

**DETAILS SURROUNDING
A LARGE STATIONARY
AERIAL OBJECT
ABOVE MONTREAL**

by:

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Abstract

This paper describes the background and analysis of two color photographs and numerous eye witness descriptions of an angularly large stationary aerial object seen on November 7, 1990 between about 7:30 p.m. and 10:00 p.m. EST as it hovered over the downtown area of Montreal. Although the huge object was seen by between 40 and 75 people standing on the rooftop of the International Hilton Bonaventure Hotel (BH) (including policemen) and at ground level within a large area and was photographed by a newspaper journalist at the hotel's rooftop, there was no official follow-up or even general interest shown in the event by government officials. The original 35mm color negatives and positive color prints were subject to microscopic examination and to computer-based enhancements of various kinds. They were also related to the drawings and narrative descriptions of the object made by many eye-witnesses. The aerial object remains unidentified at this time.

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Chronological Order of Sighting Events

On Wednesday, November 7, 1991, at Montreal, the sun set at 4:28 local (EST) time.¹ The air was clear and cold. But a high relative humidity near the ground of approximately 95 percent gradually turned into a thin haze extending from the ground to an altitude of several thousand feet. There were only a few scattered clouds present at between 5,000 and 8,000 feet.

At 7:30 an author, age 34 (B.G.) and a Mr. P. Lachapelle, age 30, were in Old Montreal walking near the corner of Saint-Sulpice and de Brésoles Streets about ten city blocks ESE from the BH. They noticed many fire engines, police cars, and other emergency vehicles and commotion nearby which partially blocked the road; a practice fire alert was underway. Guénette happened to glance directly upward and saw a small greenish Aurora Borealis-like phenomenon with long streamers extending out from it; it did not move during the 30 to 60 seconds he looked at it. Both men felt that the phenomenon was at a very high altitude.

All of the rest of the original eye witnesses of the object were located on the 17th floor rooftop of the BH in central downtown Montreal, Quebec, Canada which boasts an outdoor heated swimming pool, and other facilities. An American woman tourist was swimming in the pool, she was the first to sight the strange lighted object in the night sky directly overhead at about 7:15. Later she described it as having an oval shape with a yellowish color. She then notified Mrs. L.S.P., age 32, the hotel's pool lifeguard who alerted the hotel's security officer, Mr. Albert Sterling, age 40, at about 7:30. He arrived at about 7:35 and also looked up at the large object hovering in the "almost cloudless sky" and soon (7:38) telephoned the Montreal Urban Community Police (MUCP) station number 25 for assistance. His first impression was that it was "...fallen debris from the sky, a satellite or other space object." He also tried to call Dorval airport to ask what the object could be but the line was busy.

Meanwhile between 7:30 and 7:35 Mrs. L.S.P. called the La Presse Newspaper office and also urged other guests to come outside to look at the apparition. Mr. Sterling said that the object was situated over the SE corner of the pool and that there were about 12 people present at that time. There were as many as 75 people present during the entire period the object was visible according to Mrs. L.S.P. At 7:55, after the object became brighter, Mr. Sterling telephoned the police station a second time.

At 8:00 the first of three journalists to be involved, Mr. Marcel Laroche, age 44, arrived from the newspaper La Presse.

Officer François Lippé, of the MUCP, was dispatched at 8:07 for the BH and arrived at about 8:11. He spoke with Mr. Sterling and looked at the object himself. Later (in MUCP file #25-901107-059) he described what he saw as three yellowish lights from each of which a single beam of light emanated. The object itself was luminous and round and did not appear to move.

Officer Lippé, Mr. Laroche, and Mrs. L.S.P. all saw a small ("Cessna type") private aircraft fly directly beneath the clouds and much farther below the object. Officer Lippé felt that the object was "...much higher than the plane" and Mr. Laroche estimated that the airplane was at an altitude of 1,200 feet above ground level (AGL). Mrs. L.S.P. and Mr. Laroche referred to the airplane as "minuscule" in relation to the aerial object.² Mr. Jules Béliveau, age 48, the second La Presse journalist who was present on the BH rooftop on November 7th, received a letter dated November 8, 1990 from a Mr. François Chevrefils who said that his friend (Mr. Jean —) witnessed the object sometime between 7:30 and 8:00 from his small airplane. Although he completed a MUFON sighting form he declined any further interviews and may not have been the pilot of the small aircraft that was seen.

