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Analysis of Selected Ground Witness Reports of
Airplanes and Unidentified Aerial Phenomena Visually
Near to One Another

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Abstract

This paper presents an analysis of 382 narrative reports made by eye witnesses on the ground who reported seeing one or more airplanes as well as one or more unidentified aerial phenomena (UAP) at the same time and in the same visual airspace and, more importantly, appearing to interact with each other in various ways. Flight safety could be compromised under these circumstances due to the seemingly small distance separating the airplane and UAP particularly if the pilot could not see or communicate with the other object and/or did not know what it was going to do next. The data was divided for analysis into two kinds of aerial events: The UAP appeared to approach and interact with the airplane(s) in some way in 136 (Type 1) reports and where the airplane(s) appeared to pursue the UAP in 246 (Type 2) reports. No attempt was made to select reports in order to deliberately match the number of witnesses, airplanes, UAP, or any other parameter within these two kinds of events. It was felt that comparisons made between and within these two kinds of sightings might provide useful statistics with which to develop and test new hypotheses. It was found that Type 2 events are significantly more likely to occur at night, to last longer, to involve more than one airplane, and to involve a single UAP than are Type 1 events. Type 2 nighttime sightings are also heavily skewed toward self-luminous rather than passively reflective objects whereas Type 1 events are more evenly balanced between self-luminous and reflecting spherically shaped objects. Considering the reported color(s) of the UAP there may be a small predominance of white UAP for Type 1 and orange for Type 2. These and other findings are reviewed and discussed in detail.

Introduction

When people fly on commercial airplanes they expect to reach their destination safely. The entire commercial and private aviation industry expects that this expectation will be met. This is no simple task however because of the great complexity of flight operations and the very large number of airplanes flying. Currently there are approximately twelve thousand airplanes that fly across the U. S. continent every day not counting the thousands of private airplane and military flights. Anything that may compromise flight safety even to the smallest degree must be addressed quickly, completely, and effectively. This paper discusses one such potentially compromising factor – unidentified aerial phenomena (UAP) and their apparent interactions with airplanes. It has been stated that U.S. flight controllers detect at least one unidentified “aircraft” each day. There were 115 remaining unknowns recorded in 2000 and 179 in 2001. (Anon, 2011) If radar (or other sensor) systems or FAA flight plan cross-checks cannot identify the unknown within five minutes one or more military interceptors are scrambled to try to identify it. This paper approaches this subject from the standpoint of reports made by witnesses on the ground who see one or more airplanes in close proximity to one or more UAP. The close angular proximity between the two vehicles, the possible distraction factor in the cockpit, and possible electro-magnetic effects on avionic systems are all potential contributors to reduced flight safety in such incidents.

One of the authors (r.f.h.) has been studying pilot and aircrew in-flight sightings of UAP for over thirty years. He discovered that there is sufficient evidence within this extensive body of data to assert with reasonable confidence that some UAP possess operational capabilities far exceeding the aerospace technology of the time of the sighting; (Haines, 1994) many of these UAP also appear to possess some degree of intelligent control in their navigation, flight control, and energy management systems. (Haines, 2000) In the course of researching aircrew and in other instances radar specialists and air traffic controller reports it also became apparent that many of the UAP were not seen by the flight crew at the time but by airborne witnesses in other airplanes nearby. In many of these cases the UAP remained out of sight behind, above, and/or below the airplane in question. This finding is reinforced by an increasing number of reports made by eye witnesses on the ground and include ground-based photographs and videos showing UAP flying relatively (angularly) near airplanes. (Guzman and Salazar, 2014) This report only addresses ground-based visual observations that can be compared with in-flight aircrew witness reports of UAP. Such data could contribute to a fuller understanding of what appears to be going on in our skies and also contribute to improved aviation safety.

Definition of UAP?

Before we proceed it is necessary to define what we mean by the term *Unidentified Aerial Phenomena* (UAP). After one or more objects, lights, or other apparently energetic phenomenon has been thoroughly studied by qualified personnel and still cannot be identified as a known “conventional” object or natural phenomenon it is referred to here as a UAP. What are they? No one knows for sure yet. The authors make no assertions concerning the basic nature of UAP or their origin. But a growing body of evidence obtained by highly qualified observers and advanced technology hardware gives us a general idea of some of their primary characteristics.

