

Neef here put on a pair of rubber boots and very thoroughly searched the pond without finding a meteorite. Even in that case there was no evidence of alarm by the animals. I believe with that summary, I'd better cease operations and have you ask questions.

Question: How many observed falls?

Dr. LaPaz: I'd like to classify those into three groups. I would say that there are ten instances that definitely merit the most serious consideration. They are strictly analogous to the green fireballs of the night of December 12. On top of that, there must be something of the order of twenty more which are so well reported, from Los Alamos for example, that although the green fireballs observed showed small...the nature of the fireball....many observations of observers who paid practically no attention to the sky at any other time in their lives and now when they see a really bright light, they report it. You will find a great many instances of bluish-white fireballs. In my opinion, those falling vertically and leaving trails, are simply ordinary shooting stars. Of high intensity, that is, what we call fireballs, a blue light, are not in any sense to be associated with the green lights. Those three categories then.

Dr. Manley: ?

Dr. LaPaz: In the case of the two green fireball paths, determined from Los Alamos observations, in one case the Starvation Peak incident, we have an East-West motion, and then also a motion exactly parallel to....In other words, these two real paths show, I think they are the only two of the first category that show any real departure from the.....It is possible to explain that. It is quite evident that we have no case of assurance that both groups of observers, the observers at Starvation Peak and the observers at Los Alamos, saw the same point of....so that if we were to merely ask what are the limits within which such real paths might fall, it turns out that it might be as short as 12 miles instead of being 25 miles long, and in that case it would be directed almost directly to the North; it would come down very nearly within 2 degrees, 5 degrees say, of the North. In the case of the Texas observations, whereas I have indicated and the maps show, we have many observations by trained observers, motion is clearly almost directly North to South. I have been informed that there are reasons for regarding the.....out here (ditch digger)..and you notice that this passes reasonably close to Lubbock. The same is true of the two earlier fireballs, those of December 12 and December 20. They both passed - one passed centrally over Los Alamos and the other about six miles North of the center, but this would not be true....(ditch digger). One point that possibly should have been mentioned earlier is this: I was the more interested when Captain Neef came to my office and brought the December 5th incident to my mind because very much earlier I had been contacted first by...White, Director of Texas Observers, from a Dr. Pruitt, Director of Northwestern Section, City Section, of the Meteor Society, I had been informed that earlier occurrences of bright green fireballs, not too far from the Hanford area. When Captain Neef came in with reports of green fireballs near Las Vegas and particularly when he disclosed that there was a Los Alamos near Las Vegas - the real Los Alamos - it had much interest.

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Dr. Hallway: Are there any reports of these from other installations, such as the Los Alamos, or places like that?

Dr. LaPas: I raised that question and I know of no other cases. I mean to say the areas from which these reports come, as in one case for such evidence asthey do not relate to the green fireballs; they relate to the daylight occurrence of horizontal moving, bright white objects - some in Memphis, Tennessee in May, 1948 - that is not too far from Oak Ridge. They relate to the Hanford area as far as the Pruitt observations go, and to the observations that I've mentioned here in the Las Vegas-Los Alamos area.....A very curious thing has come to light during these investigations. I published not long ago an article in Science Illustrated on the recovery of the.....Town meteorite. The time that fell, February 18, 1948, the rumor got around somehow in Northern Kansas and Southern Kansas that it was a Russian bomb, and it was aimed at the geographical center of the United States which is not very far from.....Apparently, a great many people gave credence to that rumor and were delighted when we finally recovered meteorites up there and proved it wasn't anything but an ordinary meteorite fall. Incidentally, it did not have the characteristics of the green fireball we're talking about here. There was an air transport pilot who made a most curious observation while flying near Cherbourg on January 16, 1946. His observation was the observation of a bouncing meteor. After what I've been telling you about the green fireballs, you probably think it not unreasonable that a meteorite should bounce but to the meteorological mind that seems very hard to swallow. The interest is that one of your own persons here at Los Alamos, one and confirmed at least in part by four other persons, saw one of the green fireballs come down and then glide off horizontally. The bouncing meteorite is manually explained by having it form, say sinusoidal motion lying in about the plane at which the observer was looking so that he first saw the high point of the curve or the peak. The next time it was at the peak, it was so far away that the altitude was very low, which will give you the appearance of a bouncing meteorite. I offer that as a possible explanation. Of course, he may have landed in Paris before he made the Cherbourg flight and then we should disregard the testimony entirely!

Mr. Newburger: Dr. LaPas, you mentioned, I believe, at one of our other meetings that they had compared the color of this with certain metals?

Dr. LaPas: That's right. Initially we could only ask them what they thought it looked like. And we got such interesting responses that we eventually carried around a spectrum chart and allowed everybody to make his own choice. Of course, the use of the spectrum chart was unnecessary if they have a color like one lady who had around her neck a green scarf which she assured me had exactly the same hue, but normally not having such things to look at, they were pleased to have the chart to look at. They will choose, in 90% of the cases, category 1 and category 2 a wave length which corresponds to something between 4900 and possibly 5300. Most of them will fall very close to 5218 which is about the color you get when you have copper salts in the Bunsen

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burner. I checked with Dr. Regener on that and asked him if an alloy had been used, like, say, copper beryllium, if there would be any change in that hue, and he has assumed as there would not. He said it would still give approximate appearance of beryllium copper.....You will find in probably 1350 of the 1500 only the merest trace of copper occurrence. There are a few meteorites like.....in South Dakota, where little veins of copper have been found, making up possibly .4 of 1%.

Dr. Bradbury: Is this true of all Meteorites?

Dr. LaPaz: It's true in any category. Even in the irons, the presence of copper is very hard to detect, very little...(ditch digger). I don't know whether you gentlemen could suggest an easy way to obtain green fireball spectra or not.

Dr. Teller: What is the geographical solution of this?

Dr. LaPaz: Another man would probably answer that best of all.

(Looked at more maps with some talk that was not audible.)

Mr. Hoyt confirmed the green hue of the green fireball he had seen on the night of December 30, 1948. (Record dead for minute or two)

Mr. Hoyt: I would have said approximately as far above the mountain as the floor of the valley was below the top of the mountain. I felt that would give me somewhere in the neighborhood of 20,000 feet or thereabouts. It was about 5 minutes to 6 on my way up here. I have a feeling that it had a downward path. I mean it was going South.

Dr. LaPaz: But it was not strictly horizontal?

Mr. Hoyt: No.

Dr. LaPaz: We have some discrepancies in that regard. 95% of the observations indicate a very nearly horizontal path. One from Fort Worth, Texas, which was not made by.....but measured by them, indicates an elevation of 6 degrees at the beginning and 2½ to 3 degrees at the end.

Mr. Hoyt: That's what I would have said, but remember that the ridge would give you the sensation that was taking a downward path. Duration - at the time I would say it was approximately 3 seconds.

Comdr. Mandalkorn: How does the calculated velocity of these objects compare with the known velocity of meteorites?

Dr. LaPaz: Apparently very much lower; that is, more than the ordinarily observed meteorite falls. First, to observe in the case of an actual meteorite fall you have a relation of the velocity from the auricle of...atmosphere down to the impact velocity which may be very...but it isn't fair to compare the velocity of the green fireballs to the impact velocity of...(ditch digger and everyone talking at once)... Not with the trajectory velocity of the meteorite which is the same as the velocity of the fragments that fall from the meteorite. After a meteorite..the fragments fall about like a bomb. Their resistance just about balances out the....and as a result, they come down with about the velocity of a falling bomb, a little less because they do not have the same ballistic coefficient.

Dr. Bradbury: This is not an excluded ? direction like the....?

Dr. LaFaz: Due to the fact that they have a curve, and practically all times during which darkness is with us, why they tend to come in from that direction?

Dr. Bradbury: Would it be a shower?

Dr. LaFaz: That was my first explanation, as a matter of fact. Geminate showers with a maximum of December 10 to December 12. The first evidence that I had was Sgt. Kinsley's report on December 2 and since then the forerunners of the showers will...I thought we were talking about Geminate showers except that I never observed a green Geminate. Matter of fact, a check of observations made at that time found that there were 44 observations since 1915 and there wasn't a single one, Geminate or non-Geminate, for which any hue of green was mentioned. Later, for instance on the night of December 12, you could watch the Geminate come down..and notice that they came in at high angles to the horizontal, whereas the green fireballs,...incidentally, we have another interesting piece of evidence there - Dr. Sherman Smith from the University - I mention an observation that he made on the same night. The time of the observation is in dispute. According to Dr. Smith it was probably as late as 10:50. He had to wait for a long time, he said, for his wife to pick him up after the concert was over. Mrs. Smith, however, times it around 10:10. Whatever the time, within one hour or say an hour and a half after the green fireball and the horizontal path were observed, we have another extremely bright blue fireball come out of the Geminate rays. I mention this because some of the first persons to concern themselves with this problem suggest that the green fireballs were simply abnormally bright Geminates. Apparently you can have very large Geminate falls of the color estimated by a trained..... checked with the spectrum charts...is quite distant, I assure you, from the green fireballs.

Comdr. Mandalkorn: How good is the coverage of the observers of the American Meteor Society as far as the top-half of the United States is concerned?