At 8:15 a mother and her daughter driving on Champlain Blvd. in southwest Montreal near the Douglas Hospital reported seeing two large white spots of light in the sky along with a number of smaller lights which did not appear to move, and were silent. This sighting location is about 4.2 miles WSW from the BH.

Officer Lippé telephoned Sgt. Masson at 8:20 for backup and at 8:30 Sgt. Masson arrived at the BH rooftop. Overwhelmed by the appearance of the object, Sgt. Masson called the Royal Canadian Mounted Police (RCMP) at 8:44. Inspector Minkoff of the RCMP said that Investigator Luc Morin would be assigned to handle the case. Meanwhile, Officer Lippé telephoned the MUCP's District Director, Mr. Denis Paré, who immediately telephoned the RCMP for "in situ assistance". Officer Lippé also called the control tower at Dorval (Montreal International) airport. He was informed (at 8:52) that he was not the first to call about the strange object and that there was nothing seen on the airport radar. Almost simultaneously, Sgt. Letendre, telephone operator at the RCMP Operations Center, also called the Dorval airport and was referred to the Flight Path (Plans de Vol) Department.

Mr. Larocche returned to his car for his personal 35mm camera between 8:30 and 8:45 and returned to the rooftop of the BH.

At 9:00 Mr. J. Béliveau and Mr. R. Mailloux, both La Presse journalists, arrived at the BH. Later, Mr. Béliveau described seeing what is sketched in Figure 4. Because of the earlier telephone call by Sgt. Masson for more assistance, Mr. Denis Paré arrived at 9:00. Investigator Morin of the RCMP also was dispatched to the scene. However, before leaving his home he called Major Thompson (Commander of Military Operations of Canada's Department of National Defence, St-Hubert Base) to discover whether or not military operations were being held in the area. He was told "no".

Numerous other telephone calls were made by various parties between 8:55 and 9:00 which will not be recounted here.

It was between 9:00 and 9:05 that Mr. Larocche took the first of several photographs with his camera. When he realized that the conditions were so dark that the photograph might not come out he called a photographer at La Presse, using his cellular telephone, for advice; he was told to stabilize the camera on a bench nearby and use a 30 second "manual" exposure for Frame # 13.^{3 4 5} He took the second exposure, Frame # 14, about two or three minutes later.

- 2 Non-scheduled private airplanes must maintain a vertical clearance of at least 1,000 feet above the highest obstruction within a lateral radius of 2,000 feet. Mount Royal is the highest point near downtown Montreal (1,199 feet altitude) and is located 2 km NW of the BH. It has radio antennas on its top so that the minimum legal flight altitude is 1,200 feet AGL. In addition, private airplanes may not fly above 2,200 feet altitude unless the airplane is instrument flight rules (IFR) equipped and the pilot is rated to fly in instrument meteorological conditions (IMC) due to potential interference with air traffic to and from Dorval Airport. Most private pilots fly between 1,500 and 1,800 feet.
- 3 Author B.G. contacted Mr. Larocche on April 8, 1991 in order to inspect the photographs and negatives. Mr. Larocche said, "I have received no communications from any officials (Department of National Defence, RCMP, or MUCP) about any aspects of this event."
- 4 Mr. Larocche was employed by La Presse as a journalist and not as a photographer and, therefore, owns all rights to the photographs he took. Nevertheless, he has not tried to capitalize on this fact to date, over one year later.
- 5 Mr. Larocche mailed author R.H. the following frames of the same roll of film containing the two unidentified object frames (# 13 and # 14), as well as frame # 2 showing a man using a mallet to break a building stone, frame # 3 showing the same man laying a stone wall, and frame # 16 showing a swimming pool scene under very dark conditions. Frame # 15 was missing along with frames # 4 through # 12 and frames # 17 through # 24.

