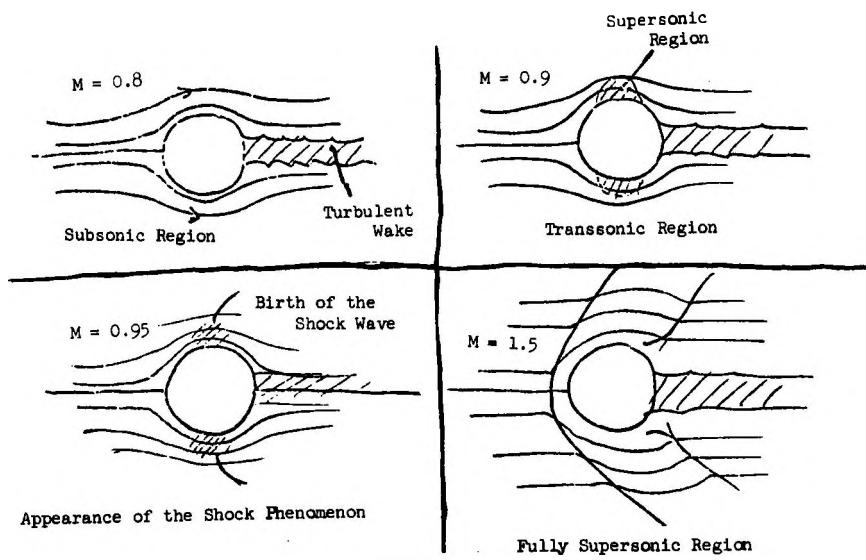


Figure 33

What are the possibilities in the presence of strong MHD interaction? One possibility is that the increased velocity due to Lorentz forces in the vicinity

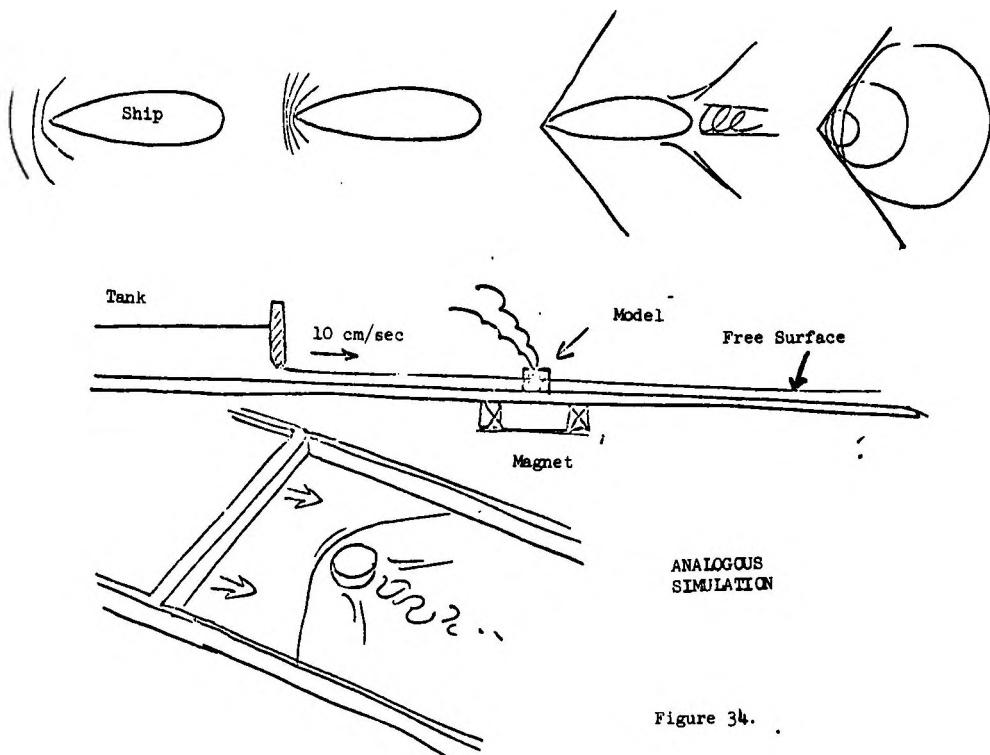


Figure 34.

of the electrodes could generate expansion waves which could interact with the shock wave (Figure 35). This figure shows how the expansion waves could damp the shock wave.

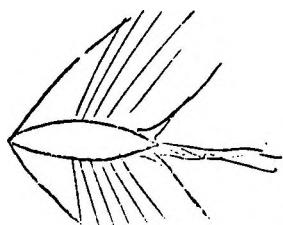


Figure 35.

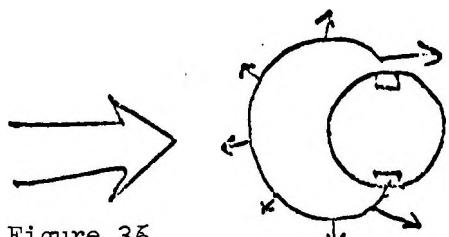


Figure 36.

There is another factor connected with the pattern of Lorentz forces. In a spherical or cylindrical model, the Lorentz forces are directed, at the front of the machine, in such a way as to slow down the velocity of the incoming fluid (Figure 36). As the discharge can extend far beyond the model, this slowing down can occur gradually. If I'm not mistaken, I believe that in a linear channel we can slow down a supersonic fluid so gradually that subsonic flow can be obtained without the usual shock (Figure 37).

The appearance of a shock wave depends on the value of the interaction

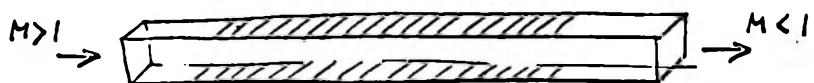


Figure 37.

parameter. In 1970 I built a MHD generator with a Faraday linear channel. The production of electric power was associated with a slowing down of the fluid. To the best of my memory, a shock wave appeared only when the interaction parameter reached the critical value:

$$s = \frac{\sigma B^2 L}{pV} > s_{cr} \sim 0.2$$

$\sigma$  is the electrical conductivity  
 B is the magnetic field  
 L is a characteristic length (the distance at which the Lorentz forces can act)  
 p is the density of the gas  
 V is the velocity

We can write:

$$s \sim \frac{\sigma VBBL}{pV^2} \quad \text{and since } \sigma VB \sim J, \text{ and } \frac{\frac{1}{2} pV^2}{L} \sim \frac{\partial p}{\partial n}$$

It follows that  $s \sim \frac{JB}{\frac{\partial p}{\partial n}} \sim \frac{\text{Lorentz force}}{\text{pressure force}}$

We believe it is not basically impossible to achieve shockless supersonic flight with MHD aerodynamics, and are preparing experiments to check this in low pressure wind tunnels in France.

#### Plasma Instabilities

There is a special problem related to high Hall parameter operations. Specialists in plasma physics know that plasmas do not like situations where both  $T_e > T_g$  and  $\beta > 1$ . Under these conditions a very strong and fast ionization instability, known as the Velikhov instability, occurs (4). Consider a spiral pattern (Figure 38). If the electron temperature lies between  $5000^\circ$  and  $6000^\circ$  K,

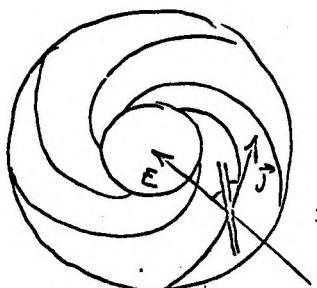


Figure 38.

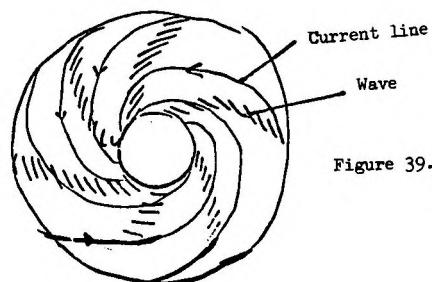
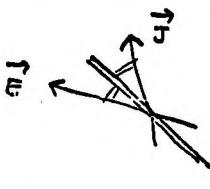


Figure 39.

the ionization level is close to  $10^{-4}$ . This means that, strictly speaking, the plasma is not completely ionized. Ionization waves then occur. According to theory, these waves will make a similar angle with J and E (Figure 38). Given the current pattern, we can predict the wave pattern (Figure 39).

In regions where the plasma is more ionized, it has a greater electrical conductivity. Consequently, the electrons will not follow the current lines, but will run into the waves (Figure 40). Finally, the wave pattern will behave like current streamers (Figure 41).

For such a turbulent plasma, we get an average apparent Hall parameter which is much lower than the initial value. Practically, we can say that the apparent Hall parameter is close to the critical value, as predicted by theory. This critical parameter has been computed (5). The growth rate of the instability, which is the inverse of the characteristic time of growth,  $t$ , is:

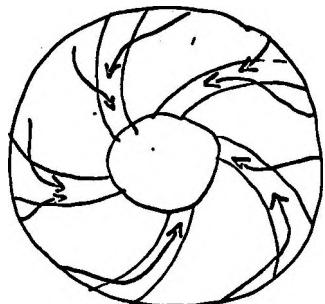


Figure 40.

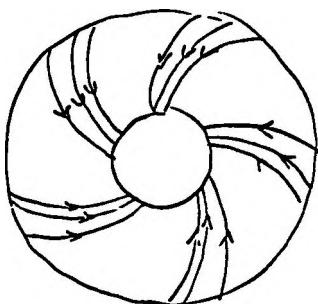


Figure 41.

where  $\sigma$  is the electrical conductivity  
 $E$  is the electric field

$$U = E_i + \frac{3}{2} kT_e$$

$E_i$  is the ionization energy

For a partially ionized plasma, the electron mobility variation is related to the electron density variation as follows:

$$\frac{\delta \mu}{\mu} = -f \frac{\delta n_e}{n_e}$$

Then the critical value of the Hall parameter has the simple formula:

$$\beta_{cr} = 1.935 f + 0.065 + s$$

where

$$s = \frac{2 k T_e^2}{E_i (T_e - T_g)} \times \frac{1}{1 + \frac{3}{2} \frac{k T_e}{E_i}}$$

If we refer to the obtained curves (Figure 42), we see that only low Hall parameters can be achieved for atmospheric plasmas. For electron temperatures greater than  $5000^\circ$  and less than  $6000^\circ$  K, the value of  $B_{eff}$  is close to 0.5.

If we want to operate at high Hall parameters, we must counter this instability efficiently.

We have observed this instability in our low pressure experiments. The observed value of the efficient Hall parameter for low electron temperature was close to the theoretical value, i.e., close to 0.7.

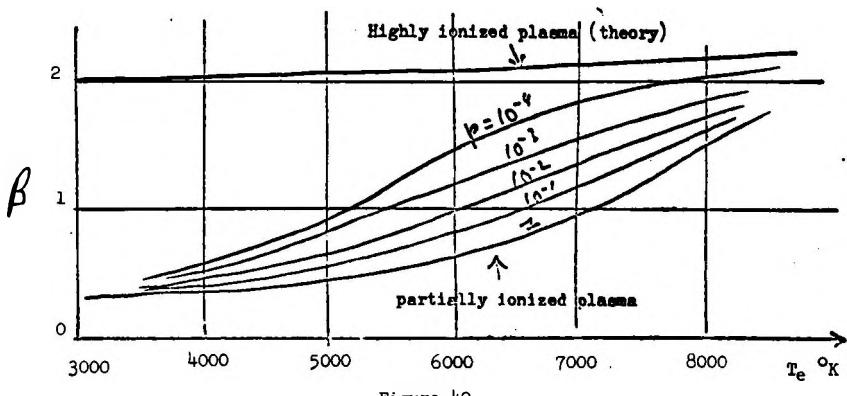


Figure 42.

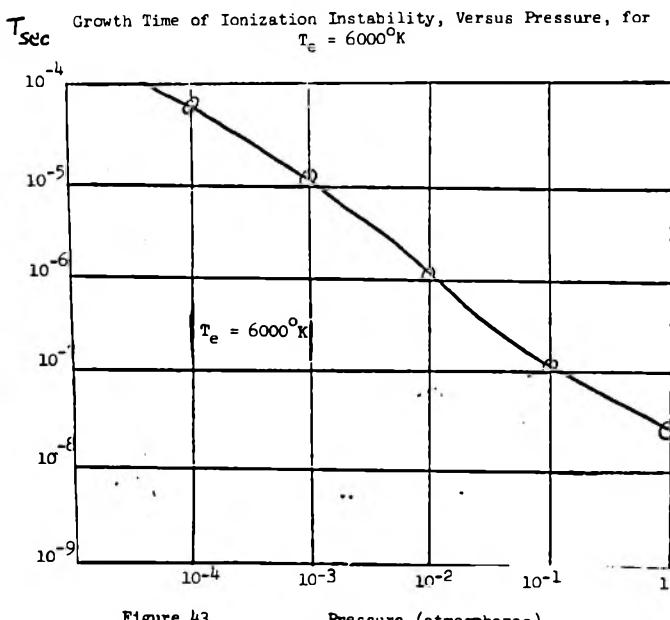


Figure 43.

Pressure (atmospheres)

This produces current streamers; the instability does exist, but it does not destroy the spiral pattern. The electrodes should be connected to the electric generator one after the other, through a dispatching device.

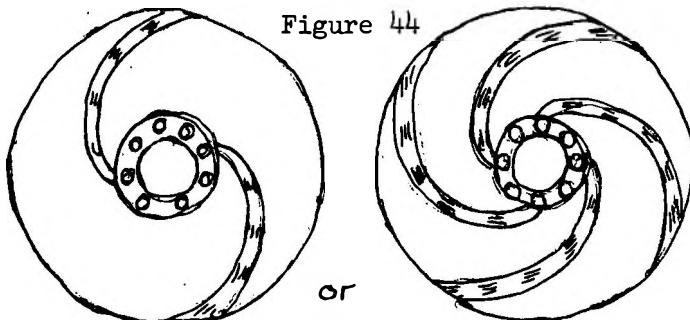


Figure 44

or

modulation should be efficient. We have planned such an experiment in a French microwave laboratory. To put it another way, one can say that the high frequency component of the current provides for homogeneity of ionization.

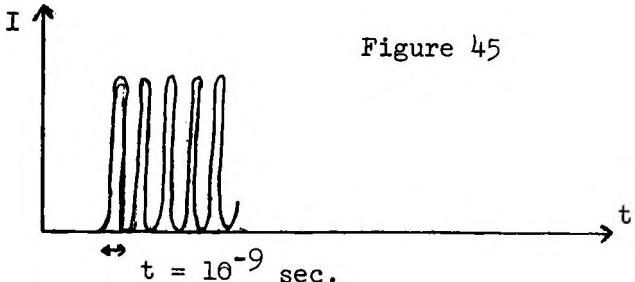


Figure 45

Let us compute the growth time of the ionization instability, versus pressure, for  $T_e = 6000^{\circ}\text{K}$  (Figure 43). For an atmospheric plasma, the dependence of growth time "t" on electron temperature is soft. At an electron temperature of  $5000^{\circ}\text{K}$ , the growth time is  $3 \times 10^{-8}$  sec.

To sum up:

At  $p \sim 10^{-3}$  atmos.,  $t \sim 10^{-5}$

At  $p \sim 1$  atmos.,  $t \sim 10^{-8}$

In short, this is a very fast phenomenon. What can we do?

First, we can operate with a limited number of electrodes at a given time (Figure 44).

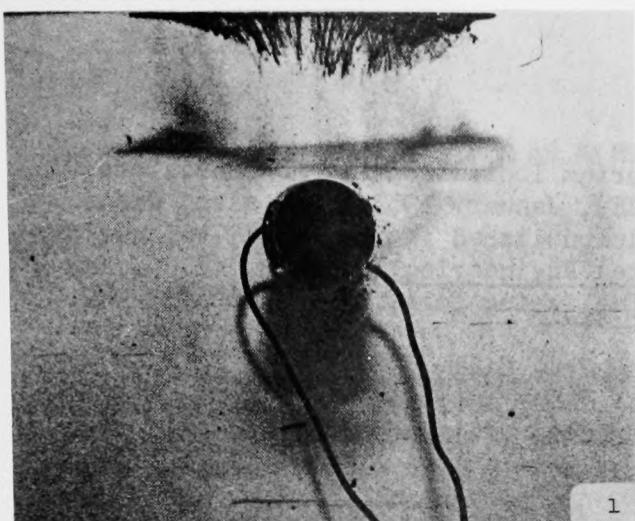
Another solution, more elegant, would be to modulate the current, using pulses of shorter duration than the instability growth rate. For an atmospheric plasma, this means that the current must be modulated with a frequency equal to about 1000 MHz. (Figure 45). For a low pressure gas ( $10^{-3}$  atmos.), a  $10^6$  hertz

modulation should be efficient. We have planned such an experiment in a French microwave laboratory. To put it another way, one can say that the high frequency component of the current provides for homogeneity of ionization.

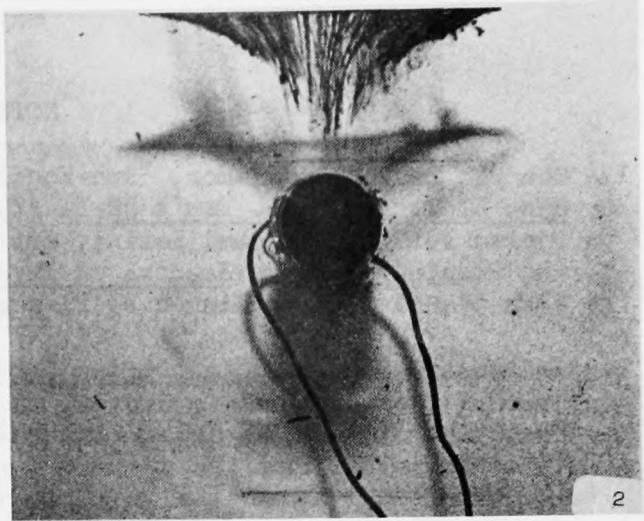
A more sophisticated solution would be to cover the entire surface of the vehicle with regulated electrodes.

The problem of the ionization instability is a very crucial problem in plasma physics. If we could counteract this phenomenon, a number of new MHD

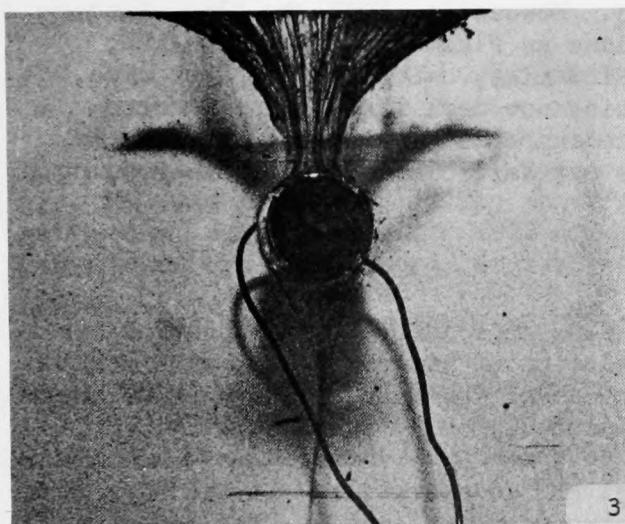
machines, with high Hall parameters, could be developed.



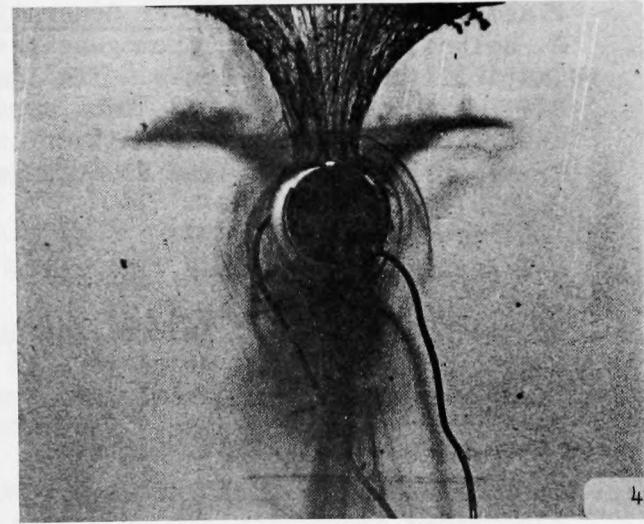
1



2



3



4

PHOTO 1 - Simulation Experiment: MHD Induced Laminar Flow

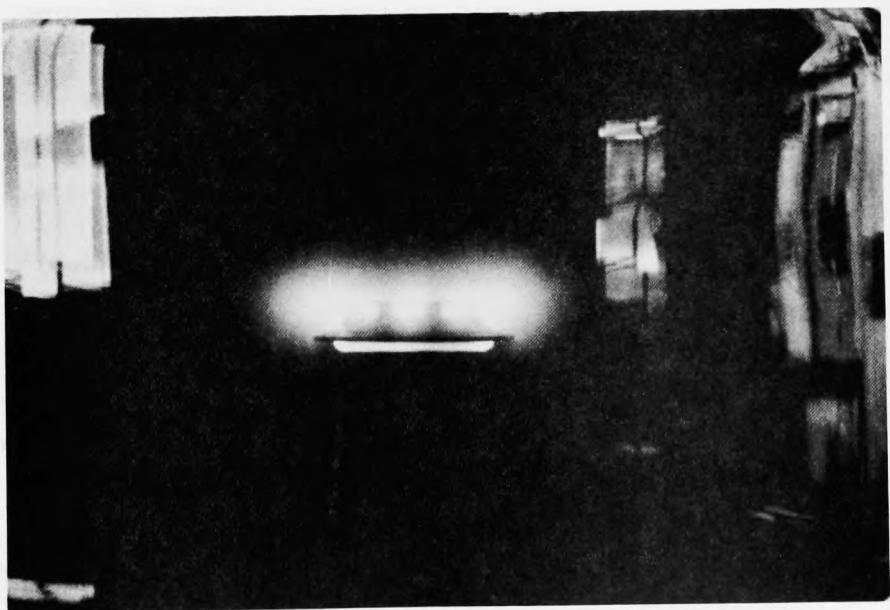


PHOTO 2 - Laboratory Model of a MHD in Operation

NOTES

1. See Ben Daniel and Tamor, "Non-Equilibrium Ionization in MHD Generators," Gen. Elec. Res. Lab. Rep't 62-RL (2922E), January 1962. See also, Jean-Pierre Petit and Michel Larini, article published in the May 1974 issue of the Russian language Journal of Physical Engineering, vol. 24, no. 5, English translation published by Plenum Publishing Corp., 1975, UDC 533-932.
2. Sutton and Sherman, Engineering MHD. McGraw Hill, 1967.
3. The authors thank Mr. Duban of the Laboratoire d'Astronomie Spatiale for these computations.
4. See E. Velikhov, "Hall Instability of Current Carrying Slightly Ionized Plasma," MHD Electric Power Generation. Newcastle, 1962, p. 135. Also, A. Solbes, "Etude des Inhomogeneites dans un Plasma de Conversion MHD; Instabilites Electroniques." PA Ign/RT Saclay, 8 Sept. 1966. See also, J-P Petit and J. Valensi, "Taux de Croissance de l'Instabilite Electro-Thermique et Parametre de Hall Critique dans les Generateurs MHD a Cycle Ferme lorsque la Mobilite Electronique est Variable." CRAS, vol. 269, pp. 365-367, 1 Sept. 1969.
5. J-P Petit and J. Valensi, loc. sit.
6. Photo 1 shows the MHD induced laminar flow in a laboratory simulation experiment, using a 35 mm. model in a 3% solution of water and HCl, with a 220 Gauss magnetic field parallel to the plane of the figure, and a power supply of 20 volts, 0.8 amps. The experiment lasted 10 seconds.

Photo 2 shows a 2-inch laboratory model MHD in operation. It has segmented electrodes around the top, a ring electrode on the bottom. The shape was determined by the results of computations. The model is fixed to a small mast, visible in the picture, as are the wires carrying the electric current. The experiment was conducted in air at 1 Torr. pressure, for a duration of from 1 to 10 microseconds. The color in the vicinity of the cathodes is pink; around the edges it is blue.

## IDEAS FOR AN EXPERIMENTAL APPROACH

Claude Poher

### Introduction

A great majority of UFO sightings (70%) occur at night. The witnesses to these night-time observations tell us that the UFOs generally appear luminous and as if surrounded by air in a state of excitation. We have many UFO photographs taken at night; they generally show only a blur, nothing more (see Figure 1). But this is in fact an important piece of information; it seems to be possible for people to take pictures of UFOs at night using very ordinary, low-cost cameras.

The UFO phenomenon is very rare, and the possibility of studying it by an experimental, scientific approach is very slight, due to the near-zero probability of an instrumented ground station observing a UFO. One solution would be to make use of thousands of low-cost stations. But we do not have the budget for this approach. We can therefore turn only to the future potential witnesses, and the question arises: Would it be possible to make a scientific instrument out of a common, ordinary camera, at very low cost?

### The Image Grating Spectrograph

The answer to the above question is: Yes, it is possible. By interposing a transmission grating directly in front of the objective of the camera (see Figure 2), we obtain a spectrograph. On the resulting photograph we would now find not only the blur, but also two spectra of that blur, as well as an indication of the degree of light polarization. Figure 3 shows the results of using this technique to photograph light from differing sources, as follows:

- a white source with a detail (diagonal bar)
- a white source with one of three sharp-cut interference filters  
(red, green, and blue)
- a completely white source
- a white source with horizontal polarization
- a white source with vertical polarization

From these results we can conclude the following:

1. The details of the source are preserved in the transmitted image;
2. Two spectra of the source are obtained (one is more intense than the other in this example because of the "blaze angle" of the high-quality grating used);
3. There is strong polarization in the direction of the diffracted image due to the presence of the grating.

When applied to ordinary night photographs, this ideal technique gives the results shown in Figure 4. In this case, we are able to obtain the spectrum of

a mercury street lamp. Thus, if a witness could take two successive pictures of a UFO, with a  $90^{\circ}$  rotation of the camera (with the grating taped over the camera objective), he would obtain the results shown in Figure 6 (in this case only one spectrum was obtained, presumably due to poor alignment of the camera).

### Performances and Potential Achievements

I have made many tests of such a spectrograph using different sorts of gratings. I believe it is possible to obtain an average performance level such as that presented in Figure 7 without any special precautions. Certainly, a few precautions and a better grating (600 lines/millimeter instead of 200, and a better efficiency) would give better results (a resolution of  $1 \text{ \AA}$  would be easy). With such characteristics it is possible to achieve very important scientific results, as shown in Figure 8.

Another very important characteristic of this technique is the great difficulty of falsifying pictures; e.g., coherence between black-body-like continuum, lines intensities, lines wavelengths, etc.

### Manufacturing the Grating

The grating used is not an ordinary high-quality holographic grating such as those made by JOBIN YVON or BAUCH & LOMB, who are accustomed to manufacturing for scientists. The suggested grating can be obtained simply by recording laser beam fringes on a holographic emulsion (see Figure 9). This, of course, gives a relatively poor grating, but the cost is expected to be of the order of \$1.00 compared to \$300 for the lowest-priced scientific gratings. JOBIN YVON is actually trying to design such a grating for mass production. First results are promising.

### Dissemination of the Gratings

The best way to disseminate the gratings to the public is to enclose one in a UFO book written by scientists, with a simple explanation on how to use it. I seriously invite CUFOS scientists to do this. I expect that the first spectrum obtained will be able to change many things.

E X A M P L E   O F   B L U R

( 3 PICTURES OF THE SAME OBJECT  
TAKEN IN 10 SECONDS WITH A  
KODAK " RETINETTE" CAMERA ).