Dr. LaFaz: It depends a good deal upon overcast conditions. I would say, however, that this year the Eastern half of the country has offered phenomenal observing conditions. One of my reasons for withdrawing from Ohio State was that after 13 years there I had given up hope of ever seeing a meteorite shower because during the season of maximum intensity of the falls we had heavy overcast, snow and so forth. On the other hand, this year they're had reasonably open skies. I have obtained no reports from people in that part of the country. We thought we had a definite check because Harvard College has now installed a photographic meteor station near or possibly inside the White Sands Proving Ground. Since the 12th of December, you correct me if I exaggerate here, we have been trying to determine the color and other characteristics of the ten or 12 brightest meteors observed at that station. We still don't know what they saw. We know they were operating and they made some photographs, but Captain Neef can probably tell you the red-tape channelization impedimenta that has dropped out any determinations better than I can.

Captain Neef: Well, it's one of those things; it's a Navy contract and they are not at liberty to divulge what they find, so we have to go through Washington, the Bureau of Ordnance, to get the information.

Comdr. Mandelkorn: I believe I can get that information; as a matter of fact, I feel very certain that I can. Just a matter of approach.

Dr. LaPaz: I feel certain if I had contacted Dr. Fred Whipple, for example, I could have obtained it, but his other occupations keep him away from that installation. And actually I felt as a meteorist, it might be wise to have OSI appeal for information rather than to ask for it directly.

Captain Neef: They did tell us they weren't using films which were going to be susceptible to these colors.

Dr. LaPaz: But, of course, they are making constant visual observations and if you were able to determine visual observations 100 miles from Los Alamos don't reveal the occurrence of bright green fireballs, I think it would be significant. I don't know why they should avoid the Southern-half of the State.

Comdr. Mandelkorn: Let us say if these had been at extremely high altitudes, they would have been visible from White Sands without any question.

Captain Neef: This one of the 30th definitely was visible from White Sands because Commander Holloman ? and his wife and one of his assistants and his wife saw it from there.

Dr. LaPaz: On the other hand, you have evidence like that of Professor Talbot ? now in charge of the optical trajectory section down there, an experienced astronomer, a member of the American Meteor Society. I talked with him about this, and he has observed nothing out of the ordinary. I don't think anybody, I mean in the line of green fireballs, in this area has been observing as much as he does. I don't see how he could miss sighting some of these.

Question: What explanation do you have for this?

Dr. LaPaz: The only explanation is the one I gave in the beginning and had my ears promptly boxed for. I think these are defensive maneuvers of some higher U. S. Command and they are practising in the neighborhood of the regions they are going to defend, so naturally your localization of light near the atomic bomb installations, but boy, am I scolded for that! Even Dr. Kaplan of the FAD ? tells me no, no, the FAD would know all about it, and they don't have any facts.

Dr. Bradbury: Is this the physicist Kaplan?

Dr. LaPaz: Yes. Kaplan is my old boss. He was chief of the operational analysis section when I was....director there.....During Kaplan's visit

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to the University of New Mexico, where he was lecturing, we called a conference with Major Dodson and other interested parties. He gave a brief resume of the observations that had been made to date. Now, Kaplan is one of the charter members of the American Meteor Society, and he said certainly these could not be conventional meteorite falls. He, of course, mentioned as other people do who have not gone into it more thoroughly, the possibility of abnormal types of meteorite falls, that might come in from a peculiar direction or might droop at very low level, but I don't think he was able to explain the absence of sound.

Dr. Teller: Did I understand you correctly that the velocity of the object appears to be some 50 kilometers per second?

Dr. LaPaz: No. In the case of the green fireballs something between 3 miles per second and 12 miles per second. Depending, you see, if you choose one ruled map or another. For example, let me illustrate how that affects the velocity determination. This is the one I think possibly best represents the observations of the case of the fireball of December 12. That is the path I assume the Los Alamos observers saw the same point of the curves that the Starvation Peak observers did, likewise to the point of disappearance. If we deny that possibility, the path might shorten to this dotted line (Dr. LaPaz worked on maps with Dr. Teller, explaining paths.) Dropping from 25 to something between 11 and 12 miles. The January 30 observation gave us our first long path.

Dr. Teller: How long was it?

Dr. LaPaz: The first observations we had here indicated... That was because of errors in the determination of the azimuth at the point of beginning, made due to the faulty transit they used. But that's correct that the path runs over 100 miles.

Dr. Teller: And how long does it take?

Dr. LaPaz: Duration estimates range from 5 to around 14 seconds. I think that a 10 second average is about the best, that would give about 10 miles per second.

Dr. Bradbury: Green is not an unknown color in meteors?

Dr. LaPaz: If I were to rewrite the report that I first presented on that subject, instead of saying "rarely observed" this color green, I think I would now say "never observed". You sometimes see green, Dr. Bradbury, but it is a blue-green. The blue-green color is rare, but it is observed. For instance, Dr. Sherman Smith's observation was essentially a blue-green, but on the blue side.

Dr. Bradbury: What other colors do you see in meteors?

Dr. LaFaz: Whites chiefly. If you look closely and without interference from outside lights, yellows, oranges and reds.

Dr. Bradbury: But it's apparently a yellowish-green we're talking about here. If you can see a bluish-green, you can also see yellows and whites.

Dr. LaFaz: There is some defect, possibly in the vision, that requires a pretty high intensity in that yellow-green before it's noted in a meteor fall.

Dr. Bradbury: Looks like green?

Dr. LaFaz: Yes it does, that's perfectly true. Now here's a peculiar property of those yellow-green fireballs - some people will refer to them as red. The only explanation that I can think of is they report afterwards that they see what is an exposure to a very green-bluish light rather than the light itself - I don't know if that is correct. And, incidentally, due to your observation, I don't know how to explain the inability of meteor observers to report this renegade color, but I simply know it doesn't occur. You go through long lists, like those of the American Meteor Society, you will find, I imagine, not 1 in 100 where a green is mentioned. Even in the case of the ? showers, where you have large numbers of very bright colors - let me recall something that all of you must have seen. The....shower of October 9, 1946 - anyone here who saw that? There were large numbers of extremely bright fireballs at that time. Kaplan himself recalled that they were blue, maybe blue-green, but never yellow-green. And I observed those under very favorable circumstances - we were flying at about 20,000 feet in a B-29. We had no absorption effects at all. They definitely did not show hues of green.

Dr. Bradbury: You mentioned the noise problem also. The noise occurs only when the meteor itself blows up, breaks up?

Dr. LaFaz: No, that isn't strictly true. You have, in addition to the hollow sound, the normal sound of the breakup of the....you have headwind; you're near the path. You get a real shock; for instance, we have....apparently broken up by that headwave, shock wave, in the case of the Norden County Falls. And then from the turbulence and reflections all the way along the path, you will have a rumbling which may endure not for the matter of a tenth of a second, but for minutes, and they're real rough.

Dr. Bradbury: But these occur fairly close to the trajectory?

No.

Dr. LaFaz: In the case of the Norden County Falls again, they were heard clear down to....City. Shakes buildings that far away. The....Falls were heard up to 300 miles from the point of impact.

Dr. Bradbury: Large number of observations.....

Dr. LaFaz: No, there again I checked very carefully because I was concerned. I am trying desperately to give a logical explanation to the absence of sound.

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I have found in the literature only three cases where no detonations, no rumblings were reported. One of these is the Belgium observation in 1855, and I think should be discounted because meteorists hardly existed at that time. Some falls occurred and were not reported at all. The other two are reasonably recent observations - one in 1921 and one in 1922. They occurred, however, in the deep South where negroes, I think, were the only observers. Even there, the whizzing of the meteorites as they fell through the air, was reported. I know of no case of an actual meteorite where at least the whizzing of the falling body coming down through the air has not been reported.

Dr. Bradbury:....?

Dr. LaFaz: Meteorite falls, I believe that was the way you phrased it? In the case of a shooting star, of course, you never hear a thing because the entire mass is very kindly vaporized before it gets, say, within 50 miles of the earth.....Not only noises, but accompanied by such noises that persons or animals are really frightened out of their wits. For example, we have a beautiful case where 2 horses killed themselves - in the Norden County Falls - they may have been felled by meteorites, but I'm inclined to think that the noise frightened them until they dashed into a ditch...Animals go crazy.

Comdr. Mandelkorn: Do you think it unusual no fragments are found?

Dr. LaFaz: I certainly do. And I think it unusual, not only in the case of the green fireballs, but in view of the fact that a great fall, like the...fall of October 30, 1947, where for the first time we detected a bit of the interest on the part of the military, there too we recovered nothing. October 30, 1947, about 4:48 in the afternoon there was, what appeared to be, a tremendous meteorite fall over the reservation area - the Four Corners Area. We got there within a very few hours, had excellent observations, went back time and again, exhausted ground search, CAP people in airplanes, we had a radio centered, we had radio controlled jeeps and a lot of people out walking around - not a trace. I can't give you a color on that because....

Comdr. Mandelkorn: Ordinarily, when phenomena of that nature occurs, you are able to recover some material?

Dr. LaFaz: Yes, some material is recovered almost always. If proper search is conducted by Gill Field Corps of Intelligence Unit; Dr. Lansberg of the Research and Development Board, very kindly interested himself in the problem and the air searchers resulted not even in the discovery of a broken branch. The region is heavily forested. If branches had been broken, I think they would have been detected. I haven't classified that particular fall, however, with the green fireballs and for this reason: that left a train. Another thing which I might have mentioned - a normal meteorite fall....will produce a long enduring train visible by day and night. Luminous by night and by day, illuminated by the sun.