One of the two photographs was published with an article on November 8th in an edition of *La Presse*.⁶ The newspaper article stated: Mr. Sterling described a lighted object with six lights on the perimeter of a large circle with a ray of light emitted from each one. Most witnesses described the rays as white while some also claimed they saw blue, yellow, and red lights.

Having been called at his home, RCMP Faction Officer, Inspector Luc Morin (General Inquiries Department, RCMP) arrived at the BH at 9:30 and also saw the object; his description of the object is very similar to that shown in Figure 2A. About this time all three of the journalists left for their offices at *La Presse* to write the article which appeared on 8 November. Personnel from the Quebec Provincial Police (QPP) and the Canadian Security Intelligence Service (CSIS) may also have been present, along with RCMP and MUCP, according to a witness who was qualified to make this observation.

Also present on the rooftop at 9:40 was a BH client, an Air Canada pilot. He remarked that he estimated the altitude of the object was between 8,000 and 10,000 feet although the cloud ceiling was about 3,500 feet at the time.

Thoughtfully, Officer Lippé contacted the superintendent of a 45 story commercial building being built across the street to the West from the BH (at 1000 de La Gauchetière, the tallest building in Montreal) to turn off all of the intense construction lights which were located on the top of a construction crane. As expected, no influence was noticed on the appearance of the object when these lights were extinguished. There is no possibility that the object was a direct or indirect result of these construction lights shining upward onto the bottom of clouds due to the very great difference in cloud base height above the top of the building. Likewise, the calculated angle (from vertical) from the top of the BH to the top of the 45 story commercial building was about 60 degrees which is much lower than the object.

As Officer Lippé was telephoning Lt. Proulx of the MUCP's Survey (Surveillance) Department at 9:45 for a video camera to be brought to the BH, Officer O'Connor of the MUCP's Judicial Identity Department arrived in order to take photographs with his 35mm photographic camera.⁷ None were taken, however, because "the clouds were too thick", even though the object was still faintly visible to the eye. It is interesting to note that this gentleman did not try to obtain a low contrast image, using a very long exposure (as the journalist had successfully managed to do).

Investigator Morin telephoned the Montreal Headquarters of the RCMP at 9:58, some 28 minutes after he first saw the object, to request more assistance in order "...to solve this mystery." Mr. Morin stated that the object disappeared from sight at about 10:10 due to increasingly dense cloud cover. If true this suggests that the object remained at a constant altitude while the cloud base became lower and lower; this is impossible to verify. The cloud base was about 3,600 feet above ground level (AGL), very opaque and from four to five thousand feet thick when the object was last seen. Mr. Sterling (later) estimated that by about 10:00 the object had moved to a position above the NW corner of the pool.⁸

6 This article was authored by Mr. Jules Béliveau and Mr. Marcel Laroche and was entitled "Un OVNI dans le ciel de Montréal?" appearing on page A3.

7 Officer Michel Côté of the MUCP Survey Department arrived at the hotel at 10:20 with a camcorder but the object was no longer visible so he left again.

8 Mr. Sterling's estimate of the visual (angular) size of the object's body (see Table 1) is inconsistent with his statement that the object moved from the SE to the NW corner of the pool during the course of the entire sighting period. If the object was at an altitude of even 3,000 feet and subtended an angle of 20 degrees it would be 1,058 feet across. A horizontal movement of such a large object of only 65 feet, the diagonal dimension of the swimming pool, is only six percent of the object's width. This very small movement extended evenly over a 2.5 hour period very likely would be perceptually invisible. It is more likely that his estimate of the object's position was in error and influenced by where he was standing when he made these judgements.

Officer Morin, of the RCMP, left the BH at 10:15. All of the MUCP policemen left at 10:30.

A Mr. Pierre Caumartin, age 31, said that while he was driving home from work between 10:30 and 11:00, he saw some "very odd lights, a strange luminous object in a boomerang shape, low in the sky, at about the level of clouds". Its lights were "very big and strong". He thought that it may have illuminated the interior of his car. Upon arriving near his home in the eastern section of Montreal, not far from the Longue-Pointe Military Base, he watched the object hover near the Hydro-Quebec, Longue Pointe, electrical power station which received 120,000 volts. When he got out of his car he heard a "purring" sound and thought the object was a dirigible with only the gondola visible below the cloud base. His total sighting lasted from ten to fifteen minutes.