F I G U R E 1

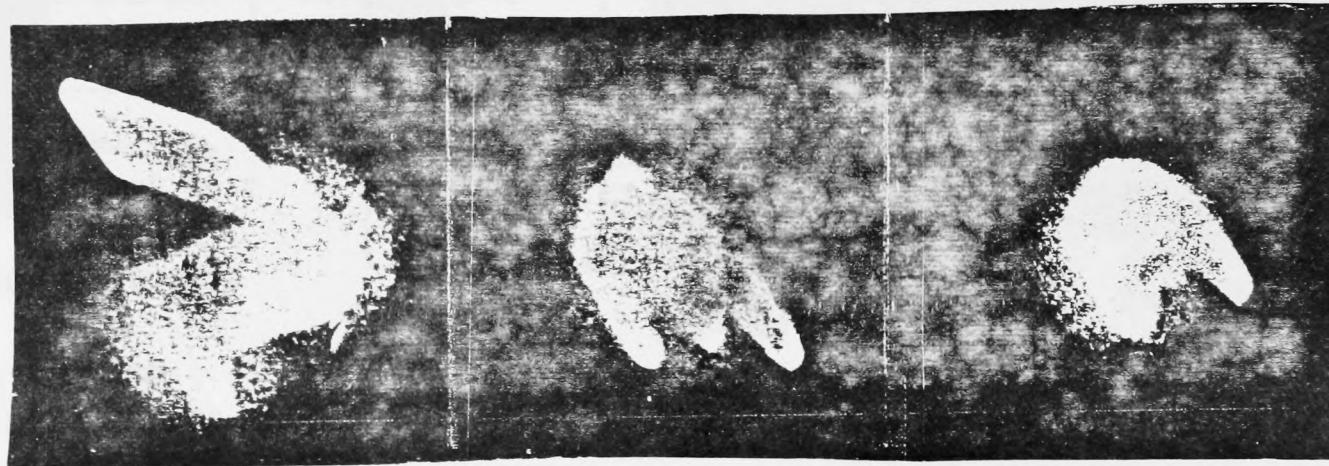


FIGURE 2

## E Q U I P M E N T

---

- 1) TAKE TWO PICTURES WITH  
 $\pi/2$  ROTATION
- 2) TRY OTHER PICTURES
- 3) TAKE A PICTURE OF A  
STREET LIGHT

HIGH SENSITIVITY  
BLACK AND WHITE  
FILM ( KODAK TRI X  
OR ILFORD HP 4 )

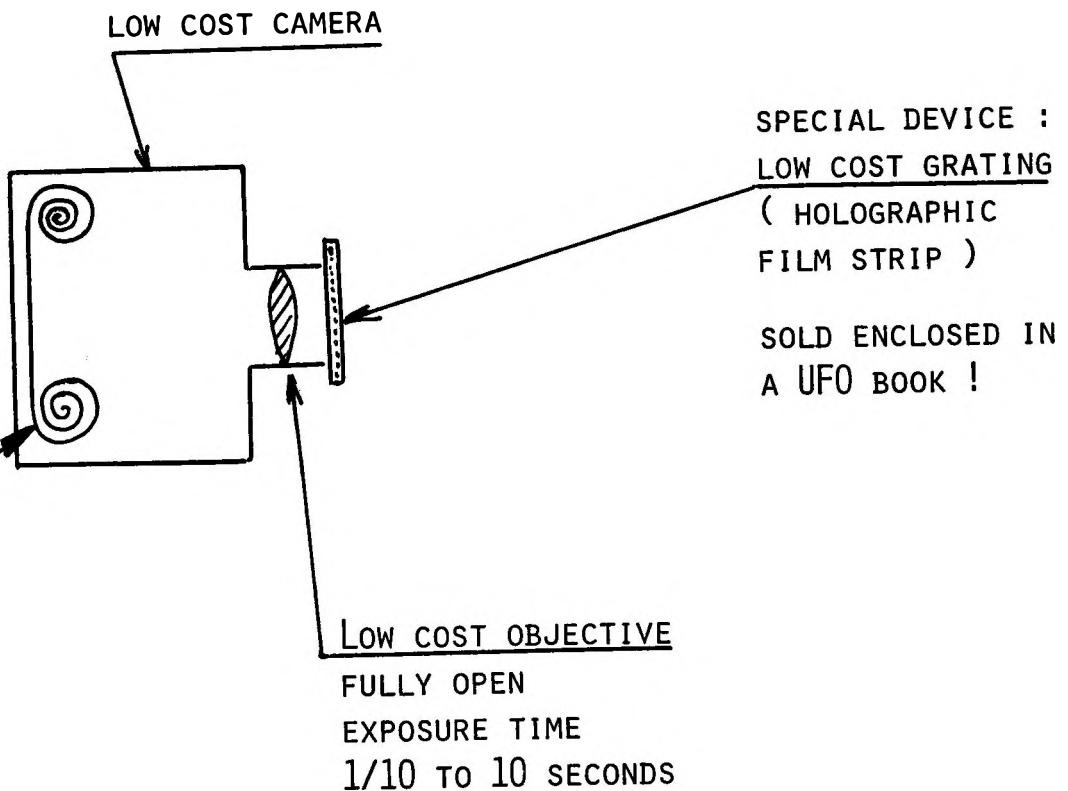


IMAGE WITHOUT GRATING

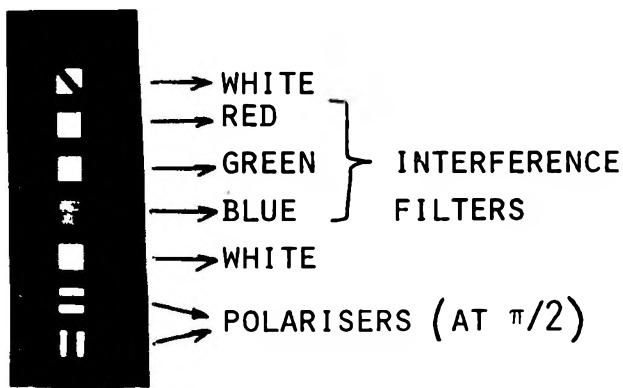
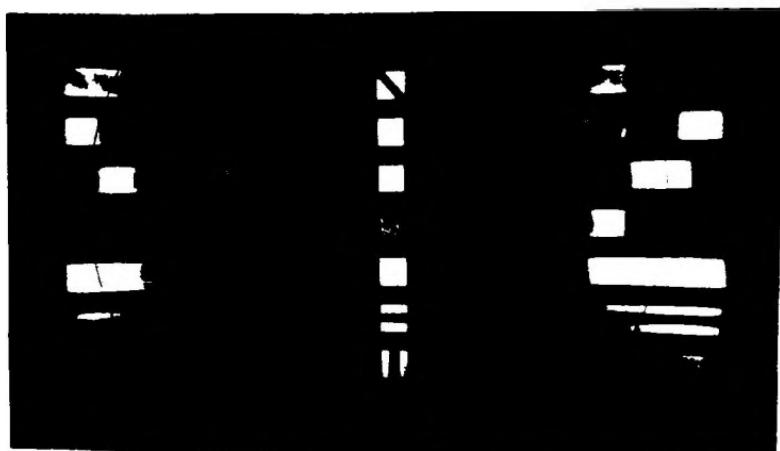


FIGURE 3

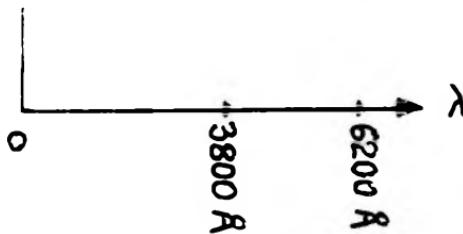
## IMAGE WITH GRATING



↑  
DIFFRACTED  
IMAGE  
N° 1

↑  
NORMAL  
IMAGE

↑  
DIFFRACTED  
IMAGE  
N° 2



2 PICTURES OF A MERCURY  
STREET LAMP

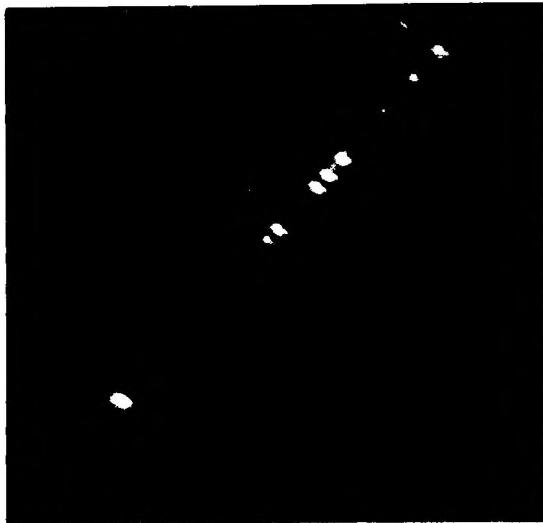
CAMERA : COLORPACK 80 (POLAROID)

F = 100 mm F/6 = 64

EXPOSURE TIME  $\approx$  ONE SECOND

FILM : POLAROID 87 BLACK AND WHITE  
(3000 ASA)

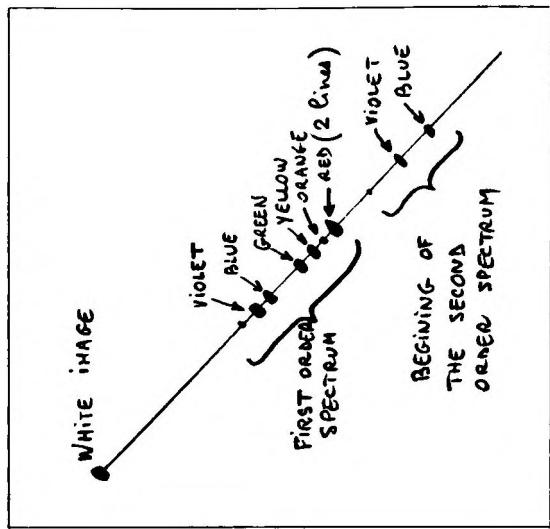
GRATING :  
JOBIN-YVON - 600 lines/mm -



DISTANCE  $\approx$  100 m



DISTANCE  $\approx$  20 m



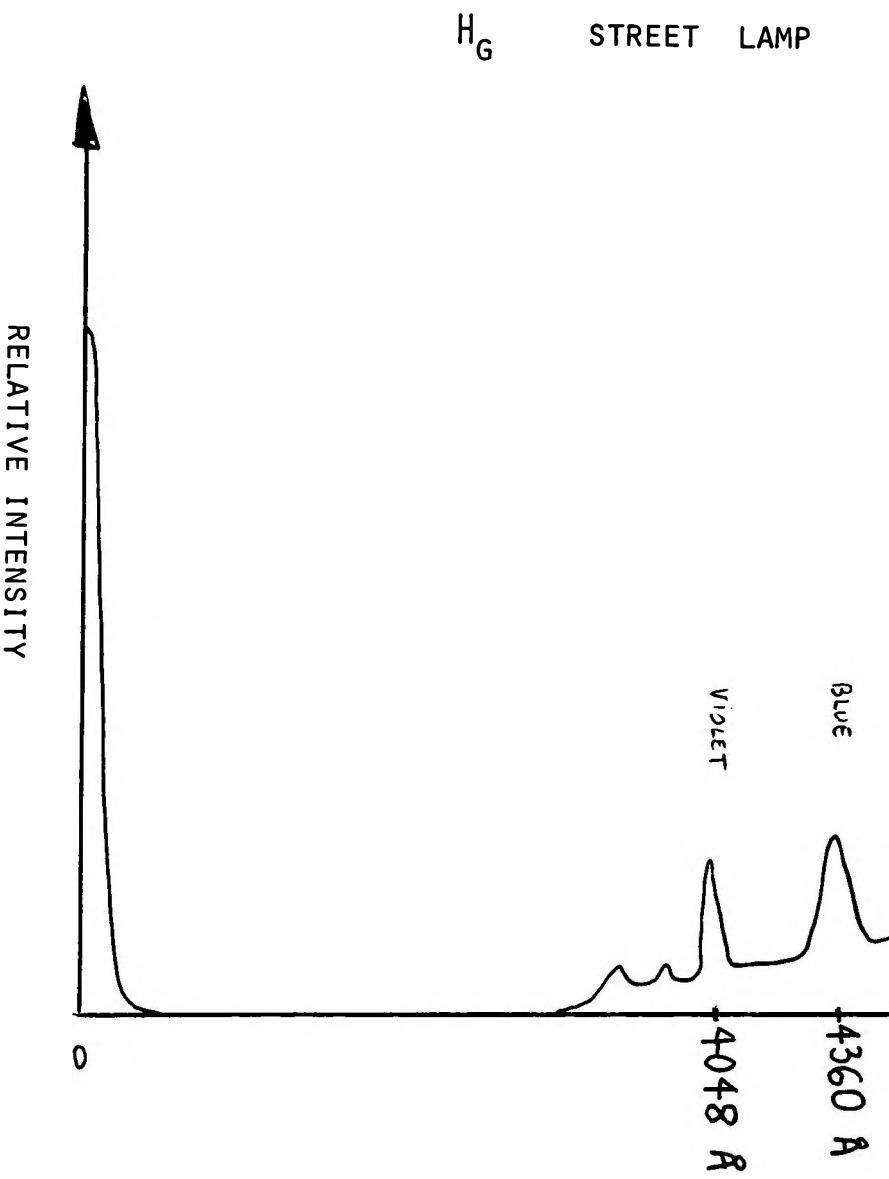
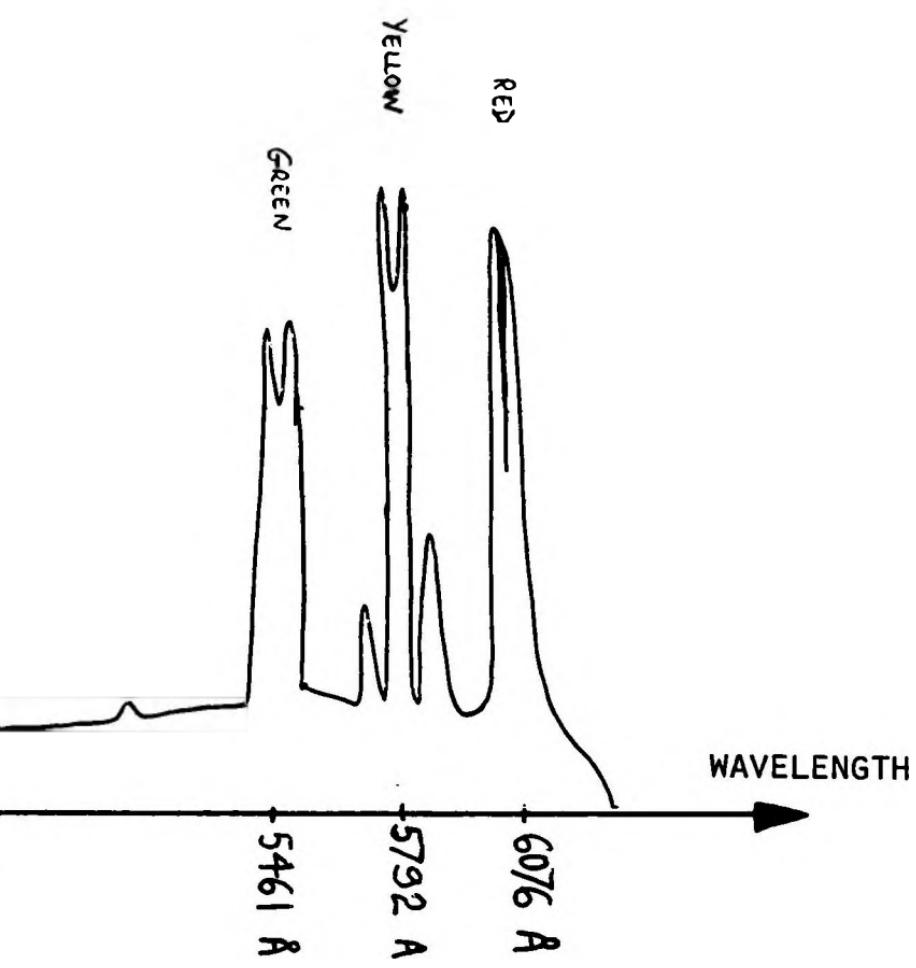


FIGURE 5



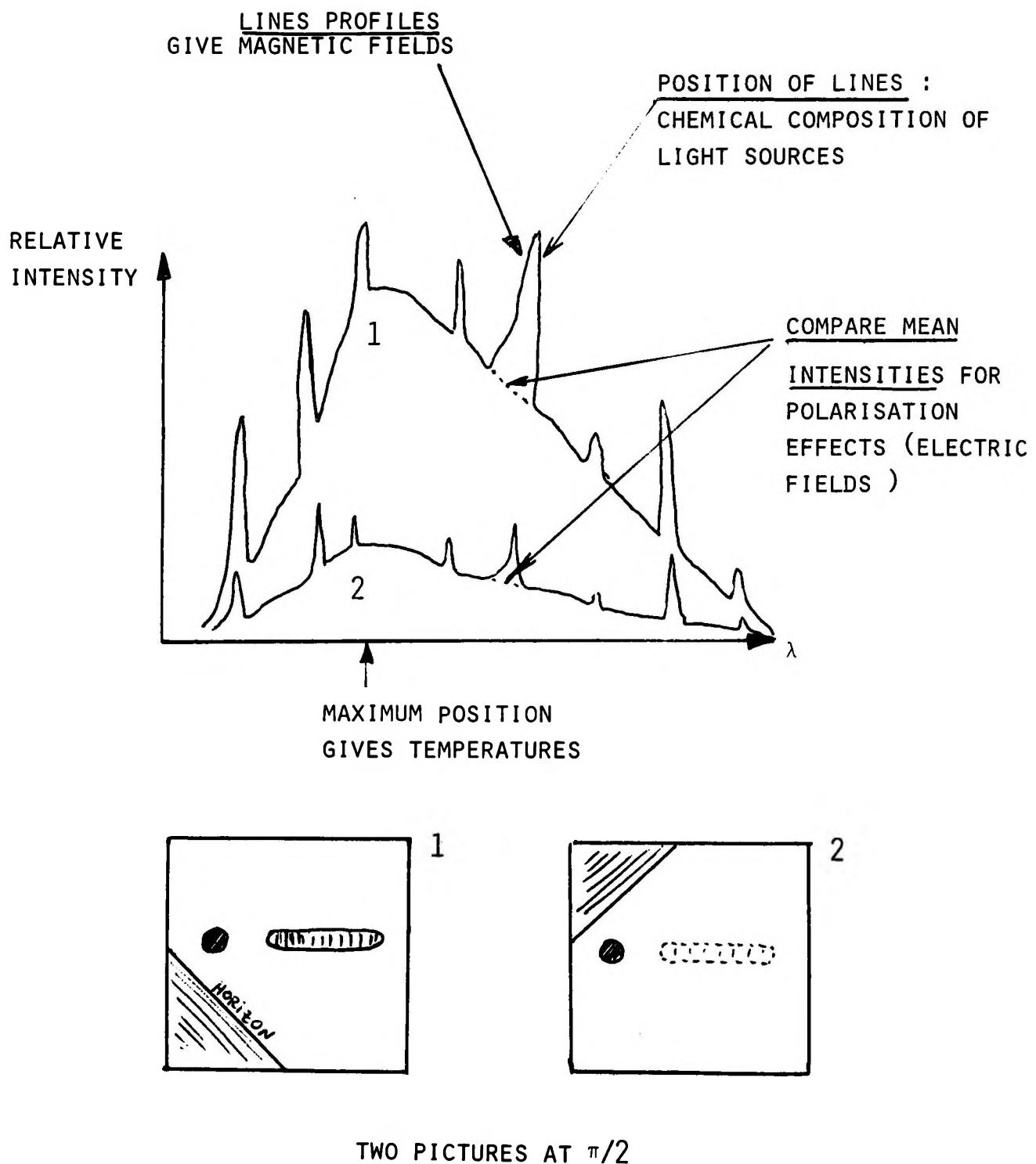


FIGURE 6

## MAIN PERFORMANCES

DISPERSION:                  400 Å/mm to 200 Å/mm  
SPECTRAL RESOLUTION:        10 to 20 Å  
ANGULAR RESOLUTION:         2.5 Arc minute  
SPECTRAL RANGE:              3800 to 6200 Å

## FIGURE 7

## ACHIEVEMENTS

1. Confirmation of Air Excitation, Ionization
2. Measurement of:
  - a. Electron and Ion Temperatures
  - b. Orders of Magnitude of Electric and Magnetic Fields, if any
  - c. Radiated Power
  - d. Presence or Absence of Seeding Atoms, and Their Nature
  - e. Degrees of Light Polarization
  - f. Angular Velocity and Angular Dimensions
3. Very Difficult to Falsify Coherent Pictures
4. Possible Reorientation of Models

## FIGURE 8

### III HOLOGRAPHICALLY RECORDED DIFFRACTION GRATINGS (H.R.D.G.)

#### A Production flow chart of H.R.D.G.

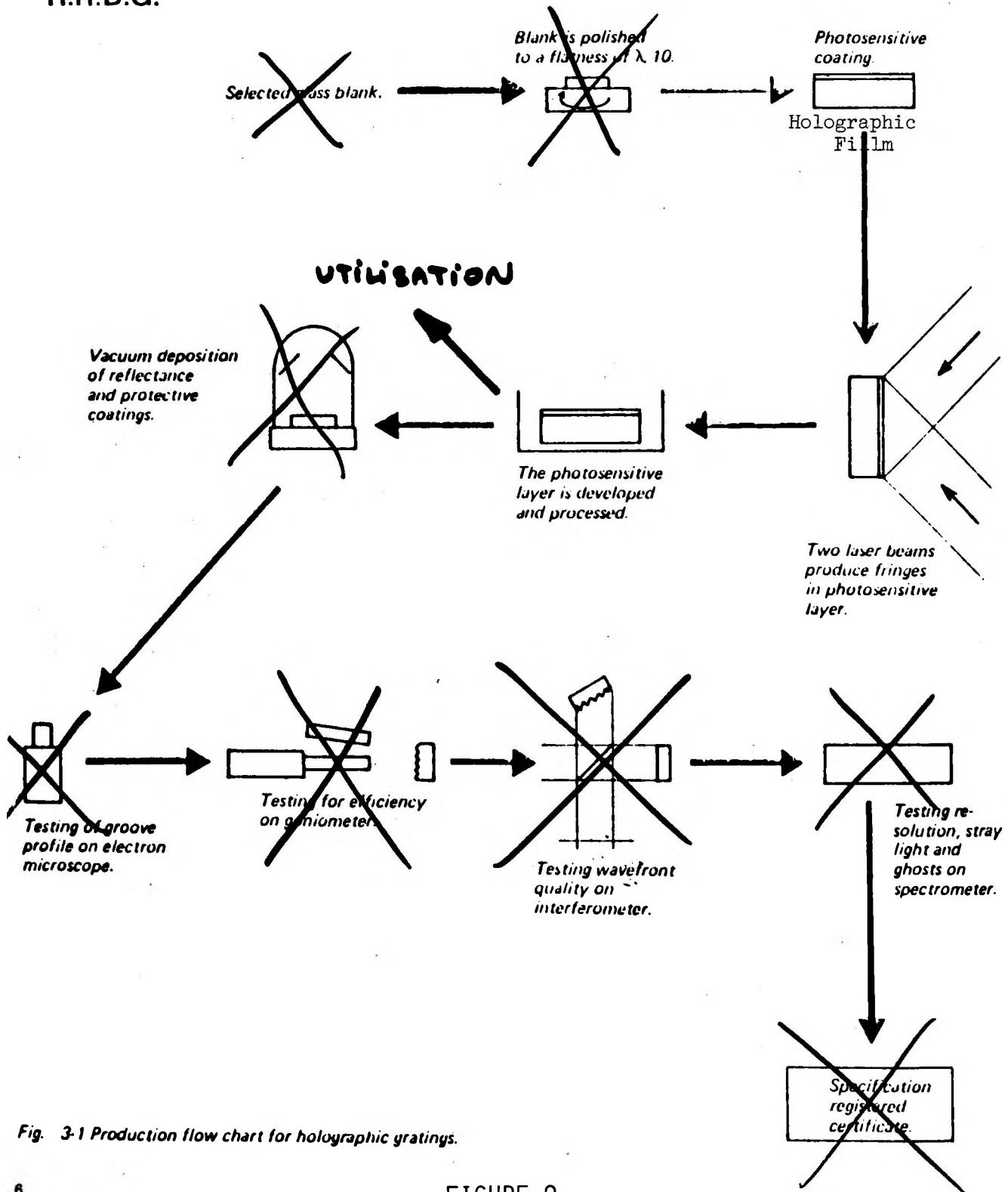


Fig. 3-1 Production flow chart for holographic gratings.

# A SPATIO-TEMPORAL INVARIANT FOR MAJOR UFO WAVES

by D.R. Saunders

Whatever explanation(s) may eventually be adduced, there can be no doubt that UFO-reports do exist as reports. We have collected over 40,000 of them from various sources, about half of them US reports. A regression analysis of the geographic distribution of 18122 reports coming from 3053 US counties has yielded a multiple correlation of 0.82 between reporting activity and demographic predictors,<sup>1</sup> indicating at least that reporting activity has been measured with statistical reliability. Particularly in view of the high positive weight found for the educational factor, this analysis argues strongly against any psychopathological theory of the etiology of the reports as a whole.

The chronological distribution of UFO-reports is also non-uniform. Both diurnal<sup>2</sup> and weekly<sup>3</sup> periodicities have been demonstrated; these too may be at least partly due to demographic effects. On a broader time scale, there have been several major peaks of reporting activity as listed in Table 1. The data in this table contain a new relationship which probably cannot be explained demographically, and which therefore provides evidence favoring the reality of the UFO-phenomenon itself.

The first step in analysis of Table 1 is to classify the UFO-reporting waves as positively or negatively skewed. This may be objectively accomplished by comparing the total frequency of reports for three to five weeks preceding each peak date with the total frequency for a like period following the peak date. Positively skewed waves display a relatively rapid onset and a relatively slow decline, and are relatively easy to interpret as responses to events occurring at the time of onset. Negatively skewed waves display a relatively gradual build-up and a relatively sharp cut-off; even if the cut-off is socially inevitable, this will not account for the occurrence and particularly not for the timing of the negatively skewed UFO-wave.

The second step in analysis of Table 1 deals only with the negatively skewed waves. Figure 1 is a plot displaying the relationship between the calendar dates of these waves (time-of-year) and their geographic longitudes. The most uncertain aspect of Figure 1 depends on the geographic diffuseness of the 1950 wave; if the balance of the Figure is correct, the date of the 1950 wave places it in the Far East, from whence few UFO-reports have come at any time. Otherwise, Figure 1 seems perfectly monotonous.

Five of the waves plotted in Figure 1 (1947, 1952, 1957, 1967 and 1972) are separated by temporal intervals that are multiples of 61 months, or 1853 days. The absence of a 1962 wave in this series is understandable, since it should have occurred in the mid-Atlantic Ocean where there are few available witnesses. The date and longitude of the 1972 wave in this series were predicted in advance,<sup>4</sup> though the details of the prediction were deliberately not publicized in order to avoid any self-fulfilling prophecy. We must note, however, that important negatively skewed waves have occurred that do not conform to the 61-month cycle and do conform to Figure 1.

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\* 250 Cold Soil Road, Princeton, New Jersey 08540, USA

Because the progression of longitudes in Figure 1 is eastward rather than westward, there is an interesting astronomical invariant associated with the negatively skewed waves. On the date and at the longitude of any such wave, if we consider a constant local time such as the time of the diurnal maximum for reporting, Greenwich Sidereal Time will also be a constant. In other words, the rotational synchrony of the earth with respect to an extra-solar coordinate system is invariant for all these waves.

We offer no affirmative explanation for these findings at this time. However, it is unlikely that they are due to chance, and it is difficult to conceive any hypothesis purely in terms of UFO-reporting mechanisms.

References

- <sup>1</sup> Saunders, D. R. AIAA Paper 75-43, January 1975.
- <sup>2</sup> Vallee, Jacques, & Claude Poher. AIAA Paper 75-44, January 1975.
- <sup>3</sup> Saunders, D. R. Flying Saucer Review 17(1), 10-12, January 1971.
- <sup>4</sup> Saunders, D. R. Data-Net Report 5(12), 4-5, December 1971.

Table 1 -- Major UFO waves since 1900.

<u>Date</u>	<u>Locale</u>	<u>Skewness</u>	<u>Possible stimulus</u>
** July 8, 1947	Western USA	Negative	Arnold publicity
March 31, 1950	Worldwide?	Positive?	Keyhoe publicity
** August 3, 1952	Eastern USA	Negative	
October 13, 1954	France, Europe	Negative	
** August 21, 1957	South America	Negative	
November 6, 1957	USA	Positive	Sputnik II launch
April 29, 1964	USA	Positive	Socorro publicity
August 4, 1965	Midwest USA	??	
March 30, 1966	USA	Positive	Swamp-gas publicity
** October 24, 1967	England	Negative	
** November 1972	South Africa	Negative	
October 1973	Southern USA	Positive	Pascagoula publicity

\*\* Waves separated by a multiple of 61 months; see text.

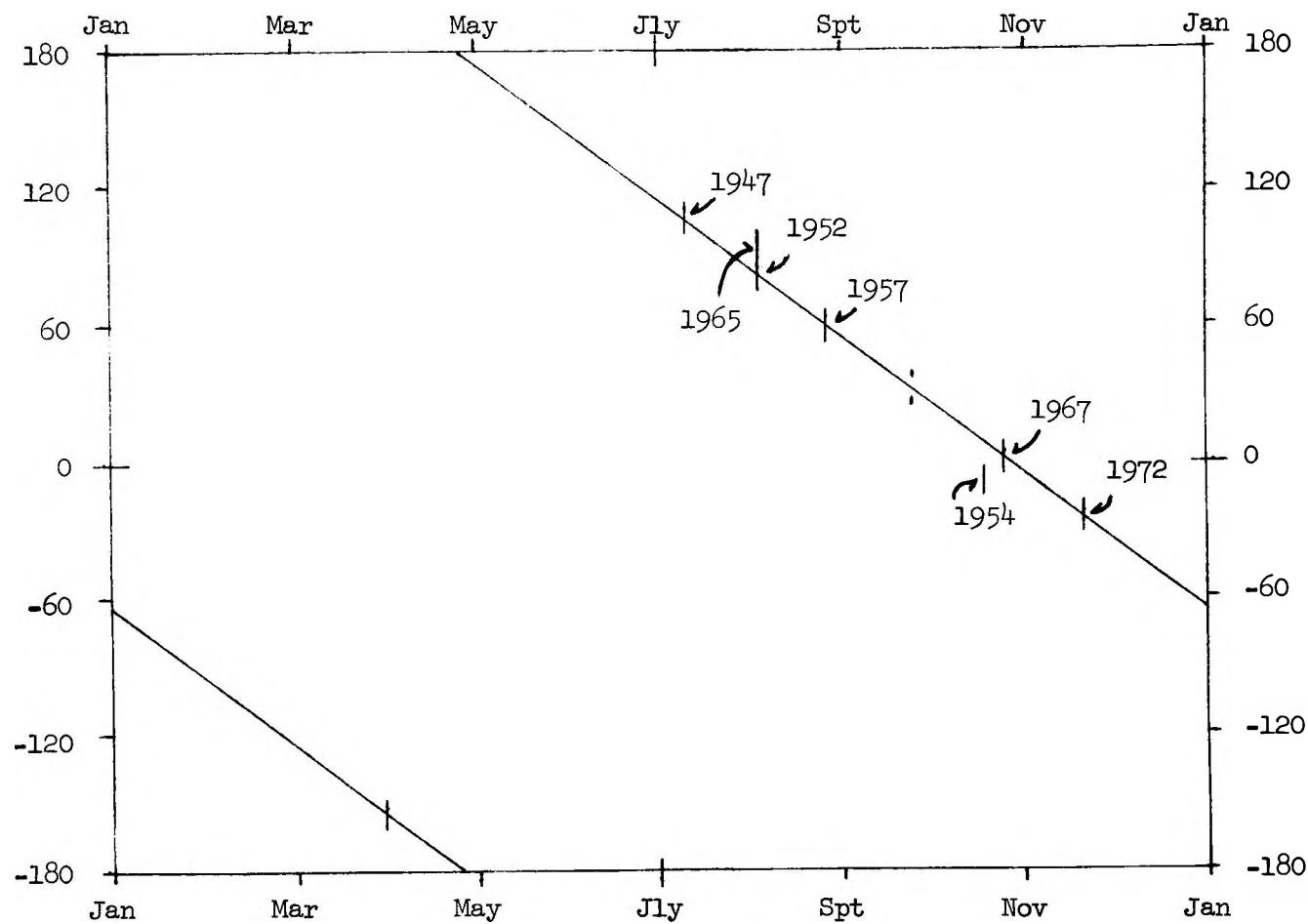


Figure 1 -- Longitude vs Time-of-year for negatively-skewed UFO-waves

UFOLOGY AND THE DIGITAL COMPUTER:  
THE TRENT PHOTOGRAPHS REVISITED

W. H. Spaulding

The active phase of Ufology research has taken on a new approach to an old and persistent problem - the interpretation of photographic evidence of this anomalous phenomenon.