One class of UAP may well be a natural atmospheric phenomena in the form of a contained radiating plasma of some kind that is dependent for its long duration and (perhaps) flight dynamics upon gravitational field dynamics and/or electrical field spin dipole. Perhaps UAP are a variation of ball lightning [Haines, 2010(b)] or a plasma resulting from the release of electric charges during periods of seismic strain within Earth’s surface (Derr and Persinger, 1990). Another class of UAP appears to be comprised of self-luminous and/or passive reflectors of ambient light usually limited to a relatively small volume that can perform a wide variety of precise, geometric motions without any visible means of lift, propulsion or guidance. They may or may not be detected by ground and/or airborne radar, i.e., they behave in a similar manner to manmade so-called “stealthy” aerovehicles in this regard. Some possess a three-dimensional form that can change quickly in size and sometimes in outline shape and some disappear from sight instantaneously. This second class of UAP is not yet understood by science because it has not been seriously studied so far. (Maccabee, 1986) The U.S. Air Force funded study of UAP conducted at the University of Colorado purported to be an objective review of the best UAP evidence (Gillmor, 1969) but could not explain thirty percent of their total cases although they had selected them themselves; “...that fact alone should arouse sufficient scientific curiosity to continue its study.” (Anon, 1970). As Astrophysicist Dr. James McDonald testified before the U. S. House Committee on Science and Astronautics on July 29, 1968 about the many cases that he had personally investigated “...all of which imply a problem that has been lost from sight, swept under the rug, ignored, and now needs to be very rapidly brought out into the open as a problem demanding very serious and very high caliber scientific attention. “ He went on to say,

“I wish to emphasize that. We must very quickly have very good people looking into this problem, because it appears to be one of very serious concern. We are dealing here with inexplicable phenomena, baffling phenomena, that will not be clarified by any but the best scientists.” (McDonald, pg. 19, 1968).

While the present paper does not address what UAP could be it does present ground witness sighting data that can help form the basis for new working hypotheses while raising additional interesting general questions.

Thousands of reports of UAP have been made by air traffic controllers in airport control towers, radar operators at flight “centers” and by pilots around the world. (Bravo and Castillo, 2010; Challenger and Haines, 1980; Clark, 1990; 1996; Corliss, 1974; 1975; Ferguson, 2013; Guzman, 2001; Guzman and Salazar, 2014; Haines, 1979 -1995; Randles, 1998; Shough, 2002; Smith, 1997; Stacy, 1987; Startup and Illingworth, 1980) But what has seldomly been discussed in any detail are the large and ever-growing numbers of sightings where one or more witnesses on the ground report seeing a UAP approach, pace, encircle, and otherwise interact with an airplane. These are called Type I events here. The second type of aerial encounter considered here involves airplanes (jet interceptors, helicopters, or other kinds of clearly manmade airplanes) that appear to be chasing one or more UAP. These are called Type 2 events. It isn’t particularly surprising that, if pilots see UAP while in flight, eye witnesses on the ground will also see aircraft and UAP in apparently near proximity to one another.

Method

The witness reports studied here were drawn from thirty one public and private sources. No attempt was made to seek all available ground witness reports – virtually an impossible and perhaps even useless task considering how many there are and the fact that there is no way to verify their reliability.

The 382 reports studied here spanned a sixty-seven year period from 1944 to April 2011. Most of these reports came from public, on-line files of the *National UFO Reporting Center* (www.nuforc.org). The main listing of data within the NUFORC database provides a one line summary of information. This summary is taken almost verbatim from the witness’s submitted report. Therefore, if this summary did not contain some indication of airplane-UAP involvement it was not included here, i.e., not every report was read completely and some relevant cases probably were overlooked.

A smaller percentage of the sighting data studied here came from thirty other sources such as the personal research files of one author (r.f.h.), files of the major ufo organizations in America, Filer’s Files articles, U. S. Air Force Project Blue Book files, books, magazines, etc. No claim is made for completeness or reliability of the data provided in these reports; we do believe (without substantiation) that most of the witnesses reported what they saw more accurately than not.

While searching this literature several hundred additional ground witness reports were discovered where both an airplane and a UAP were seen at the same time in the sky but were not conclusively linked in some way by the witness. This third category of aerial events was not included here but presented a fascinating array of details that deserves more study.

Results

The primary findings of this data review are presented in Table 1 which answers the question whether Type 1 events were markedly different from Type 2 events. As is shown below the answer is emphatically yes for every comparison.