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Page 15

In the case of the irons, it will be very faint, but it'll be there if you look for it. In the case of the Four Corners Fall, that train was observed and I'm inclined to believe that it might have been a conventional meteorite fall. In the case of the green fireballs, to my knowledge, no such train has been observed. That question is always asked of people - did you observe a long enduring train; their replies were always negative.

Comdr. Mandalkorn: Then you would say there were 10 incidents which are analogous to the green fireballs, with reports checked by a sufficient number of independent observers, that there is no doubt whatsoever of their occurrence?

Dr. LaPaz: That's right.

Comdr. Mandalkorn: Then there are 20 with some deviations, two of these probably are related to the green fireballs.....

Dr. LaPaz: I believe two of those incidents I mentioned occurred before the 5th of December. A very remarkable one of the 4th of August - note that that again is very close to the time of.....meteor shower....From late in July on and my report will be producing quite a number of these....., but it is physically impossible with this particular observation from near.....Oregon....

Dr. Bradbury: Then their directions were wrong?

Dr. LaPaz: As a matter of fact, we can't tell because they were single observations. Maybe I should pass that letter around, but it is, I believe, the first detailed report on what might be characterized as a typical green fireball. After the Oscar.... incident of January 1, 1948, was merely a remarkable green flash, which might have had some other interpretation.

(Dr. LaPaz showed some letters around the table, and there was general talk not able to be picked up individually)

Major Godsoe: The basic purpose of this meeting is: we want you to find a meteor!

Mr. Newburger: Have the military - anyone from the National Defense establishment - given up anything? Sent out any conjectures about this thing?

Major Godsoe: No, most of the military authorities think we are crackpots; that is, except for the Army Air Force, which is taking an active interest in details.

Mr. Newburger: The Air Force does have the primary interest in this gadget?

Major Godsoe: Yes, the Air Force is the gathering, reporting agency for this phenomenon.

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Comdr. Mandalkorn: I'd like to remove that temporary statement about the Armed Forces Special Weapons Project; we aren't laughing...(record blank for minute or two)

Dr. Bradbury: None of us are experts in this field, so we essentially have to believe what we are told. I suppose if you try to look for logical explanations, there are probably some.

Dr. LaPaz: I would like to ask one question here - unless you feed power into a body moving into a horizontal path, can it preserve essentially a horizontal trajectory? A plane does it; meteorites don't do it; shows curves as the energy falls off. This thing apparently ignores air resistance and gravity and goes blissfully on its way.....

Dr. Teller: As far as straightness of the path is concerned, if you have a meteorite that you have observed for 10 seconds, and in these 10 seconds it has gone a distance of 100 miles, it will have fallen in this distance 1/3 of a mile and now I should like to dare any observer to tell a curvature of this kind - because you are completely unprepared for the phenomenon.

Dr. LaPaz: As it slows down, it curves toward the bottom.

Dr. Teller: But apparently before it has happened, slowed down too much or exploded or something, and then it has disappeared. Now the...point is, of course, if it has no power it will slow down, but I do not know how quickly you would have to estimate that; furthermore, the rate at which it slows down will depend very much on the question whether it has been at a 10 mile altitude or a 20 mile altitude.

Dr. LaPaz: The elevation estimates are very concordant on these, and I doubt that you will be able to change that elevation of 8 to 10 miles by very much. These are the real path observations that I have mentioned.

Dr. Teller: Well, can you say...do you think anything can be said about that?

Dr. LaPaz: I doubt it. The eye, of course, is not a good speedometer. You can't detect a change. At least, I did not in the one observation that I made, and no such change has been reported. In the case of those who observed the green fireballs say that near the end of the Texas fireball path of January 30 it was noted that the fragments moved out leisurely to the point at which there was apparently less velocity, as shown by them on the green fireball itself. May I mention, however, that in the case of the normal meteorite fall that curvature in the path, the transverse vertical, is one of the most apparent. You see that in the case of any large, ordinary detonation fireball fall even though it may not produce...there is a tendency to curve.

Dr. Teller: What about total light...How does the brightness compare to the brightness of the meteorites that come from a meteor?

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Dr. LaFaz: In the case of the Texas fall, this is very rough; I didn't see it, I can only base an estimate on the comparisons that were made with the moon as to size and total intensity. In the case of the Texas fall it would certainly be comparable to - it was one of the brightest observed fireballs in total intensity....In the case of the Starvation Peak incident, we can compare it with Venus which was conveniently located, and it certainly was of stellar magnitude minus 4, possibly a little brighter. That comparison was made almost immediately after the observation.....

Mr. Hoyt: It was very bright and clear that night....

Dr. Teller: You saw it at 6 o'clock?

Mr. Hoyt: At five minutes to six. Very, very clear that night.

(ditch digger - in between ditch digger, a few coherent remarks:)

Dr. Manley: In 1945 or 1946 I observed practically the same thing as in this letter. We thought it was a roman candle. Definitely light green in color. I am still worried about the fact that they don't report any green color in these falls.

Dr. Bradbury: Lack of noise, lack of....., the lack of these things would be equally astounding for any material object.

Dr. LaFaz: Dr. Kaplan suggested the possibility of the same sort of phenomenon that he could produce experimentally in his laboratory...and he tells me under certain conditions he can produce a globe or leaps of yellowish-green light..... He conjectured for a minute that that might have some relation - an artificial aurora.

Comdr. Mandelkorn: As long as you brought that up, Maj. Johnson has a letter - I obtained from Gen. Bunker which may be pertinent. Gen. Bunker transmitted the information you've heard to the Air Materiel Command, and in reply received a letter from an Air Force General who recently returned from Alaska. I'll let Dr. LaFaz read this.

Dr. LaFaz: This is closely related to what I was talking about. It begins: "Dear Bunker: Received your interesting phenomena of 1 February and promptly turned it over to Howard...now saddled with the responsibility of clues. Regard as coincidental that on dates you mention Gen. Carroll was in Fairbanks, Alaska, and on his return related that he had never seen before in his life such a beautiful technical display of Northern Lights. Maybe what these people have seen is a reflection from the.....of these pyrotechnics. So far as we know, it is still phenomena and not material. Best Regards, Paul".

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Page 18

Dr. LaPaz: May I make the observation that if you look in the chapter by..... you'll find that in Alaska where this observation was reported, there are very few times at this season of the year when you can't see an aurora.

Dr. Teller: I have the feeling that it is....either a discovery in physical psychology or.....

Dr. LaPaz: I thought that psychological element would come in here!

Dr. Teller: Here is a slightly irrelevant question - you brought in the flying discs. What is the connection?

Dr. LaPaz: I didn't bring in the flying discs.

Mr. Newburger: I brought in the matter of the flying discs because the Air Force, as I understand, now have classed the flying discs and these fireballs into one category.

Captain Neef: ...The only indication we have is a letter from WAC in Washington Saturday where they indicated the old project Sign is now project Grudge, which includes the phenomena observed in New Mexico. They knew of this meeting and were going to send a representative.

Dr. LaPaz: I just asked Mr. Hoyt a moment ago how he would compare the brilliance of this object with that of an aircraft flare. He said they were of comparable magnitude. I think that was definitely ruled out...

Dr. Teller: I understood that a reasonable explanation of the flying discs - and I suppose that it is generally known - is that they are meteorological balloons.... I understand that in quite a number of cases there have been very close directions established....I must say that from what you have said it certainly sounds like everything else but meteors. The thing that impresses me is your evidence of the horizontal flight. Meteors do not usually come in like that...

(mumbled talk between Drs. Bradbury and Teller)

Captain Neef:....Change of direction such that we haven't been able to follow it up yet. One of our men was returning Sunday night when our tower operator saw this object to the Southwest from Kirtland Field and....Arizona reported it was Southeast from there. From the Kirtland tower it was a bronze color. The time checks, but from....Arizona it was green until it turned straight down and veered going.....

Dr. LaPaz: Dr. Teller, may I mention this one other instance that shows maybe why I have more concern than is merited by the evidence I am able to present. I deal with Vic Regener and I know that the physicist doesn't like to work with anything that can't be photographed. I share that view but a meteorist is not available sometimes to photograph shooting stars, even the conventional type. During the war I was acting as Director of the Ohio Section of the American Meteor Society and all at once we began to get reports of large numbers of stationary fireballs; not moving. The burst

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was there, but no motion. Now one who observes normal conventional fireball falls is aware of the fact that not 1 out of say 500 shows actual fixity; there is always motion. So, this looks very, very strange. Of course, you all know what those stationary fireballs turned out to be. They were the self-destructive devices on Japanese paper balloons operating. You had a hydrogen filled sphere with a top-crown mask of magnesium flash-light powder. And when the magnesium and the hydrogen went off together, you could see it for a long way. We got stationary fireballs but they certainly were not meteoritic. My experience since I was suspected of psychological apparitions at the time I reported these stationary fireballs to, for example, Dr. Kaplan, my experience with...led me to be very cautious about taking my concern...but at the same time I feel that we shouldn't be too hasty in giving a natural explanation to these green fireballs.

Dr. Teller:....but I would like to ask, these phenomena are apparently quite bright, more luminous than normal meteorites?

Dr. LaFaz: Well, the January 30th one was; I would say that about the one I saw on December 12. That was a very bright fireball, but not extraordinarily so.

Dr. Teller: What is the chance of getting pictures?