Over the years I have been fortunate, or shall I say unfortunate, to view hundreds of purported pieces of photographic evidence of the vexing UFO phenomenon. With the exception of a few photographs, approximately two dozen, most UFO pictorial evidence can hardly be called scientific quantitative data. Aside from the obvious hoax photos, a vast majority of this type of UFO secondary evidence lacks the proper sensitivity and resolution to permit discerning the simplest of data points.

At the annual GSW Spring Conference (1) of consultants and technically-oriented field investigators, the advisory board, studying the scientific advantages of secondary evidence, outlined the recommendations of the Ad Hoc Committee for UFO photographic data. The recommendations were listed in order of priority, as follows:

- a. Data Processing - Improved data processing techniques can permit additional testing methodology to gain more information than is presently attainable.
- b. The present computer technology, software and hardware, must be coupled to the multiple signal outputs of existing data, to aid in diagnosis of the UFO photographic evidence.

Years ago it was impractical to suppose that the scientific community would ever seriously investigate this global phenomenon, after the Military/Government's total lack of enthusiasm, well defined in the Colorado Project Report, commonly known as the Condon Committee Report (2). However, recent developments within government circles and the phenomenon itself have changed many of the previously closed minds of science.

A closer look at the phenomenon is necessary, and modern technology can help. The useful tool is the digital computer, and it is presently being utilized on a laboratory basis.

Digital computers are employed in test applications for two fundamental reasons:

1. To improve data that could not have been retrieved previously, and to improve the data acquisition procedure; and

2. To extract more information from the available data base.

To best illustrate how the Ufology field applies computer methodology, this paper covers three general steps, and their application, where the digital computer adds a significant dimension to the field.

The Problem Defined

UFO photographs have existed in great quantity, with low quality, since the inception of modern-day sightings (3). UFO photographs are generally divided into two categories - the Daylight Disc (DD) and the Nocturnal Light (NL). Statistically, 25% of the photographs are taken during the daylight hours, with the balance taken at night. Obviously the DD cases offer the highest quantity of data and that is the type we will concentrate our efforts upon.

Upon our initial evaluation of a DD photo, we generally found a bright dot-like apparition or a blurred image in a light blue sky. Some of the photographs even had reference points; landscaping, mountains, the sun, clouds, etc. This was helpful to the photo interpreter in gauging size, distance, angulation, and in checking on the witness(es)' story.

In the past an evaluation consisted of normal photographic testing techniques. After all the data was gathered on the sighting, including all camera settings, the photos generally were given the following tests: electronic densitometry, image sectional enlargements, and a close study of the sun's azimuth and the apparent ground and "object" shadows. With a few variations, that was the extent of the "scientific" evaluation.

With the advent of the digital computer and special viewing/enhancement systems (4), the evaluation can go on indefinitely and great quantities of data can be retrieved.

The Test Described

Two sequential photographs (refer to Figures 1 and 2) taken in the spring of 1950, each purportedly representing an unknown flying object, were given to GSW to be evaluated on the computerized system for photographic evaluation. Of the hundreds of UFO photographs in existence, none are as controversial as these Trent Photos.

This bit of pictorial evidence has been analyzed on numerous occasions by some fairly competent individuals (5). The evaluations have not always complemented one another; one researcher claims the object to be an actual unknown craft, whereas others make strong suggestions that the UFO is a mere model representing an elaborate hoax. Because the pictures are so clear, with sufficient landscaping data points, they obviously exemplify the best type to analyze on the computerized system. Our test would hopefully clarify the following existing points of confusion:

1. The time of day (plus or minus an hour) that the photos were taken;
2. The apparent size of the UFO;

3. The distance of the object from the camera;
4. The effect of veiling glare and similar atmospheric anomalies;
5. The lumen distribution across the bottom face of the UFO; and
6. Objective (measurable) data on the foreground and background objects.

It is the unanimous opinion of all the photographic experts that if indeed the above data can be positively quantified, the object in the Trent photographs actually represents a bonafide disc-shaped craft. Conversely, if the data analyzed reveals negative results, the UFO will be considered a model, smaller than eight inches in diameter.

With the procurement of first-generation copies of the Trent pictures, the next step was the analysis, using the computer.

#### Step 1: Edge Enhancement

To gain additional data points from the test pictures, they were subjected to the edge enhancement analysis. With enhancement, fine lines representing delicate structures are magnified and made very distinct for visual analysis. The same technique can be used to evaluate areas of any photographs or transparencies which are too dark or too light; i.e., over- or under-exposed. Hard data exists within these areas of light and dark densities, but the human eye cannot perceive details in portions of photographs that lack proper density (grey value).

We subjected the two photographs to the edge enhancement process. In the case of the first Trent photograph (Figure 1), details were revealed by enhancement of the edges and the conical dome (refer to Figure 3). By enhancing the edges of this photograph, it now becomes practical to measure the object's aspect ratio and the height of the protuberance, exactly, without concern for the slightly fuzzy edges caused by unsharpness factors (6).

The second picture (Figure 2) reveals details of the elliptical bottom of the UFO (refer to Figure 4). The edge process enabled our photo technicians to interpret visually the quality and quantity of the picture cell (pixel) shift, for an assessment of the object's true position (the relationship of distance to the camera).

Additional data was obtained using the edge enhancement process on the surrounding sky area. There is absolutely no evidence of a supporting wire and/or string in the area above the suggested model. Lines and similar linear structures are well detailed by this portion of the pictorial analysis process. The sky and top portion of the UFO are void of any supporting structure(s). Edge enhancement can generally resolve a wire of nine mils diameter with an object-to-camera distance of up to ten feet.

This edge enhancement technique helped with our initial evaluation of the subject film, and operates in the following manner. A black line is produced on a TV display system when a normal image changes from white to black, or from a lighter to a darker grey value. Conversely, just the opposite occurs when we are working with a white line or lighter grey value. Then all bright and dark

areas in the picture are suppressed to a simple shade of background grey. Any minute change in grey value, with the slightest amount of linearity, will become highly visible with the edge enhancement technique.

In order to facilitate the analysis, the enhanced display can be adjusted for different degrees of enhancement; that is, from a normal photo to a fully enhanced one for optimum analysis. The width of the enhanced lines is adjustable from fine to very coarse for maximal visibility of finite details.

#### Step Two: Color Enhancement/Profiles

The next evaluation method, color enhancement, offers the greatest amount of analytical data. Both photographs were subjected to this process to determine such hard data as exact density of the object and its surrounding area; the average reflectivity of the object; the exact shape of the UFO; and a relationship of its true size to its distance perspective.

The density was the first item examined with the color analysis. The grey scale of a photograph is expressed in terms of photographic density (H and D Standard Units), which has different meanings in different pictures. (Refer to Figures 5 and 6.) The grey scale values are directly related to the cross-sectional thickness of the objects. With the utilization of color enhancement, the photographic density is electronically analyzed. The measurements taken from the color data in the Trent photographs clearly show a solid, uniform distribution of color(s). In the picture of the bottom of the disc (ellipse), a similar density (shadow) is noted across the entire bottom portion of the object. Digital densitometry, a more highly sophisticated system than the color evaluation method, indicated slight variances.

The second Trent photo, of the disc on edge, revealed a darker color in the center of the object than at the extreme edges. This quantifies the object's true circular shape and tapering disc profile.

The profiling technique was performed to gather additional data on the shape of the unidentified object. (Refer to Figures 5, 6, and 7.) Note the profile cursor and its resultant in each picture. In these output pictures of the Trent photographs the 90 degree profile of the image reveals a true disc shape.

The coloring technique transforms a bland, non-detailed photograph into one of vivid colors, in one of an infinite number of different color analyses. The data on any photographic medium is electronically evaluated and classified into 30 colors plus black and white. In this case, the full spectrum of color is divided equally over the total density range of the image. Areas shown as white and shades of blue and green represent respectively lighter film densities than areas shown as yellow and shades of violet and red. The thickness of an image is constant within all areas that are displayed as the same color.

By color/profiling an image, one can identify its apparent shape logically, as for example:

1. A cloud would have a broken, uneven density display.
2. An aircraft body would naturally have a cylindrical shape, with protrusions for wings, thus producing a variable density display.
3. A weather balloon would not have the density of a true metallic object, even if the balloon was photographed at a "good" sun angle.
4. A hoax photograph generally consists of such ordinary items as "Frisbees" (TM), camera lens caps, pie plates, etc. The density profile from such a common object would be one of low reflectivity, and its obvious shape would be resolved when color contouring and magnification techniques were added to this ultrasensitive, high resolution technique.

An authentic UFO photograph would profile itself into a disc or ellipse shape with a generally even density; that is, brighter in the middle than at the periphery, due to its configuration. This coloring effect has been noticed on numerous occasions during the interpretation of a bonafide object photo, especially when the object has been filmed in the edge profile (view). Conversely, a hoax photograph of a UFO would generally have a multiple band of colors, depending of course on the manufacture of the UFO model.

To further explain the profiling technique, reference should be made to Figure 7. A profiling cursor, denoted by the vertical white lines through our various test objects, reveals the object's true shape, flat, round, disc-shaped, elliptical, etc. Hypothetically, if a UFO was a hoax item such as a pie plate, montage, or hub cap, the cursor lines would "profile," with respect to the density, into a flat, shallow shape. The same is true with a lens flare, a common photographic anomaly. Then logically a tangible, metallic bonafide object would have a profiling cursor line or lines with substance and shape.

#### Step Three: Image Enhancement, Digitizing

The final test for our pictures is the digitizing of image, for either a high resolution picture or a true analytical review of the data points on the film. A typical black and white photograph is called a continuous tone image because the shades of grey blend continuously, both in intensity (level) and in spatiality (area). However, our evaluation system is not continuous, but rather it is composed of a number of discrete elements with each having a discrete grey level assigned to it. System resolution may therefore be defined as having the ability to reproduce images with a visual quality comparable to the continuous-tone originals. This requires a sufficient number of picture elements to give the appearance of spatial continuity, and a sufficient number of grey levels to give appearance of depth and width.

The pixel (picture cell) is the basic element of picture resolution. Our system divides a picture into an array of 512 horizontal columns and 480 vertical rows, thus producing 245,760 equal and discrete pixels. Each pixel is then assigned a value based on the average level of grey contained on that minute portion of the picture it encompasses. The grey scale (Z density) of the pixels ranges from 0 to 255, where 0 is black and 255 is white.

When we digitized/computerized the second Trent photograph (refer to Figure 9), the true shape of the object was determined. A finished computerized photograph gives us hard data about the shape, density and reflectivity

of an image, as well as information on atmospheric light (veiling) glare and a size relationship. In some cases where more than one picture has been taken the angular motion can also be accurately measured.

The system uses a special scanner to digitize photographs or any other type of photographic medium that can be sensed by a television type camera tube. The computer operates under program control, requesting information from the peripheral device regarding the brightness of any point on the image. The computer additionally provides random access to picture information, and can be programmed to digitize the entire picture or only those parts of the image that are of special interest.

The computer system operates continuously as a standard television system, providing the technician with a flickerless display of the image being digitized. A white dot, known as a cursor, is superimposed on the display showing the exact location of the picture being interrogated by the computer. This cursor aids the operator in monitoring the operational sequence of the program. A graph that portrays the density of the picture can also be superimposed on the display, allowing the digitizer to be calibrated in photometric units and adjusted to cover the density range contained within the picture.

The capability of the cursor is extremely useful when it comes to evaluating motion pictures of UFO images. For example, in a frame-by-frame examination, the cursor can be positioned repeatedly to four points at the corners of each frame. Successive frames can then be aligned to the four points and digitized in registration. Similarly, the cursor is then positioned by the computer to indicate "objects" in the picture which have been categorized by pattern recognition programs.

The enhancement of the data in our UFO pictorial evidence gives us vast quantities of data from a relatively poor original picture. Our computer program for this type of work has the key functions of control and calibration of the film characteristics.

#### Conclusions

It is the consensus of the GSW photo technicians that the photographs tested represent the following data points:

1. The time of day when the picture was taken was analyzed to be between 7:30 and 8:00 a.m. This contradicts the Trents' verbal report; however, it is the only discrepancy we found in the entire sighting. The time can be substantiated by measuring the length of shadows under the eave of the nearby garage. Additional testing and research determined the sun's azimuth at the time of the sighting. A sun angle of 22 to 25 degrees would produce shadows such as appear on the objects in the photographs.
2. The object is of a vast size, approximately 20 to 30 meters in diameter. This figure is considered accurate, and was determined by measuring the resolution of the pixel data on the edges of the object

and comparing the results with other features in the photograph at known distances.

3. The object is at a great distance from the witness/camera. Refer to Figures 10 and 11, which depict respectively the edge of the nearby garage, and the telephone pole, which is further away. The sharpness factor of the close building should be compared to the semi-fuzzy telephone pole.

The Trent photographs are considered strong UFO evidence, and the computer revealed the following information:

1. The object has a solid substance.
2. The profiler revealed the UFO to be disc-shaped, with three dimensional proportions.
3. The color contouring and digital densitometry revealed a disc-shaped object.
4. The object is at a great distance from the camera. The computerized technique took into consideration the possibility of a model being suspended by an overhead wire; slight inconsistencies in the witnesses' reports; and veiling glare. However, these factors were nil, and had no real bearing on the outcome of this analysis.
5. The digital densitometry revealed a brighter grey value for the UFO than for the shadows at selected positions on the garage. This indicates that the UFO was obviously at a vast distance from the witness. In addition, the foreground images, i.e., the wires and building, are much sharper than the "object," also indicative of distance. Refer to Figure 12, which portrays pixel displacement for distance factoring.
6. Veiling glare - a photographic anomaly caused by atmospheric light being reflected from the ground to an object and then enhanced by dirt on the camera lens - is not the explanation. Veiling glare will affect photographic evaluation, as it will change the grey value of the pixel; however, it does not affect the sharpness of the pixel, so far as computer analysis is concerned.
7. A suspended model would have to be perfectly constructed to reveal the detail shown in the photographs. In addition, this model would have to have some bright lights or a light source on the bottom of the disc, of even light (lumen) distribution, and a relatively thick wire to support the weight of the model and its battery pack. An electron microscopic examination of the original negatives (7) revealed no evidence of such a supporting attachment above the UFO to the overhead wires, thus validating the conclusions of the computer analysis.
8. A digital density evaluation comparing the two Trent pictures revealed only a slight density differential in a measurement of selected shadows. This measurement, along with the size and position of the shadows, indicates that the two pictures were taken within a reasonable amount of time (less than five minutes, maximum, of one another).
9. The sophistication and level of technology required to concoct such a grandiose hoax, as some UFO antagonists have suggested, is, in GSW's opinion, beyond the technical skills of the witnesses. However, I wish to stress that if this were the only counter to the argument

concerning real object size versus model, I would not even bother making the claim, for this is at best only subjective reasoning and poor logic.

10. Finally, the test to gauge true size of the object, and individual pixel measurement, indicates that the UFO is large. The reflectivity of the surface is similar to our pre-programmed (software) data of polished metal, with all other evaluation factors being considered.

I foresee within the near future highly sophisticated computer programs, with improved hardware to aid in the evaluation and analysis of all UFO photographs, some of which have been rated genuine.

I am often asked what good will come from the computer evaluation, and is it worth the large capital expense for equipment? After reviewing our 400 purported photographs of the phenomenon, all I can say is, absolutely Yes. The subject of Ufology has been dealt with in an unscientific and subjective manner for too long. The introduction of computers can and will permit objective research.

No longer will it be possible for our typical stereotyped UFO photographer, male adult, to fake a UFO photograph. Let those days perish, and let us look to the future of Ufology, when modern technology will help solve one of the strangest mysteries of our time - the UFO.

It is hoped that this broad look at Ufology and the computer may stimulate wider applications of some of these newer objective photographic/computer approaches.

FOOTNOTES

- (1) GSW's (Ground Saucer Watch, Inc.) Fourth Annual UFO Conference met in Cleveland, Ohio (March 1975) to analyze present computer technology as a useful tool to extract quantitative data from UFO pictorial evidence.
- (2) The University of Colorado was granted a \$500,000+ contract by the U.S. Air Force to scientifically investigate the UFO phenomenon. Headed by Dr. Edward Condon, the committee found and reported in a voluminous 900 page evaluation that over 50% of the cases studied were rated "unknown." This report has been labeled a true effort of redundancy and a scientific "whitewash" by prominent scientists.
- (3) Modern-day Ufology began with the first "flap" (UFO jargon for a high concentration of sightings) in June, 1947. The aerial phenomena were publicly termed "flying saucers." One year after the 1947 mass sightings, the U.S. Air Force (see "The Estimate of the Situation," 1948-49) officially began to investigate the phenomena as serious business related directly to the country's defense.
- (4) The sophisticated electronic equipment utilized in these tests and research is manufactured by the following: Digitizing/Enhancement equipment by Spatial Data Systems, Inc., Goleta, CA; Computer hardware by Digital Computers, Phoenix, AZ.
- (5) The Trent photographs have been studied by competent commercial photographers for Life magazine, and by the photo techniques of the USAF. A more scientific analysis was performed by Dr. Hartmann for the Condon Committee, who concluded that "all factors investigated...appear to be consistent with the assertion that an extraordinary flying object flew within sight of two witnesses." A negative evaluation comes from R. Sheaffer and his counter points are well defined in P. Klass' book, UFOs Identified, Random House, New York, 1974. A newer approach to the analysis of these pictures is currently being undertaken by Dr. B. Maccabee, utilizing the GSW computer enhancement technology, to substantiate his conclusions.
- (6) Unsharpness factors exist within most UFO pictures because of numerous simple mistakes, such as camera movement, the wrong film (ASA) for the subject being photographed, improper F-stop, severe object movement; such things have created in the final result a blurred or out-of-focus image.
- (7) GSW is indebted to Dr. B. Maccabee for supplying the original negatives of the Trent photographs. These negatives offered the best data for analysis because of the sharpness and clarity of the UFO images.



Figure 1 - Trent (McMinnville, Oregon) Photograph



Figure 2 - Trent Photograph #2



Figure 3 - Edge Enhancement, Side View

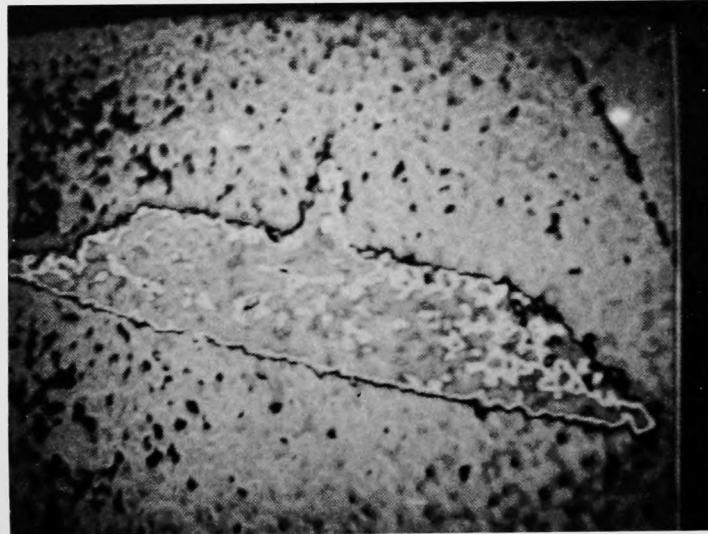


Figure 5 - Color Contour



Figure 4 - Edge Enhancement, Bottom View

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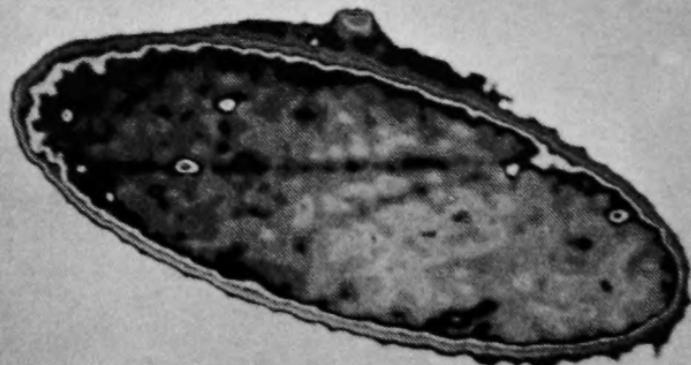


Figure 6 - Color Contour

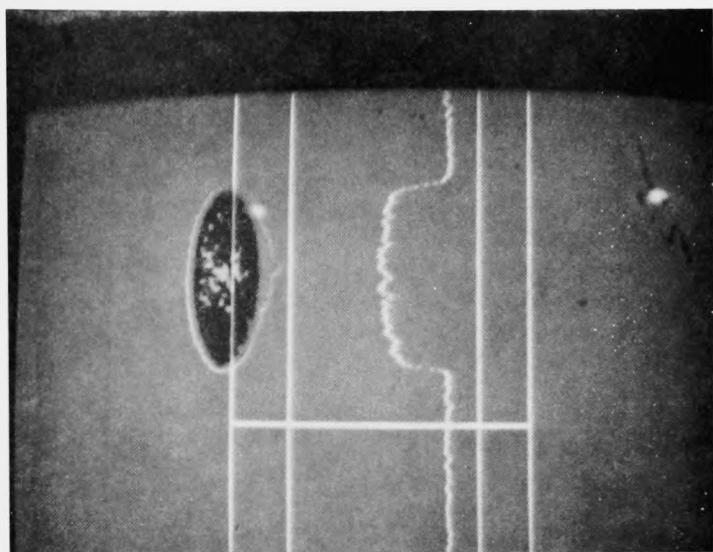


Figure 7 - Color Contour with Profile

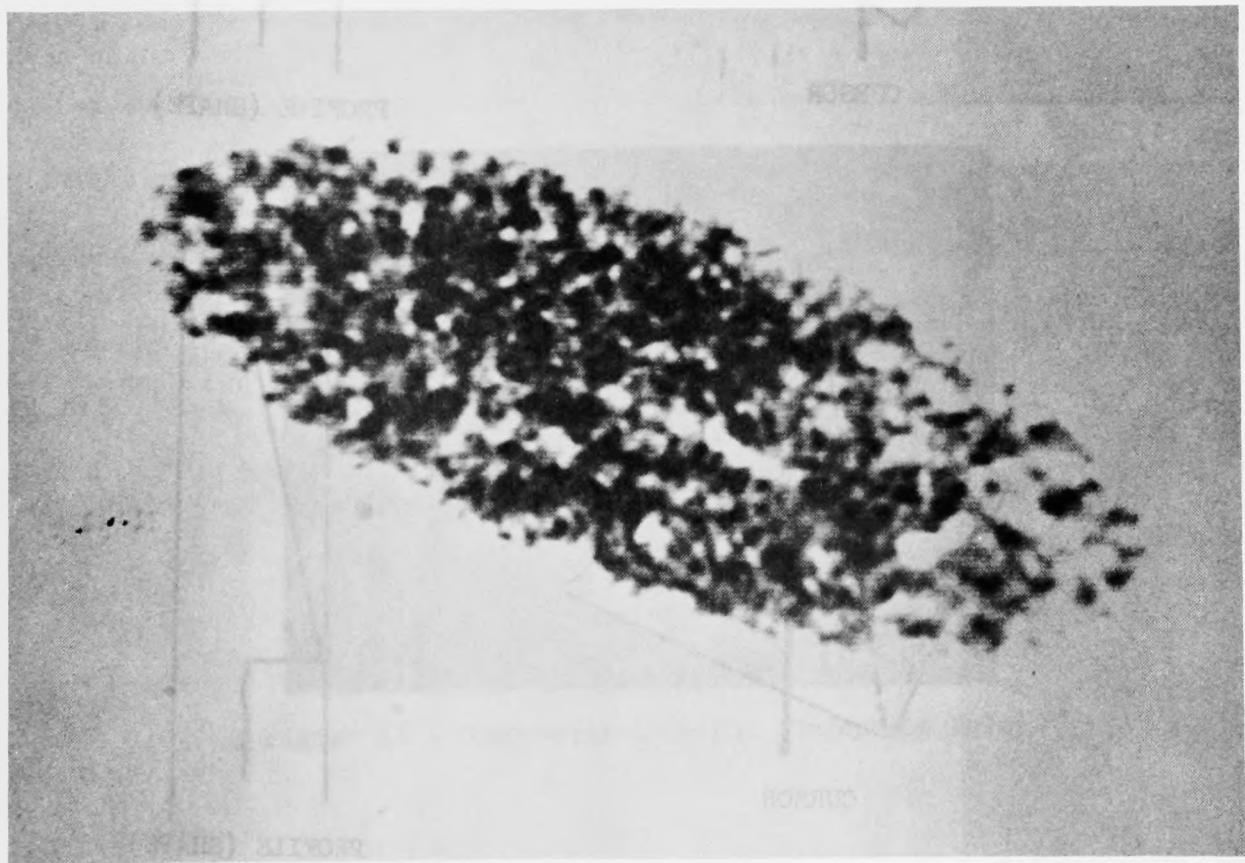


Figure 9 - Digitized Results

FIGURE 8  
Profile (Shape) Technique

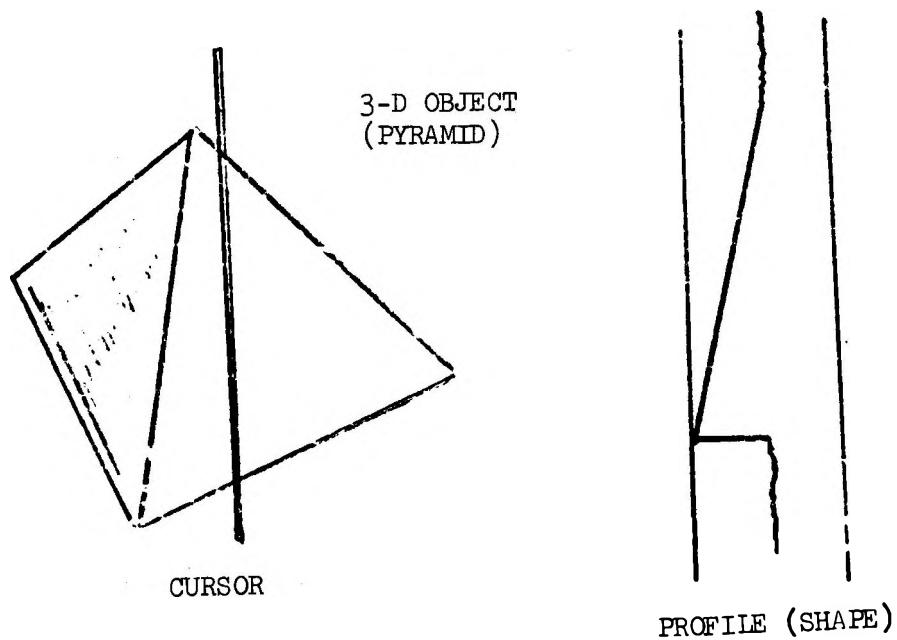
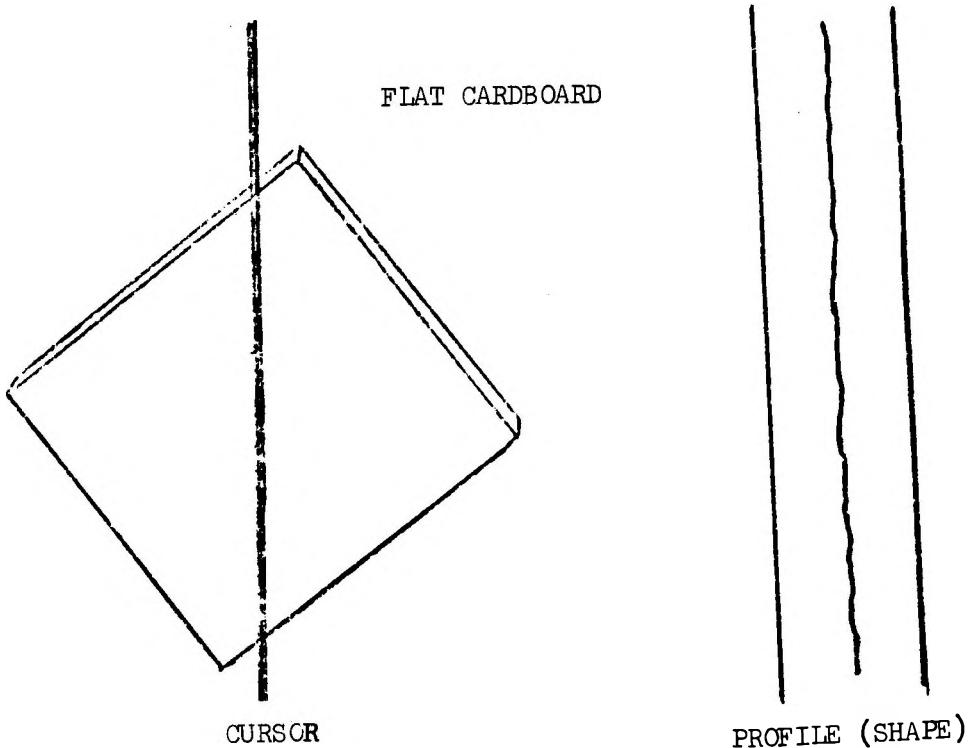




Figure 10 - Computerized Output (Garage)

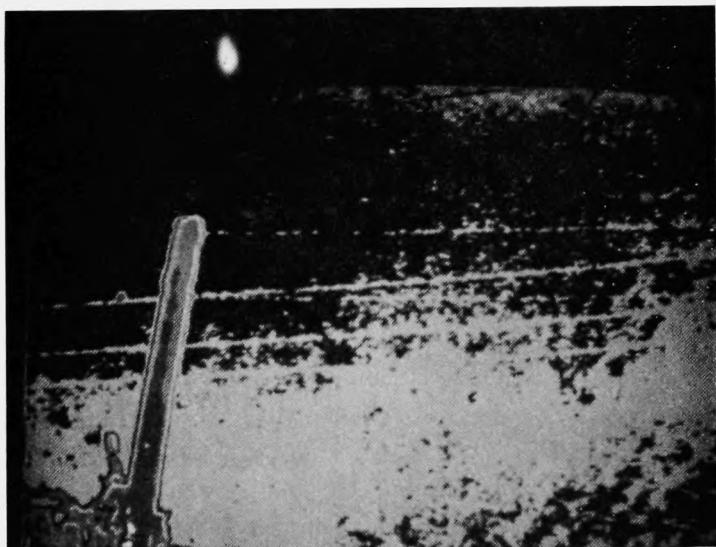
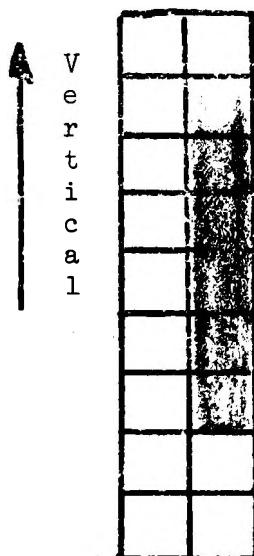


Figure 11 - Computerized Output (Telephone Pole)

FIGURE 12

PIXEL ALIGNMENT FOR DISTANCE FACTORING

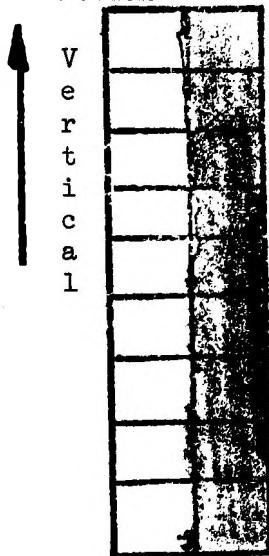
Vertical Pixel Presentation - Typical for  
Any Two Rows in Any Photograph



1. Subject close to camera (within focus parameters of camera/lens system)

Pixel edges are sharply defined

Two rows of Pixels



2. Subject at moderate distance from camera

Pixel edges are slightly fuzzy

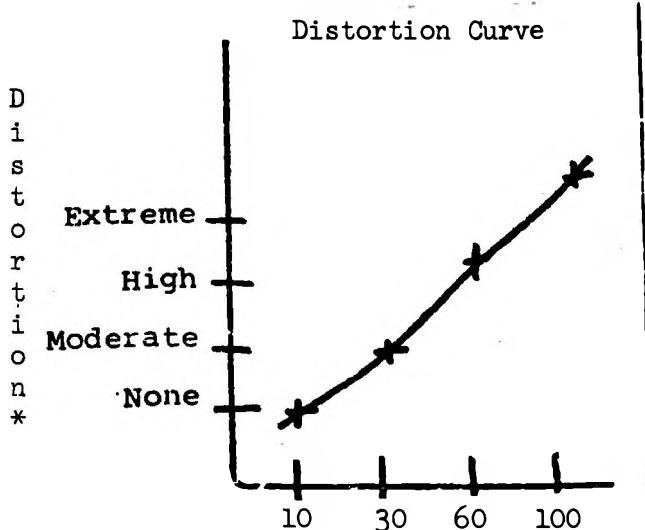
Two rows of Pixels



3. Great distance from camera

Pixel edges are widely broken and extremely fuzzy

Two rows of Pixels



\*Distortion is variable with respect to film type/camera manufacture.

