

[REDACTED]

Incident #1, 1c, 1d, 1e -- Maroc, California -- 8 July 1947

No astronomical explanation for this incident is possible.

It is tempting to explain the objects as ordinary aircraft observed under unusual light conditions, but the evidence of the "tight circle" maneuvers, if maintained, is strongly contradictory. This incident must be judged with reference to other similar incidents, which probably have a common explanation.

88

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Incident #2, 2a -- Maroo, California -- 8 July 1947

No astronomical explanation is possible for this incident.
The object's slow speed and apparent size suggest aircraft
under unusual light conditions, but the tactics argue against this
interpretation.

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Incident #3 -- Luroo, California -- 7 July 1947

There is no astronomical explanation of this incident.

In this investigator's opinion, there is nothing in the evidence offered that is basically contradictory to the hypothesis of a weather balloon. Perhaps ascending currents of warm air over the desert could give the illusion that the object was oscillating.

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C

Incident #4 -- Rogers Dry Lake, California -- 8 July 1947

There is no astronomical explanation for this incident.

Is there any definite reason why the object observed
could not have been a bursted weather balloon?

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Incident #5 -- Portland, Oregon -- 4 July 1947

There is no astronomical explanation for this, incident, nor for numerous others (#6, 7, 8, 9, 12, 13, 14, 15, 16) which occurred in and near Portland on the Fourth of July, 1947.

Besides being observed in the same vicinity and most of them at the same time, the objects seen have in common a round shape, "terrific" speed, abrupt tactics, and quick disappearance. Abrupt tactics certainly suggest that the objects were of a very light weight.

This investigator can offer no definite hypothesis, but in passing would like to note that these incidents occurred on the Fourth of July, and that if relatively small pieces of aluminum foil had been dropped from a plane over that area, then any one object would become visible at a relatively short distance. Even moderate wind velocities could give the illusion that fluttering, gyrating discs had gone by at great velocities. Various observers would now, of course, in this case have seen the same objects.

The above is not to be regarded as a very likely explanation but only as a possibility: the occurrence of these incidents on July 4 may have been more than a coincidence. Some prankster might have tossed such objects out of an airplane as part of an Independence Day celebration.

If these were aircraft of either known or unknown type,

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Incident #6 -- page 2

it would be difficult to explain their appearance over only one locality and at only one time, their apparent random motion, the lack of any sound or obvious propulsion method, and the lack of aerodynamic construction.

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Incident #6 -- Milwaukee, Oregon -- 4 July 1947

There is no astronomical explanation for this incident.
See report on incident #5.

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Incident #7 -- Portland, Oregon -- 4 July 1947

There is no astronomical explanation for this incident.

See report on incident #5.

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Incident #8,8a -- Portland, Oregon -- 4 July 1947

There is no astronomical explanation for this incident.

See report on incident #5.

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Incident #9 -- Portland, Oregon -- 4 July 1947

There is no astronomical explanation for this incident.

See report on incident #6.

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Incident #10 -- Boise, Idaho, 4 July 1947

There appears to be no astronomical explanation for this incident.

One minor lead is suggested: observation was made at the time of sunset, when light conditions are changing rapidly. Disappearance of the object might have occurred simply because of the changing visibility. It is the time of day when illusory effects are most likely to occur, and it might not be out of the question that the objects actually were other aircraft.

Despite these conjectures, no logical explanation for the incident seems possible at this time.

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Incident #11 -- Seattle, Washington -- 4 July 1947

There is no astronomical explanation for this incident.

The description answers that of a "hot air balloon," such as those launched at Fourth of July celebrations. There is nothing in the evidence given which is contradictory to this hypothesis.

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Incident #12 -- Vancouver, Washington -- 4 July 1947

There is no astronomical explanation for this incident.

See report on incident #5.

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Incident #13 -- Portland, Oregon -- 4 July 1947

There is no astronomical explanation for this incident.

See report on incident #5.

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Incident #14 -- Portland, Oregon -- 4 July 1947

There is no astronomical explanation for this incident.

See report on incident #5.

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Incident #15 -- Portland, Oregon -- 4 July 1947

There is no astronomical explanation for this incident.

See report on incident #6.

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Incident #13 -- St. Jefferson, Oregon -- 4 July 1947

There is no astronomical explanation for this incident.

See report on incident #5.

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ARNOLD *ASW*

Incident #17 -- Lt. Hanier, Washington -- 24 June 1947

There appears to be no astronomical explanation for this classic incident, which is the prototype of many of the later flying saucer stories.