Dr. LaFaz: I refer to the one attempt that was made on the night of December 19. We set up a photographic patrol - the AESS, as you probably know, has been interested in this problem. They brought a lot of speed graphics and so on and set them up. Mr. Maxwell, a member of the group...and they were able, I think the night before, to photograph a bright Geminate. But on the night of the 19th nothing was observed. The next night, however, the night of the 20th there was an incident which I believe might have been photographed, but by that time the equipment had been disbanded and nothing was obtained. I should think, with proper coverage, say 10 to 15%, of these should record themselves provided you do not use green insensitive...and film such as the.....

Dr. Teller: Is there any possibility of having a wide coverage of the sky triggered by a photo cell?

Dr. LaFaz: I have discussed that, for example with Dr. Reneger, who has been very much interested in the apparatus, and his answer is more or less in the negative. I understand that Cornell University - Gartline of Cornell - has produced some sort of photo-electric triggering device which has been used in this connection. I wrote him about it, asking for reprints or instructions, but never received a reply.

Question: Do you think you are going to find film sensitive to this green color fast enough? We have some that can't be left out over 12 hours.....

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Dr. LaPas: It should be possible ...The conventional meteor cannot be photographed at the present time. The so-called meteorochroms that Harvard College is now having produced at very great expense, they expect to go down to the 4th and possibly fainter. With one of those, a bright green fireball might be photographed, but they are not available...

Mr. Newburger: Does anybody know if there were any experiments carried out in Europe, prior to the war when our last best information came from over there, along this line?

Dr. LaPas: Not to my knowledge. I raised that question with Dr. Kaplan and he gave me some rather surprising information. Dr. Kaplan had attended the IAU meetings in Syria? and the Russians had a large representation there. Sufficiently large, as a matter of fact, to beat down the proposal that the IAU appoint an international committee to investigate the so-called... meteorite crater produced in the fall of 1947, February 12. On the contrary, at the Oswald, I think it was, conference of the International Geophysical Union, none of the Russian geophysicists were present. Kaplan's interpretation was that they feel so far ahead of us that they didn't think they could learn anything, and they were taking the precaution that no leak occurred.

Mr. Newburger: Were the Germans experimenting in any phase that was possibly connected with it?

Dr. LaPas: Well, they had the so-called stations in space ...might have some attachment to it.

Comdr. Mandelkorn: You don't have any record of experiments.

Dr. LaPas: No, no knowledge of experiments. I have the belief that no country in the world has there been meteoritics developed as it has in Russia in recent years. Recently, the Academy of Science of the USSR has been issuing a so-called meteoritic, an extraordinary publication - very little work of the caliber being done by the Russians has been conducted in the United States. Apparently, there it has big support; here, it is an individual matter. Until we had some military interest in meteoritics, we were never able to found even an institute in meteoritics in the United States. The one in New Mexico is an outgrowth of application of meteoritics to determine, say, ballistic coefficients for shells of unconventional design like the proximity fuze shell with the radio in its nose, and that sort of thing. That's where we got a start. Apparently, the Russians got that earlier and have full-fledged state support.

Dr. Holloway: How much interest would the military have if they found out these things were landing all over the country, Canada, Hawaii, etc.?... Have you contacted people in the East?

Dr. LaPas: Olivia, S.C. Olivia, President of the Meteoritic Society, King, Leonard, Pruitt, Kaplan, etc. Most of them have been observing. Kaplan, I imagine, has not, because he is now preoccupied with laboratory

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Conference on AERIAL PHENOMENA

Page 21

experiments. I think that if anyone of the UCLA Institute of Geophysics had been observing, it would have gotten to Kaplan's ears.... There are two great advantages to this area; first, you have clear skies at night and can observe them as they come down, and second, (record blank for a minute or two).

Dr. Holloway:..... this was before the war. They had a telephone network which covered a fair section of the East there.... a network so that your observations.... I mention this to indicate, I don't know what he is doing now, but at least they may have a group of people who have been observing. May not be in a position to... green fireballs, but they might have seen them.

Dr. LaPas: My one attempt to contact.... and unfortunately I did not approach him again for information, but someone acquainted with him should certainly ask if they have observed any of this sort of thing there.

Comdr. Mandelkorn: Well, wouldn't phenomena of this nature have been reported to the Society, no matter where they occurred?

Dr. LaPas: Yes, I would think so. For example, you can consult the so-called meteor notes of the American Meteor Society, and popular astronomy, they are published from month to month with the President, G. C. Olivia, Director of the Florida Observatory at the University of Pennsylvania. I've been through those very carefully. There's one single solitary case of a fireball which by one of the observers - a doubly observed fireball - so it was possible for me to.... in which one of the observers mentions a green color. Not this peculiar yellow-green which most people in that work find unusual, and in the case of that the elevation determined is of the order of, oh 199 kilometers from the beginning point and roughly 100 for the end, so I think it is only an ordinary fireball; nothing unusual about it. That was the only case I found.

Comdr. Mandelkorn: According to recent records, where the observation conditions in other parts of the country satisfactory? At least part of the time?

Dr. LaPas: Well, I infer from the fact that we have had so much trouble out here and the East has been bragging about its climatic advantages; that probably during the recent months, they have had good observancy. I haven't attempted a full scale check on that.

Comdr. Mandelkorn: Let's put it this way then: Have there been a sufficient number of fireballs reported in the last 60 days in other parts of the country to lead us to infer that had some of these occurred, they would have been reported?

Dr. LaPas: I think that definitely is true. To my knowledge, as far as the contacts I've had with Olivia and so on, there was nothing out of the normal noticed in the East, and in the South, shall we say as far up as White Sands. Whether the Harvard Observatory setup observed anything peculiar or not, I don't know. We tried right away to get that information. We were told by the gentleman in charge down there, I'm sure this will be interest to you, that

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it was impossible to make an estimate of the approximate wave and angstroms without detailed spectroscopic equipment, which he did not possess. So whether the Captain actually cut out the spectrum charts and sent them to him or not, I don't know, but it was considered.

Dr. Bradbury: Well, we're not coming up with any bright ideas for you very fast.

Mr. Newburger: No, but as long as we have the problem presented to you, maybe by thinking on this, you will come up with an idea!.... Of course, you know our entire connection with started with Madelyn Owynn Merchant back in 1946!

Dr. LaPaz: Except for the flying discs, nothing that you could say would cause me greater embarrassment! I have actually had communications from Madelyn myself.

Dr. Teller: Your statement of the absence of sound when this thing has gone apparently overhead at the distance of 10 miles, within earshot of people.

Dr. LaPaz: That seems incomprehensible, doesn't it, Dr. Teller? I'm glad to hear you say that because that has been my feeling from the beginning. And we tried desperately to get confirming evidence whenever sounds were mentioned. No reports have been obtained.

Dr. Teller: I must say that the admission in which one could get.... typical phenomenon is something in the light of...

Dr. LaPaz: Kaplan told me he was going to get out one of his old blow pressure tubes and begin experimenting as soon as he returned from the UCLA, to see if he could duplicate in any way the descriptions we have given him.

Dr. Holloway: What sound does a P-2 make when it goes overhead?

Dr. LaPaz: I can tell you what they make when they come down.

Comdr. Mandelkorn: I can tell you what they make when they go overhead at the height of about 1,000 yards. But anything manmade that passes overhead at the height of 8-10 miles, at this speed, could be inaudible.

Dr. Teller: You think it could be?

Comdr. Mandelkorn: I think it could be. The only .

Dr. Teller: Even if it went at the speed of 10 miles per second?

Comdr. Mandelkorn: Well,

Dr. Teller: You see, at that time, the... begins to come up.

Dr. LaPaz: You bet it does.

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Dr. Bradbury:.....

Dr. Teller: You have to get a shock wave out of it. With a very small object the shock wave would be smaller than....I have not made calculations on it, but it's just common sense...

Dr. LaPaz: I would like to ask a question. Isn't it true in the case of the so-called light movement that you have very intense, luminous effects off them without noise?

(talk between Drs. Bradbury and LaPaz too fast and too jumbled to be transcribed.)

Comdr. Mandelkorn: From what Dr. Teller said apparently a solid object converging with the atmosphere horizontally at about 5 to 10 miles altitude, it's incredible that it wouldn't be accompanied by some sort of sonic phenomenon.

Dr. Teller: I would like to repeat that to try to get an estimate of the size of the object, that it would have to have in order to get sound effects, is not an easy thing, but offhand I would say - this is what I would expect - that you get a very small object, as small as an inch or smaller.

Dr. LaPaz:.....

Dr. Teller: If I remember correctly, the intensity, the amount of energy that goes into a shock wave is proportional to the square of the velocity. The velocity that you have here proportional to the square of the velocity and of course, is proportional I should think probably to the square of the linear dimensions of the object that you have. Now you have 10 miles per second... velocity of the object that you have. Now you have 10 miles per second... velocity you have 20 miles per second, so this could be, on that count, ten times fainter - the sound would be ten times fainter. On the other hand, a meteorite that you will hear, I think,..... that much across....

(too much cross talk)

Dr. Teller: That is something we could do right away. Now I do not know, tried to get from you information on brightness, but I would like to ask again some details...

Dr. LaPaz: The brightest meteorite fall in history, of which we have historical record, was the... fall in 1908, June 20.... estimates the power, the light power, of that was of the order of 10^{18} - 10^{19} ergs per second. In the case of the Texas fall it was probably not 100,000th as bright.

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Dr. Teller: Now let's try to get a check of this.