2



4

#### APPENDIX A

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Photo 1



Photo 2

Overhead wires, close to camera -  
Note extreme sharpness of edge pixels

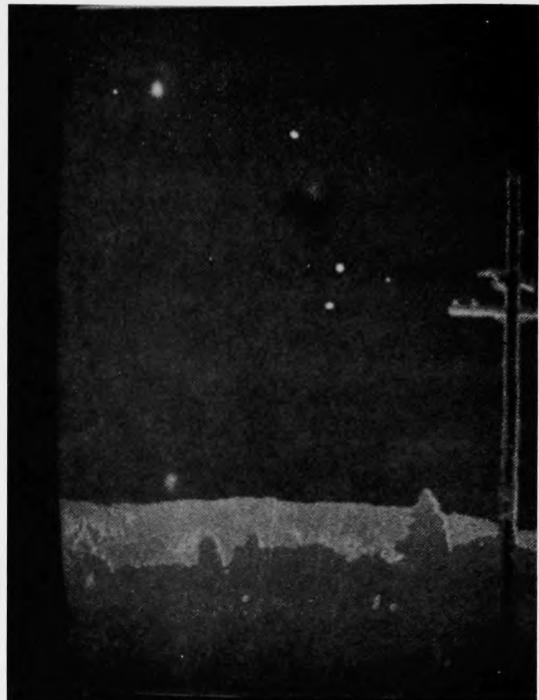


Photo 3

Telephone pole, moderate distance -  
Note slightly blurred edges and  
pixel distortion

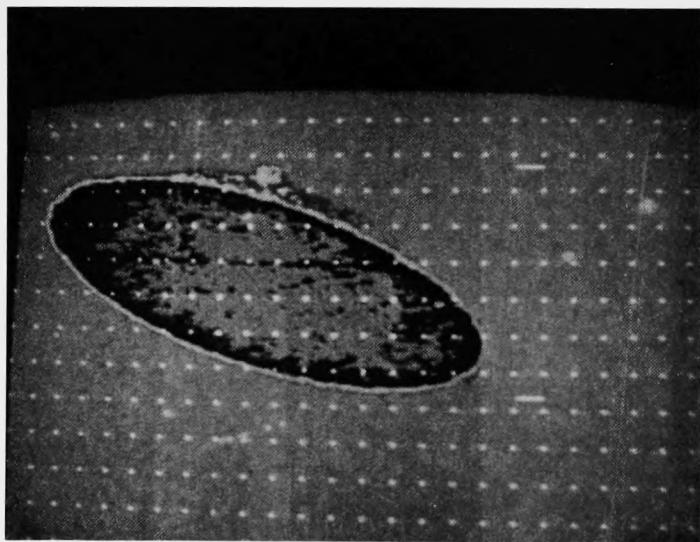


Photo 4

Bottom of disc, with superimposed grid and video  
micrometer to measure aspect ratio

## HYPNOTIC AND PSYCHIC ASPECTS OF UFO RESEARCH

R. Leo Sprinkle

The purpose of this paper is two-fold: to engage in speculation and in exhortation. The writer recognizes that speculation and exhortation are behaviors which are not to be valued as highly as the behaviors of investigation and verification. However, the UFO phenomenon continues to offer a perplexing array of problems; perhaps some speculation and exhortation may assist UFO investigators to develop a set of hypotheses which can be used in analyzing UFO reports.

### Hypotheses About the UFO Experience

There are nine general hypotheses about UFO reports which appeal to the writer. These hypotheses are as follows:

1. The experience hypothesis: An UFO report is a description of a real experience of the UFO witness (Hynek, 1972).
2. The truth hypothesis: The UFO witness is telling the truth (McCampbell, 1973).
3. The reflective hypothesis: The UFO experience reflects the attitudes and characteristics of the UFO witness (Keel, 1969).
4. The display hypothesis: The UFO sighting is a display to the UFO witness (Salisbury, 1974).
5. The programming hypothesis: The UFO phenomenon is programmed to be visible or to be experienced (Michel, 1974).
6. The inconclusive message hypothesis: Each UFO experience contains an element of doubt or an inconclusive message (Moyer, 1975).
7. The aura hypothesis: The aura, or bioenergetic field, of the UFO witness is somewhat different from the auras of other persons (Edwards, 1976).
8. The psychic forces hypothesis: UFO experiences are manifestations of psychic forces from the collective unconsciousness of humankind (Clark and Coleman, 1974).
9. The control system hypothesis: UFO activity is a control system for conditioning human beliefs (Vallée, 1975).

The hypothesis of "control system" is appealing to this writer because it may be viewed as incorporating many of the other hypotheses. In addition, the hypothesis is not limited to one "level" of experience: the hypothesis can refer to UFO experiences which are perceived as "physical," "biological," "psycho-social," and/or "spiritual" events.

### Cosmic Consciousness Conditioning

The writer wishes to offer a speculation (or hypothesis, depending upon the generosity of the reader): "cosmic consciousness conditioning" (CCC). The CCC hypothesis suggests that the UFO experience may result in an increase in the level of "cosmic consciousness" of the UFO witness.

Bucke (1901), a Canadian psychiatrist, studied the lives of approximately 50 men and women who were seen as extraordinary in their bodily, mental, and spiritual attributes. He analyzed (pp. 72-75) each of the experiences of cosmic consciousness and concluded that there were several common features, including a sense of being "immersed in a flame, or a rose-colored cloud;" "joy;" "intellectual illumination;" etc. The descriptions are similar to the statements which were chosen by 30-40% of persons in a poll of USA adults (Greeley and McReady, 1975). Perhaps the religious experience, or mystical illumination, is becoming more common--or perhaps more persons are willing to admit to their mystical experiences.

According to Bucke (p. 76), these experiences of cosmic consciousness cause the percipient to develop certain attitudes and attributes:

- a. He knows without learning: (1) that the universe is not a dead machine but a living presence; (2) that in its essence and tendency it is infinitely good; (3) that individual existence is continuous beyond what is called death. At the same time:
- b. He takes on enormously greater capacity both for learning and for initiating.

The basic question which arises from consideration of the CCC hypothesis is this: Can UFO activity be explained as an educational system, or a control system, for conditioning human beliefs toward a higher level of cosmic consciousness or universal awareness?

One advantage of the hypothesis is that the UFO investigator does not have to assume who "they" are:- the intelligences behind the UFO phenomena. Thus, investigation of UFO reports can proceed without undue concern about the source of the UFO activity - Extraterrestrial intelligence (ETI)? Etherian or other dimensional intelligence? Poltergeists or ghostly beings? Subconscious forces from the collective unconsciousness? Space travelers from the "past" or "future"? Or some combination of these sources?

The disadvantage of the CCC hypothesis is that the UFO investigator may be unable to document any connection between the UFO experience and the process of "cosmic consciousness conditioning." Suppose, for example, that a group of children in contemporary society were to form an organization in order to investigate the existence of Santa Claus. Various investigations might uncover evidence (e.g., photographs, physical traces, and testimony of eye witnesses, etc.) which supports the possibility of a Jolly Elf, or a Generous Giver, who rewards children for good behavior! However, other investigations might uncover evidence that the photographs, gifts, songs, and stories were parts of a huge cover-up: a conspiracy to "brainwash" children so that they might engage in gentle, cooperative, and conforming behaviors!

The example suggests a possible outcome for the UFO problem: the cycles of UFO activity may continue until most of humankind believes in the reality of Flying Saucers and interplanetary space travelers; later, when Earthlings develop spacecraft which allow direct contact with representatives of other civilizations, then the new generation can laugh at the silly ideas of those of us who claimed to have sighted Flying Saucers back in the Twentieth Century.

The analogy of the investigation of Santa Claus indicates that the important issue is not the physical existence or non-existence of a jolly old elf; the major issue is the effectiveness of the belief in Santa Claus to develop altruistic attitudes, benign behaviors, and conforming cooperation.

Likewise, we can ask ourselves: Is the major issue the physical existence or non-existence of Flying Saucers and Flying Saucer occupants? Or is the major issue the change in human beliefs which may be developing from the cycles of UFO activity? Vallée (1975) suggests that a major problem of UFO research is to determine whether we are in a "closed" control system or an "open" control system. The CCC hypothesis suggests that we are becoming aware of the close relationships between "science" and "religion:" the relationships of normal consciousness and altered states of consciousness.

#### Hypnotic and Psychic Aspects of UFO Reports

Some UFO reports (APRO Bulletin, Flying Saucer Review) describe the claims of persons who believe that they have experienced "loss of time" during UFO sightings. In some cases, UFO observers claim that they have been abducted and examined by UFO occupants (Fuller, 1966; Lorenzen and Lorenzen, 1968; Lorenzen, 1976). These reports often include claims of "trance states" and "mental communication" during the UFO experiences.

Experienced UFO investigators are aware of the hypnotic and psychic aspects of UFO reports. The question is not "whether" but "how" are hypnotic processes and ESP processes being utilized in the programming of UFO phenomena. The predicament is that UFO occupants usually are not available for interrogation; investigators must rely upon the only available "experts:" the UFO percipients. The writer wishes to exhort other investigators to listen to and learn from UFO observers. We can convey our acceptance of the UFO percipient as a sincere person who is attempting to describe accurately his or her experience, without succumbing to the view that the UFO experience must be a "physical" experience. There may be other layers of "reality" in each UFO experience.

With greater acceptance of the reality of UFO experiences, perhaps more UFO observers will come forward with their reports; then we may be able to learn more about these cases of apparent abduction and examination. Will we learn that the abductions and examinations are "staged"? Will we learn that these cases involve apparent sexual experimentation? Will we learn that these experiences are programmed in order to control our beliefs about ourselves and the world around us? Will we learn that we are increasing our level of cosmic consciousness?

#### Hypnotic Techniques

The UFO investigator may wish to combine efforts with a professional person

who is trained in the use of hypnotic techniques. There are professional practitioners in many fields, including dentistry, education, medicine, psychiatry, and psychology. Two well-known USA organizations are (1) The American Society of Clinical Hypnosis (ASCH), 2400 East Devon Avenue, Suite 218, Des Plaines, IL 60018; and (2) The Society for Clinical and Experimental Hypnosis (SCEH), 205 West End Avenue, New York, NY 10023. The ASCH publishes the American Journal of Clinical Hypnosis; the SCEH publishes the International Journal of Clinical and Experimental Hypnosis.

An UFO investigator may wish to learn the use of the pendulum technique (LeCron, 1964, pp. 31-34). The pendulum technique is a useful method for uncovering "subconscious" information (Check and LeCron, 1968). The technique has several limitations; however, it may be used to obtain information about "loss of time" UFO experiences, so that hypnotic sessions may be arranged for further exploration (Sprinkle, 1967; 1969).

#### Psychical Research Techniques

Psychic phenomena (telepathy, clairvoyance, precognition, and psychokinesis) appear to be an important aspect of UFO phenomena. The experienced UFO investigator may wish to become acquainted with the literature of parapsychology (the study of ESP and PK). The field of parapsychology offers an approach to the understanding of UFO experiences. Some writers (e.g., Clark and Coleman, 1975; Guérin, 1976; Keel, 1976; Zeibell, 1976) have considered the possibility that psychic phenomena are the explanation for UFO experiences. (The 1953 story by Arthur C. Clarke, Childhood's End, offers an interesting slant on the possible significance of psychic phenomena and UFO occupants.)

The interested reader is referred to these books and periodicals:

- Ashby, R. H. The guidebook for the study of psychical research. NY: Samuel Weiser, 1972. (The book reviews terminology, methods, and general findings of psychical research, plus bibliographies and organizations; it is useful for the beginning and advanced student.)
- Rhine, Louisa. PSI: what is it? The story of ESP and PK. NY: Harper & Row, 1975. (Written at a level for high school students, the book reviews the research results and conclusions of contemporary parapsychologists.)
- White, Rhea A., & Dale, Laura A. Parapsychology: sources of information. Metuchen, NJ: The Scarecrow Press, 1973. (The book offers an annotated bibliography, and listings of journals, agencies, and organizations; it is useful for the advanced student.)
- Journal of the American Society of Psychical Research, 5 West 73rd Street, New York, NY 10023. (Theoretical and experimental studies are presented quarterly. Any interested person may join ASPR.)
- Journal of Parapsychology. Parapsychology Press, P.O. Box 6847, College Station, Durham, NC 27708. (Theoretical and experimental studies are presented quarterly. Membership in the Parapsychological Association is limited to persons who have conducted parapsychological research.)
- Parapsychology Review. Parapsychology Foundation, Inc., 29 West 57th Street, New York, NY 10019. (The bimonthly bulletin offers articles on current issues; reviews; letters; announcements of lectures and research studies; and information about academic programs and scholarships.)

Psychic: exploring the extended nature of man and the universe...P.O. Box 26289, San Francisco, CA 94126. (Bimonthly magazine offers to the intelligent layperson news items and articles on current topics; reviews; letters; and interviews with well-known psychics and researchers.)

UFO investigations may lead to further knowledge of psychic phenomena; and, on the other hand, parapsychological methods may provide UFO investigators with additional tools for research (Sprinkle, 1976). Persons with psychic abilities may be able to discover and evaluate some of the clues in the UFO puzzle.

#### The Question of Prophecy

The writer wishes to offer one more speculation and exhortation: let us consider the literature on prophecy as a possible aid in the investigation of UFO phenomena.

There are several disadvantages of the speculation: the theoretical difficulties of explaining precognition; the psychological difficulties of interpreting any vision or impression of "future" events; the social difficulties of discussing the topic with fellow investigators; and the embarrassments which occur when specific prophecies fail! (See Festinger, Riecken, and Schachter, 1964.)

However, consideration of the possible role of prophecy can lead to some interesting questions: What if UFO phenomena are the "audio-visual aids" of an educational system? What if UFO experiences are lessons to be learned about future events? What if UFO experiences contain messages and prophetic visions of the next 25 years of history?

There is a growing body of literature which offers a variety of visions or predictions (see Appendix). Some of the books and papers are well-written; some are not. Most share a common theme: the next 25 years are crucial for the development of humankind; a series of cataclysms (earthquakes? tidal waves? nuclear explosions?) will cause many deaths and much suffering; those persons with greater cosmic consciousness, or spiritual development, will "survive"--spiritually, if not physiologically.

As UFO investigators, we need not take a position on the accuracy of these claims; however, we can take the position that these statements may be useful as guidelines for evaluating the patterns of UFO experiences.

For an interpretation of UFO activity and religious or spiritual changes, the reader is referred to Moyer (1970) and Downing (1968). Vaughn (1973) has an excellent discussion on patterns of prophecy. Stanford (1973) has provided a psychic interpretation of the Fatima Prophecy. Webre and Liss (1974) compare the current knowledge of earthquakes, and other natural forces, with the prophetic visions of Edgar Cayce. The Urantia Book purports to be the history of the Earth as presented by various spiritual messengers from higher realms of Universal Knowledge; the writer has no standard by which to evaluate the book--except for his feelings of awe.

#### Summary and Conclusions

In summary, the writer has offered speculations and exhortations on the

possible advantages of considering hypnotic and psychic aspects of UFO research, including the possible role of prophecy in understanding the emerging pattern of UFO experiences.

In conclusion, perhaps it is appropriate to quote from a recent article which deals with the double controversy of the Geller phenomenon and the UFO phenomenon (Zeibell, 1976, p. 19).

"The UFOs and all the other Geller phenomena seem to be products of mind. This is not to say they aren't real. Mind is real. And I think that is closer to the point than saying that all these phenomena have some externalized source unrelated to us. It seems to have a logic and perhaps even a 'technology' of its own that serves as a carrot on the stick, keeping us exploring the realm of mind ever more deeply. And it seems to be linked intimately to our own minds..."

Maybe the intelligences Uri believes in are, in fact, a superior civilization trying to contact and educate us, but maybe that civilization of superior intelligence is another dimension of ourselves--a part of our consciousness not in our time and space dimension. Its major function may be a natural product of man's evolution, stimulating our imagination and giving us clues in our search as we go ever deeper in the quest to understand ourselves and our place in the universe."

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THE OPERATION ARGUS CONCEPT  
A NEW LOOK AT UFO EVENT SHARING AND DATA SHARING

Ray Stanford

UFO researchers possess a wealth of anecdotal accounts of both aerial objects and landed ones. But in the absence of any extensive, instrumentally-recorded hard data, some prominent students of UFO reports have published speculations that are even more fantastic than the objects reported.

While the cautious introduction of hypotheses certainly has its place in UFO studies, a group of researchers with a nonprofit research corporation headquartered in Austin, Texas, decided in 1972 that speculation based on anecdotal UFO accounts had outstripped the probative value of those reports. It was decided that energy and funding should be directed toward developing a complete system of automatic monitoring and recording instruments which could operate at a remote location 24 hours per day, seven days a week. It was further decided that a vital core of these instruments should be portable, and use should be made of a four-wheel drive vehicle capable of transporting this core to remote locations, where large numbers of UFO events are thought to occur.

Such a system of instruments is now for the most part complete, and is currently being placed in operation by Project Starlight International (P.S.I.) at its Laboratory of Instrumented UFO Research, located in the hill and lake country about 20 miles northwest of Austin, Texas.

It seems probable that UFO activity will be monitored more by continuous observation from one geographic location than by jumping from one "flap" area to another, always one step behind the UFOs, which usually remain for only a short time in any specific locality. The experience of Project Twinkle personnel in trying to instrumentally record data on the "green fireball" phenomenon of the late 1940s and early 1950s illustrates this principle. As Kevin Randle stated (in Official UFO, May 1976), "One of the major problems was that the team did not remain in one place (my emphasis). Each time there was a series of sightings, the team would move to a new location, always too late to see anything."

The P.S.I. staff has established a permanent base for continuous operation of equipment on its 400 acre research site. There, at the laboratory building, instruments automatically monitor and record (with correlated universal time data) numerous physical data which might profitably be studied in connection with UFO events. Data on anomalistic objects is also obtained with cameras of various types, a computer-centered triangulation system, radar, and other devices. The laboratory now operates 24 hours per day.

Although focussing its research at the permanent laboratory, the salaried P.S.I. staff of five (including a full-time equipment engineer) is prepared to

load essential equipment quickly into the project's four-wheel drive van, for transportation to areas where concentrated UFO activity is reportedly occurring. The equipment could be transported anywhere in North America if necessary, although field work within the southwestern United States is emphasized.

The purpose of this report is to explain broadly the working philosophy of P.S.I. and its Operation ARGUS (Automated Ringup on Geolocated UFO Sightings), rather than to offer a technical dissertation on any particular piece of equipment. It should be pointed out that the P.S.I. mobile laboratory and its crew are on call and available free of charge to any serious, scientific UFO organization, provided it can be demonstrated that there is a reasonable and valid cause to transport research equipment into a given area. Further, groups requesting that P.S.I. equipment be brought into an area must have demonstrated a sincere willingness to reciprocate in cooperative efforts to solve the problems of UFO research.

As indicated in the title of this presentation, techniques have been devised for broad-scale sharing of recorded UFO hard data, as well as for actual UFO-event sharing on a local level. These capabilities are commensurate with P.S.I.'s purpose of actively serving both the scientific community and the public at large.

#### The Equipment

Reports of close-range UFO events have repeatedly contained descriptions which may indicate that UFOs produce magnetic, radio-frequency, and even gravitational effects and disturbances, as well as unusual barometric changes, electrostatic effects, temperature changes, and odd sounds. Hence the P.S.I. lab incorporates the following: an automatic recording magnetometer; an automatic recording gravimeter, a recording ambient thermometer, a three-foot parabolic (directional) microphone; and an ambient microphone, with appropriate amplification and recording circuitry. All recordings are made with universal time input for correlation studies. Also included is an eight-channel sensor-activated chart recorder, for visual display of all low-frequency data (to 150 Hz) as well as WWVB time (Photo A). Various radio-frequency scanners and recorders, with similar time inputs, are available for use during UFO events.

Even though it is rumored that some UFOs are not detectable by radar, the laboratory uses a 12-mile range, 360° radar (Photo B) capable of detecting objects of very small cross-section. Recordings of the radar scope are made during UFO events, along with universal time data. (Almost all recordings made at the lab, even movies and photos, are correlated with universal time.)

A device called UFO/VECTOR (UFO/Video Experiment Console for Transitional-Overt Response) can be used to monitor, display, and record pulsation or modulation, up to two and one-half million pulses per second, in UFO-related light (Photo C).

The National Aeronautics and Space Administration (NASA) has recently acknowledged that it is conducting research that will be "the first step toward actually contacting extraterrestrial life" (Dr. I. Rasool, NASA's Office of Space Science, Washington, D.C., according to National Enquirer, March 9, 1976).

With a corresponding purpose, the P.S.I. Laboratory staff feel they should attempt to evaluate whether or not UFO intelligences (which some persons theorize to be extraterrestrial) are capable of, or interested in, exchanging intelligent communication. To that end, they have incorporated into UFO/VECTOR a modulated laser which can transmit voice, code, or video (TV) pictures. The UFO/VECTOR light pulse evaluation system mentioned earlier can receive, and display as sound or TV images, any continuous (direct current) light response, up to 2.5 megaHertz, that a UFO might make to P.S.I.'s laser communication experiment signals. Red laser light was chosen for the communication response experiment, rather than radio-frequency transmission, because UFOs reportedly disrupt radio transmission and/or reception, and because no radio transmissions (other than radio-frequency noise) have ever been reliably reported to have come from UFOs. On the other hand, several seemingly reliable UFO accounts describe light resembling a laser (coherent) beam coming from an object to the ground, to persons, or to another UFO.

The media may have slightly overplayed the P.S.I. UFO/VECTOR laser experiment, in contrast to the monitoring equipment, because it provides rather sensational copy. The P.S.I. staff would probably be surprised if the unit ever served any purpose other than monitoring and recording non-communicational UFO light pulses. The equipment could also help test the hypothesis that there are atmospheric density variations around some UFOs which bend light beams rather sharply. However, as project director I would have felt negligent if some capability for sophisticated communication experiments had not been designed into the P.S.I. equipment.

The UFO/VECTOR operator can aim the equipment by watching a TV image of the UFO and moving a control stick to cause the image to coincide with an aiming mark superimposed on the TV screen. A direct optical aiming mode is available in case of failure in the video-assisted aiming system. In that situation the operator must use laser safety goggles, in case the UFO should respond with a dangerously bright beam.

A 35mm movie camera and numerous other cameras, one employing a diffraction grating for spectrum studies, photographically record any UFO event from various stations at the site.

Because UFOs have often been reported to check new or unusual light patterns on the ground, and even to respond to lights deliberately flashed at them from below, a light pattern response experiment has also been devised. This consists of 91 spotlights of 150 watts each in a hundred-foot circle, with a single light in the center. This is not intended to be a UFO decoy. The lights may be sequenced in an almost infinite number of patterns, and even in response to UFO light patterns, by application of solid-state circuitry and a microprocessor.

The most sophisticated equipment yet designed by the laboratory staff is currently being assembled and should be completely functional before August, 1976. The system is called Operation ARGUS (Automatic Ringup on Geolocated UFO Sightings), and operates as follows. At three communications-linked locations on the 400 acre site, phototheodolites (telescopic cameras with sophisticated pan-and-tilt heads) will record a UFO event while shaft encoders on

their vertical and horizontal axes will simultaneously give UFO coordinate information, in binary form, to the P.S.I. computer. During each period of data input to the computer from the three pan-and-tilt heads (every five to ten seconds), each theodolite operator keeps the UFO carefully centered on an illuminated spot located at "optical infinity" in a special aiming scope. Almost immediately the computer uses the input to calculate and display, both on video and in typed form, the distance of the UFO, the horizontal distance, and the altitude. Data is also recorded for computation of the size of the object. Also computed and displayed will be the range error of each distance computation, for that will vary with actual distance, etc. (Photo D).

In addition, the computer simultaneously selects a pre-recorded image, made from an aerial photo or topographic map, of the area over which it determines the UFO to be passing, hovering, or landing. That image is displayed via a video screen and the computed, to-scale path of the UFO is superimposed over it. The combined image is recorded for later study. In this way the P.S.I. staff can determine over which ground objects the UFO passes or hovers, and even the location of a UFO landing. Hence, even if a landing site cannot be reached by P.S.I.'s four-wheel drive mobile van before the object leaves, investigators can be there as soon as possible to look for traces.

Now for the reasons for using the acronym ARGUS, in Greek mythology a creature with many eyes: While the computer is calculating and displaying all the aforementioned data, it is also scanning its memory for the names and phone numbers of all ARGUS volunteers located within the computed visibility radius of the UFO (based on an evaluation using the object's size and altitude). It begins a completely automated telephoning of all volunteers within the visibility radius, using several phone lines simultaneously. When a volunteer answers, a recording says, "This is an Operation ARGUS alert. Please do as you were instructed." The volunteer (layman, engineer, scientist, or media person) will then go outside, hopefully spot the UFO, and acquire photos, notes, and other data. This is the UFO-Event Sharing mentioned earlier. The computer will also type out the names and phone numbers of all volunteers whose phones are answered, so that the P.S.I. staff can check with them later if they do not report back on their own.

Simultaneously with the phone calls, the computer is capable of generating a general UFO alert via selected amateur and citizens' band radio frequencies. Such a general alert would tell the listener what to do and how to reach P.S.I. to report back.

In event of a power failure, rumored to be often associated with near-by UFOs, all P.S.I. equipment is automatically switched to an emergency power supply that is safely shielded from any such disturbances.

The low frequency data monitored and recorded, with universal time correlation, via the eight-channel chart recorder can be photocopied and mailed to volunteer scientists, engineers, and serious research groups around the world within 24 hours following any instrumentally-recorded UFO event at the lab. Within a week or so, copies of photos, spectrum displays, magnetic recordings, etc., can also be duplicated and sent to appropriate persons and groups, along with the lab crew's verbal reports.

Also installed at the Laboratory of Instrumented UFO Research is a complete electroencephalograph for studying brain waves, and a polygraph ("lie detector") system, for physiological studies of persons who have reportedly experienced close-range UFO encounters and/or been abducted by UFO "beings." This equipment, and its qualified operator, are also available at the lab to all responsible, serious UFO groups for examining persons they have located who have had important UFO experiences. Such groups will be free to publish all results in their own publications, provided an appropriate permit has been signed by the person(s) examined.

The Project Starlight laboratory, its Operation ARGUS, and its physiological monitoring equipment for the specific study of UFO abductees are at present unique in all the world. The facilities are freely open to benefit all serious researchers. It is hoped that the work of the laboratory and the results being obtained (as reported in the project's Journal of Instrumented UFO Research) will encourage other groups to begin a similar approach, where such equipment is deemed useful to an organization's area of research emphasis.

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Project Starlight International is a research division of the Association for the Understanding of Man, a nonprofit, federally tax-exempt corporation. Its mailing address is P.O. Box 5310, Austin, Texas 78763.