Table 1

Results by Report Type For Selected Parameters of Interest

Parameter of Interest	Type 1		Type 2	
	UAP Approaches A/C		A/C Approaches UAP	
A Number of aircraft involved	No. of Reports	%	No. of Reports	%
1	119	91.5	68	38.2
2	8	6.1	59	33.1
3	1	0.8	19	10.7
4	0	0.0	10	5.6
5	1	0.8	9	5.1
> 5	1	0.8	13	7.3
	Total = 130*	100	178*	100
	Std. Dev. 0.88		Std. Dev. 1.33	

Note: The two totals with asterisks were statistically different using Chi Square at the $p < 0.001$ level of confidence. (d.f. = 322.4)

B Number of UAP involved	No. of Reports	%	No. of Reports	%
1	102	77.8	184	84.8
2	20	15.3	17	7.8
3	6	4.6	6	2.9
4	1	0.8	4	1.8
5	0	0.0	2	0.9
> 5	21	1.5	4	1.8
	Total = 131*	100	217*	100

Note: The two totals with asterisks were statistically different using Chi Square at the $p < 0.002$ level of confidence.

C Number of witnesses involved	No. of Reports	%	No. of Reports	%
1	81	65.9	109	53.7
2	32	26	64	31.5
3	5	4.1	19	9.4
4	4	3.2	2	1.0
5	0	0.0	3	1.5
> 5	1	0.8	6	2.9
Total =	123*	100	203*	100

Note: The two totals with asterisks were statistically different using Chi Square analysis at the $p < 0.001$ level of confidence.

Maximum (per event)	7	10
Mean	1	2
Median	1	1
Minimum	1	1

Note: These values were statistically different using a Student “t” test (2 sample, 2 tail, unequal variance) at the $p < 0.032$ level of confidence (d.f. = 203.8).

D Reported Duration of Event (minutes)

Number of Reports	89	168
Maximum duration	30	120
Mean duration	3.55*	14.30*
Median duration	1.5	5
Minimum duration	0.03	0.05

Note: These mean duration values* were statistically different using a Student “t” test (2 sample, 2 tail, unequal variance) at the $p < 0.001$ level of confidence.

E Number of Reports by

Time of Day	% of all reports		% of all reports	
Daytime	75	18.75	41	10.25
Nighttime	41	10.25	156	39
Blank (or other)	20	5	49	12.25
Total =	136		246	

Note: These time of day data were statistically different between the two types using Chi Square at the $p < 0.001$ level of confidence.

F Number of UAP by General Appearances

	Day	Night	Day	Night
Self-luminous	8	20	13	110
Reflective	17	0	21	3
(Blank)	5	2	0	0
	Total = 52		Total = 147	

Note: These data were statistically different between the two types using Chi Square at the $p < 0.001$ level of confidence.

G Number of Reports by

Reported UAP Shape	No.	%	No.	%
Disk	17	13.7	24	9.9
Sphere	88	71	99	40.7
Cigar	3	2.4	6	2.5
Triangle	3	2.4	17	7
Point, Dot, no area	12	9.7	59	24.3
Other	1	0.8	38	15.6
	Total = 124		Total = 243	

Note: These shape data were statistically different between the two types using Chi Square at the $p < 0.001$ level of confidence.

H UAP Departure Direction	No.	%	No.	%
NW, N, NE	9	39.1	15	34.1
E	3	13	17	38.6
SW, S, SE	5	21.8	11	25
W	6	26.1	1	2.3
	Total = 23		Total = 44	

Note: These data were statistically different between the two types using Chi Square at the $p < 0.001$ level of confidence (Yates correction applied).

Table 2 presents the number of airplanes involved for each type of airplane model. Four hundred seventeen different airplanes were reported. When witnesses were unsure about which model was seen a best guess was made by the authors. We may ask why over half of all the airplanes seen were military? Considering the fact that commercial flights within the conterminous United States far

outnumbers the number of military flights at virtually any hour of the day or night one might expect an opposite outcome.