(Dr. Teller then spent approximately the next twenty minutes or so figuring on the blackboard - estimating light, speed, kinetic energy, shock wave, etc.)

Dr. Teller: If I can just believe everything I have heard and put it together with what I theoretically believe in, it ought to be a material body - might be an electron phenomenon.

Dr. LaPas: You see why I'm puzzled, Dr. Teller. Nothing like this, to my knowledge, has ever been observed in the case of meteorite drops.

Dr. Teller: If you go to a group like UCLA or some other place where they have a good sound laboratory, they ought to be able to take the absence of sound observations - that is definitely incompatible, assuming that you know that there are... and assuming that they have heard no sound from this, they ought to be able to work an upper range upon the sight of the object which has been moving, and from these figures I would be inclined to believe the object could probably not have a heat or something like 1 cubic centimeter. One centimeter in dimension, and that in turn would not have given the blinding effect, if it was a material object.

Dr. Bradbury: Wait a minute, I think you've left out something in light effects - you don't have to worry about kinetic energy. You can get your light from chemicals as well.

Dr. Teller: That is correct.

Mr. Newburger: This seems to wind up the meeting.

Dr. Bradbury: Still don't feel that the meteor stuff is out. The puzzling thing is the long horizontal path; also absence of noise is puzzling.

hgc

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Fourth Army
Intelligence Liaison Office
Box 251, Sandia Base
Albuquerque, N. M.

16 February 1949

REPORT OF TRIP TO LOS ALAMOS, NEW MEXICO, 16 FEBRUARY 1949, BY COMMANDER
RICHARD S. MANDELKORN, U.S.M., RESEARCH AND DEVELOPMENT DIVISION, SANDIA
BASE.

Subject: Project "Grudge".

1. On 16 February, a conference was held at Los Alamos to consider
the so-called green fireball phenomena which commenced about 5 December
1948. The following were present:

For Los Alamos:

Mr. N. E. Bradbury
Mr. Marshall Holloway
Mr. Fred Reines
Mr. John Manley
Mr. Edward Teller
Mr. Elmo Morgan (AEC)
Mr. Sidney Neuberger (Security)
Mr. Maxwell (AESS)
Mr. Hoyt

For the Fourth Army:

Major William A. Godsoe
Major Wynn

For the U. S. Air Forces:

Captain Neef

For the University of New Mexico:

Dr. Lincoln LaPaz

For Sandia Base:

Commander Richard Mandelkorn

2. Captain Neef opened the meeting by saying that the problem was
being presented to Los Alamos scientists in hopes that they would be able
to indicate some mode of attack on the problem and offer some explana-
tions for the phenomena observed. He stated that this question had been
classified military SECRET under the name, Project "Grudge", and that the
investigation was now the primary responsibility of USAF, Air Materiel
Command, T-2. He then turned over the discussion to Dr. LaPaz.

3. Dr. LaPaz stated that he had been assisting the Military for
the past two months at their request in the investigation of the subject
problem, and went on with the general discussion of phenomena attending
normal meteorite fall, postulating the following important character-
istics:

- a. Random path of fall.
- b. Color and intensity variations in light emitted.
- c. Sound.
- d. Frightened animals.

4. Dr. LaPaz then went on to discuss the number of observers re-
porting the subject phenomena and the diversity of their backgrounds,
including commercial airlines' pilots, military pilots, special intelligence
agents, Los Alamos personnel (Mr. Hoyt), and himself, as well as various
and sundry previously untrained citizens.

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5. Dr. LaPas then described the "Observation Peak Incident" which he observed himself, detailing the following characteristics which indicate that the phenomenon can not be classified as a normal meteorite fall:

- a. Initial bright light (no period of intensity increase) and constant intensity during the duration of the phenomenon.
- b. Yellow-green color (about 5,200 angstroms).
- c. Essentially horizontal path.
- d. Trajectory traversed at constant angular velocity.
- e. Duration about two seconds.
- f. No accompanying noise.

6. Since about 5 December 1965, there have been more than ten incidents analogous to the "green fireball" described, and some twenty more presenting minor deviations to the above, which should be considered in connection with them. In addition, there have been a number of normal shooting stars and meteors observed.

7. There ensued a general discussion in which it was brought up that the majority of the observers whose reports were here under consideration were not subject to previous psychological influences or prior knowledge as to what they should look for. Furthermore, "seeing" conditions for meteor observation throughout the continental United States were at least average during December, January, and February, yet no green fireballs have been reported in any other areas. They seemed to be confined to the Los Alamos, Las Vegas, and West Texas triangles.

8. Mr. Teller then took over the discussion and showed that a material object travelling with the velocity of the subject phenomenon (about eight miles per second) would have to have a mass of about twenty grams, assuming all the kinetic energy could be converted to light, under the assumption that the light output is in the vicinity of 10^{14} ergs per second. He then went on to show that the shock wave produced by the passage of an object of these dimensions or greater passing through the atmosphere at a height of eight to ten miles (the observer figures) with a velocity of eight miles per second would produce a loud noise easily audible ten kilometers from the source. No sound has been observed. Therefore, Mr. Teller has the tentative opinion they are not material objects passing through the air. We should look to electronics and optics for an explanation rather than in the field of hydrodynamics. In any event, it was apparently agreed by those present that it was almost incredible that a large object such as a guided missile or informer vehicle could pass through the atmosphere at a height of eight miles at a velocity of seven to eight miles per second without producing a loud noise which would have been audible to observers. Mr. Bradbury demurred so far as the electronic explanation was concerned, saying if it were assumed that the answer lay in that region, many more difficult problems would have to be solved.

9. The following action seems in order:

- a. Recalculation of the data outlined by Mr. Teller with a more accurate treatment to verify his tentative conclusions.
- b. The establishment of well-equipped and organized observation stations to give as thorough photometric and photographic coverage as is possible in the geographic area involved.
- c. Assuming that Mr. Teller's theories are borne out by recalculation, declassification of the Project to permit participation and thinking by scientists throughout the country.

10. Dr. LaPas and Captain Neef have fruitlessly attempted to obtain information from a meteorite observers' group now at White Sands, said to be performing work under contract for the Navy. Commander Mandelkorn offered to assist them in their endeavor to enlist the services of the group for observations in connection with Project "Grudge".

11. Conclusion: It is my belief that these phenomena, particularly if there are any further incidents, are deserving of serious consideration

see next page.

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Report of Trip to Los Alamos, 16 Feb. 49 (Cont.)

16 February 1949

All their purpose and meaning have been satisfactorily explained. Although Mr. Keller's discussion tends to disprove the hypothesis that guided missiles or informer vehicles are responsible, there is cause for concern at the continued occurrence of unexplainable phenomena of this nature in the vicinity of sensitive installations.

*Captain Neef reports blue fireball visible from Sandia at 0530, 17 February 1949, and a yellow-orange cigar-shaped light at 1759, visible until 1806, 17 February.

RICHARD MANDELKORN,
Commander, U.S.N.

Copy furnished:
Fourth Army, G-2 -- Major William A. Godsoe (2)
USAF - Captain Neef
USAF POPAK - Brig. Gen. Edward G. Bunker

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THE UNIVERSITY OF NEW MEXICO
ALBUQUERQUE

February 21, 1969

Insights of Espionage

To: Lt Colonel Doyle Ross, Commanding Officer
District No. 17
Office of Special Investigations

From: Kenneth Kalya, Director
Insights of Espionage

Subject: Anonymous Insiders phenomena (As report)

1. Several additional sightings of unexplained aerial light phenomena have occurred since the third report in this series was prepared. Outstanding among the as yet unidentified incidents was the green fireball of Sunday evening, January 30, 1969, 5:54 p.m. MST. Within Las Cruces one reports after the appearance of the fireball, an eyewitness (Mr. Naboth) called to report the impression of a group of persons who saw the fireball through an east window while seated about the dinner table in a brightly lighted room. Within twelve hours after the fireball appeared, more than 100 eyewitness accounts had been placed or written in to the Insights of Espionage, or had been obtained by the director through personal interviews. An unusually high percentage of the reports came from military personnel (walking out under the sky for Post Theater to open), from guards and other special agents already alerted to watch for anomalous incidents phenomenon and from airplane pilots, control tower men and ground workers working on the 14th afternoon to midnight shift.

2. On February 1st, a shift crew was placed at the writer's disposal by Major William Gudson of the Fourth Army and a field survey was begun of the region in New Mexico and Texas in which the majority of the above reports reporting the fall lived. This survey, carried out under unusually severe weather conditions, included visits to the following localities: Berlandy, Roswell, Tropic, Rosam, Rosam, Roswell, Caprock, Tatum and other towns in New Mexico; and Lamesa, Brownfield, Plains, Lubbock, Dalhart and other towns in Texas. (Several of these towns were visited two or more times.) As a result, there very effectively cooperation was provided by the OSI group of Miller Air Base under Lt Paul Ryan, and the local CAP unit under [redacted] Special Agent Bill Flecht was added to the survey party and gave much aid in later work. At Lamesa, Texas, the ground survey party was led by an air search party consisting of Major Charles William Davis, Captain Kalya, Lt. Keef and Special Agent Jack L. [redacted], from the 17th Airborne OSI Office at Klamath Field, and Corporal Covert.