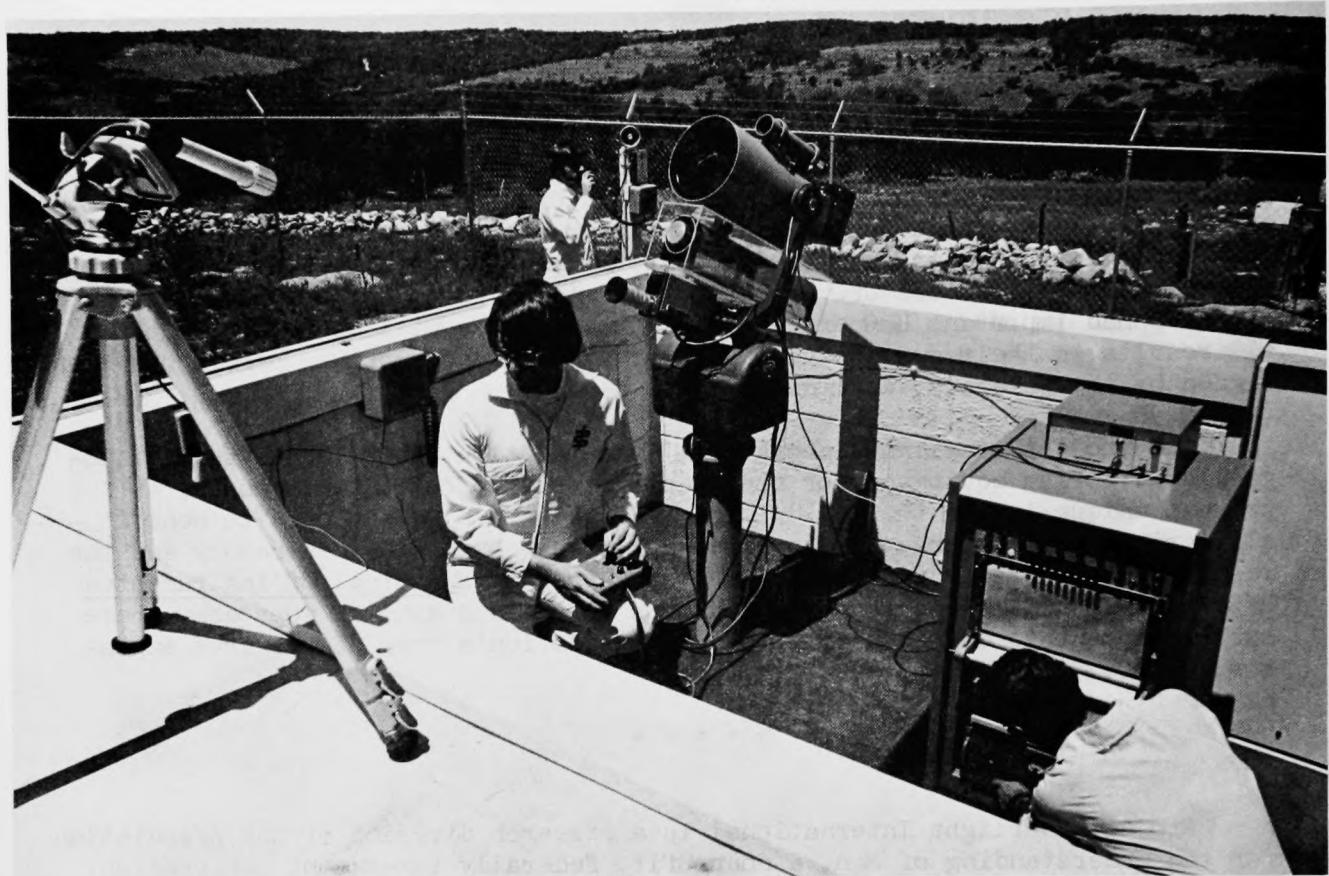


PHOTO A

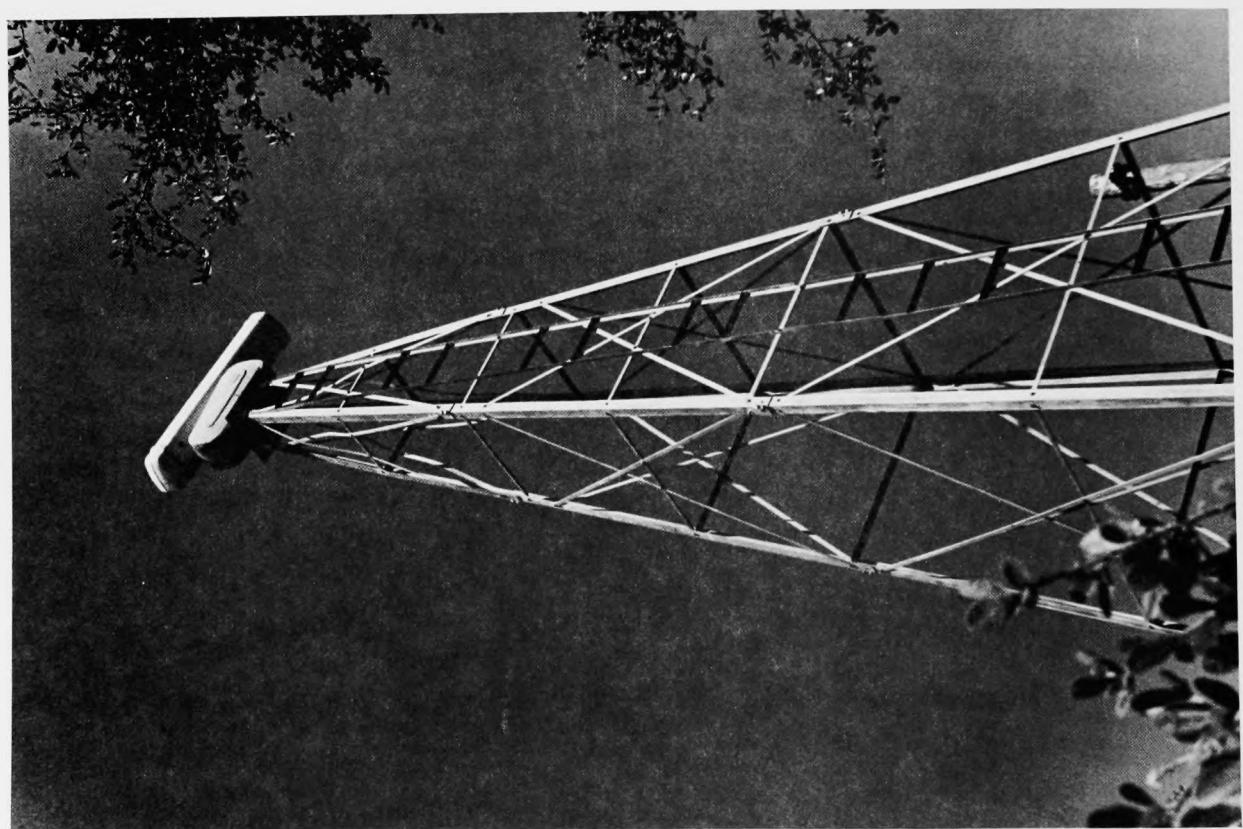


PHOTO B

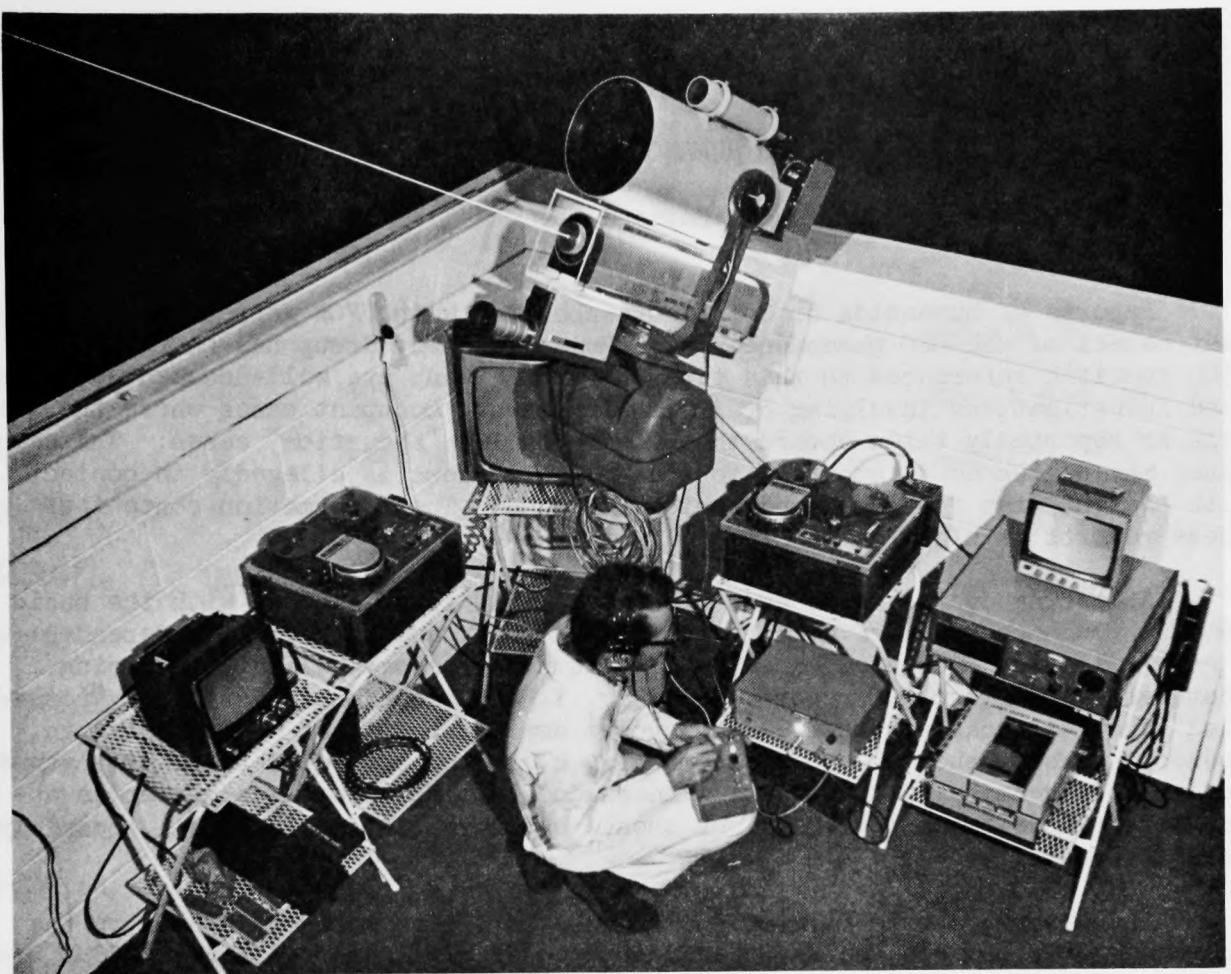


PHOTO C



PHOTO D

## ANALYSIS OF HUMANOID/ABDUCTION REPORTS

David Webb

Reports of humanoids or entities associated with UFOs represent an important aspect of the UFO phenomenon. The Humanoid Study Group has on file over 1000 specific references to this type of report; many are well-documented, first-hand investigations involving credible witnesses. Occupant cases where the witness is reportedly taken aboard the UFO are called "abduction" cases. These cases may be the most important to study; the witness is allegedly in contact with the entities for prolonged periods of time. The information content of these reports is high.

A listing of the known abduction cases (51) is presented, with the basic data, a rough estimate of my rating of the report, and the source references. A matrix is also presented, showing case number vs. some salient, recurring features of this type of report. Finally, I have included a listing of "potential" abduction cases; those which involve some feature that we recognize in abduction cases, such as apparent amnesia, a missing period of time, or a vague feeling of dream, even though the witness does not consciously remember an abduction. These cases are being, or should be, investigated in detail, possibly using hypnosis.

Abductions, a bold form of entity behavior, have apparently been on the increase; over half of the known abduction cases have occurred since 1970. Recurring features include such physical characteristics of the humanoids as slanted eyes, small stature, small noses and ears and a mouth slit. On-board medical examinations, induced amnesia, intelligible communication, paralysis of the witness, and an alarming number of cases of reported abductions from which the witness has not returned, are also common features.

The large number of these cases and their internal consistency demand that we critically analyze them, especially the witnesses involved. We should try to uncover other "hidden" cases and take a fresh look at the "contactee" situation.

POTENTIAL ABDUCTION CASES

(Loss of memory, time, etc.)

Date	Local Time	Place Name	State or Country	Witness Name
55/06	0100	Muros	Spain	Agulla Riveiro
60/09/02	M	Bunnell	FL	Palmes
64/02/03	N	Gum Creek	S. Australia	(Conf.)
66/06/L	0315	Chelmsford	MA	Argerake
67/12	M			(Conf.)
68/02/27	0430	Templeton	MA	Bernor
69/04/20	N	Itaucu	Brazil	Roque
71/04/02	2200	Kempsey	New South Wales	Anon.
71/09/24	1140	btw. Itaperuna and Cataguases	Brazil	Miranda
73/05/22	0300	Catanduva	Brazil	Patero #1
73/10/(15)	0105	Omro	WI	W (Conf.)
73/11/02	0330	Goffstown	NH	Morel
74/05/31	0230	Umvuma	Rhodesia	
74/09/(03)	(0300)	Duxbury	MA	F (Conf.)
75/04/06	0200	btw. Athens and Wausau	WI	Seagraves and Lewandowski
75/08/13	0120			(Conf.)
76/01/06-07	2330	Stanford	KY	Smith, Stafford, Thomas

## UFO-RELATED ABDUCTION CASES

Report Number	Date	Local Time	Place Name	County	State/Country	Witness Vicinity
15-01	15/08/21	M	Gallipoli Pen.		Turkey	Suvla Bay
21-01	21		Marseille	Bouches du Rhone	France	
42-01	42/L Sum	N	Newbiggin-by-the-Sea	Northumberland	Britain	coastal radar site
53-01	53/03/22	0200	Tujunga Canyon	Los Angeles	CA	in cabin
53-02	53/11/23	E	Lake Superior		MI	F89 aircraft
55-01	55/03/05		Paris	Edgar	IL	
56-01	56/06/15	1910	Sao Sebastiao	Sao Paulo	Brazil	seashore
57-01	57/05/01	0700	nr. Pajas Blancas airport	Cordoba	Argentina	a road
57-02	57/10/16	0100	Sao Francisco de Sales	Minas Gerais	Brazil	a field
57-03	57/11/05	1700	nr. Kearney	Kearney	NB	H 10 & Platte R
61-01	61				USA	F86 aircraft
61-02	61				USA	transport plane
61-03	61		Saratov		Russia	mid-air
61-04	61/08		Tobelak	Siberia	Russia	mail plane
61-05	61/09/19	2200	Indian Head	Grafton	NH	road nr. Rt. 3
62-01	62/08/20	M	Duas Pontes	Minas Gerais	Brazil	hut
62-02	62/09/16	N	nr. Vila Conceicao	Amazonas	Brazil	jungle
65-01	65/01/30	0200	La Selva Bch.	Santa Cruz	CA	beach
65-02	65/05/30	1400	Lake Mason	Marquette	WI	porch
65-03	65/08/21		nr. Mexico City		Mexico	
65-04	65/09/03	N	nr. IL-WI border		IL-WI	road
67-01	67/04/11	2130	Wellington	Collingsworth	TX	
67-02	67/11/17	1800	Calgary	Alberta	Canada	field
67-03	67/12/03	0230	Ashland	Saunders	NB	jct. Rts. 6 & 63
68-01	68/08/06	A	Brooksville	Hernando	FL	

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Witness Name	No. of Wit.	Wit. Age	Sighting Duration	No. UFOs	No. Hum.	Height of Hum.	Report Rating
Reichart	22		1 hr.	6-8	0		High
Anon.					2		Undocumented
Lancashire				1	sev	pigmy, normal	Moderate
S, W (Conf.)	2	22,23	2½ hrs.	1	7-8	normal	High
Moncla				1	0		High
Metcalf	1		brief	1	0		Low
de Freitas Guimares	1		30-40m	1	3-4	5'10"	Low (press only)
Anon.	1			1	5-6	5'8"	Low (press only)
Villas-Boas	1	23	4h 15m	1	5	5-6'	High
Schmidt	1	58	30m	1	6	5'4"	Low (unreliable)
Anon.				1	0		Mod. (military)
Anon.	26			1	0		Mod. (military)
Anon.			3 days	1	3		Low (press only)
Anon.	4		2 days	(1)			Low (press only)
Hills	2	39,41	30-40m	1	6	5'	High
Mafra de Silva	1		brief	2	0		Moderate
Xavier	1			1	3		Moderate (press)
Padrick	1	45	2 hrs.	1	9	5'9"	Low (unreliable)
G #1 (Conf.)	1	(45)	4 hrs.	1	4	3½-4' & 5'10"	Moderate
Anon. students	sev	youths		1	many	7'	Low (press only)
G #2 (Conf.)	(4)	(45)		1	6	6'3"	Moderate
Watts #2	1	28	1½ hrs.	1			Low (inconsistent)
Seewalt	1	youth	50 m	1			Moderate
Schirmer	1	22	20 m	1	(4)	4½-5'	High
Reeves	1						?

## UFO-RELATED ABDUCTION CASES

Report Number	Date	Local Time	Place Name	County	State/Country	Witness Vicinity
69-01	69/05/04	1500	Bebedouro	Minas Gerais	Brazil	lagoon
71-01	71/03/14	E	nr. Apache Jct.	Pinal	AZ	desert
71-02	71/09/22	1945	nr. Itaperuna	Minas Gerais	Brazil	Rt. 100
71-03	71/11/17	2130	Bananeiras	Minas Gerais	Brazil	Rt. 100
71-04	71/12/05	1900	nr. Itaperuna	Minas Gerais	Brazil	Rio Carangola
71-05	71/12/06	2200	nr. Tel Aviv	Tel Aviv	Israel	desert
72-01	72/10/04	0315	Buenos Aires	Buenos Aires	Argentina	home
73-01	73/03/21		nr. Apache Jct.	Pinal	AZ	desert
73-02	73/06/23	N	Phoenix	Maricopa	AZ	home
73-03	73/10	M+	btw. Columbus & Mansfield	Delaware or Morrow	OH	Rt. I-71
73-04	73/10/11	(2100)	Pascagoula	Jackson	MS	Pascagoula R.
73-05	73/10/16	2300	Lehi	Utah	UT	in home
73-06	73/10/17	2345	nr. Loxley	Baldwin	AL	Rt. I-10
73-07	73/10/25	1820	Buena Park	Orange	CA	a road
73-08	73/10/28	0115	nr. Bahia Blanca	Buenos Aires	Argentina	H 3, 18 km. fr. Bahia Blanca
74-01	74/02/09		Shores Comm.	Giles	TN	
74-02	74/04/26		Guaranta	Sao Paulo	Brazil	a road
74-03	74/05/26	M	Mitchell Caverns	Bernardino	CA	mine
74-04	74/07/E		Navegantes	Parana	Brazil	beach
74-05	74/08/31	N	Navegantes	Parana	Brazil	beach
74-06	74/10/25	(1600)	Medicine Bow Nat'l Park	Carbon	WY	hunting in park
75-01	75/01/05	0330	Puerto Ingeniero White	Buenos Aires	Argentina	nr. home
75-02	75/08/26	0400	nr. Buffalo	Cass	ND	I-94
75-03	75/10/27	0300	btw. Poland & Oxford	Androscoggin	ME	nr. Lake Thompson
75-04	75/11/05	1815	nr. Heber	Navajo	AZ	logging road
75-05	75/12/02		Fargo	Cass	ND	home

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Witness Name	No. Wit.	Wit. Age	Sighting Duration	No. UFOs	No. Hum.	Height of Hum.	Report Rating
Antonio da Silva	1	24	4½ days	1	10-12	4'	High
Scott, Corbin #2	2			1	4-5	5 or 7', 9'	Low (inconsistent)
Caetano Silveira #1	1	27		1	6	3'	Moderate
Silveira #3	2	27	5m	1		3'	Moderate
Silveira #4	1	27		1		3'	Moderate
Puharich, Geller Ciccioli	2						?
	1	50	40m	1	sev	7'	Moderate
Scott #3	1			1	2	short	Low (inconsistent)
T (Conf.)	1		4-5 hrs	2	2	big, tiny	Moderate
V (Conf.)	1	29	55-85m	1	3+	5'	Moderate
Hickson, Parker R (Conf.)	2	45,18	15-30m	1	3	5'	High
	5	6-34	(45m)	1	5-6	4½'	High
Patterson	1	30	15-30m	1	6		Moderate
Scott #4	2	28,17	1½ hrs.	1	2+	short	Low (inconsistent)
Llanca	1	25	40-45m	1	3	5½'	High
Swanner #4	1		45m	1	2	4-5'	Low
Patero #2	1	40	6 days	1	sev	5'8"	Moderate
Susedik	1	52	(2hrs)	1	8		Low (inconsistent)
"Boca-de-Traira"	2			1			?
Azevedo	2		brief	1	3	short	Moderate
Higdon	1	40	2½ hrs	1	3	6'2"	High
Diaz	1	28		1	3	5'8"	High
Larson #1	3	31,15	1 hr	8-10	1		Moderate
S, G (Conf.)	2	22,18	2-3 h	3	5	4½'	Moderate
Walton	1,7	22	5 days	1	3,4	5'	High
Larson #2	1	31		1			?

Report Number	15-01	21-01	42-01	53-01	53-02	55-01	56-01	57-01	57-02	57-03	61-01	61-02	61-03	61-04	61-05	62-01	62-02	65-01	65-02	65-03	65-04	67-01	67-02	67-03	68-01	69-01	71-01	71-02	71-03	71-04	
Wrinkled Skin																						X					X				
Slanted/Wrap-around Eyes					X			X														X									
No. of Digits										5												5	4			3					
Mouth Slit								X																		X					
Small/No Nose								X																							
Small/No Ears								X																							
Free Will							X	X									X	X													
Communication-Intelligible							X		X							X	X	X				X						X			
Communication-Unintelligible						X		X														X				X					
Telepathy					X		X															X			X						
No Communication					X																						X	X			
Paralysis					X				X								X					X			X						
E/M in Capture							X	X	X								X									X	X				
Medical Exam					X	X											X		X	X						X	X	X			
Stripped for Exam					X				X								X			X											
Blood Sample								X																					X		
Humans Observed																	X	X	X	X									X		
Abduction-No Return	X		X	X	X					X	X	X	X			X	X														
Bright Light or Beam		X							X								X	X				X				X	X				
Amnesia		X	X														X					X	X								
Psychic Before or After		X															X					X									
Knowledge Increase			X																												
Headaches																		X													
Other Physiological																	X														
Repeater			X						X								X		X												
Traces/Artifacts									X				X	X																	
Hypnosis Used					X								X				X					X	X	X							
Messages																	X										X			X	X



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## THE EFFECT OF UFOs ON SOCIETY

Ron Westrum

In this paper I will assume that the UFO phenomenon represents an intelligent force which is interacting with mankind. It seems to me to be most probable that this force is another species of intelligent beings like ourselves. I would like to indicate, however, that other theorists have made valuable arguments to the effect that the UFO phenomenon does not represent another race of intelligent beings, but in fact is something else, possibly even a projection of our collective unconscious mind(1). Different theories of the UFO phenomenon point to different interpretations of its effects. I am aware, therefore, that many others who do not share my belief about UFOs may wish to look at the facts in a different light. I hope they will do so. Nonetheless, I think it is important to look at the implications of UFO events - and our reaction to them - in the light of inter-species strategy. Such will be the aim of this paper.

The implication of this assumption is that research on UFOs has much more in common with military intelligence or criminal investigation than with scientific research. As I have stated before(2), we are engaged in a battle for information with the intelligences of the UFO phenomenon. We must constantly struggle for more information about a phenomenon which in all probability is doing everything it can to deny us some information and bias the rest. It is the information that society receives about UFOs which is the phenomenon's major channel of influence on human life. There is therefore every reason to believe that this information, and its impact, is carefully controlled, and is purposely manipulated to influence our beliefs in certain ways. Nonetheless, it is all we have to work with at the moment, and we must make the best of it.

Our problem is greatly compounded by the essentially passive stance which our society has taken vis-a-vis UFOs. Instead of actively seeking information through the most advanced technology available, we have largely let the phenomenon choose its own ground, and then we have investigated afterwards(3). In the United States, the military has given UFOs a chance to interact freely with the population, instead of carefully controlling these encounters through surveillance and vehicle reaction. Or, if the military has done anything, the fear of public panic has kept the efforts so small that little about them has gotten out. Again, this allows the phenomenon to work freely, and to influence public opinion directly. Let us see what the effects of this influence have been.

### Beliefs About UFOs

Something like 11 percent of the American adult population have seen what they believed was a UFO, according to the Gallup Poll of October, 1973. How many of these sightings involved landings, close encounters, or physiological effects can only be guessed at. Sightings seem to be higher for younger people, and for those of higher status(4), but for the rest, it is striking how widely and democratically UFO experiences are distributed in the population. This is undoubtedly one factor in the finding that 51% of the persons interviewed

in the 1973 poll believed that UFOs are real(5). That 51% of the population believes that something is real which the government says is not is in itself a cause for concern, since it indicates that a credibility gap already exists between the government and the population.

Even more important, however, is what the population believes about UFOs. Even those who do not believe that UFOs are real might have a good idea of what they were like if suddenly the government were to admit their existence. If one were to guess at what the composite portrait of UFOs in the mind of the American population would be, it would come out something like this: UFOs are (generally disc-shaped) extra-terrestrial spaceships which are piloted by little green men. While constituting a hazard to one's nerves, they are seldom dangerous, and only occasionally molest people, as in the Betty and Barney Hill and Hickson/Parker cases. This is the message conveyed by the Keyhoe and Edwards books. There is also probably a fair amount of credence in the von Däniken thesis of "ancient astronauts."

What is interesting from a sociological standpoint is how these views are about seven years behind what most major UFOlogists now believe. One might predict that in another seven years the public will come to believe what the UFOlogists believe now. UFOlogists may precede the public by a few years, but in time the public may come to accept psychic aspects of the UFO phenomenon, too. Does this mean that in a few years the public will begin to wonder about "control systems," the "superspectrum," and the effects of the "collective unconscious"? If so, then what we are seeing here may be the first shadows of a major revolution in consciousness. After all, do not UFOs provide what occult science has so strikingly failed to provide, namely, authentic miracles? Here would be an important phenomenon, believed in by the public, which science ignored, and whose implications would be far more significant than the daily horoscopes.

#### The Threat to Reason

The greatest danger posed by the UFO phenomenon is its threat to human reason. Although modern culture contains many other elements, reason is basic to the type of social structure we have developed. Admittedly this "reason" is only one way of looking at the world, and there are other equally valid ways(6); but they are not ours. Let me review briefly what some of the postulates of this "reason" are:

- NASA MONK  
EST 1958
1. The world is comprehensible in terms of natural and sociological laws.
  2. The world does not behave capriciously or at variance with these laws.
  3. One's life and one's society can be planned because of these regularities.
  4. Human actions may be impeded, but they are not systematically blocked or thwarted except by other humans.

It is evident that UFOs pose the possibility that some of these postulates may not prove workable. If so, what will be the effect on human morale? On human action? On our society and culture? I would like to argue that even if there are no massive landings or open contact, UFOs threaten to undermine the basis of our institutions, because they make the world a place in which human

reason is not sovereign, a place in which another reason may be more powerful than ours. UFOs are a powerful, intelligent, and capricious force, one which can be exerted without warning to change the course of lives, and perhaps the fate of societies as well.

Writers on UFOs, whether believers or not, have often stressed the "unreasonable" nature of the phenomenon. For instance, persons who are isolated but have high contact with the phenomena often suffer serious cognitive dissonance which may lead to the kind of "personality deterioration" which John Keel talks about(7). I suspect that confusion is deliberately programmed into many UFO contacts(8) and that the intended target of the confusion is not so much the contactee as it is the whole society. If there are military organizations studying the UFO phenomenon, I suspect that they are having problems that the use of crazy but classified data is bound to intensify. UFOs present the recipient, the researcher, and society at large with a mass of confusing, contradictory, and disturbing information. What makes the information disturbing is precisely this implication that cultural assumptions we have long held will no longer be valid.

These properties of the phenomenon call forth a variety of defensive adaptations on the part of those who have contact with UFOs. Religious conversion or a "new consciousness" is one consequence. Ambivalence and denial is another adaptation. Still others attempt to make the phenomenon appear rational and so deal with it in that fashion. Paranoia is another possibility, as is shown by the popularity of the men-in-black stories. There is a definite need for many researchers to deal with the phenomenon by denying some parts and focussing on others. Evidently UFOs represent a threat to our emotional sense of security, and we have trouble dealing with them head-on. Hence also we are continually getting into squabbles with each other over the meaning of the phenomenon. Clearly this is not an easy subject for us. If this subject is hard for intellectuals to deal with, how hard is it going to be for the rest of the population?

A film that I think every UFO researcher ought to see appeared in the late 1960's and was called The Bubble (I don't remember any other details). It involved a strange external force which had collected an enormous number of human artifacts together around a small town and placed a transparent and indestructible bubble over the whole area. The town's inhabitants were turned into programmed zombies. The plot concerned a couple who somehow had managed to escape the programming and were trying to get out of the bubble and avoid being snatched by the force (which snatched people away except on Tuesdays). The two finally do dig themselves out from under the bubble; the force departs without leaving an explanation.

The film is significant because it shows a situation which, in some sense, we all may confront; a force far more powerful than ourselves, which does not act rationally, takes over our lives, and restructures our environment. How to survive after capture or military conquest is an important consideration for all thought about future interactions between UFOs and the human race. I think in some respects UFOs could present us with a situation analogous to captivity or conquest, or even more closely, to a child's relation to an unpredictable parent. The temptation in such circumstances to become passive and autistic is very strong. One need only consider how contact with superior technology

introduced benignly can be disastrous(9), to appreciate what such technology introduced indifferently or malignantly might do. Societies which pride themselves on their technical superiority and advancement (as ours does) would seem particularly vulnerable. By contrast, societies which emphasize literary or aesthetic values, such as the ancient Chinese, are much more likely to survive a period of conquest, since the values they prize cannot be easily over-matched by an outside force.

These somewhat gloomy reflections are relevant, of course, only to a world in which UFO sightings continue to occur, and in which therefore human beings come increasingly to believe that UFOs represent non-human intelligence; or relevant to an increased rate or a change in character of UFO encounters. It is well to be concerned about these matters in advance of the event, although I recognize that many people would consider thoughts like these alarmist. But one should not be fooled by the trivial effects on our society which UFOs now exert. UFOs are a Protean force. It is wise to consider not just the actual, but also potential, behavior. What UFOs do now should not be taken as a given; it could too easily change.

I am not suggesting that there is nothing that our society can do. On the contrary, I feel we ought to do a great deal more to find out about UFOs. I think we ought to hunt them in the skies, on the ground, in people's memories, and in the records of history, written or otherwise. I think the government should redirect some of its enormous resources for surveillance to keeping watch on UFOs. I think we should develop unobtrusive (non-reactive) indicators of the volume of UFO sightings by type, and this data should be constantly monitored. I think we should do everything we can by private and public channels to funnel more money and resources into UFO research. We need full-time, professional UFO researchers. We need a real institute for research.

But what if this research reveals a force of inconceivable power and intelligence? What will we do next? We had better start thinking about our strengths and weaknesses very seriously. Otherwise we may see the civilization we have worked so hard to build dissolve before our eyes.