It is impossible to explain this incident away as sheer nonsense, if any credence at all is given to Mr. Arnold's integrity. However, certain inconsistencies can be pointed out in the facts as reported:

Arnold's attention was first drawn to the objects by a bright flash on his plane, which was followed by numerous other similar flashes. If these were something like the flash one gets from a distant mirror, it means that the reflection was specular, or direct. For a direct reflection, the angle between the observer, sun, and object must be "just right," and at such distances as 20 or 25 miles, the chance of a series of direct reflections is extremely small. If the object was a diffuse reflector -- that is, scattering the sunlight falling on it, much as the moon or a balloon does -- then at such a distance it seems quite unlikely that Mr. Arnold would have been startled, or that our attention would have been called to it, unless the objects reflecting were extremely large.

The supersonic speeds called for if the estimated distance is correct also throw suspicion on the original calculations; by computation (see below) it can be seen that, considering the detail which Arnold observed in the objects, at least one of his estimates

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Incident #17 -- page 2

must have been erroneous:

Arnold states that the objects seemed about 20 times as long as wide. Let us assume that the thickness was just discernible, which means that the object was just at the limit of resolution of the eye. Now, the eye cannot resolve objects that subtend an angle of appreciably less than 3 minutes of arc, and, in general, for any detail to be seen at all, the angle subtended must be much greater. Even if we assume the limiting resolution of 3 minutes, then, if the distance was 25 miles, elementary calculations show that each object must have been at least 100 feet thick, and if, as Arnold's drawings indicate, the object was some 20 times longer than wide, it must have been about 2000 feet long.

Looking at the matter in another way and assuming that Arnold's estimate of distance as 20 to 25 miles (120,000 feet) and his estimate of length as 40 to 50 feet are both correct, then it can be shown that the object will subtend an angle of only about 80 seconds of arc, which is definitely below the limit of resolution of the eye.

If Arnold actually saw the objects, and if his estimate of distance is correct, that of size cannot be, and vice versa. It seems most logical to assume that his estimate of distance is far too great. In fact, assuming a reasonable limiting size to the objects of 400 feet, in order to show the detail that Arnold's drawings indicate, the distance must have been not over roughly six miles. At this distance the objects would have travelled 11 miles (rather than 47 miles) in 102 seconds, or at a rate of approximately 400 KPH. (Arnold's

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Incident #17 -- page 3

original estimate is also incorrect; if the objects had travelled 47 miles in 102 seconds, they would have been travelling at a rate of approximately 1700 MPH, not 1200.)

In view of the above, it appears probable that whatever objects were observed were travelling at supersonic speeds and may, therefore have been some sort of known aircraft.

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Incident #18 -- Toronto, Canada -- 20 September 1947

It is stated in the information given here that this incident has been determined to be a hoax.

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Incident #19 -- Dayton, Ohio -- 20 October 1947

Information given here is insufficient to exclude positively the possibility that the objects observed were a close pair of fireballs, but this seems extremely unlikely. Since the length of time in sight is not stated nor the speed estimated, it is impossible to draw any definite conclusions. Assuming these to be appropriate, if one were to stretch the description to its very limits and make allowances for the remarks of an untrained observer, he could say that the "cigar-like shape" might have been an illusion caused by rapid motion and that the bright sunlight might have made both the objects and the trails nearly invisible.

This investigator does not prefer that interpretation, and it should be resorted to only if all other possible explanations fail. In short, while it is not out of the realm of possibility that the objects seen were an unusual double fireball, it is most unlikely.

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Incident #20 -- Xenia, Ohio -- 20 October 1947

The information given here is insufficient to determine any possible astronomical origin of the object observed.

As in incident #19, while it is impossible to rule out the meteoric explanation (e.g., straight course, fast speed), the lack of information about trail, length of time in sight, manner of disappearance, and distance from observer, make any attempt at a definite interpretation rather futile.

Again, in short, it is not impossible that the object seen was a daylight, slow-moving bolide, but it is highly improbable, judging from the limited information offered.

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Incident #21 -- Des Moines, Iowa -- 29 June 1947

There is no obvious astronomical explanation for this incident.

If the estimate of size can be given any credence at all, the objects could not have been farther than five miles away; this is an absolute upper limit, and objects probably were very much closer.

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Incident #22 -- Spokane, Washington -- 21 June 1947

This incident does not have any obvious astronomical explanation.

The information given is too limited to suggest any definite interpretation. It would seem, however, that the objects might possibly have been a series of balloons.