On January 30th, the four persons just named flew a low-level air reconnaissance mission in a T-11 aircraft over the area surrounding the earth-pit of the fireball of January 30th. At the same time a second ground survey party under Lt Paul Ryan made a careful field search along a route extending from Lanes through Abbeville, Texas, to Clovis, New Mexico.

3. As a result of the ground and air searches referred to above, and of an analysis of the very large amount of information obtained from spontaneous by personal interviews, by telephone conversations and by letter, it has now (three weeks after the fall) become clear that several thousand persons in New Mexico and Texas saw this great fireball laterally traverse the sky. It has been possible to determine that the January 30th fireball became visible at an altitude of approximately twelve miles over a point at latitude $36^{\circ} 50'$, longitude $102^{\circ} 5'$, and disappeared at an altitude of approximately eight miles over a point at latitude $30^{\circ} 48'$, longitude $102^{\circ} 22'$, after traversing a nearly horizontal path approximately 143 miles long at a velocity of 7000 miles per second. Although the January 30th fireball must be ranked among the brightest observed in the last quarter-century, and in spite of the fact that its real path lay closer to the earth throughout its entire extent than any other meteoritic path of which the writer has knowledge (excepting only the anomalous green fireballs of December 12th and 20th, 1948), the anomalous detonations and long continued ramblings which without exception accompany large meteoritic falls were not observed on January 30th by anyone in the very large region covered by the various ground surveys. However, what may have been Cohen Holmes' (anomalous whining and hissing sounds frequently reported by very distant observers as having been heard at the same time that a meteoritic fireball was seen) were heard at Smalls, New Mexico, and near Wells above, Texas.

4. In addition to the absence of noise usually referred to in the last paragraph, the fireball of January 30th, 1949, shows several other features (e.g. nearly horizontal path, absence of long enduring luminous train or dust clouds, path to South direction, etc) characteristic of the green fireballs earlier described in this series of reports. However, the January 30th fireball was much brighter than any of those earlier reported and differed from the other green fireballs in that many of the Texas observers who were situated nearest its path reported its color as blue, orange, red and even purple instead of green.

5. Up to the present time (February 21st), no evidence whatever supporting the belief that solid fragments fell to earth from the January 30th fireball has been discovered. However, as it is possible, a much more thorough ground search should be made in the probable area of fall as outlined by the earlier surveys, for, in my opinion, the fireball of January 30th is the only one of the anomalous luminous objects under investigation which gives any indication of having been a meteoritic fall.

6. With the present report, the writer's participation in the OGI's investigation of the puzzling fireball question ends, to his regret, however. During the time I was on leave of absence from the University of New Mexico, I was glad to donate my time and services to this investigation. Now that I am again working as head of the Department of Meteorology with a full time teaching load, it is impossible for me to continue cooperating with the OGI.

LEONARD H. HAYES
Head of Dept of Meteorology

~~SECRET~~
 FEB 26 1949

**Brig. Gen. James McCannick, Jr., Director,
 Division of Military Application, USMC, Washington
 Carroll L. Tyler, Manager, Santa Fe Operations Office,
 Los Alamos
 OBSERVATION OF PHENOMENA AT LOS ALAMOS PROJECT**

**REFER TO
 SYMBOL: AFD-3-1**

Reference is made to your memorandum, above Subject, dated February 14, symbol MA:PTP. This correspondence was referred to my Security Division, and they advise as follows:

Local FBI authorities advise that they are conducting no further inquiries and that this is a matter for the Office of Special Investigations, USAF. The Bureau, however, is to be kept advised by the appropriate IEE organization concerned.

This information is from a FAX message from Washington Headquarters, FBI, to the El Paso Field Office dated December 29, 1948.

For your further information, my Security Division informs me that all correspondence and reports pertaining to this subject are to be classified Secret under AR 600-5. This classification was placed on the subject matter by the USAF as transmitted by the Commanding Officer, 17th District OSI, Kirtland AFB, Albuquerque, New Mexico. We are upgrading our files accordingly.

CC: Bruce Utman

RESEARCH & DEVELOPMENT (COM)

OFFICE	Sec Op Br	Director	Manager		
SURNAME	Newburger:sgt	Wells <i>Wells</i>	Tyler <i>Tyler</i>		<i>#17</i>
DATE	2/24/49	<i>SPK</i>	<i>DK</i>		

Kirtland Air Force Base
Kirtland Field, New Mexico
28 February 1949

TO: Materiel Commander
17th District OSI (IG) USAF
Kirtland Air Force Base
Kirtland Field, New Mexico

FROM: Security Division
17th District OSI (IG) USAF
Kirtland Air Force Base
Kirtland Field, New Mexico

RE: Aerial Phenomena (24-4)

MEMORANDUM FOR FILE:

On 24 February 1949, a meeting was held in the Office of the Security Division, 17th District OSI. The following were present:

Dr Lincoln LaRue, University of New Mexico
Major William E. Coitsoe, Fourth Army
Captain Melvin E. Neef, Office of Special Investigations
Captain Roger J. Cromelows, Air Materiel Command
First Lieutenant Robert V. Smith, Air Materiel Command
Special Agent Jack L. Belling, Office of Special Investigations

The topic of discussion was the relation of the anomalous "luminous phenomena" observed in the Santa Fe - Las Vegas - West Texas area to Project "Crucible", formerly Project "Sign".

A definite form, developed by Project personnel, was provided for the collation of data pertaining to future observations. It was specifically requested that complete data, rather than a reduction thereof, be forwarded, so that all scientific branches might study the original figures and description.

The establishment of observation posts for accurate study and location of the phenomena was strongly recommended by Major Coitsoe, and covered in by the AMC representatives. These observation posts should be three in number, each equipped with eight cameras (for complete sky coverage) and two operators. A transit would be provided so that immediate, accurate readings may be taken.

The AMC representatives said that Professor Hineck, the present scientific adviser for Project "Crucible", was to leave the Project to return to academic duties at Ohio State University. It was recom-

mended that a request be forwarded for a consultant to be offered the University of New Mexico, so that Dr LaRue could discuss with him the scientific and evaluation of data pertaining to both the overall project and the local manifestations.

Dr LaRue recommended a detailed ground search, supplemented by air search, of the known areas where any phenomena which may exist should be found. These areas have been roughed out and are being further refined. All ground covered.

MELVIN E. NEEF
Captain, USAF
Materiel Supervisor

DETAILS

1. This is a joint investigation by the writer and Special Agent WALTER E. RUD.

AT OKMATH, NEW MEXICO

2. On 16 February 1949 the writer interviewed numerous persons in Okmath, New Mexico, relative to the Fitzhalls' observations of 14 February 1949. No results were obtained except a report that one [redacted] had seen the object. [redacted] a real estate operator, could not be contacted.

ALONG U.S. HIGHWAY 66

3. Between Grants and Gallup, New Mexico, on 16 February, the writer interviewed numerous persons at trading posts, but no one was contacted who had any knowledge of any unusual celestial phenomena.

AT GALLUP, NEW MEXICO

4. Newspaper personnel, police, students and other likely sources of information were contacted on 16 February 1949 with negative results. Several had knowledge of the "four corners" snowfall of late 1947, but no more recent observations were obtained.

AT GAYLORD, ARIZONA

5. En route to Grants, several members of the Panhandle Order were interviewed at St. Kinnally's Mission. No positive results were obtained, but it was arranged that the writer would be notified in the event that any of the brothers heard any reports from the Indians.

6. At Grande Wagon (Proctorville), [redacted] was interviewed on 16 February 1949 by the writer. [redacted] said that at about 12:00 on 14 February 1949, as he and his wife, [redacted] were returning from Gallup, they crossed the Long Bridge about two miles due east of Grants. As they came up the hill west of the bridge, where the road bends south, a brilliant white light was observed in the sky directly in front of the car, and some what above the horizon. The object appeared to hang stationary, then fell in a slight curve to the west. [redacted] said that the object had a slightly greenish color. Both agreed that the object had an orange tinge as it fell, and that sparks appeared to trail off the object, both while stationary and as it fell. [redacted] said that his first reaction was that it was an airplane on fire, and that he had so reported to the Arizona State Police.

7. [redacted] advised the writer that one [redacted] Indian trader at Flagstaff, Arizona, had told him that two Indians said that they were east of Sheep Springs when a ball of fire appeared "two tree tops" above them. The object disappeared over a hill, and then they heard a big explosion. These Indians are reported to have come in separately to Flagstaff, to have made separate observations, and to have told identical stories. The time was estimated to be about 18:30 on 14 February 1949.

8. The writer proceeded to the spot from which [redacted] observations had been made and took observations with a pocket compass. These readings showed that the road headed due southward, rather than south as [redacted] thought. The true heading indicated from his observation given by the readings was 243°. It is to be noted that this heading does not agree with the readings reported by [redacted].

9. The condition of the roads was such that it was impossible for the writer to reach Flagstaff, Arizona, by automobile on 17 February 1949. No personal interviews with other [redacted] the Indians was possible therefore. OKMATH: "Sheep Springs" is a very common place name in this area, so that no accurate location is possible without additional information.