References

1. I have dealt with these arguments in a paper which will be printed in the forthcoming Proceedings of the 1976 MUFON Symposium.
2. See my articles "Question of Deception by UFOs," Skylook, August 1974 (pp. 7-8); and "Matching Wits with Extraterrestrials," Skylook, June 1975 (pp. 10-13).
3. Donald Keyhoe has argued that the U.S. Air Force has taken an active role in seeking information about UFOs. I think this may have occurred in some sections of the organization, but doubt that any high-level policy has been followed. See "The Hidden Gamble," Chapter 3 in Keyhoe, Aliens From Space (New York: Signet, 1973).
4. Donald I. Warren, "The Reported Sightings of UFO's and Individual Social Integration: An Exercise in Classical Sociology," paper presented at the International Sociological Association Committee on Stratification, Geneva, Switzerland, December, 1975.
5. The percentage tends to increase with education, at least up to the level of "some college." There seems to be no discernible relation of UFO belief to political opinions.
6. See Robin Horton and Ruth Finnegan, Modes of Thought: Essays on Thinking in Western and Non-Western Societies (London: Faber and Faber, 1973).
7. John Keel, UFOs: Operation Trojan Horse (New York: Putnam's, 1970), p. 302.
8. See Jacques Vallee, The Invisible College (New York: Dutton, 1975), pp. 115-117.
9. See Lauriston Sharp, "Steel Axes for Stone Age Australians," in Edward H. Spicer, Editor, Human Problems in Technological Change (New York: John Wiley, 1965), pp. 69-90. Also the novel by Arthur C. Clarke, Childhood's End.

THE PHYSICAL POSSIBILITY OF MACROSCOPIC BODIES  
APPROACHING ZERO REST MASS AND THE UFO PROBLEM

F. Winterberg

UFO Models

Any new observation gives an impetus to find an explanation, and the UFO phenomenon is no exception to that rule. These efforts to explain the phenomenon can be labeled according to certain models. One model enjoying widespread popularity in the scientific community is the Misperception Model (for example, Menzel and Condon). A close study of the UFO phenomenon soon shows that this model may explain many reports, but totally fails to give an adequate explanation of Close Encounter cases. Another model maintains that all these reports are fabrications of the witness. One proponent of this model is the eminent French astrophysicist Professor Schatzmann, who charges witnesses with intellectual dishonesty. This model fails in cases where there is little doubt about the veracity of the witnesses. Another UFO model, one which I consider a good one, is the Psychopathological Model studied by the famous C. G. Jung. In my opinion this model gives a quite satisfactory explanation for the many occupant and contact reports. The fact that the witness' personality, sex and health play such an important role in these cases strongly supports this model. Also, the humanoid nature of the occupants speaks for a psychopathological explanation. For example, if these are beings from another solar system, why don't they have four arms and six eyes? Were it not for other cases which definitely can not be explained by any of these models, there would be little reason to be interested in the UFO phenomenon.

The ETI UFO Hypothesis and Physics

C. G. Jung, in his study of the UFO phenomenon, noted that it contains a class of reports which cannot be explained simply as a psychopathological aberration of the mind. Without exception these reports did not involve a contact, and were supported by certain unimpeachable evidence, such as a photograph made under controlled circumstances, or radar-supported visual observations. Jung clearly rejects a psychopathological explanation for such cases as being at variance with our basic scientific experience. As a non-physicist he seriously raises the question of the physical reality of UFOs as some kind of spacecraft from another world, and also recognizes that the widely reported inertia-less behavior of the UFO phenomena raises basic physical questions.

Even though we now have in the scientific community an almost universal consensus that there must be many other technical civilizations in our galaxy, many of them far ahead of us, it is not conceded that these civilizations could communicate with us by means other than radio signals. The question of interstellar space flight has been studied by many authors and they have all come to the same conclusion, that if possible at all, interstellar space flight would

require unparalleled technical effort on a really grand scale, which would make interstellar excursions events of extreme rarity, even for a highly advanced civilization. These findings seem to be in gross contradiction to the ETI hypothesis, and Markovitz, in an article published in Science, claims that the explanation of the UFO phenomenon as a manifestation of secret extraterrestrial visitation is at variance with the basic laws of physics. However, what Markovitz has shown is only that our presently known laws of physics cannot explain the UFO phenomenon. This, of course, is like someone in Plato's time trying to disprove the feasibility of TV by showing that it cannot be realized by the application of mechanical laws alone.

It is clear that if we take seriously the hypothesis that UFOs are manifestations of some extrasolar space probes, frequently seen by reliable witnesses, this would necessitate physical laws yet unknown to us which would make a trip from here to Alpha Centauri as easy as a trip from Chicago to Los Angeles. I will now show that such laws are not so implausible, and I will try to show what they would imply.

Physics has advanced during the past century by going from lower to ever increasing energies, uncovering along the way new fundamental laws. The world of low energy physics in the eV-range is chemistry. Higher energies lead to the generation of plasmas and to the decomposition of the atom into its ionic nucleus and surrounding electrons. The exploration of the MeV energy range opened the world of nuclear physics, and it was then possible to decompose the nucleus into its constituent parts, the neutrons and protons. To date this research has shown that all the basic laws of physics can be reduced to four fundamental forces; the strong, the electromagnetic, the weak, and the gravitational forces. It is important to stress here that if the UFO phenomenon is a manifestation of yet unknown laws of physics, then these laws must be hidden in the subnuclear world and beyond our present knowledge about these four forces. In fact, it is widely believed that these four forces can be reduced to just one fundamental force, and efforts to formulate a fundamental unified field theory have been going on since Einstein, within the framework of the general theory of relativity, and by Heisenberg on the basis of quantum theory.

In recent years physicists have gone to much higher energies and something very strange has emerged. In high energy scattering experiments it has been found that the neutron or proton behaves as if composed of three even smaller particles, sometimes called partons, believed to be identical to the hypothetical quarks, which can explain extremely well the observed spectrum of elementary particles. However, in spite of enormous efforts, quarks or partons have never been observed as free particles. In other words, it has not been possible to break up the proton or neutron, as it has been possible in the past to break up the atom or nucleus. Schwinger has proposed that the quarks are the long-sought magnetic monopoles first postulated by Dirac. Around 1930 Dirac had shown that the well documented electric charge quantization would have a simple explanation within the framework of quantum mechanics if magnetic monopoles existed. Before that time the phenomenon of electric charge quantization had to be accepted as a supplementary fact not explained by quantum theory. Dirac also showed that, in contrast to electric charge, this would imply an extremely large magnetic charge. If the electric charge is given by the dimensionless coupling constant  $e^2/hc \approx 1/137$ , then magnetic charge would be characterized by the coupling

constant  $g^2/\hbar c \approx 137$ ; that is, about  $10^4$  times larger.

One of the problems with Dirac's hypothesis is that the magnetic binding of two such extremely strong interacting magnetic monopoles, forming the dipoles observed in nature, would create a state of total negative energy and hence mass, whereby the negative binding energy would overcome the positive rest mass energy of the constituent monopoles. Another problem with Dirac's theory, only recently discovered, is that it does not work if formulated in the nonlinear framework of general relativity. However, I have recently shown (Lettere Il Nuovo Cimento, 1975) that the Dirac charge quantization theory can be rescued if one assumes that the magnetic monopoles are particles endowed with negative mass. It then happens, happily, that a bound state of oppositely charged negative mass monopoles would lead to a bound state with positive mass, as is observed in nature. In the context of Schwinger's theory, the quarks would then be magnetic monopoles possessing negative mass. This would also explain why it is so difficult to see free quarks, since a very strong magnetic field may be the only means to pull the monopoles apart. Also, the absence of monopoles in the earth's crust could be explained by the fact that negative mass particles undergoing collisions would speed up rather than slow down, thereby escaping into space.

The physical possibility of negative masses is a consequence of the negative root sign in the relativistic mass energy equation. In the Dirac theory, the negative sign of this root is the cause for the occurrence of the negative energy states which lead to the positron. But it is worthwhile to note that there is an even more direct evidence of the physical reality of negative masses, manifest in the Zitterbewegung phenomenon of the Dirac electron, first studied by Schrödinger. This phenomenon, in its simplest physical interpretation, results from the admixture of negative mass states to the electron wave function, giving rise to a mass pole-dipole state which automatically leads to the characteristic feature of the Zitterbewegung phenomenon.

Let us now suppose that negative mass magnetic monopoles do in fact exist and that we have found a way to pull them apart; for example, by an extremely strong magnetic field. It is then quite conceivable that we could dope solid matter with these negative mass monopoles. This would affect the crystal lattice of the solid material in two important ways: (1) Because of the much higher forces associated with the monopoles, the tensile strength and hence the melting point of the lattice could be increased by orders of magnitude; and (2) Assuming that the monopoles have a negative mass, this would reduce the overall inertial mass of the solid. We can therefore visualize that by the doping procedure one may approach a state of a macroscopic solid body with vanishing rest mass. Even though it may be extremely difficult to exactly compensate the positive rest mass of the body, it nevertheless may be possible to bring it arbitrarily close to this state.

The energy required to accelerate a body approaching zero rest mass to relativistic velocities would decrease in proportion, and a space craft using such a hypothetical material state could conceivably reach such high velocities in arbitrarily short times, for example, within hours or less. A space craft using the material state of vanishing rest mass could in fact traverse interstellar distances in arbitrarily small proper times. A photon for which the rest mass exactly vanishes and for which  $ds = 0$  can traverse any interstellar

distance in zero proper time. If a macroscopic material state of vanishing rest mass should in fact exist, it would be almost a miracle if it is not being used somewhere in the universe for the purpose of interstellar space flight; and this material state perhaps serves as a window through which we have been observed from time to time by highly advanced galactic civilizations. Such a means would also be quite different from the popular concept of antigravity machines which violate basic principles of physics such as the law of energy conservation. If equipped with TV cameras, a space probe employing this material state would be infinitely more effective than any conceivable interstellar radio contact. All the information obtained from close viewing by the TV camera could be transmitted at once back to the planet from which the probe originated.

The negative mass hypothesis could also perhaps provide an explanation for the mysterious energy source of the quasars, since the pulling apart of negative mass magnetic monopoles would be accompanied by the release of an enormous amount of energy. The pulling apart may occur because of very strong magnetic fields in the cores of the quasars.

The physical possibility of negative masses of course completely destroys all the arguments raised, for example, by Markovitz or Sagan. According to Gellmann, in physics what is not forbidden by some law must exist. Therefore, unless we can formulate a general law forbidding negative mass, we almost have to postulate its existence.

How does the hypothesis that at least some UFOs are manifestations of a highly advanced civilization making use of such a material state - how does this hypothesis compare with the reports which we have been able to examine?

First, the reported extremely high accelerations are consistent with this hypothesis. Harder, for example, analyzed a UFO report supported by photographic evidence indicating an acceleration of  $\sim 10^4 g$ , which would have given the object relativistic velocities in less than one hour. In order for these objects to traverse interstellar distances at relativistic velocities, they would need to have a very strong magnetic field, of the order of several megagauss, to push interstellar matter out of their way. This strong magnetic field could easily be provided by a monopole charge in conjunction with the high tensile strength. Another report analyzed by Harder, in which the observer used polarization filters, indicates a field strength of this order of magnitude. In one old Project Sign report, a prospector named Johnson claimed to have seen a flying disc over the Cascade range on the same day as the Arnold sighting. During the sighting the prospector's compass moved wildly. Since the earth's magnetic field is about  $\sim 0.1$  Gauss, one can assume that the magnetic field of the disc at the observer's position must have been at least of the same order. If the disc had a radius of  $\sim 10^3$  cm and was at a height of  $\sim 10^6$  cm, then in the case of a dipole field decreasing with  $r^{-3}$ , this would require a disc field of  $\sim 10^8$  Gauss. This value seems fantastically high and was the reason why the Project Sign investigators discarded the report. For a monopole field, however, which decreases only by  $r^{-2}$ , the disc field would have to be only  $\sim 10^6$  Gauss.

If these objects are real and have such very strong magnetic fields, two other observations could be explained. If an object with a magnetic field H

moves with velocity  $\underline{v}$ , it will induce an electric field  $E = (1/c)v_x H$ . If  $v = 10^6$  cm/sec, which is a typical value for radar visual cases, and if  $H = 10^6$  Gauss, then  $E \approx 10^4$  Volt/cm. An electric field of this strength would be enough to produce a corona discharge around the UFO and may explain the reported fuzziness and glow surrounding these objects, which changes into an intense brightness at high velocities. The corona discharge transforming the air surrounding the UFO into a plasma can then also explain the absence of a sonic boom. Because in a plasma the occurrence of a shock wave is determined by the Alfvén speed rather than by the sound speed, a shock wave occurs only if the object moves faster than the Alfvén velocity. The velocity of sound in air is  $v_s = 3 \times 10^4$  cm/sec, and any normal object moving with  $v > v_s$  will create a sonic boom. The Alfvén velocity is given by  $v_A = H/\sqrt{4\pi\rho}$ , and for  $H = 10^6$  Gauss,  $\rho \approx 10^{-3}$  g/cm<sup>3</sup> and one has  $v_A \approx 10^7$  cm/sec = 100 km/sec. UFO reports are consistent with velocities of  $\sim 10$  km/sec, but not above  $\sim 100$  km/sec. The magnetic field here would serve as a cushion, preventing the sonic boom.

The large reported accelerations which are consistent with a material state approaching zero rest mass would not be consistent with finite rest mass, low tensile strength biological systems, and would exclude a craft manned by intelligent biological beings, unless a way had been found to grow biological systems themselves incorporating such a state of matter.

But why do we never recover any physical residues from these objects if they are in fact real? One explanation may be that the almost massless characteristics would make them highly vulnerable if captured. These objects would have to sustain their pure state of almost vanishing rest mass by avoiding any contamination by us which would drastically increase their inertia. Also, the capture of such an object could reveal to us a knowledge which they may not wish to share with us and which, in the course of normal research, may take us 100,000 years to reach. Still, the absence of direct physical evidence remains the most unsatisfactory feature of the whole phenomenon, and is the strongest argument against the ETI hypothesis.

#### Conclusion

The UFO problem is like the mathematical problem of what is the result of multiplying zero by infinity. Mathematically, of course, this product can assume any value. According to our present knowledge, the probability that the UFO phenomenon is a manifestation of some extraterrestrial intelligence seems to be almost nil. However, if against all expectations the ETI UFO hypothesis should turn out to be the truth, the scientific implications would be almost infinite. The justification for doing UFO research is therefore derived from the mathematical theorem that the product of zero times infinity can be finite rather than zero.

THE UFO-RELATED ANTHROPOIDS - AN IMPORTANT NEW OPPORTUNITY  
FOR INVESTIGATOR-RESEARCHERS WITH COURAGE

Don Worley

Not in my wildest dreams did I ever see myself sitting here talking to you about this outlandish thing. I was once so conservative that I would not even listen to a man who claimed he had once worked at Wright-Patterson Air Force Base and seen little frozen UFO occupants there. He became very peeved when I didn't listen. Well, it seems that the years do change one's perspective.

In the last seven years there has been a dramatic increase in a specific type of ground-level manifestation associated with UFOs. Henceforth I will call this bizarre anthropoid-like form simply the "creature." There are now hundreds of creature witnesses, and who knows how many others we have not heard about.

Let me give you a brief description of King Kong Junior as he appeared in my area. He had a huge upper body with long arms and legs. In Preble County, sitting in a hog shed window, his knees came up to his head. In three cases he was estimated to be 7 to 8 feet tall, covered with long rust-colored hair. He had a large helmet-like or bulged-out head which sat directly on his shoulders. At a distance of 15 feet, witnesses were attracted to his eyes, described as reddish-yellow and seeming bright even in daylight. The skin on his forehead and cheeks was darker in color than his hair.

I do not want to imply that these creatures are all carbon copies of each other. There have been a variety of descriptions in our country. Let me also make it clear that the creature I am talking about here is not thought to be the animal called Sasquatch, Big Foot, or Yeti. They may be an entirely different thing.

In my supplementary information I have demonstrated the certain link between the creature and the intelligence behind UFOs. I have supplied some 19 instances of linkage. Of major importance to us field investigators is the time factor in the creature phenomena. In no other manifestation - not in lost-time abduction nor ESP-oriented contact - do we find the source behind UFOs so exposed. For the first time ever they have begun to approach closer, sometimes seem to remain in a given area for an extended period, or return to the same place days or years later. In a very limited summary I found some 67 percent of the creatures returned to the scene.

This disposition of the creature to return is unprecedented in the annals of modern Ufology. In the past we have suffered from what I will call the unpredictability syndrome. Now it seems our opponents have moved somewhat away from this position, in an ugly, unbelievable form. We are presented with an opportunity never before present in any other type of UFO activity. We have an entity which is probably the embodiment of many of the unfathomable secrets

of the UFO mystery, and it is returning often to the same location. With thorough research and planning, we may now have the option of a direct prepared response, such as on-the-scene experimentation.

How could our response be accomplished? You, the field investigator, would be the vital element in such an undertaking. Your task would be to learn about creature encounters in your area. Since these creatures often remain for a period, or return, you may one day find yourself an actual on-the-scene witness, instead of playing the usual sterile interrogator-of-witness role you have played so long.

Of course I want to stress that I am not advocating that you abandon other avenues of UFO investigation. I certainly do not want to seem to belittle any efforts to increase our comprehension of what we face. But let me put it this way: for many years now we have played the aerial object game, the landing game, the occupant game, the lost-time abduction game. I have even played the crazy metal strips game. But I would love to play the most difficult game of all - the anthropoid game. Why? Well, let me use a little basketball game analogy. In the anthropoid game we would no longer be dribbling around in back court. We would be up near the basket and have a chance to really score.

I know you are now thinking that all this sounds reasonably good on paper, but you suspect it is unworkable in the field. Certainly I will admit that the odds are very much against us; but somewhere, somehow, some of us may meet with success. Perhaps most of you have never heard of a creature encounter in your area. Well, I will tell you that they have occurred there and will occur in the future. The problem is probably that you have never really gone after them. You must use law enforcement agencies, television, radio, newspapers, et cetera. I know you have had experience in these methods. I have had some moderate success in my area; if I can do it, you can do it.

I have said that this is a new opportunity for investigators with courage, and it is here that the courage must be applied. Yes, you will see the raised eyebrow and head shaking of the skeptics. You won't be able to get through to some persons you really need in important places. The endeavor is difficult and full of disappointment. But actually, I enjoy the game most when the odds are greatest against me. Well, most of the time I do. I didn't when the irate dairy farmer ordered me out of the area where his young wife had suddenly vanished. In this deadly serious business we need a little humor occasionally, too. Some of my critics have said I am training my little miniature poodle to track Big Foot, and they gleefully pointed out his track to me at my place of employment. It was five feet long.

What is the state of creature investigation and research in our country today? Well, with the exception of Stan Gordon and his group in Pennsylvania, it is ill-prepared, sporadic, and nearly non-existent. Many investigators either don't comprehend the opportunity or have decided not to accept the challenge. Even in Stan's infested area, where they contemplate trying to use a laser if given the opportunity, the information already gathered has not yet been computerized and studied in depth. Stan is willing to contribute his material to any such effort. Meanwhile, we in the field need a center which could feed back to us much needed information, and possibly even set up some

tests or experiments, should we get to a creature case while it is still hot.

I have brought out the interesting dual nature of the creatures in that they seem both physical and non-physical (see the following Supplementary Information). I have alerted you to the occasional psychic aspects of the situation. This is such an intriguing mystery. How do the creatures get here, and what are they? In three of my cases, they retreated in a certain direction to something. Sometimes their arrival is heralded by loud pounding sounds, or snapping sounds on electronic devices. What is it that sustains them? Do the UFO-related anthropoids have an Achilles heel? Can we discover it? By working together we might stumble upon some things that could help solve the riddle we face. Only you are in the position to make the attempt, against great odds. In the race with our earthly enemies for the discovery of vital scientific secrets, our contribution could be of major importance to our beloved America.

#### Supplementary Information

In the following creature cases, please note the characteristics which support the conclusions of this paper; i.e., the reliable UFO link, the return factor, the occasional psychic manipulation, the physical indications, and the paraphysical indications.

#### Sharpsville, Indiana, 1971-72: UFO link, Return, Psychic, Physical.

One night in June, 1970, Dale King was visiting his future wife in Sharpsville when both suddenly felt dizzy, light-headed and strange. There seemed no explanation for their feelings of fear and increased sensitivity. They decided to drive to his home in the country, and on the way encountered what they describe as a black area covering the country road and extending upward ahead of them. They debated several minutes about going on or turning back. When they drove on through the blackness, it seemed warm for the cool night, visibility was restricted, and the headlights didn't seem to illuminate the gravel road. As they neared home the blackness gradually lessened. There was no indication of time loss, although that cannot be checked accurately. However, Dale's dog tried savagely to attack them both; Dale finally forced off the dog and the two ran into the house greatly perplexed. They had no interest in or knowledge of such things, or of what was to come.

In June, 1971, Dale went out in the yard one night to see why his dog Zipper was acting up. There, 25 feet away, stood a great ape-like creature, which Zipper was lunging at. He seemed to come down a short distance from it, and the creature, growling in a deep rumbling manner, would make a slow swing at the dog without quite touching it. The shocked witness called off his dog and retreated into his house where he frantically sought shells for his shotgun. When he emerged, the creature was moving away down by the creek. Dale put two shots in its direction but was sure they could have little effect at that distance. He called the sheriff, but never did so again, after the way the sheriff acted about the incident.

Thus began an incredible series of events in which the creature returned to the home a total of five more times in 1971 and 1972. On one occasion Dale arrived home to find his wife and her girl friend cowering in abject terror.

A powerful smell of rotten meat filled the air. The creature had attempted to enter the home by pulling loose part of the aluminum storm window.

This man, an ex-marine with considerable weapons skill, now became obsessed with the desire to drop this animal and prove to his unbelieving friends that it did exist. But he and Zipper, an extra-large police dog with the fury of a junkyard dog, both failed. Dale pursued the creature three times when it appeared around 11:00 p.m. It always retreated in the same direction up the wooded creek, where he could hear it in the woods and shallow water. It never ran, but seemed to be taking quick giant steps which kept it well ahead of its pursuers. Once Dale's mother looked out an upstairs window and discovered that the creature had followed him back home after a chase. Dale found shallow footprints and once, while out rabbit hunting, came upon a 30 or 40 foot circular browned area where all the weeds and grass were laid down in a perfect counterclockwise swirl.

Galveston, Indiana, October 1973: UFO link, Return, Psychic, Physical

On September 11, 1975, the Kokomo Herald published an article about the dozen or so UFOs seen since 1965 by John Grey, a middle-aged factory worker. In one of his first experiences, he felt a strange sensation forcing him to go outside, and an unspoken command to shine his flashlight up in the sky. Suddenly an orange glow, which he had seen at other times, appeared in the sky. He flashed his light three times and the glow blinked three times. Grabbing his binoculars, he saw in the sky a round black disc as big as a house with a curved lighted section. As it sped away he heard a humming sound. Then three jets came swooping in from Grissom Air Force Base.

Mr. Grey's soon-to-be son-in-law, Jim Mays, a relative skeptic about the unknown, was curiously enough destined to introduce Grey to the creature. At twilight one October evening in 1973 Jim sat fishing at a spot called The Pits, when a creature approached from behind and placed its hand on his shoulder. The startled witness got a quick look at the towering spectre's hand, legs and face before it turned and fled in a strange leaping fashion up a blacktop road and across a bridge. Jim could hear the slap of its feet on the blacktop. The creature leaped a ditch and went into the woods, from which a glowing bronze light source soon ascended into the sky, shooting up and fading away so quickly that it seemed almost instantaneous.

Two days later an uneasy Jim, with a bayonet stuck in his belt, returned to the scene with John Grey and three others. A glowing aerial light seemed to follow them part of the way and then disappeared near the bridge. The creature was spotted standing at the edge of the woods from which it had disappeared before. Later, by comparing the height of the weeds with that of a human, it was established that the creature was 8 or 9 feet tall. Two witnesses retreated in fear to the car. The creature was illuminated by two flashlight beams, and questions and a few curse words were yelled at it. One witness believed the flashlight beams seemed weaker when on the creature. A few rocks were hurled, but it could not be determined whether they missed, bounced off, or went through the creature. The giant sandy-colored ape-like thing did not move at any time. An approaching car made it necessary for the witnesses to move their car, and when they returned the creature was gone.

During these years Grey seems to have acquired a degree of psychic ability. In addition to ESP events, he had one dream which still puzzles him. He was standing in a room with light coming out from the walls, and colored lights

flashing like a computer to his left. He remembers talking mentally to a short figure with a large bald head, who told him in his mind that he must get him back home to go to work in the morning.

Preble County, Ohio, July 1975: UFO link, Return, Physical, Paraphysical.

In 1966 a neighbor of the Miller family watched a glowing object descend beyond their barn, after which the Millers began to hear pounding sounds near their home. Another evening snapping sounds came over the TV and a tall indistinct white form moved by the porch. The dogs hid. As visitors were leaving, something unseen pounded across a weed field and crashed loudly into a hidden manure spreader. No blood was found at the site.

On July 10, 1975, Tim Hurst and Emily Turner, aged 10, were playing in bright daylight in a cornfield near the Miller barn. Leaning over in the six-foot tall corn was an ape-like figure, intently watching them. The surprised witnesses ran to tell Donna Miller, aged 12, who ran back to the spot to see what they were talking about. She came to a sudden stop when the creature's face loomed up 15 feet away in the corn. The confrontation was short, and the children ran to the barn to tell Donna's father. He was busy milking and didn't heed them. They ran back out and climbed the roof of a low shed, where they could hide and watch the creature from behind another roof. The giant biped suddenly fled across the cornfield and over a hill in the direction of the woods.

Two days later Tim was out playing with his football. It bounced away onto a cement cattle run, and as he was picking it up, he looked up to see the creature sitting in the window of the hog shed watching him. He rushed to get his mother, but when they returned the creature was gone.

Six weeks later and 13 miles west, a young dairy farm wife vanished, never to be found. I shall mention presently the Waterloo case, which occurred 12 miles south and about four weeks after the farm wife vanished. I am not saying that the victim disappeared at the hands of the creature; I am only offering a secondary hypothesis that if it was not a human kidnapping and murder, it could have been the creature, for the following reasons: the creature was in this area; the girl disappeared about dusk, and data from Pennsylvania indicate that a good percentage of the creatures appear then; the topography of the area - the girl crossed a highway in front of her home to a one-block section of country road surrounded by cornfields, nearby woods, and a bush-lined railroad - fits in well with other data involving woods, roads, railroads, etc.; the creatures have an overriding attraction to women, substantially during the menstrual period. However, so far as I could learn there have been no other disappearances to support my abduction hypothesis, and in-depth investigation in the area was halted by the irate husband of the girl.

Waterloo, Indiana, August 1975: UFO link, Return, Paraphysical

A farmer, looking out his upstairs window at 3:00 a.m., saw a red light in his soybean field. He also observed, at the edge of his dusk-to-dawn light, a large upright animal which moved in the direction of the light in a forward swaying manner. The red light turned to a brilliant white, then vanished, as did the moving form. The next day the farmer discovered a 30 foot circle of browned soybeans in the field at the site. When I arrived several weeks later, after an intervening rain, I found no prints, above-background radiation, or residual magnetism. In 1966, the farmer and his wife had observed an object

that looked like an orange cut in half hovering over his cornfield. On later nights he heard the sound of a crying baby, one of the creature's typical sounds.

Roachdale, Indiana: UFO link, Return, Physical, Paraphysical.

A luminous object was seen to move over a cornfield and then apparently blow up without a sound. For the next several months over 40 persons had encounters with the creature. A family living near the cornfield could hear pounding; they saw the creature peeping in the window of the house, and in the door of the chicken house. Sometimes they could see through the creature. It was shot at, etc. Many chickens and other animals were mutilated.

Rising Sun, Indiana: UFO link, Physical.

A farm home experienced power failure as mysterious lights maneuvered over a nearby ridge. The next evening the creature was observed in the barnyard 25 feet from the observer. Three-toed footprints were found, as they are in a substantial percentage of cases. The next evening a neighbor observed a glowing aerial object maneuvering overhead.

Westmorland County, Pennsylvania: UFO link, Psychic, Paraphysical.

Three witnesses watched a large red ball slowly descend toward a pasture. As they approached the location in a truck, their headlights began to dim. A 100 foot, bright white object emitting a sound like a power mower and an odor like sulphur appeared on or near the ground. Two creatures were seen nearby and one was hit with a shot from a 30.06 rifle. The creature made a whining sound and threw up its hand toward the other creature. The UFO disappeared and the sound stopped. The creatures moved off into the woods. The witnesses and a state trooper observed a 150 foot glowing white area that extended about a foot off the ground where the UFO disappeared.

Five investigators from the Pennsylvania Center for UFO Research arrived. While one of the witnesses was being questioned in the field he began to shake, breathe heavily, and growl like an animal, then threw his interrogator and another witness to the ground. The man's dog ran at him as if to attack, then ran away crying (this reminds us of Sharpsville and the dog attack there). The man ran around the field swinging his arms and growling like an animal before he collapsed. Another investigator began to feel faint and went down on his knees. Two investigators went to his aid and one of them began to have difficulty breathing. A very strong odor of sulphur filled the air. Quickly assisting those who were affected, the group fled the field.

Stan Gordon has the entire episode on tape. The references to Pennsylvania events in this paper are made through the courtesy of the Pennsylvania Center for UFO Research, 6 Oakhill Avenue, Greensburg 15601, and the MUFON 1974 UFO Symposium Proceedings, MUFON, 103 Oldtowne Road, Sequin, Texas 78155.

Beaver County, Pennsylvania: UFO link, Psychic.

Two girls waiting for a ride saw a creature run into a nearby woods carrying a luminescent sphere in its hand. UFO occupants have been seen carrying glowing balls in their hands on at least three other instances. Later a hovering aerial craft projected a light beam into the woods, and the father of one of the girls went into the woods. Later he seemed to undergo a personality

change; he became interested in prophecy and talked frequently about the end of the world.

Penn, Pennsylvania: UFO link.

While driving through a woods, three women saw a large rectangular metallic object on the ground; a door opened, a ramp was lowered, and three ape-like creatures came out and ran into the woods.

Fayette County, Pennsylvania: UFO link, Return, Paraphysical.