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Incident #23 -- Boise, Idaho -- 30 June 1947

It seems exceedingly probable that the object observed in this incident was a combination sun-cloud effect. The altitude of the sun was 30°, azimuth 280°. At that time of the afternoon, the sun's position was such that it could easily have illuminated a background cloud which was perhaps almost entirely covered by a foreground cloud. (Boise weather reports indicate an entirely clear sky, but the report of the incident itself states that the object "seemed to be clinging to a huge cloud.") This investigator himself has observed such effects.

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Incident #24 -- Weiser, Idaho -- 12 June 1947

There is nothing in the description of this incident that is fatal to the hypothesis that the objects observed were parts of a "double fireball," but any such identification must remain uncertain.

The most convincing element favoring the meteoric hypothesis is the persistent train. Fireballs occasionally leave trains that persist for over an hour.

As far as trajectory is concerned, this is in agreement with that to be expected from a meteor on its way out from the sun (it having gone toward the sun several weeks previously and now being on its return journey toward outer space). Such a fireball would be travelling relatively slowly, and could appear to "shoot out from the sun" and to travel in a southeasterly direction.

The absence of bright flame and of noise is not unusual, since reported daylight meteors are frequently not luminous (but do leave a trail), and often no noise is heard.

Nor is the fact that there were two such objects fatal to the hypothesis. The object could easily have been single and have broken in two, either in its journey around the sun or upon entering the earth's atmosphere. There have been several cases of comets that were single on their trip toward the sun and double on the way out. Since comets and meteors are closely related as far as structure is concerned, the double feature is entirely possible.

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Incident #24 -- page 2

The shooting up and down might be dismissed as subjective and illusory, although small bits shooting off from the main meteor could also give this effect.

In spite of all this, this investigator would prefer a terrestrial explanation for the incident.

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Incident #25 -- West Trenton, New Jersey -- 4 July 1947

The object sighted here could easily have been a bright meteor, but in view of the date of the observation, it seems even more likely that the young lady saw part of a late Fourth of July celebration -- a rocket from some amusement park, perhaps.

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Incident #26 -- Harmon Field, Newfoundland -- 10 July 1947

The evidence presented here, and in incident #27, 27a, which refers to the same object, favors the hypothesis that the trail of a fireball was seen. The photographs submitted show a typical fireball trail. The "feathered edges" left on a cloud which the object broke through could easily have been caused by a fireball.

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Incident #27, 27a -- Harmon Field, Newfoundland -- 10 July 1947

Evidence presented here favors the hypothesis that the trail of a fireball was seen by observers. For details see report on incident #26.

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Incident #28 -- Idaho -- 24 June 1947

Any probable astronomical explanation for this incident is dependent upon the hour of observation, which is not stated in the information given with the summary.

An unconfirmed statement (by Mr. Barkham, quoted in material submitted relative to Incident #101) that the observation was made at 3:30 P. M. allows for no possible astronomical explanation other than that a persistent meteor train may have been observed. Such a phenomenon might have given the general impression suggested by the limited description of the incident.

If, however, the observation occurred during the early evening hours, shortly after sunset, which occurred that day at about 8:00 P. M. local time, then it is extremely likely that Lt. Gov. Whitehead saw either the planet Saturn or Mercury. Mercury set almost exactly an hour after the sun and was of stellar magnitude +1. Saturn, of magnitude +0.6 and hence about once again as bright as Mercury, set two hours after the sun. A bright planet shining through thin cirrus clouds could give the impression of a "comet-like object."

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Incident #29 -- Portland, Oregon -- 14 June 1947

There is nothing whatever in this incident to suggest that the objects observed were of astronomical origin. Their maneuvers and the relatively long time they were in sight definitely preclude any possible astronomical interpretation.

It is of interest to note that in this locality and at this season other possibly-similar, non-astronomical incidents were reported --
e.g., #17 and #68.

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Incident #30, a-c -- Lockbourne AAB, Columbus, Ohio -- 7 January 1948

Considering this incident with #32, 33, and 48, one is forced to conclude that the object observed from Lockbourne Army Air Base on the evening of 7 January 1943 was the planet Venus.

One report of the incident gives the location of the object as $BSZ-120^{\circ}$, or approximately opposite from that stated by other observers and that of Venus. Obviously, since the time of observation was the same, this means that one witness either was looking at a different object or had his directions mixed. Since the description otherwise agrees generally with the rest, and since it is assumed throughout the reports that all observers were viewing the same object, the latter interpretation seems preferable.