AT ALBUQUERQUE, NEW MEXICO

10. A [redacted] report was received in response to a letter requesting information of [redacted] North, Texas, meteorologist. This letter was [redacted] on 18 and 19 February 1949 by Special Agent [redacted] H. LAWRENCE, San District OEL. Verbatim report follows:

11. [redacted] was interviewed at his office at [redacted] Fort Worth, Texas, on 18 and 19 February 1949. [redacted] had no direct knowledge of the "fireballs" which occurred at about 2:00 hours, 30 January 1949; however, he is extremely interested in meteorites and this occasion of his is well known, consequently [redacted] contacted him and he had in his possession a file containing the observations of these persons. This file was examined and the following pertinent information extracted:

The first telephone call was received from a [redacted] who telephoned at 1955 plus 20 seconds (time is exact since watch was checked with WW shortly before this call) to report that he had seen a green flame trailing sparks going from North to South in the West. This occurrence had happened a minute or so prior to his telephone call. The observation had been made from the residence of [redacted] Fort Worth, Texas. The green flame appeared to have a trajectory of approximately 30 degrees downward from the horizontal. Mr. [redacted] with reference to this call interviewed a witness [redacted] on 1 February 1949, who was the first person to observe the phenomenon in the [redacted] vicinity and from her indicated North 68 degrees West, true, at approximately 6 plus degrees altitude and the end point at being 1.7th 86 degrees West altitude 3 1/2 degrees or lower. The exact time of duration by reference was measured to be 1.8 seconds. The approximate size of the "fireball" was considered to be from 1/2 down to 1/3 the size of a full moon.

The second call received on 30 January 1949, was from a Mrs. [redacted] who resided at [redacted] Fort Worth, Texas. She reported a real bright [redacted] ball seen in the [redacted] area of Little Spring. Mr. [redacted] did not contact [redacted] [redacted]

Locally no further information given over the telephone was not considered sufficiently detailed to warrant additional investigation.

16. The third call received 30 January 1949, was from a Mrs. [redacted] who is employed at [redacted] at Lake Worth, Fort Worth, Texas. Mrs. [redacted] reported that she had observed a blue streak through a West window of the [redacted] which started high in the sky and proceeded from North to South ending approximately in the West. This blue streak was quite wide appearing wider than a full moon. The streak came to a point at its rear end. The duration was approximated as being approximately 1 to 2 seconds. Mr. [redacted] did not contact Mrs. [redacted]

17. Mr. [redacted] of [redacted] Clewels, Fort Worth, Texas, reported at a later date, that he was driving with his brother in a car on the highway from Hurley to Fort Worth, Texas, at approximately 1900 hours, 30 January 1949, and saw a silhouette, green ball of fire moving from North to South in the West just prior to its apparent disintegration which occurred slightly North of the West and about 15 degrees North of the moon and 10 degrees lower than the moon. Just prior to disintegration the color changed from green to an orange-yellow and then to a deep red color. According to the observer the disintegration appeared similar to a rocket launch.

18. [redacted] was interviewed early in February by Mr. [redacted], since he discovered that [redacted] was on duty in the CIA Control Tower at Meacham Field, Fort Worth, Texas, during the time of the occurrence of the phenomenon and had observed it. [redacted]'s observations were referred to the control tower and from this it was determined that the indicated beginning point was approximately North 68 degrees West, true, at an altitude of about 13 degrees and that the end point was approximately due West but no altitude was determined due to extraneous lights in the vicinity of the air field. The duration of the observation was considered to be about 2.4 seconds. The color of the "fireball" was considered as similar to the green of the runway lights. [redacted] did not see any terminal flare.

19. On the night of 30 January 1949, Mr. [redacted] placed a telephone call to Big Springs Municipal Airport, Big Springs, Texas, and spoke to a Mr. [redacted] together with two others, was in the control tower at the air field and observed the phenomenon. His observations placed the beginning point at about 5 degrees West of North and the end point slightly north of West of Northwest. The exact direction was between 5 and 7 seconds. The altitude was considered to be about 20 degrees above the horizon. The course was from North to South.

20. Mr. [redacted] in an attempt to determine the end point of the "fireball" wrote to various individuals in the neighborhood of Pampa, Texas, for reports of the observation of the phenomenon, since according to his calculations the end point should have been observed from

that visibility as being "in the snow". Reports received from that area from individuals who had observed the phenomenon gave the end point as a 15 mile to the right and below the snow.

13. From this information and from other information furnished by Mr. [redacted] of Radio Station [redacted] Lawson, Texas, Mr. [redacted] has plotted the ground track as being from approximately Tolls, Texas to Tolls, Texas.

14. From correspondence in Mr. [redacted] file it appears evident that Mr. [redacted] has been contacted by Army or Air Force Intelligence Agents.

15. Mr. [redacted] has actively engaged in his examination of the study of substances for the past 13 years; consequently his interviews and deliberations are considered to be the best available source in this area. Mr. [redacted] has indicated his complete willingness to assist in reporting on any further questions or to furnish information on any past conversations which he may have in his files.

16. A report was received from [redacted] concerning his findings relative to the observation of 30 January 1949. In his report the description of the object agrees with those given for previous sightings, except that as the ground track of the object is approached, the color shifts from green to red or orange. The ground track extends from near Amarillo, Texas, to Loop, Texas, a distance of some 143 miles. The course is slightly west of due north. Well over a hundred interviews were considered in the development of data for the LAMB report, which is attached to and made a part of this report.

NOTE: The sub-judicial police given by both [redacted] and [redacted] agree to about ten miles. [redacted] evaluates the reports by Layman on the basis of the person's experience and probable ability to furnish accurate information as to altitude and direction. It is possible that [redacted] data is not so weighted, inasmuch as many of the sightings were obtained from Mr. [redacted], who gives equal value to all sightings, and those taken on average.

- PENDING -

Inclosures:

FOR COMMANDING OFFICER, FERRIS LAB

Report of [redacted] University of New Mexico, dated 21 February 1949

FOR HEADQUARTERS GBT

Report of [redacted] University of New Mexico, dated 21 February 1949

[redacted]

STANDARD OFFICE NO. 11, FERRIS LAB

Will report any further descriptions of aerial phenomena of this nature.

~~SECRET~~
UNCLASSIFIED
3 DEC 1975

AFCSI
Capt. Koch/lse/72231
Wrtn 2 March 49

OFFICE OF SPECIAL INVESTIGATIONS
THE INSPECTOR GENERAL

24-

SUBJECT: Request for Information Concerning Aerial Anomaly Sightings
SPECIAL INQUIRY

TO: District Commander
5th OSI District (IG)
Wright-Patterson Air Force Base
Dayton, Ohio

1. This office is in receipt of a query from the 17th OSI District Office, Kirtland Air Force Base, New Mexico for advice and assistance concerning the ever-increasing sightings of aerial anomalies in that area. The 17th District Office has further advised that they have received no instructions or equipment from Air Materiel Command to assist them in their investigations of these anomaly sightings. A representative from Air Materiel Command was to attend a conference on these matters at Kirtland Air Force Base on 16 February, 1949, but he did not appear.

2. In view of the foregoing information, it is requested that your office contact that section of Air Materiel Command that has been designated to monitor all reports of aerial anomaly sightings and request them to render all assistance and advice possible to the 17th District Office.

3. It is further requested that this Headquarters be advised of the action taken in this matter as expeditiously as possible.

FOR THE DIRECTOR:

WILLIAM M. TURNER
Lt. Colonel, USAF
Executive, Special Investigations
The Inspector General, USAF

~~SECRET~~
UNCLASSIFIED

CONFIDENTIAL

HQ USAF
THE INSPECTOR GENERAL
OFFICE OF SPECIAL INVESTIGATIONS
REPORT OF INVESTIGATION

FILE # 24-8 DATE: 9 MAR 49
REPT. MADE BY: JACK L. BOLING
REPT. MADE AT: Kirtland AFB
PERIOD: 16-19, 21 Feb. 1949
OFFICE OF ORIGIN: D.O.#17
STATUS: PENDING

TITLE: UNKNOWN (AERIAL PHENOMENA)

CHARACTER: SPECIAL INQUIRY

REFERENCE: Rept. of EDGAR J. BETHART, file 24-8, dated 9 February, 1949

SYNOPSIS:

Numerous persons were interviewed without result in and between Grants and Gallup, New Mexico, and Ganado, Arizona. [Censored] reported the sighting of a "fireball" at a point two miles east of Ganado. It was reported that two Indians had also sighted a "fireball". Their location was given as "east of Sheep Springs", the exact location of which is unknown.

Mr. [Censored], of Fort Worth, Texas, was interviewed in connection with information he had collected pertaining to the sighting of a fireball on 30 January, 1949.

Dr. La Paz reported his findings relative to the sighting of 30 January, 1949.

DISTRIBUTION:

CO, Kirtland AFB
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Hq OSI (Incl.) 2
File 2

ACTION COPY FORWARDED TO:

CO, Kirtland AFB

APPROVED:

A. C-MURELLE, II
Captain, USAF
Acting

24-185-49

CONFIDENTIAL

Office Memorandum • UNITED STATES GOVERNMENT

TO : DIRECTOR, FBI

FROM : SAC, SAN ANTONIO

SUBJECT: PROTECTION OF VITAL INSTALLATIONS
BUREAU FILE 65-58300

APPROPRIATE AGENCIES
AND FIELD OFFICES
ADVISED BY ROUTING
SLIP (S) OF deletem
DATE 3/23/49

DATE: March 22, 1949

Mr. Clegg	.....
Mr. Glavin	.....
Mr. Nichols	.....
Mr. Rosen	.....
Mr. Tracy	.....
Mr. Egan	.....
Mr. Gurnea	.....
Mr. Harbo	.....
Mr. Mohr	.....
Mr. Pennington	.....
Mr. Quinn Tamm	.....
Mr. Nease	.....
Miss Gandy	.....