A power failure (hors tension) was experienced on November 7, 1990 between 11:08 and 11:50 at the Longue-Pointe Military Base (LPMB).⁹ The base is fed by a 12,000 volt lead from the Hydro-Quebec Longue-Pointe power station. It is the only one which broke down.

A check of the operating records of telecommunications networks, amateur radio operators, and telephone circuits during the evening of November 7, 1990 did not uncover any unusual amount of malfunctions.

In summary, all of the professionally trained eye witnesses inspected the luminous, stationary object for between 1 and 2.5 hours yet no one was able to obtain any photographic, magnetic, radio frequency, microwave radiation, or other "hard" evidence of the aerial object, or even request that an aircraft be sent up to investigate. One must ask how long an unusual aerial phenomenon must remain stationary and in plain sight in order to evoke an adequate scientific and/or technical analysis response. This is yet another reason why traditional science has not become involved in UFO studies.

9 The LPMB, which is part of the Montreal Canadian Forces Base, supports three military schools and the biggest military supply and repair installations in Canada (the 25th Dépôt d'approvisionnement and the 202nd Dépôt d'ateliers). The LPMB facilities include 11 warehouses (77,000 cubic meters each) and 8 exterior storage emplacements covering the equivalent of 30 football fields. No one at the base could be found who saw the aerial object on November 7th.

Eye Witness Descriptions and Drawings of the Object

In this section a total of six drawings are presented in the order in which they were made. Mrs. L.S.P., who was the second person to see the object was the first to describe the oval outline of eight separate lights to MUCP Officer Lippé, of station 25, at about 8:12. Since he had also seen the object it is likely that his sketch (made on her behalf) was as much his own sketch of the object (cf. Figure 1). She was quoted in the MUCP report as saying "it looked like what was seen in the film Close Encounters of the Third Kind."

Figure 1 (A)

Drawing of aerial object by Mrs. L.S.P. as appeared on police report and as drawn by Officer Lippé on November 7, 1990.

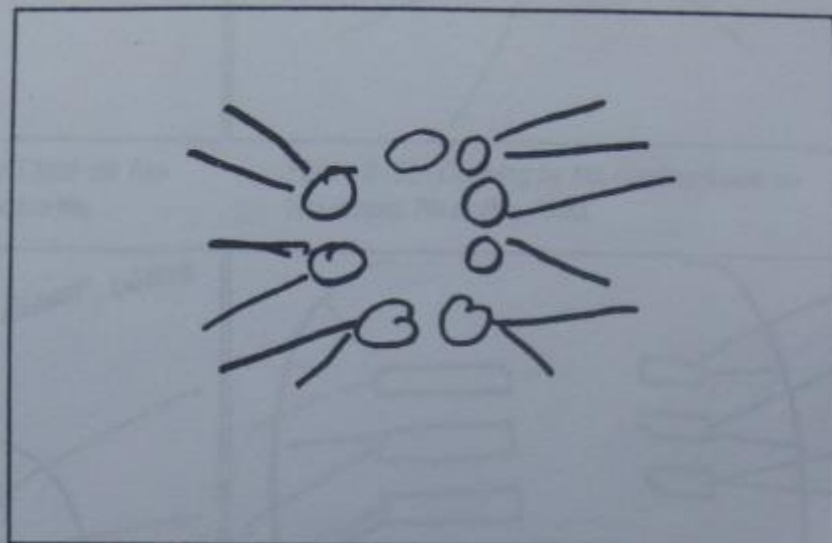
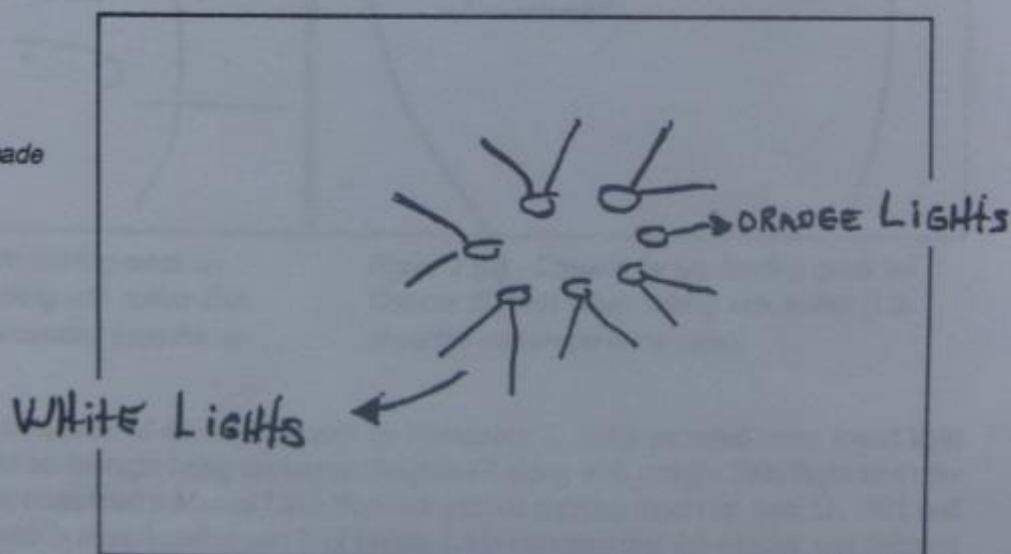