Table 2
Types of Aircraft Reported

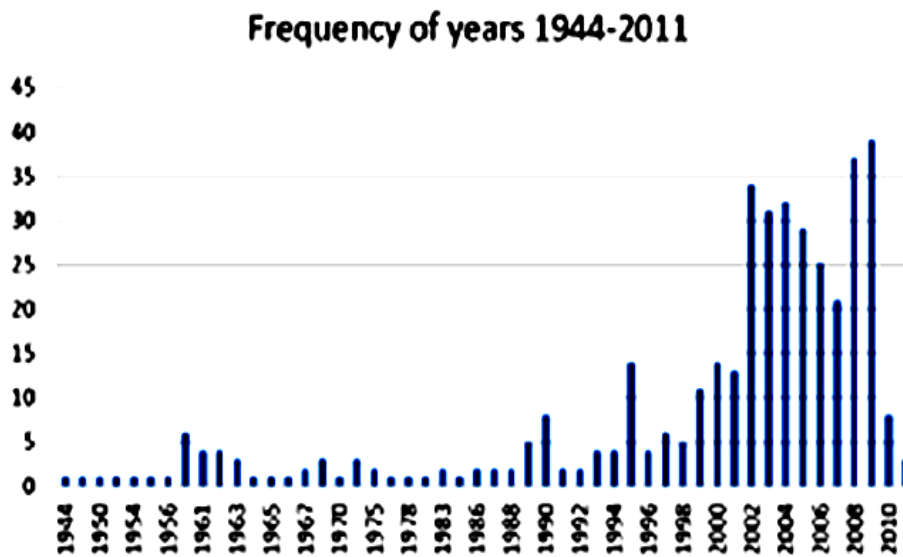
Class	Airplane Model	No. Aircraft Involved
Commercial (28%)	(N = 116)	
	B-727	2
	B-737	2
	B-747	4
	B-757	1
	MD-80	1
	“Lear jet”	2
	Heavy cargo	2
	“airliner”	38
	“airplane”	64
Military (54%)	(N = 225)	
	High perform. jet	56
	Stealth (F117)	3
	Bomber	4
	helicopter	57
	“airplane”	3
	Heavy cargo	10
	“jet” “small jet”	83
	jets & helic.	7

	Police helicopter	2
Civilian	(N = 76)	
	Light airplane	14
	Other	
	“unspecified”	62

Figure 1 shows that most of these sighting reports were made after 2001.

Figure 1

Distribution of Reports by Year



Although the data reviewed in this study were not chosen at random from the universe of all possible data the two types of data studied here can, at least, be considered independent samples. No two reports described the same aerial events.

Additional Findings

- (1) There is no predominant month of the year when these sightings occurred.
- (2) These sightings occurred in 48 states of the union and seventeen foreign nations.

- (3) The states having the most sighting reports were: California (42); Texas (30); Washington (22); Pennsylvania (20); Florida (16); and Oregon (13).

Discussion

This study has discovered several interesting things. First, there was a significantly larger number of airplanes reported (Table 1A) when they were seen pursuing a UAP than when a UAP appeared to interact with the airplane(s). This is interesting because when viewed from the ground both Type 1 and Type 2 sightings very likely have the same degree of conspicuity (visual detectability), inherent interest (psychological interest), and noise levels. We assert that most of these Type 2 sightings involved military scrambles by numerous airplanes sent to try to identify the UAP. This finding is difficult to reconcile with the suggestion that the UAP were merely misidentified natural or manmade phenomena. What kind of atmospheric phenomena can stop instantaneously, turn very sharp corners, disappear and reappear, and accelerate out of sight leaving high performance jets far behind? These puzzling questions deserve to be answered by serious, highly qualified scientists. They call for more focused research to attempt to control all of the primary variables.

It is also interesting to note that there were significantly more reports involved when a UAP was seen approaching a single airplane than when there were two or more airplanes present. Almost 92% of all Type 1 events involved a single airplane while only 38% of all Type 2 events involved one airplane. The larger number of pursuit airplanes in Type 2 strongly suggests a military operation was underway.

The number of UAP seen (Table 1B) in both types of sightings is also interesting. The largest percentage of reports involved one UAP for both types of events (78% and 85%). Otherwise the number and percentage of reported UAP was remarkably similar for both types of events.

Table 1D showed a significantly longer mean sighting duration for Type 2 events than Type 1, viz., 14.3 minutes versus 3.55 minutes. Is this because it was four times more fascinating to watch airplanes chasing some unidentified object than the opposite? This does not seem very likely.

What about the shape and apparent size of the UAP (Table 1G)? For the first four shape categories listed the UAP must be angularly large enough for its shape to be correctly perceived. As shown here, for both Type 1 and Type 2 events most UAP are described as spheres. The interested reader should consult Haines et al. [2010(a)] for a review of various aspects of spherical UAP. And since a disk may appear circular if seen from certain viewing angles some of these (disk) reports may be included in the sphere category. However, when the UAP is angularly small (a point or dot) by virtue of its actual size and/or distance then we may note that the percentage of Type 2 reports is over twice the percentage of sighting reports of Type 1 for some reason. In other words,

when aircraft are seen pursuing UAP a large percentage of UAP appear very small; this comparison is probably made relative to the apparent size of the airplane nearby.

The statistically significant differences discovered here between Type 1 and 2 sightings may be the result of a sampling bias where we consciously or unconsciously selected more of one type sighting event than the other. However, we can categorically state that no conscious attempt was made to “stack the deck.” There was no reason to do so. Another possible explanation is that whomever coded the NUFORC data on the website introduced a similar bias for some reason that was then reflected in these results. This seems unlikely. A third possibility is that people who see airplanes approaching or chasing an unknown object in the sky are more prone to report the event than if they see an unknown object approaching, pacing, or otherwise engaged with an airplane. Why this might be is a question for further research and cannot be answered here. The fourth possibility for these significant results is that they reflect the occurrence rate of what actually happened.