CONFIDENTIAL

DECLASSIFIED BY SP-1 GSK/PSK
DN 2/8/63

** Flying Discs*

Re San Antonio letter to the Director dated January 31, 1949, which outlined discussion had at recent weekly Intelligence Conferences of G-2, ONI, OSI and FBI in the Fourth Army Area concerning "Unidentified Aircraft" or "Unidentified Aerial Phenomena" otherwise known as "flying discs", "Flying saucers" and "balls of fire". It is repeated that this matter is considered secret by Intelligence Officers of both the Army and the Air Force.

G-2, 4th Army, has now advised that the above matter is now termed "Unconventional Aircraft" and investigations concerning such matters have been given the name "Project Grudge".

G-2, 4th Army, advised on February 16, 1949, a conference was held at Los Alamos, New Mexico, to consider the so-called "Green fire ball phenomena" which began about December 5, 1948. It was brought out this question has been classified "secret" and that investigation is now the primary responsibility of the U.S. Air Force, Air Materiel Command, T-2.

Dr. LINCOLN LA PAZ of the University of New Mexico, discussed one ~~being~~ which he himself had made which was termed the "Starvation peak incident" and described the following characteristics which indicated that the phenomenon could not be classified as a normal meteorite fall.

1. There was an initial bright light (no period of intensity increase) and constant intensity during the duration of the phenomenon.
2. Yellow green color about 5200 Angstroms.
3. Essentially horizontal path.
4. Trajectory traversed at constant angular velocity.
5. Duration about two seconds.
6. No accompanying noise.

G.I.R.-7
~~SECRETED - PROTECTED~~

RECORDED - 40

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B
37 APR 1 1949

- md 33
- 2 cc: El Paso (100-4562)
- 2 cc: Dallas
- " " Houston
- " " Little Rock 1949
- " " Oklahoma City

File Five ENM
~~SECRETED - PROTECTED~~

DIRECTOR, FBI

March 22, 1949

It was brought out that since December 5, 1948 there have been more than ten incidents analagous to the "green fireball" above described and some twenty others with minor deviations from the above. It is also pointed out that the only sitings which had occurred seemed to have been confined to the Los Alamos, Las Vegas, and West Texas triangle.

G-2 also advised that as of November 1, 1948, information had been received from higher Military authorities that the Air Force had advised that such sitings occur periodically and that another period of sitings was then imminent. Further, on February 14, 1949, higher Military authorities advised that it was believed that ultimately it would be found that the phenomena in question have a natural explanation.

It is further noted that about 7:30 p.m., March 6, 1949, what was at first thought to be a flare was seen approximately one-half mile north of Killeen Base in the area of the Vital Installation at Camp Hood, Texas, and a second flare was noticed at 1:45 a.m., March 7, 1949, approximately three miles from Killeen Base. It has since been concluded that the flares seen near Killeen are probably similar to the phenomena previously noted in the Los Alamos, Sandia Base Area although these are the first sitings of such phenomena near Camp Hood.

There appears to be reason to believe that the above-mentioned phenomena may be connected with secret experiments being conducted by some U.S. Government Agency as it is believed that the United States is farther advanced in guided missile development than any foreign power.

Although the primary responsibility for investigating such matters is now with the U.S. A.F. Air Materiel Command, G-2, 4th Army is still interested in being advised of any further sitings of such phenomena which might be observed.

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON

THE INSPECTOR GENERAL USAF
17th DISTRICT OFFICE OF SPECIAL INVESTIGATIONS
KIRTLAND AIR FORCE BASE, NEW MEXICO

19 April, 1949

SUMMARY OF INFORMATION:

1. This is a comprehensive summary of all observations of unidentified aerial phenomena possessing similar characteristics which have been observed in the New Mexico- West Texas area. The common characteristics of most of the incidents are:

- a. Green color, sometimes described as greenish-white, bright green, yellow-green, or blue green.
- b. Horizontal path, sometimes with minor variations.
- c. Speed less than that of a meteor, but more than any known type of aircraft.
- d. No sound associated with observations.
- e. No persistent trail or dust cloud.
- f. Period of visibility from one to five seconds.

2. All of the incidents reported do not possess all of the above characteristics, but in each case one or more are present. In none of the reported incidents has any natural or man-made object been determined to be responsible.

3. The body of this summary consists of a tabulation of observations with notes attached to clarify or amplify certain of the more important observations. Note numbers 1, 2, and 3 are taken directly from reports compiled by Dr. Lincoln LaPaz, University of New Mexico. Dr. LaPaz is internationally known and respected as a meteoricist, and has taken a great interest in these phenomena.

4. The tabulation of sightings is not a complete record of all reported observations, but comprises only those in which interviews were conducted by OSI personnel. Many other persons were interviewed by Dr. LaPaz and his colleagues, but inasmuch as complete data is not available, these interviews are not taken into account in this summary. In addition, numerous reports have been received from individuals who could not provide sufficient information to warrant inclusion of such facts as they did possess. Any interview where the veracity of the interviewee was doubted was discounted in the preparation of reports for transmittal.

1 encl.

Tabular Summary w/ notes

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<u>Date</u>	<u>Time</u>	<u>Color</u>	<u>Course</u>	<u>Seen From</u>	<u>Seen By</u>
05 DEC 48	1930	Green	NE to SW	Las Vegas, NM	Civilian
05 DEC 48	2000	Green	N/S	Albuquerque, NM	Univ. of NM Student
05 DEC 48	2105	Green	N/S	Near Las Vegas, NM	Military Pilots
05 DEC 48	2115	Green	N/S	Las Vegas, NM	Civilian
05 DEC 48	2115	Green	N/S	" " " "	Civilian
05 DEC 48	2115	Green	N/S	Lucy, NM	Civilian
05 DEC 48	2127	Green	N/S	E. of Albuquerque	Military Pilots
05 DEC 48	2135	Green	N/S	Nr. Las Vegas, NM	Pilots, Pioneer Airlines
05 DEC 48	2200	Green	N/S	" " " " "	Civilian Pilot
05 DEC 48	2200	Red-White	NE to SW	Levy, NM	USAF Photographer
05 DEC 48	2200	Green	N/S	Onava, NM	Railway worker
05 DEC 48	2315	Green	N/S	Nr. Las Vegas, NM	Univ. of NM Student
06 DEC 48	2255	Green	N/S	Sandia Base	AEC Security Agent
07 DEC 48	2145	Green	N/S	Los Alamos	AESS Inspector
08 DEC 48	1835	Green	N/S	Nr. Las Vegas, NM	OSI Personnel
12 DEC 48	2102				
12 DEC 48	2102				
) This is Dr. LaPaz' sighting. Reference in the original document says "Note 1", however Note 1 was not attached at the time the document was released. Even so, this sighting has been previously covered in this compilation.					
13 DEC 48	2130	Note 2 (attached)			
13 DEC 48	2215	Green	N/S	20mi. E. of Las Vegas/Civilian	
14 DEC 48	0100	Green	N/S	Wagon Mound, NM	Civilian
20 DEC 48	2054	Note 2	Note 3(Not attached- presumed lost)		
22 DEC 48	0431	White	N/S	Los Alamos	AESS Inspector
06 JAN 49	0310	Green	E/W	Los Alamos	AESS Inspector
06 JAN 49	1730		Note 4(Not attached- presumed lost)		
30 JAN 49		Note 5(Not attached- presumed lost)			
14 FEB 49	1840(?)	White-greenish	NE to SW	Nr. Gando, Ariz.	Dr. Salsbury
17 FEB 49		Note 6(Not attached- presumed lost)			

SECRET

SECRET

<u>Date</u>	<u>Time</u>	<u>Color</u>	<u>Course</u>	<u>Seen From</u>	<u>Seen By</u>
27 FEB 49	1905	Green	W/E	Los Alamos	AESS Lieutenant
02 MAR 49	0010	Green	N/S	Los Alamos	AESS Inspector
03 MAR 49	0159	Green	Down	Los Alamos	AESS Sergeant
08 MAR 49	1835	White-greenish	275 to 289	Los Alamos	AESS Inspector
08 MAR 49	1835	Note 7	(Not attached- presumed lost)		
13 MAR 49	2153	Greenish-white	NE to SW	Sandia Base	MPs
27 MAR 49	1800	Note 6	(Not attached- presumed lost)		
05 APR 49	2200	Green	S/N	Los Alamos	AESS Inspector
06 APR 49	0005	Green	NW/SE	Los Alamos	AESS Inspector
07 APR 49	0100	Green	S/N	Los Alamos	AESS Inspector
07 APR 49	0135	Green	E/W	Los Alamos	AESS Inspector
12 APR 49	1930	White	E/W	Sandia Base	MP

NOTE #2*

INCIDENTS OF 13 AND 20 DECEMBER 1948:

The unusual feature of these two incidents is that there were reported two red lights trailing the green fireball. In each case observers agreed that the trailing lights retained a constant position with respect to each other and the green light. Also, these two sightings are the only ones of all the green fireballs where a sharp change of direction in the vertical plane was observed. One of these incidents, that of 20 December, was observed by Atomic Energy Security Service Inspectors, while the other was observed by a truck driver and his wife. That of 20 December was observed in the Los Alamos area, while that of the 13th of December was observed southwest of Las Vegas, N.M.

*Note #2 is apparently the only one of the seven notes cited in this compilation which has survived.

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