Witnesses state that the object "couldn't have been a star" (of course, it wasn't), because the sky was completely overcast. However, reports from the Columbus weather bureau indicate that, although the afternoon was cloudy, the sky was clear by 1900 hours. (This does not mean, of course, that there were no clouds near the western horizon.)

For possible explanations of the "tautics" reported by observers of this object, and further discussion of the incident, see report on #33.

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Incident #31 -- northern Arizona -- mid-December 1946

The trail seen here was almost certainly that of a slow-moving fireball. In daylight quite frequently the primary thing observed in such cases is a white smoke trail.

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Incident #32 -- over Columbus, Ohio -- 7 January 1948

The evidence given in this incident fits the hypothesis that the object observed was the planet Venus, and, considered with incidents #30, 33, and 48, it is incredible that it could have been anything else.

See report on #33 for detailed discussion of sightings of 7 January 1948.

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Incident #38, a-; -- Godman Field, Fort Knox, Kentucky -- 7 January 1943
& discussion of all incidents reported for this date

Incidents #30, 32, 33, and 43 all occurred on 7 January 1943, with #33 involving the death of Lieutenant Lantell. Detailed attention has therefore been given to any possible astronomical body or phenomenon which might serve to identify the object or objects concerned. The four incidents are considered together here.

Although the several reports differ considerably in regard to the bearing and motion of the object (assuming for the moment that the afternoon and evening sightings refer to the same phenomenon), they are generally consistent concerning the time, manner, and place of its disappearance over the horizon. Hour and azimuth are given as 1903 CST, about 250° , by observers at Godman Field; 1955 EST, west southwest, by those at Lockbourne Air Base; and 1955-2000 EST, about 210° , by those at Clinton County Air Base; (there are, as is to be expected, slight differences in individual reports). Using this for the focal point of attack, one notes immediately that all these times and bearings agree closely with the time and place of the setting of Venus. Furthermore, all accounts except one agree that the object was low in the southwest before the time of disappearance. Reports vary as to details of its motion, but the overall motion was southwest and then over the horizon. These facts taken together preclude any question of coincidence. Furthermore, simultaneous observation from scattered locations proves that the object had negligible parallax, or, in short, that it was a very great distance away. All other statements concerning the object must,

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Incident 33, a-3 -- page 2

it seems to this investigator, be weighed in terms of the overwhelming evidence of the manner of disappearance over the horizon.

The stellar magnitude of Venus on January 7 was -3.4, which makes it 29 times brighter than the bright star Arcturus. Venus, when as bright as this and shining through interstices in a host of clouds, could very easily give the effect of a flaming object with a tail. Concerning the erratic motion reported by some witnesses, this can be said: motion of clouds past the object could give the illusion of rapid movement, as when clouds scud by the moon; or the effect could have been a psychological illusion; a third possibility, remote but based on a rarely-observed phenomenon, is that, owing to thermo-inversions in the atmosphere, stars near the horizon have been known to jump about erratically through arcs of two or three times the moon's apparent diameter. Venus, when very close to the horizon, has been known to twinkle brilliantly with rapidly changing colors.

It appears to the present investigator, in summing up the evidence presented, that we are forced to the conclusion that the object observed in the early evening hours of January 7, 1943, at these widely separated localities, was the planet Venus. To assume that a terrestrial object could be located so high as to be visible simultaneously over a wide area, could have such intrinsic brightness (of incredible brightness, far surpassing any known man-made light), and would be placed essentially at the very position of Venus in the sky over an

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Incident #33, -a-g -- page 3

interval of more than half an hour, would be incredible.

Incident #33 is the only one of the four that includes the daytime observation of presumably this same object. The importance of the incident is, however, paramount, for it was in tracking down the mysterious object that Lieutenant Mantell lost his life. Again it is possible that the object observed was the planet Venus, although the evidence is by no means as definitive as that for the sightings made later that day. First, the bearings of the object as reported by various witnesses differ considerably; where one says southwest, another says south, for the same instant. However, integrating all the evidence, one is again struck with the coincidence of the object's position with that of Venus. The following short table of sightings vs the position of Venus shows the general agreement of the two in azimuth:

CST	Object	Venus
1330 (PFC Oliver)	SW of field	Almost due S: 1.4°
1345 (Sgt. Blackwell)	South of field	1.9°
(PFC Oliver)	SW	
after 1400 (Lt. Orner)	SW	from due S (130°) at
1445 (Capt. Mantell)	210°	1400, moving westward
(Col. Hix)	215°	195°