Figure 1 (B)

Mrs. L.S.P.'s own sketch made on November 29, 1991.



The second eyewitness to produce a description (and subsequent police report drawing) was Mr. Sterling. The policeman's sketch of the shape which Mr. Sterling remembered seeing is reproduced in Part (a) of Figure 2. Part (b) and (c) were drawn by Mr. Sterling himself on October 29, 1991, from memory. Note the difference in the number of light sources. He felt that there were from six to nine separate, intense white ("as from a welding arc", according to Mrs. L.S.P.) light sources around the edge of the object, each emitting a pencil of light. These luminous rays were not oriented vertically but seemed to be directed out horizontally from the object. He also offered the opinion that the object was "something made, it was something artificial, not human."

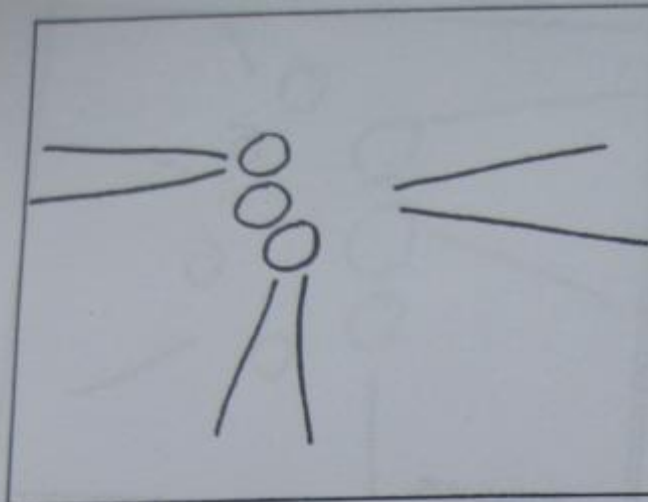


Figure 2 (A) - Drawing by Officer Lippé on November 7, 1990 as part of official police file.

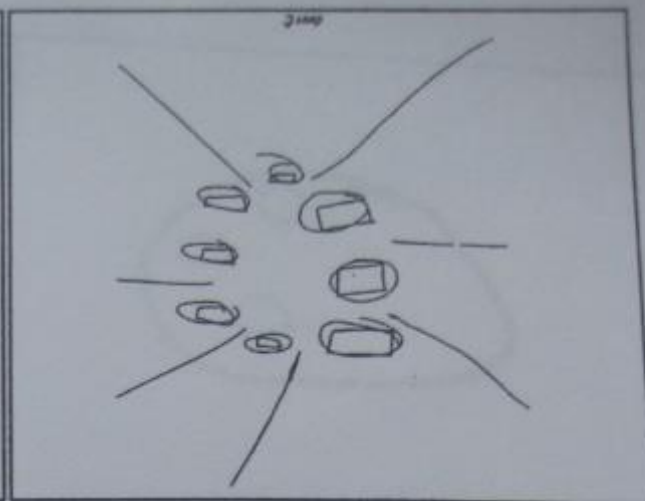


Figure 2 (B) - Drawing by Mr. Sterling made on November 7th or 8th, 1990.