A bright flashing light hovered over a woods; nearby a woman heard a humming sound and later a rattling on her front porch. Thinking it was the wild dogs which were in the area, she took her 16 gauge shotgun and went out to the porch to scare them off. Six feet away stood a tall ape-like creature. It raised its hands over its head and she thought it was about to leap on her. She fired point blank at it, and it disappeared in a flash of light.

The preceding year strange lights had appeared over the woods and a witness had fired six shots from his revolver into a creature, only to have it disappear into thin air. He could hear it running away but could not see it. The witness rushed home and got his 30.06 rifle and again fired at the creature, which was back in physical form. This time the shots made the creature cry like a baby as it moved away.

Marlington, West Virginia: Paraphysical

An auto approached a hairy ape-like creature near the road. The hair on the creature was standing up, and the car motor stopped. When a large bus backed up on the road to help the motorist, it frightened the creature and its hair dropped. The motor of the auto then began to run.

Hurst, Texas: Physical

Charles Buchanan, an engineer, was hoisted aloft, sleeping bag and all, by a creature which dropped him to pick up a bag of barbecued chicken.

Louisiana, Missouri: Physical

Two picnicking women abandoned everything, including the car keys in a purse, and retreated to their car when a creature appeared. The creature made gurgling sounds, caressed the hood of the car and tried to open the door. The sound of the horn made it retreat; it discovered a peanut butter sandwich, smelled it, wolfed it down in one bite, and lumbered off into the woods.

Florida Everglades: Physical

An archaeological group of four scientists searching for prehistoric civilizations in the Everglades had eight encounters with a group of creatures which emitted a very foul odor. This powerful offensive odor is present in a substantial percentage of creature cases.

Derry, Pennsylvania: UFO link, Return.

A farm was haunted by giant ape-like creatures when UFOs were seen in the sky.

Palm Beach, Florida: Physical

A security guard encountered a giant smelly ape, which approached to within 30 feet. The guard fired six rounds of dum-dum ammunition at it, and it grabbed its chest and ran like a track star.

Miami, Florida: Paraphysical

A security guard saw a giant creature standing in the bed of an electric company truck; it suddenly disappeared for no cause at all.

Louisiana, Missouri: UFO link, Return, Physical.

A fireball alighted atop a cottonwood tree. Colored lights, and an object with lighted windows which landed atop limestone bluffs, were seen. A number of subsequent encounters with the creature in this area were well publicized.

Washington State: UFO link, Return, Physical.

On the Yakima Indian Reservation in the Cascade mountains, intense UFO activity in the form of glowing and cigar-shaped objects occurred in the inaccessible canyons. There were earth rumblings and a high frequency noise which hurt the ears of forestry lookouts, as well as some encounters with peeping, smelly ape-like creatures.

Mojave Desert, California: UFO link, Return, Physical.

There were over 30 UFO sightings in three weeks around Big Bear Lake on the eastern edge of the San Gabriel Mountains. Campers encountered ape-like creatures, and strange mechanical sounds coming from under the forest floor were picked up by microphone.

Midland, Pennsylvania: UFO link, Return.

Over 100 witnesses observed a disc-shaped craft maneuver over two small towns. Police received many calls concerning ape-like creatures. A 42-foot diameter ring of pressed grass with several triangular holes was found.

Hampton, Pennsylvania: UFO link, Return.

There have been many UFO sightings in the North Hills area, including a large craft which dived at the gas station on Gibson Road near Route 8. Creatures were encountered from August 1974 to March 1975.

Westmoreland County, Pennsylvania: UFO link, Return.

Many witnesses observed a large glowing craft hover above a lake; a short time later creature reports began to emanate from the area.

Greensburg, Pennsylvania: UFO link, Return

A boomerang-shaped UFO was seen over the exclusive Beech Hills section, and a doctor shot at a creature.

## EXOSOCIOLOGY: SOCIOLOGY AND UFO'S

Richard E. Yinger

A conference on UFO research would not be complete without some discussion of theory. Theory serves two basic functions in research, in that it both guides research and is a basis for interpretation of data uncovered in research. The theory presented in this paper is part of the new field of sociology for which I have coined the term Exosociology.

Exosociology is the study of the concept of extraterrestrial life and the implications for Earth life from a sociological perspective. The term is derived from the term Exobiology, the study of life processes and evidence in the universe. It occurred to me several years ago that if the exobiologists are successful in their efforts to find life in outer space, the consequences of the discovery would be more a matter for the social scientists than for the astronomers and biologists. One can reasonably ask, "What do biologists know about life, anyway?" But, as of 1974 there was no area of the social sciences devoted to a disciplined study of the concept of extraterrestrial life.

In November, 1974, I presented a paper to the Pennsylvania Sociological Society meetings in Philadelphia, Pennsylvania, in which the concept of exosociology as a new field of sociological study was proposed. The paper was well received, and with the encouragement of this reception I made plans for the First National Exosociology Symposium to be held in February, 1975. Several local newspapers ran stories on Exosociology and there was enthusiastic public response to the idea of a scholarly treatment of a subject that seemed to many to be the property of cults.

The First National Exosociology Symposium was attended by about 70 people. The Keynote address was given by an astrophysicist who is developing a theory on the origin of the universe. I presented papers on the rationale for Exosociology and developed a theoretical framework which took an "open systems approach" to life on Earth. Primarily, Earth was seen to be influenced physically by significant inputs from outer space such as the sun. With this notion of an open systems Earth, it becomes reasonable to ask if there could be inputs on the order of life forces. Specifically, it becomes reasonable to hypothesize the UFO phenomenon as an input that differs slightly from the sunlight energy and other inputs from space.

When we look at Earth as an open system interacting with the universe, we see a myriad of input-output exchanges. As early as 1907 Arrhenius is reported to have speculated on the notion of panspermia, the idea that life drifts through the universe colonizing planets. We might further speculate on the vast amount of literature which suggests that Earth was visited in the ancient past and that the development of civilization might have been influenced by those visitations. These speculations certainly are not ridiculous if examined within an open systems theory. There is no good reason to assume these speculations are not possible. Therefore, if we can employ them as a part of theory, and if they serve the function of a good theory, then we are compelled to give them proper consideration as part of the scientific process.

Soon after the First National Exosociology Symposium, the notion of a theoretical framework for explaining the UFO phenomenon as part of Exosociology began to expand. It soon became apparent to me that the real issue for a sociologist was not quite the same as it was for the person collecting hard data on UFO observations. For the person collecting data was compelled to sort out the valid reports and obtain as much significant detail as possible. If time and other resources ever should be in great enough abundance, the data collectors might even turn to comprehensive data analysis. But as a sociologist-exosociologist my concern was not so much with validity and details of sightings as it was with the general nature of the UFO phenomenon as a social phenomenon independent of the individual observer and researcher.

If you look at the UFO as a social phenomenon, it shows distinct patterns that go beyond individual data. First, the UFO appears throughout recorded history. Secondly, UFOs appear across all cultures as though they were a sort of cultural universal. We find that UFOs are sighted by people from all age groups and other background variables such as sex, religion, occupation, education, and race. This is not something limited to a particular segment of society. Consequently, the UFO phenomenon meets basic criteria of what has been called a "social fact" in sociology. The important characteristic of a social fact for a sociologist is that its "realness" is not determined by its concreteness. Consequently, we do not need "real" physical evidence of UFOs in order to analyze them as social facts from a sociological perspective.

The most important characteristic of the UFO as a social fact is that it can be a vehicle for intellectual travel to spaces in the thought process not normally traversed. If you begin with the open systems theory, and consider the full implications of the Copernican Revolution, you can soon move into speculations about the most profound philosophical as well as sociological issues of human existence. When we consider the question "What will they look like?" we are saying something important about ourselves. What difference does it make what they look like? A lot of difference. We are not known for our friendly attitudes toward those too different from ourselves. A more important question is, "What will they be like?" Will they be "human?" What is "human?" What is life? How do we fit in with the life processes of the total universe?

As a sociologist I think the most important question to be dealt with by exosociology is the question of contact with extraterrestrials. It seems there is enough data on contacts to warrant serious consideration of the idea that some significant contacts could be made in the future that go beyond the isolated event. When we speculate on the social impact of such a contact and the exact procedures that might be followed, we are dealing with weighty issues. Unfortunately, up until now the social scientists have been content to leave these issues in the exclusive realm of science fiction writers, cultists, and a few astronomers with the courage to speak of them.

We are reaching a point in the life of this planet where many people are trying desperately to make sense of their existence. More and more people are finding the traditional social structures to be inadequate in providing the necessary structure to make life itself a worth-while enterprise. We seem to be demanding that life have meaning beyond a religious belief or an Earthly

definition of life. When we speculate on the significance of the UFO phenomenon we may be able to provide a new structure to the meaning of life.

And so, we can use the UFO as a vehicle for intellectual travel through philosophical and sociological discussions. We can also see the UFO as an indicator. No matter what UFOs actually are, something is happening. Even if they are not actually from outer space, there is some sociological significance to the fact that so many people see them, report them, and want to talk about them. There is also significance in the reluctance of the academic establishment to take the issue seriously.

This brings us to the Second National Exosociology Symposium. A major theme of the symposium held on February 21, 1976, was the historical perspective of new ideas in science. Emphasis was placed on the reluctance of the scientific community to accept radical ideas that do not fit into the accepted order of things. The history of astronomy and related subjects deserves special consideration. During the repressive period in which Bruno was burned at the stake and Galileo was threatened with the rack unless he recanted his support of Copernicus, the speculations about the nature of the universe and the position of the Earth within it could be dangerous to your health. Have we really advanced much beyond that today?

It is not enough merely to count the number of UFOs. Somehow we must get beyond raw data. Not that it is not important to count and measure. But we must begin to make some sense of the data. I contend that we won't make much sense of the data, no matter how great the quantity, until we develop theory that provides a frame of reference for analysis of the data. This is one contribution Exosociology may be able to make to those who presently are researching the UFO phenomenon. It is not the task of exosociology to become involved in a debate over the "reality" of UFOs; rather its task is to analyze the social context and social implications of UFO research.

In addition to UFOs, Exosociology provides for an analysis of related issues, such as the hypothesis that extraterrestrial influences had some impact on the development of human civilization and maybe the very development of Homo Sapiens as a species. As of now, the best research tells us that we really don't know whence we have come. It is no more unreasonable to speculate as to extraterrestrial origins than to speculate about terrestrial origins.

Another related area of study is the colonization of space from Earth. Who will go, and where will they go and when? This is not so much a technological issue as it is a political and economic issue. All the issues surrounding the American Revolution will be of significance to any serious consideration of space colonization. Exosociology can encompass every subject within sociology. The consideration of extraterrestrial life and its implications for Earth life has profound and far-reaching consequences for the study of human behavior.

To further explore and develop Exosociology, the Third National Exosociology Symposium will be held in Palm Beach, Florida, in April, 1977.

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THE USE OF THERMOLUMINESCENCE FOR THE EVALUATION  
OF UFO LANDING SITE EFFECTS

Edward J. Zeller

Introduction and Theory

Thermoluminescence is a property of many common minerals which are present in soils and rocks. Usually abbreviated as TL, the term refers to the ability of these minerals to emit visible light when they are heated through a temperature range of from room temperature to red heat (roughly 400° C). When crystals of semiconductors or insulating materials are irradiated with X-rays, gamma rays, or high energy particles, ionization results. Basically, this occurs when some of the energy of the incident radiation is transferred to the electrons of the lattice atoms, and these electrons are effectively knocked out of their normal positions. For a short period of time these energetic electrons are free to move about within the crystal structure of the mineral. Most of the free electrons return rapidly to their original energy states in the lattice atoms, but a few will become trapped at imperfections in the lattice itself. Impurities, missing atoms and dislocations are all capable of trapping electrons. Since the trapped electrons retain some of the energy they got from the incident high energy radiation, they are required to give up this energy if they make a transition from their traps to the lower energy states they occupied originally.

Heating causes the electrons to escape from their traps and the energy that is lost by the electrons is emitted as visible light. Once the sample has been heated and the electrons have been released from their traps, subsequent heating will not produce TL unless the sample has been subjected to an additional dose of ionizing radiation.

Almost all natural crystals are capable of acting as natural radiation dosimeters because they can show TL. In nature, the ionizing radiation which produces it comes primarily from included trace amounts of uranium and thorium. Potassium 40 may also be present as a major constituent in some minerals and it too can contribute to the total natural radiation background. Cosmic rays can also cause ionization but their contribution to the total natural TL is much less than that of the radioactive impurities. Any ionizing radiation which is artificially applied to the minerals tends to increase the TL above the natural levels present in the soil or rock. Conversely, any artificial heating will reduce the TL below that in the unheated material.

Nature of the Apparatus for the Measurement of TL  
and Sample Preparation

For the purposes of this discussion, only a brief description of the apparatus for measuring TL will be included. The grains of the sample to be tested are distributed as uniformly as possible on a silver plate which is heated

by nichrome heating coils at a rate of  $1^{\circ}$  C per second by an automatic heating rate program controller. Light emitted by the sample is carried to a photomultiplier by means of a quartz light pipe, which is positioned 1 cm above the sample on the top of the electric furnace. The photomultiplier converts the light emitted by the sample to an electrical signal which is amplified and recorded on an X-Y recorder. Temperature is recorded on the X axis and light intensity on the Y axis. The glow-curve can be measured between room temperature and approximately  $400^{\circ}$  C, above which the furnace itself begins to glow in the visible spectrum to which the photomultiplier is sensitive.

Although the glow-curve measurement itself is completed in a short time, sample preparation prior to the measurement is often tedious and time consuming. In the case of soil samples, organic matter must first be removed and as much as possible of the clay component of the soil must be washed out. It is imperative that all samples be examined under a microscope before TL runs are undertaken, in order to be sure that no substantial differences in mineralogical composition exist among samples from a specific site. Any major differences in mineral content in the samples is very likely to produce differences in the glow-curves, but these differences may not be related to UFO effects and conclusive results may be impossible to obtain.

#### Application of TL to UFO Landing Sites

##### 1. Detection of Ionizing Radiation

Because of the sensitivity of soil and rock forming minerals to radiation, they can be used to evaluate UFO landing sites. If the UFO emits ionizing radiation while on or near the ground, the effects should be detectable in rock or soil samples. Radiation levels of approximately 10 Rad can be detected with ease in quartz-rich soils or sands. Figure 1 shows the form of the natural glow-curve of Kansas River sand. After irradiation with a dose of approximately 100 Rad from cobalt-60 gamma rays, a marked increase in the total TL intensity is observed. In addition, a small peak at roughly  $110^{\circ}$  C is beginning to appear. This peak is never present in natural samples because it decays within a few days if the samples are kept at room temperature. The  $110^{\circ}$  C glow-curve peak is found only in samples which are run within a period of a few days after irradiation or which are kept under refrigeration during the time between irradiation and measurement of TL.

##### 2. Heating Effects Associated with UFO Landing Sites

UFO landing site traces sometimes include evidence of heating or burning of objects on the ground at the landing site. If sufficiently high temperatures are generated, it may be possible to detect these effects by observing a loss of TL in samples of rocks or soil. Figure 2 shows the effect of artificial heating in the laboratory of Kansas River sand. The untreated sample shows the maximum TL. Heating the sample to  $200^{\circ}$  C for approximately one minute results in a significant decrease in both peak height and area under the curve. An accompanying rise in the temperature at which the glow-curve peak occurs is also apparent. Heating the same material to  $250^{\circ}$  C for one minute causes all of these trends to be further accentuated.

Temperatures high enough to cause ignition of organic matter are certainly

adequate to produce changes in the TL but only if they are maintained long enough to permit the rock or soil actually to reach an elevated temperature. Water saturated soils have a very high heat capacity and any heating effects are likely to be measureable by TL only if the soil is actually dried out by the UFO activity. Furthermore, both soil and rock tend to be poor conductors of heat, so that any observable effects are likely to be confined to the extreme surface of the material.

#### Nature of the Samples Required for TL Evaluation

In order to make any practical use of TL in the evaluation of landing site traces it is necessary to determine what the average value of the TL in the soil or rock may have been prior to the landing occurrence. Unless this can be established with considerable accuracy, it is impossible to determine whether the variations which might be found are within the normal variability or whether they are truly anomalous. For this reason it is necessary to collect samples sufficiently far from the landing site that they cannot be expected to have been affected by the UFO. The necessity for the collection of these "background" samples cannot be overemphasized.

When sampling the affected area, care must be taken that specimen labeling is adequate to prevent any mix-up after the samples are returned from the field. Obviously, the area showing the maximum ground effect must be sampled with great care. A radial pattern or a grid of samples should be taken around the affected area and extending well beyond the region which shows the landing traces. By this means, any systematic variations in TL can most effectively be observed. If the approach and departure trajectories of the UFO are known and if they are close to the ground, samples should be collected along the flight path and at right angles to it.

Because even such penetrating radiations as X-rays and gamma rays are rapidly absorbed in soil or rock, the effects are likely to be most pronounced in the surface samples. Nevertheless, a sequence should be taken from the surface to 20 or 30 cm. Such a sequence would be especially valuable in establishing the nature of any anomalous TL effects which might be observed. In every case, samples should be collected as soon as possible after the sighting, and they should be kept under refrigeration until they reach the laboratory where the TL measurements are to be made.

Owing to the time involved in preparing samples, making TL runs and evaluating the results, investigators should be especially careful in selecting both sites and samples which are to be tested by this method. Only the best documented cases should be chosen, and specific attention should be devoted to sampling procedures in collecting material for the test. It is recognized that the nature of the UFO phenomenon is such that it probably precludes the collection of an ideal set of samples. At the same time, it is clear that the ultimate quality of any data obtained by TL evaluation is at least as dependent upon the field investigator as it is upon the laboratory technician.

#### Test Case Evaluation

It seems appropriate to conclude this discussion with an example of some data obtained from a set of actual samples from a reported UFO landing site. The site was located at Medford, Minnesota and consisted of a total of five

sample locations. The soil is rich in quartz and apparently uniform in composition with no obvious microscopic differences among any of the samples. All samples were collected from the upper centimeter of the surface soil.

Figure 3 shows some of the results obtained from the study. A pronounced difference is found between the TL of the site center and the site edge samples. The soil collected from the site edge shows a glow-curve peak at  $240^{\circ}$  C that is roughly four times higher than the same peak in the soil at the site center. Three additional samples were collected along a line extending north from the site, at distances of 10, 75, and 100 feet from the site edge. All of the samples outside the site show glow-curves similar to that from the site center and differ in intensity from it by less than one half.

A quantity of the soil from the site center was next irradiated with 1500 Rad from a cobalt-60 gamma ray source, to determine both the sensitivity to radiation and the shape of the glow-curve which might result from any artificial irradiation. This treatment caused the development of a strong glow-curve peak at  $110^{\circ}$  C which was not present in the site edge sample. However, it must be noted that the samples were not refrigerated after collection and that, in fact, they were not obtained until some time after the UFO landing is reported to have taken place. As a result, the peak at  $110^{\circ}$  C would have decayed and could not have been expected to be retained in the samples as they were supplied to the laboratory.

For this reason, the irradiated sample was subjected to a one-minute heating at  $160^{\circ}$  C to remove the low temperature peak to about the same extent as might be expected from natural decay at room temperature over a period of several months. The glow-curve which was obtained is shown in Figure 4, and has the same general form as that from the site edge.

The investigator might be tempted to jump to the conclusion that this result firmly establishes the fact that the site edge sample was indeed irradiated with a dose of ionizing radiation in excess of 1500 Rad, and that this proves that the UFO was responsible for the observed anomaly in TL. Such a conclusion would be premature and some of the objections to it can be listed as follows:

1. Too few samples were collected and too few glow-curves were run to provide satisfactory statistical proof of the natural variation in TL existing in the soil in and around the site.
2. The site was reported to and visited by field investigators too late to obtain samples which could provide convincing proof of recent artificial irradiation with ionizing radiation.
3. No information was obtained about any possible disturbance of the soil prior to the UFO occurrence. Some samples might have been transported from other areas as construction fill, or have been dug up from lower layers in the soil at the site, thus contributing to the inhomogeneity of the results.
4. No attempt was made to test the samples for small variations in the radioactive elements present in the soils which might have caused substantial local variations in TL that would have nothing to do with UFO activity. (Samples were tested, however, for large

scale variations in radioactivity, and none were found.)

#### Conclusions

Like so much of the other data which has been obtained on the UFO phenomenon, the results of the TL studies on the Medford, Minnesota case are inconclusive. An anomaly seems to exist between the expected natural order of things and the observed relationships. Unfortunately, inadequate information is at hand and convincing proof of the cause of the anomaly cannot be obtained. TL does offer one large advantage in UFO research, however. Any TL effects which might be caused by the UFO are retained in the samples after the UFO has disappeared, and repeated runs on the samples can provide a basis for statistical treatment of the results. Furthermore, a carefully collected and well preserved set of samples obtained immediately after a UFO landing might provide some genuine hard evidence about the true nature of the phenomenon.