Assuming that these eye witnesses accurately described what they saw and could not in any way have controlled or otherwise influenced the aerial objects or their flight behavior we should not expect the number of UAP or the general luminous appearance or the shape of the UAP to be different for either Type 1 or Type 2 events. But highly significant differences were found for these characteristics. When an airplane(s) was seen pursuing a UAP (Type 2), for example, there were significantly more UAP involved, [viz., 217 total versus 131] , particularly at night [viz., 156 versus 41].

What kinds of prosaic objects and phenomena could explain some of these aerial events? Table 2 lists many of them.

Table 2

Abbreviated List of Prosaic Explanations for These UAP

Astronomical

Meteorite(s)

Planets

Sun dogs and various other optical effects

Aeronautical

Balloons (of all types)

Lighter-than-airships (aerostats, blimps, dirigibles)

Piloted airplanes

Unmanned airplanes/drones (including models of all shapes and sizes)

Geophysical

Ball lightning

Low level luminous sources (perhaps) related to tectonic strain

Meteorological

- Small cloud formation(s)

Research Projects

- Aerial flares

- Aeroturbulence monitoring (e.g., objects tethered behind airplane)

- Sounding rockets and parachutes

Optical

- Reflections

- Refraction

Perceptual

- Poor eyesight

- Misidentification of shape/form . (Many possible causes from entoptic to atmospheric)

- Optical illusion(s)

Psychological/Motivational

- Deliberate hoax/lies

- Delusions

- Hallucinations

Each of the above possible explanations must be compared with the details of each narrative and placed into a possible, probable, insufficient data, or impossible category. Most of the present reports were not detailed enough to make this comparison possible.

The data presented here are all relatively current (some extending back to 1944). The state of developments in commercial, military, and even private unmanned aerial vehicles (UAV) is high today such that some of the smaller aeroforms described by these witnesses may have been UAV vehicles under test or being used operationally to assist the other object that was identified as an the aircraft . Discriminating a UAV from a UAP will become increasingly difficult with time. (Haines and Reed, 2014) Nevertheless, many of these reported incidents took place within controlled airspace and/or above highly populated areas where such testing has not yet been approved by the FAA.

The attitude shown toward UAP by most Americans today is one of two things, either benign neglect and indifference (particularly by aviation and government officials and academicians) or an intense fascination that includes a strong entertainment factor. Through television programming in particular America has almost trivialized the subject of UAP to the point of their being considered an assured fiction. By demonstrating to American viewers that very realistic UAP can be generated virtually on the television screens Hollywood has helped remove much of the earlier fear that was felt from the possibility of their being “real threats.” It is interesting that this happened at the same time so much social stigma has developed around reporting them publically.

It has been suggested that we have created a mythos concerning those things that can't be explained as yet by science. Perhaps this mythos comes from a need for a sense of security in a frightening world. We tell each other what we want to hear rather than what are the often scary facts. So what is a better solution? We believe it is to simply and openly present the documented facts about UAP and allow the interested public to come to their own conclusions. Whether or not officials in high places may follow along later remains to be seen.

Conclusions

There is no doubt that U.S. military aircraft continue to be scrambled to these days to try to identify aero-vehicles of all kinds. Some of these "vehicles" may well be UAP. There is a large body of evidence to suggest that many people on the ground are seeing and reporting some of these military responses to airspace violations that are occurring in America's air defense identification zones each year. We believe that the present study has sampled only a small percentage of all available.

This study has also demonstrated that even uncontrolled, informal research that does not begin with a null hypotheses or have so-called control groups can yield interesting and surprising results. For example, further research is needed to discover precisely why some UAP approach, pace, and then depart from airplanes almost exhibiting a kind of curiosity. And why do UAP tend to approach only one airplane rather than more than one? Would any natural atmospheric phenomena be expected to make this discrimination? If some of the Type 2 events studied here represented military scrambles to try to identify the UAP it is understandable why two or more airplanes are seen pursuing the UAP. In a large percentage of these events the UAP clearly outflies the jets.

Although the present data were not chosen at random from the universe of all possible data the two types of data studied here can, at least, be considered independent. Whether or not these data involve some hidden biasing factor that would invalidate the statistical tests carried out on them cannot be assessed, however, it is considered unlikely. Nevertheless, a certain percentage of these ground witness reports probably come from misinterpretations of what was seen. (Haines, 1980) Without having more complete data this percentage cannot be determined.

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