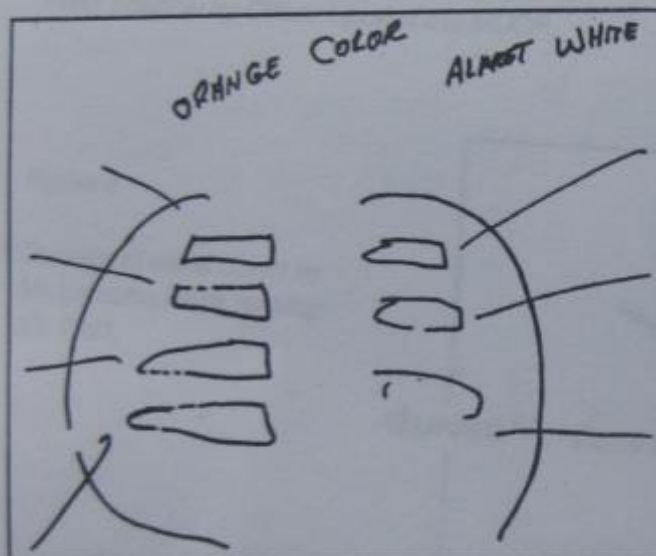


Figure 2 (C) - Drawing by Mr. Sterling made on October 29, 1991 when talking with author B.G. about the pencils of light emanating from the object.

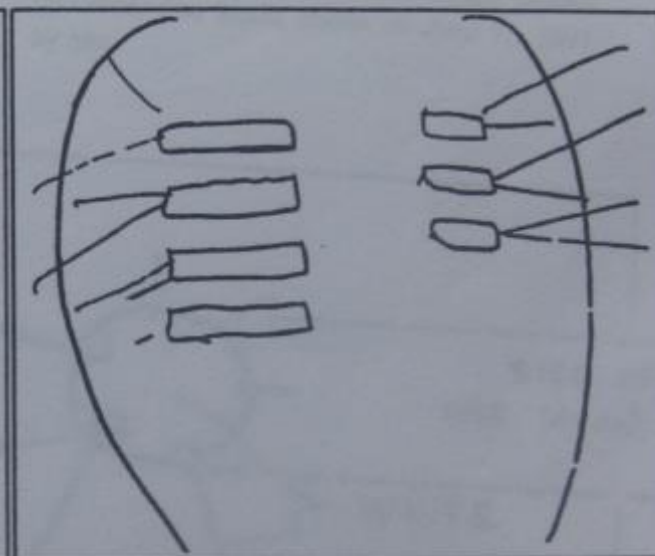


Figure 2 (D) - Drawing by Mr. Sterling made on October 29, 1991 when talking with author B.G. about the oval shape of the object.

RCMP Investigator Luc Morin's sketch of the object (made on November 7, 1990) included seven round light sources in an oval with the three on the right being the largest (brightest?) along with straight lines (light rays) extending out from the object. He completed a Mutual UFO Network general sighting report on June 11, 1991 and made a sketch of the object which is reproduced in part B of Figure 3. He indicated that the weather was overcast and that the object was an oval with three light sources on it.

On May 23, 1991 Mr. Marcel Laroche drew a sketch of what he saw between 8:00 and 9:30 from the roof of the BH. It is reproduced in Figure 4. He described it verbally as appearing round, white with six or more smaller round lights the color of orange or a sunset color and about the angular diameter of the full moon (i.e., 32 min arc). It remained above him the entire time. He heard no sound at any time. It is interesting to note the direction of the rays from the three circular areas (light sources?) since they are not all pointed in the same direction. Does this suggest that there were other sources of light which produced the ray pointing to the right?