#### KANSAS RIVER SAND

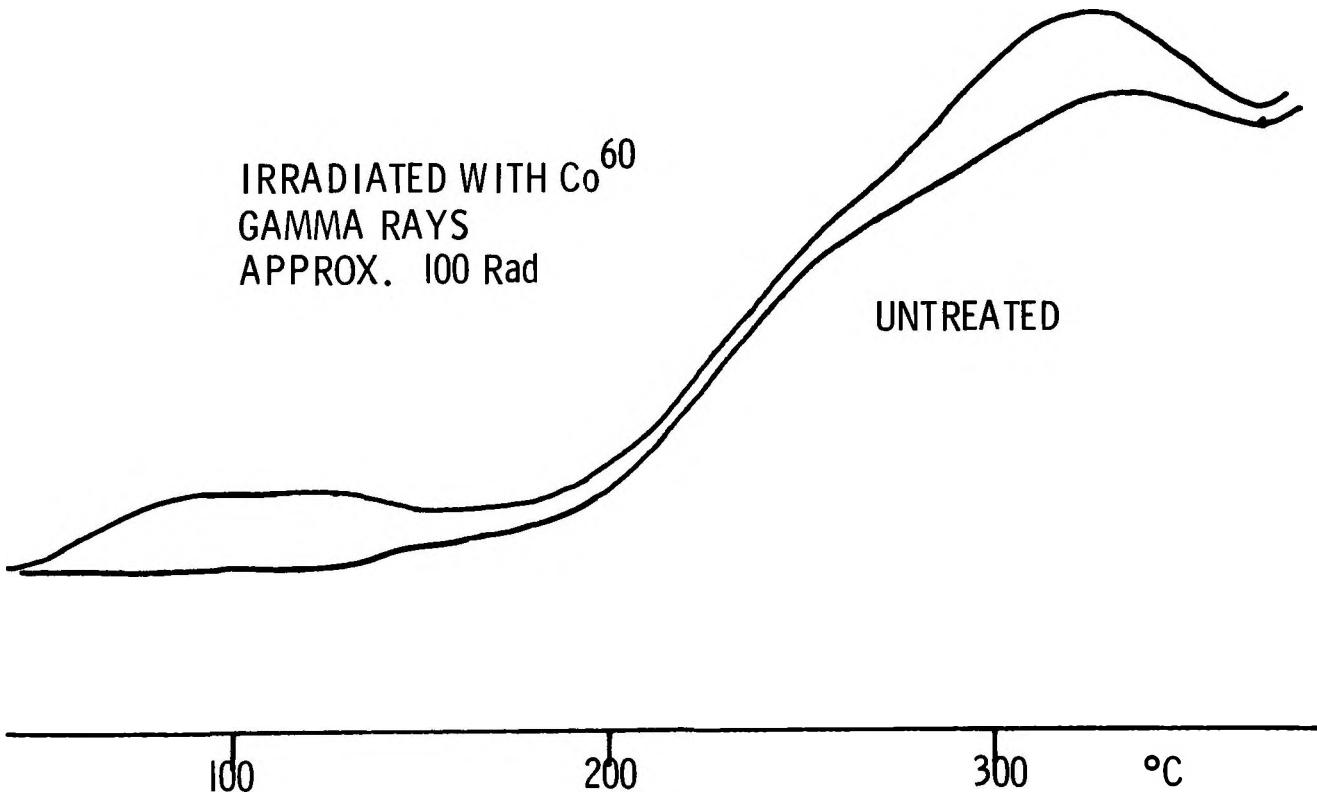


FIGURE 1

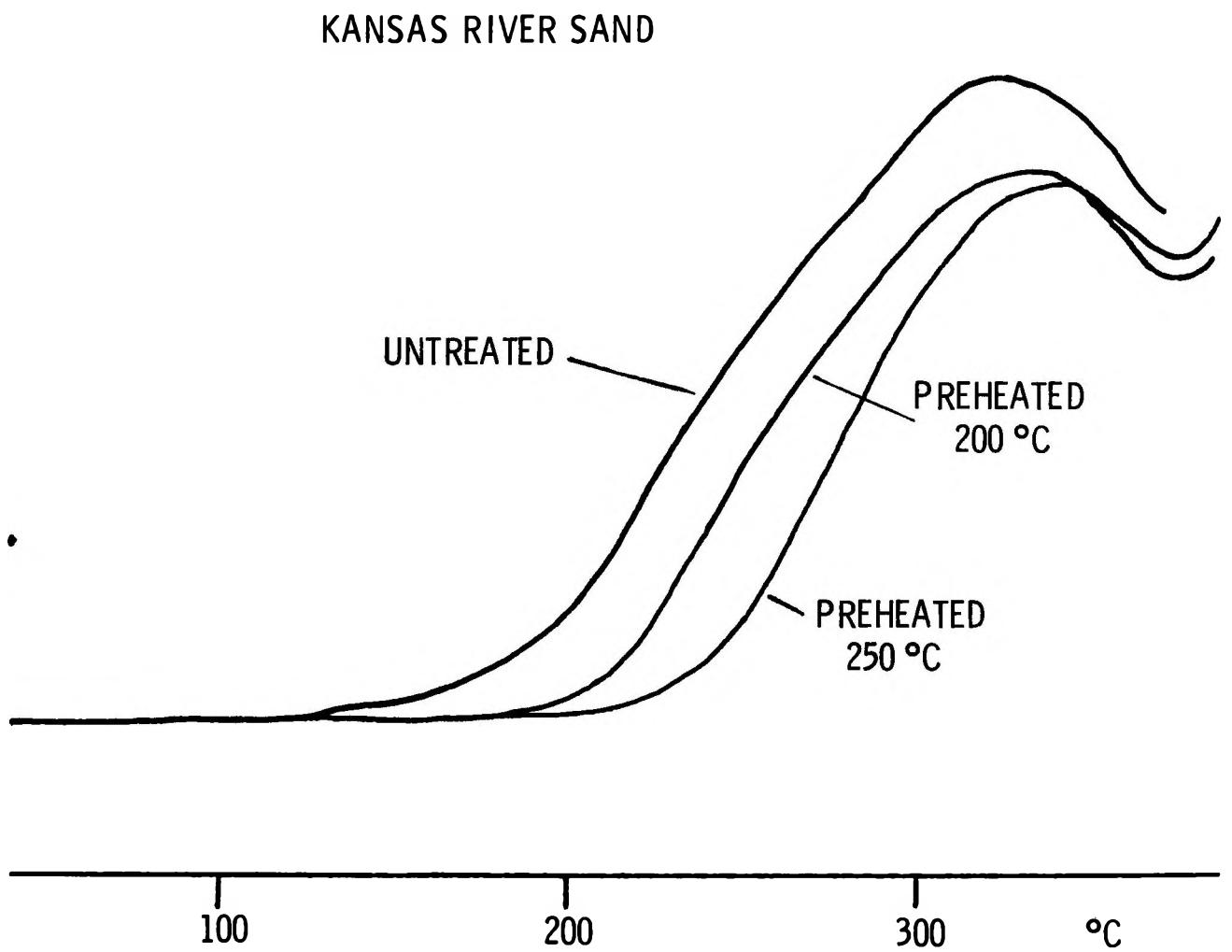


FIGURE 2

MEDFORD, MINNESOTA SITE

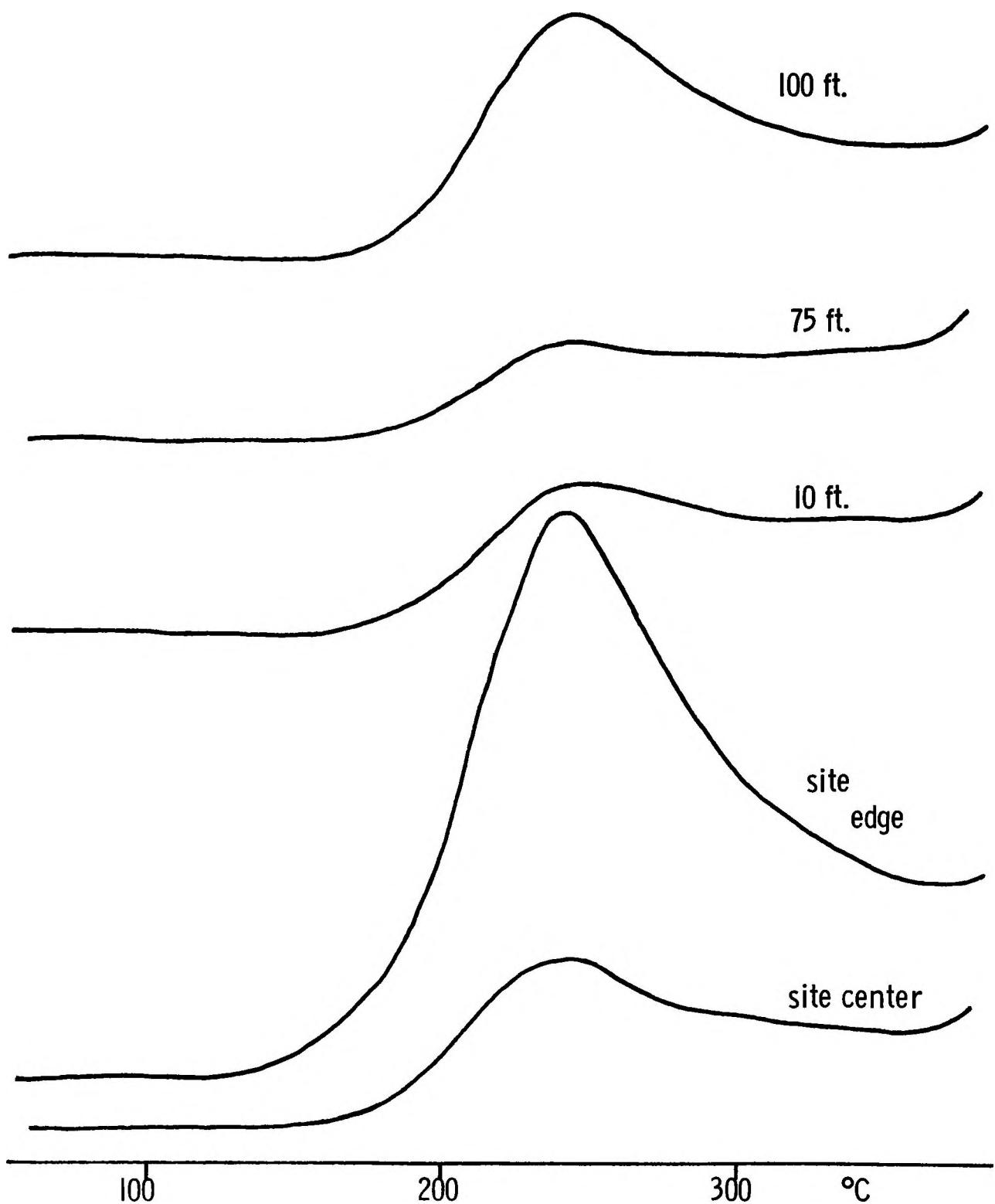


FIGURE 3

MEDFORD, MINNESOTA SITE

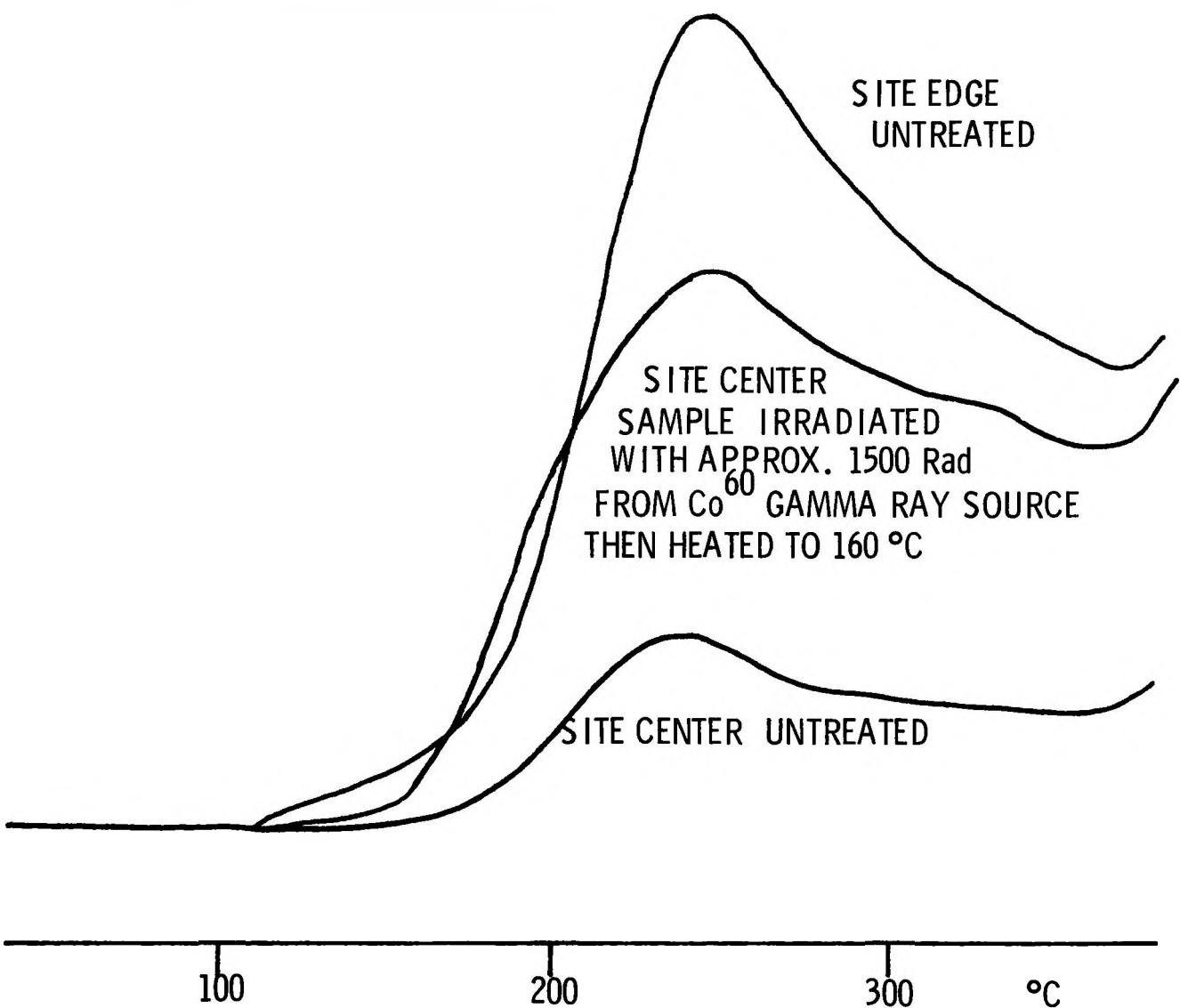


FIGURE 4

## APPENDIX I

### THE AUTHORS

#### ANDERSON, IRVING

Mr. Anderson received his degree in computer science from Roosevelt University, and works as a computer systems implementer for an oil company in Chicago. He conducts a monthly lecture series on UFOs at the Adler Planetarium, and serves the Center for UFO Studies as its vice president for sales.

#### AUSTRALIAN CO-ORDINATION SECTION (ACOS)

The Australian Co-ordination Section of the Center for UFO Studies is a group of eight regional organizations and a number of unaffiliated individuals engaged in UFO study and research throughout Australia. A list of these organizations and individuals, with their addresses, appears at the end of the ACOS report, which was prepared by Keith Basterfield, Harry Griesberg, and David Seargent.

#### AYERS, BRADLEY EARL

Mr. Ayers, a freelance non-fiction writer and professional private investigator, has had experience as a military officer, intelligence agent, commercial pilot and aircraft accident investigator. He has conducted independent research and study of the UFO phenomenon since 1965, following a personal UFO experience, and serves as a field investigator for the Center for UFO Studies. His articles on UFO research, psychic phenomena, aviation, parachuting and scuba diving have appeared in popular magazines. He has also written an insider's account of CIA covert operations against Cuba, THE WAR THAT NEVER WAS (Bobbs-Merrill, 1976). A graduate of Minnesota Metropolitan State University, he lives on a small farm near Minneapolis-St. Paul.

#### BALLESTER OLmos, VICENTE-JUAN

Born in Valencia, Spain, in 1948, Mr. Ballester Olmos holds a diploma in computer programming from the Faculty of Philosophy (Department of Logic), and the degree of Technical Engineer from the School of Engineering. He is employed by Ford Espana. Since 1969 he has specialized in the study of UFO landing reports, and his CATALOGUE OF 200 TYPE-1 UFO EVENTS IN SPAIN AND PORTUGAL was published by the Center for UFO Studies. He is also interested in computer analysis of Iberian UFO data, as well as the possibility of extraterrestrial life and contact with extraterrestrial intelligences. He has written numerous articles for such important UFO journals as FLYING SAUCER REVIEW (see Notes, p. 24), LUMIERES DANS LA NUIT, PHENOMENES SPATIAUX, and STENDEK, and is currently finishing a book devoted to the close encounter problem.

## BASTERFIELD, KEITH

Mr. Basterfield is an auditor by profession, and serves as a research officer for UFO Research, Inc., of South Australia. He is a member of the Australian Co-Ordination Section of the Center for UFO Studies.

## BLOECHER, TED

Mr. Bloecker was a founding member of Civilian Saucer Intelligence of New York in 1954, and has been actively engaged in UFO study and investigation ever since. He was a staff member, writer and editor for the National Investigations Committee on Aerial Phenomena, Washington, D.C., in 1968 and 1969, and has been a member of the Mutual UFO Network since 1972, serving as State Director for New York in 1974, and currently as State Section Director for New York City, as well as Co-chairman, with David Webb, of the Humanoid Study Group, formed in 1974. His publications include "Report on the UFO Wave of 1947," privately published in 1967; portions of "UFOs: A New Look," published by NICAP in 1969; and he edited the "U.S. Air Force Projects Grudge and Blue Book Reports, 1951-1953," published by NICAP in 1968. He also served as co-editor of two books by Aime Michel. An accomplished actor-singer, he studied music and drama at Columbia and art at the Cooper Union Art School. His home is New York City.

## BONENFANT, RICHARD

Born in Lewiston, Maine in 1944, Dr. Bonenfant spent three years in military service before taking his bachelor degree work at the University of Maine. In 1971 he received his master's degree in anthropology from the State University of New York, and since then has been engaged in the study of birth defects, first at Albany Medical College and more recently with the New York State Department of Health. He has published several articles in this field.

## DESARIO, MARIO

Owner of an electronics business in Carbondale, Illinois, Mr. DeSario is also a student in the Design Department of Southern Illinois University, as well as a consultant to the faculty. He is 31 years old.

## DRUFFEL, ANN

Mrs. Druffel received her BA degree in sociology from Immaculate Heart College, Hollywood, and did graduate study in social case work at Washington's Catholic University. With five years' experience in family and child welfare case work, she is now a wife and mother of five children of her own. Her interest in the UFO phenomenon dates back to 1945, and for the past 19 years she has investigated Southern California reports for NICAP, DATA-NET, and MUFON. She has also served as Coordinator of SKYNET, now an adjunct of MUFON, since 1965, and has published numerous articles in research journals. Her current activities include working toward a MA degree in creative writing, with emphasis on screen plays.

## GATES, TOM

President of the International Society of Planetarium Educators in 1975-76, Mr. Gates is employed as the Coordinator of Community Science Services for the Foothill Community College District, Santa Clara County, California. In this capacity he directs the District's Space Science Center, which includes an electronics museum, a planetarium and an observatory, and is in charge of science activities of the Community Services Division. He conducts a daily "Stargazer" program on KCBS radio, and speaks extensively on the subjects of UFOs, astronomy, and related fields. A graduate of Washington State University, with degrees in music and mathematics, he has served as director of the Morrison Planetarium in San Francisco, part-time instructor at San Francisco State College, and supervisor of the Boeing Spacearium in Seattle, as well as consultant to the Minolta Corporation. He also aids in UFO investigations by MUFON and CUFOS.

## GRIESBERG, HARRY

Mr. Griesberg, by profession the manager of a retail department store, is one of two coordinators for the Australian Co-Ordination Section of the Center for UFO Studies, located in Gosford, New South Wales.

## GROSS, LOREN

Mr. Gross served four years in the U.S. Air Force as a radar operator with the Air Defense Command. In 1966 he received a B.A. degree in Social Science from the University of California at Chico, and has since completed post-graduate work in physical science, history and art. He is the author of three booklets on the early history of the UFO problem: THE UFO WAVE OF 1896, THE MYSTERY OF THE GHOST ROCKETS, and the recently published CHARLES FORT, THE FORTEAN SOCIETY, AND UNIDENTIFIED FLYING OBJECTS.

## HAINES, RICHARD F.

Dr. Haines received his BA degree in 1960 from Pacific Lutheran College, Tacoma, Washington, and his MA and PhD degrees in 1962 and 1964, respectively, from Michigan State University. His major areas of specialty include human vision, perception, physiological optics, and behavioral physiology. He has authored more than 40 scientific journal articles, holds two U.S. Patents, has produced several technical films, and currently serves as an editor of KRONOS, Journal of Interdisciplinary Synthesis. He is employed as a research scientist and is cited in WHO'S WHO IN THE WEST, 1976 edition, AMERICAN MEN OF SCIENCE, INTERNATIONAL SCHOLAR'S DIRECTORY, and other biographical listings.

## HALL, RICHARD

Dr. Hall is Senior Abstracts Editor of PSYCHOLOGICAL ABSTRACTS, published by the American Psychological Association, Washington, D.C. Between 1958 and 1967 he was Assistant Director of NICAP, editor of THE UFO EVIDENCE (1964), a consultant to the Colorado UFO Project (Condon Committee, 1966-67), and author of numerous articles on UFOs. He is currently the International Coordinator for MUFON and a columnist for the MUFON news magazine SKYLOOK.

## HEATON, HAROLD I.

Dr. Heaton is a specialist in infra-red molecular spectroscopy and is currently a senior scientist at EG&G, Inc., Los Alamos, New Mexico. Trained as an astrophysicist, Dr. Heaton is presently working on laser radar studies of stratospheric chemistry, and on radiometric analysis of filmed spectra from old atmospheric nuclear events.

## HOVILLE, WIDO

A German emigre now living in Canada, Mr. Hoville is employed as a project engineer in the fields of high voltage DC transmission, hydroelectric power, and mining engineering. His interest in UFOs dates back to 1952, when he lived in Germany. Since 1966 his work as a field and construction engineer has taken him from northern Alberta to Newfoundland to the West Indies, and enabled him to investigate first hand more than 200 UFO incidents. Mr. Hoville is a member of APRO, NICAP, FSR, GEPA, and Provincial Director for MUFON. For the past two years he has served as director of the very active French-speaking group "UFO Quebec" in Montreal, and is co-editor of the quarterly journal of the same name.

## JACOBS, DAVID

Currently an assistant professor of history at Temple University, Dr. Jacobs was born in Los Angeles in 1942, received a BA in history from UCLA in 1966, and the MA and PhD degrees from the University of Wisconsin, where he taught for a year before joining the faculty at the University of Nebraska. At Nebraska he conducted an extension course on UFOs, and this coming year he will offer a credit course on this subject through the Liberal Arts Department at Temple. Dr. Jacobs is the author of THE UFO CONTROVERSY IN AMERICA (Indiana University Press) and numerous articles and book reviews on UFOs. He served as historical consultant and writer for the nationally syndicated TV show, "UFOs, Past, Present, and Future," and is a member of NICAP, APRO, MUFON, and CUFOS.

## JAMISON, BENTON

Dr. Jamison is a professor of mathematics at the State University of New York at Albany. He went to Albany in 1970 from the University of Minnesota, where he had been a member of the mathematics department since receiving his PhD in 1960 from the University of California at Berkeley. He has investigated UFO reports in the Albany area since 1973, and is currently a State Director (for New York) for MUFON.

## KLINN, ROBERT

Mr. Klinn travels for the Legal Division of the U.S. Small Business Administration Disaster Corps, and is presently serving on the Island of Guam. Beginning in 1973, he and David Branch co-authored for the Santa Ana REGISTER a column entitled "The Continuing UFO," the only weekly investigative column to appear in a major daily newspaper. From this column emerged important cases such as the Ely, Nevada Broken Axle Paradox, discussed at length in Hynek and Vallee's THE EDGE OF REALITY.

## KRETSCH, JEFFREY

Mr. Kretsch graduated from Northwestern University in 1975 with a BA degree in astronomy. He is currently a graduate student in physics at Southern Illinois University in Carbondale.

## LAWSON, ALVIN

Dr. Lawson holds the BA degree in English Literature from the University of California at Berkeley, and the MA and PhD degrees in the same field from Stanford. He is a member of the faculty at California State University at Long Beach, where he teaches a class in UFO literature, The Rhetorical Analysis of the UFO Debate, and is working on a workbook of logical fallacies, using examples from UFO literature. He is the MUFON director for Orange County, and maintains in his home the UFO REPORT CENTER OF ORANGE COUNTY, a telephone answering service for receiving UFO reports.

## MACCABEE, BRUCE S.

Dr. Maccabee received his PhD in physics in 1970 from The American University, Washington, D.C. His major areas of research include lasers, thermodynamics, critical phenomena, and electronics. Currently employed as a research physicist by the Naval Surface Weapons Center in White Oak, Maryland, he has served as a consultant to Tracor, Inc., Science Applications, Inc., and other companies. He has authored over 20 publications, holds two patents, and will be listed in the 1976 edition of AMERICAN MEN OF SCIENCE.

## MCCAMPBELL, JAMES

Mr. McCampbell received a BS degree in engineering physics from the University of California at Berkeley, and later completed extensive graduate work in physics. His early career appointments were in applied research on nuclear weapons and reactors. For more than a decade he managed large-scale engineering projects including industrial plants, research facilities, and nuclear power stations. As a private consultant in 1973-74 he planned, organized, and managed the environmental protection for the Alaskan Pipeline. He is the author of UFOLOGY, NEW INSIGHTS FROM SCIENCE AND COMMON SENSE, and serves MUFON as Director of Research.

## MCKAY, HENRY H.

Mr. McKay holds the dual positions of MUFON Director for Ontario and for Canada. He is the founding chairman of the UFO Research Center: Ontario, and a contributing author to CANADIAN UFO REPORT. He initiated and conducted Continuing Education courses on UFOs at Centennial College and for the Toronto and Scarborough Boards of Education. Mr. McKay's conference questionnaire appears as Appendix C.

## MERRITT, FRED

A merchant by trade, Mr. Merritt presently serves as vice president for development of the Center for UFO Studies. He has amassed a library of 180 books and stacks of periodicals on the subject of UFOs. He is primarily involved in searching for patterns in the accumulated data.

## MICHEL, AIME

Mr. Michel is a noted French mathematician and engineer who has written numerous books and articles on the subject of UFOs, including THE TRUTH ABOUT FLYING SAUCERS and FLYING SAUCERS AND THE STRAIGHT-LINE MYSTERY.

## MUSGRAVE, JOHN

President of the Edmonton (Alberta, Canada) UFO Society, Mr. Musgrave was educated at the Universities of Chicago and California at Berkeley, majoring in the history and philosophy of science. He serves as a Provincial Director of MUFON, an investigator for APRO and CUFOS, a contributing editor for the CANADIAN UFO REPORT, and an International Committee member of Contact International.

## PETIT, JEAN-PIERRE

A plasma and astrophysicist, Dr. Petit is Chief of Research of the French National Center for Scientific Research, and lives in Aix-en-Provence. His interest in the subject of UFOs grew out of his theoretical work on magneto-hydrodynamic propulsion systems and the resemblance of his theoretical models to the objects described in UFO observation reports.

## POHER, CLAUDE

Dr. Poher is currently Head of the Scientific Systems and Projects Division of the French National Center for Space Research. He previously served this Center as Head of the Astronomy Department for six years, and Head of the Sound-Rockets Division for two years. An aircraft pilot with a doctorate in astronomy and degrees in aeronautics and telecommunications, Dr. Poher had ten years' experience in the aeronautics industry before becoming affiliated with the French National Center for Scientific Research. His work has been rewarded by receipt of the National Center for Space Research Medal, the medal of the National Order of Merit, and the Astronomical Prize of the AAAF (the French AIAA) for 1974.

## SEARGENT, DAVID

Mr. Seargent is one of the two coordinators of the Australian Co-Ordination Section of the Center for UFO Studies. By profession he is an adult education lecturer.

## SAUNDERS, DAVID R.

The originator of UFOCAT, a sophisticated computer file of nearly 80,000 reports of UFOs, Dr. Saunders has a background in both the physical and social sciences. He received his bachelor's degree in chemistry and physics from Harvard, and his doctorate in psychology from the University of Illinois. He was a member of the Manhattan Project for a time, and later served as a statistician for the Educational Testing Service. While a member of the psychology department of the University of Colorado, he was appointed co-Principal Investigator of the Colorado Project (Condon Committee to investigate UFOs), until his disapproval of the committee's conduct of the investigation led to his dismissal. An account of this investigation is given in his book, *UFOs? YES!*

## SPAULDING, WILLIAM

Mr. Spaulding is a quality assurance engineer for AiResearch Manufacturing Company in Arizona, where he has worked on numerous aerospace programs over the past 14 years. He is a specialist in the field of non-destructive testing, and has lectured and written extensively on this subject. He is also the director of GSW (Ground Saucer Watch), Inc., Western Division, a position he has held since 1963. During this time he has presented over 600 lectures on the subject of scientific ufology.

## SPRINKLE, R. LEO

Dr. Sprinkle is an associate professor of psychology and Director of Counseling and Testing at the University of Wyoming. He received his BA and MA degrees from the University of Colorado, and his PhD in counseling and personnel services from the University of Missouri. He was a faculty member of Stephens College and the University of North Dakota before joining the Wyoming faculty. He is a member of several professional associations, including the American Society of Clinical Hypnosis, the American Society of Psychical Research, the American Association for the Advancement of Science, and the Parapsychological Association. He has on several occasions, in the presence of other persons, observed unusual aerial phenomena.

## STANFORD, RAY

A veteran of 23 years of UFO research, Mr. Stanford has long advocated the use of instruments in UFO research, and his efforts have stimulated researchers around the world to pursue this approach to gathering data on UFOs. Since 1972 Mr. Stanford has directed Project Starlight International, the first and only full-time facility employing a broad array of scientific instruments for monitoring and recording hard data on UFOs. He edits the project's JOURNAL OF INSTRUMENTED UFO RESEARCH, and has published a book entitled *SOCORRO 'SAUCER' IN A PENTAGON PANTRY* (Blueapple Books).

## VITON, MAURICE

Mr. Viton is an astronomer at the Marseilles Observatory in France.

## WEBB, DAVID

Mr. Webb is a physicist employed by the Solar Physics Group at American Science and Engineering, Cambridge, Massachusetts, where he specializes in solar research using data acquired by X-ray imaging detectors in satellites and rockets. He has been active in UFO investigation since 1960, as a member of NICAP, a field investigator for APRO and CUFOS, and a member of MUFON since 1974. He is currently co-chairman of MUFON's Humanoid Study Group, as well as MUFON state director for New Hampshire, Eastern Regional Director, and member of the Board of Directors. He and CUFOS have published a revised edition of his 1973-YEAR OF THE HUMANOIDS, a compilation and analysis of the Fall 1973 U.S. wave of humanoid reports.

## WESTRUM, RON

Dr. Westrum received his BA degree cum laude from Harvard in 1966, and his PhD in sociology from the University of Chicago in 1972. He is an assistant professor of sociology at Eastern Michigan University, and is currently preparing for publication several professional papers and a book dealing with social reaction to anomalous events.

## WINTERBERG, F.

Dr. Winterberg received a PhD in theoretical physics in 1956 under Prof. Heisenberg of the Max Planck Institute. He is the author of about 80 scientific publications, primarily in the field of nuclear fusion. His most important work relates to his original proposal for igniting thermonuclear microexplosions by means of intense charged particle beams. This work is presently receiving worldwide study.

## WORLEY, DON

Mr. Worley works as a patternmaker for an industrial manufacturer in southeastern Indiana, where he also serves as a field investigator for a number of UFO organizations. An ex-member of the Coast Guards, he has a layman's interest in astronomy and psychology, and since 1965 has investigated some 300 UFO sightings. He also lectures and appears frequently on radio and TV in his area.

## YINGER, RICHARD

Dr. Yinger received his PhD in sociology from the Florida State University in 1971, taught sociology at the State University of New York from 1970 to 1973, and is currently Director of the Exosociology Institute in Lake Worth, Florida. The concept of exosociology was developed by Dr. Yinger, and he has presented several papers on the subject. He has also conducted two national Exosociology Symposia, in 1975 and 1976, and is currently developing the concept as a sub-field of sociology.

ZELLER, EDWARD J.

Dr. Zeller is Professor of Geology, Physics and Astronomy at the University of Kansas, Radiation Physics Division, Space Technology Laboratory. He has served as an investigator for NASA, the Air Force, the Atomic Energy Commission, and the National Science Foundation, including field work in the Antarctic. His research interests include thermoluminescence and electron spin resonance in geologic materials, chemical interactions of fast protons in solid targets, radiation effects from nuclear waste, aerosols and planetary albedo, and paleoclimatology. He is a member of numerous professional societies devoted to geophysics, geochemistry, and cosmochemistry.

## APPENDIX II

### SUGGESTIONS TO THE CENTER FOR UFO STUDIES

(Personal letter to J. Allen Hynek, March 9, 1976)

Ray Fowler, John Oswald, Joseph Santangelo, Fred Youngren, and David Webb

1. The Center should take steps to train one or more of its central staff to become a proficient licensed operator of "psychological stress evaluation" (PSE) equipment. PSE equipment should be purchased for use at CUFOS. CUFOS should issue special PSE tape-recording tape technique instructions to its investigators for use in UFO investigation interviews on a selected case basis. The tapes would be sent as part of the UFO investigation report to CUFOS for evaluation and analysis. This would help weed out hoaxes and further establish the character/credibility of UFO witnesses.

2. CUFOS "White Papers" should be carefully prepared on special cases such as the Travis Walton, Delphos, Kansas, and other cases, for free unsolicited distribution to selected members of the scientific community and USAF FTD (TDETR) and for sale to interested parties.

3. CUFOS should encourage and assist in the preparation of "follow-on" catalogs which document other types of "special effects" cases (E-M, Animal Effects, etc.). The Physical Trace and Humanoid catalogs should be updated/corrected periodically by revised volumes or change pages.

4. CUFOS should advertise its presence nationally and/or locally through the telephone "yellow pages," national newspapers, etc. Others felt such advertising would attract unwanted data.

5. CUFOS should press for closer cooperation with federal agencies such as the FAA, especially in regard to the obtaining of radar data on a confidential basis. Ray Fowler feels that although the FAA and local USAF bases are providing data on civilian-instigated UFO reports, there may be radar data and certain types of reports not passed on to him and others.

6. CUFOS should attempt to interest already-active mobile staffed scientific organizations such as the Smithsonian Institute's Short Lived Phenomena Group to cooperate and assist CUFOS with short-lived incidents such as ground/vegetation traces, "angel's hair," etc.

7. CUFOS should provide a set of typical UFO models/sketches for use by investigators in determining UFO configurations from witnesses. An alternate proposal, to prevent "leading the witness," was to provide such investigators with unassembled models of typical UFOs, etc., for the witness to construct himself.

8. CUFOS should examine and select a standard color chart of nominal cost for universal usage by UFO investigators.

9. CUFOS should publish a professional UFO Journal for subscribing libraries, organizations, and interested individuals.
10. CUFOS should catalog APRO, MUFON, and NICAP files.
11. CUFOS should seek cooperation with known foreign government agencies which investigate UFO sightings.
12. CUFOS should send free unsolicited copies of all pertinent UFO reports, Catalogs, Papers, etc., to USAF FTD (TDETR), NASA, and selected scientific organizations and scientists known to have an interest in ETI.
13. CUFOS should assure that "Fire Tower" operators throughout the country become part of its UFO Reporting Network.
14. Eugene Mallove hopes to prepare a paper delineating both the need for close communication between CUFOS and scientists interested in ETI (Sagan, etc.), and how CUFOS might go about establishing such communication.
15. CUFOS should follow up each special-effects catalog with a companion volume of "brainstorming papers" which offer theories to account for special effects cases. For example, "How could a car's ignition system be affected by a UFO?", "How could we produce the Delphos ground/vegetation effects?", etc.

### APPENDIX III

#### THE MCKAY QUESTIONNAIRE

Below are the tabulated results of a questionnaire distributed to all Conference participants, who were asked not to sign their responses. A total of 53 questionnaires were completed and returned.

1. Gender: Female - 3 Male - 49 No Answer - 1

2. Number of years actively engaged in study of UFOs:

Under 5 years	- 14	11-12 years	- 4	23-24 years	- 1
5 years	- 6	13-14 years	- 1	25 years	- 3
6-7 years	- 3	15 years	- 5	Over 25 years	- 1
8-9 years	- 3	20 years	- 2	No answer	- 1
10 years	- 6	21-22 years	- 3		

3. Primary source of funding:

Personal	- 45	Business	- 2
Academic/Scientific	- 4	Other	- 4
Government/Civil Agency	- 3	(includes multiple responses)	

4. Have your efforts been restricted or kept under surveillance at any time?

Yes - 9 No - 41 No answer - 3

5. Age, to nearest figure:

Under 25	- 3	45	- 18	75	- 1
25	- 5	55	- 6		
35	- 15	65	- 5		

6. Have you been within 300 feet of this phenomenon?

Yes - 6 No - 46 Maybe - 1

7. Do you attribute this phenomenon to:

A civilization on earth	- 1	Other	- 28	(includes multiple responses)
An extraterrestrial source	- 28	No answer	- 2	

8. Primary source of information on UFOs:

UFO books	- 23	News media	- 13	Other	- 25
UFO groups	- 22	Popular magazines	- 7	No answer	- 4
		(includes multiple responses)			

9. Comments:

A total of 20 respondents offered comments and suggestions, summarized as follows:

On the conference:

1. Do not schedule overlapping sessions
2. Allow more time for "brainstorming" with participants
3. Include workshops on such topics as (a) planning an organized, coordinated effort to obtain chemical and other needed analyses; (b) planning the best ways to analyze and study data obtained by The Center; (c) serious discussion of new theories; and (d) investigative techniques.
4. Hold conferences twice a year
5. Make a better selection of papers.
6. Distribute papers in advance, so that participants may study them before the conference
7. Invite skeptics such as Klass, and researchers such as Fuller, et al.

On future activities:

1. Publish classic case histories (for paid subscription)
2. Develop a journal to publish reports and research in North America
3. Update Catoe Catalogue
4. Develop a sound-film strip for use by schools and groups
5. Increase local publicity concerning work of investigators
6. Develop an official CUFOS media contact or columnist
7. Develop a strategy for interaction with government; congressional liaison and lobbying
8. Develop funding for expenses of individual investigators
9. Select 5-man teams to "bird-dog" high potential cases
10. Develop a color spectrum chart for color identification

PUBLICATIONS

of the

CENTER FOR UFO STUDIES

Technical Reports:

- #1 PHYSICAL TRACES ASSOCIATED WITH UFO SIGHTINGS  
By Ted Phillips
- #2 A CATALOGUE OF 200 TYPE-1 UFO EVENTS IN SPAIN AND PORTUGAL  
By Vicente-Juan Ballester Olmos
- #3 THE LUMBERTON REPORT - UFO Activity in S. North Carolina, April 3-9,  
1975  
By Jennie Zeidman
- #4 1973 - YEAR OF THE HUMANOIDS - An Analysis of the Fall, 1973 UFO/  
Humanoid Wave (Second Edition)  
By David Webb
- #5 THE UFOCAT CODEBOOK  
By David R. Saunders

Occasional Reports:

- #1 "UFO CENTRAL" ANNUAL REPORT, 1974
- #2 POLICE AND THE UFO EXPERIENCE

Other Publications Available From the Center:

Reprints of assorted documents relating to governmental treatment of the  
UFO question

Reprints of articles from magazines

a Recommended commercially published books

A list of items available and an order blank may be obtained by writing to:

THE CENTER FOR UFO STUDIES  
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