A more pertinent question is that of whether it would have been possible to see Venus in the daytime on that day. All that can be said here is that it was not impossible to see the planet under those conditions. It is well known that when Venus is at its greatest brilliancy, it is possible to see it during the daytime when one knows exactly where to look, but on January 7, 1945, Venus was less than half

UNCLASSIFIED

UNCLASSIFIED

incident #33, a-g -- page 4

as bright as it is when most brilliant. However, under exceptionally good atmospheric conditions and with the eye shielded from the direct rays of the sun, Venus might be seen as an exceedingly tiny bright point of light. It can be shown that it was definitely brighter than the surrounding sky, for on the date in question Venus had a semi-diameter of 2 seconds of arc, or a total apparent surface area of approximately 125 square seconds. Assuming that a square second of sky would be a trifle brighter than the fourth magnitude, a portion of the sky of the same area presented by Venus would be about -2.4 magnitude. Since the planet, however, was -3.1, it was 6 times brighter than an equivalent area of sky. While it is thus physically possible to see Venus at such times, usually its pinpoint character and the large expanse of sky makes its casual detection very unlikely. If, however, a person happens to look toward a point on the sky that is just a few minutes of arc from the position of Venus, he is apt to be startled by this apparition and to wonder why he didn't see it before. The chances, of course, of looking at just the right spot are very few. Once done, however, it is usually fairly easy to relocate the object and to call the attention of others to it. However, atmospheric conditions must be exceptionally good. It is improbable, for example, that Venus would be seen under these circumstances in a large city.

It can be said, therefore, that a possible explanation for the object sighted in the daytime in incident #33, a-g, is that it

UNCLASSIFIED

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Incident #33, a-g -- page 5

too was the planet Venus. In the absence of exact measures, however, it is impossible to establish that it was or was not. (It is unfortunate that theodolite measures of the afternoon observations were evidently not made.)

It has been unofficially reported that the object was a Navy cosmic ray balloon. If this can be established, it is to be preferred as an explanation. However, if one accepts the assumption that reports from various other locations in the state refer to the same object, any such device must have been a good many miles high -- 25 to 50 -- in order to have been seen clearly, almost simultaneously, from places 175 miles apart.

It is entirely possible, of course, that the first sightings were of some sort of balloon or aircraft, but that when these reports came to Godman Field, a careful scrutiny of the sky revealed Venus, and it could be that Lieutenant Mantell did actually give chase to the planet, even though whatever object had been the source of the excitement elsewhere had disappeared. At the altitudes that the pilot reached, Venus would have been very much more easily observed than from the ground, and it might even be that he did not actually pick it up until he was at a considerable altitude. The one piece of evidence that leads this investigator to believe that at the time of Lieutenant Mantell's death he was actually trying to reach Venus is

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Incident #33 -- page 6

that the object appeared essentially stationary (or moving steadily away from him) and that he could not seem to gain on it.

In summing up, this can be said: the evening sightings reported in incidents #30, 32, 33, and 48 were undoubtedly of the planet Venus. Regarding the daylight sightings from Godman Field and other places in Kentucky, there seems so far to be no single explanation that does not rely greatly on coincidence. If all reports were of a single object, in the knowledge of this investigator no man-made object could have been large enough and far enough away for the approximately simultaneous sightings. It is most unlikely, however, that so many separate persons should at that time have glanced on Venus in the daylight sky. It seems, therefore, much more probable that more than one object was involved: the sightings might have included two or more balloons (or aircraft); or they might have included both Venus (in the fatal case) and balloons. For reasons given above, the latter explanation seems more likely. Such a hypothesis does, however, still necessitate the inclusion of at least two objects other than Venus, and it certainly is coincidental that so many people would have chosen this one day to be confused (to the extent of reporting the matter) by normal airborne objects. There remains one possible, very plausible explanation for this fact, however: was the original report by any chance broadcast by local radio stations? If so, with the general public on the alert, even

UNCLASSIFIED

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Incident #33 -- page 7

the commonest aircraft might suddenly have appeared to be strange celestial objects.

In any event, since it seems possible that at the time of Lieutenant Santell's death, he was actually giving chase to Venus (and since, certainly, during the evening sightings, persons assumedly well acquainted with objects of the sky were alarmed by the appearance of the planet), it might be wise to give information about this incident wide circulation among air force personnel, so that tragic mistakes will not occur in the future.

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