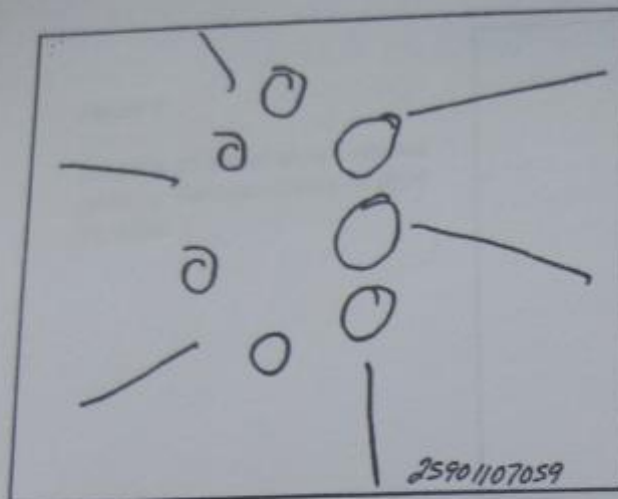


Figure 3 (A) - Drawing of aerial object included in the RCMP report, drawn on November 7, 1990, possibly by Officer Lippé of the MUCP.

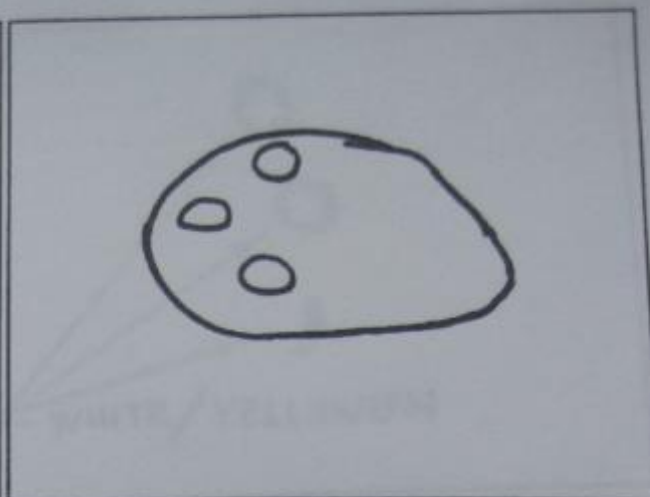
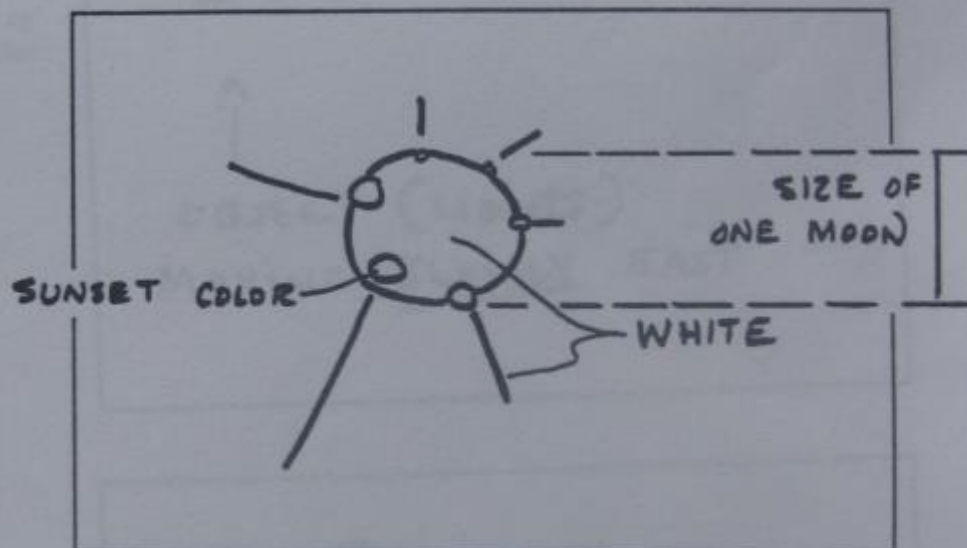


Figure 3 (B) - Drawing of aerial object viewed by Officer Luc Morin, drawn on June 11, 1991 by him.

Figure 4

Drawing of aerial object by Mr. Laroche, made on May 23, 1991.



Another newspaper journalist present was Mr. Jules Béliveau. Figure 5 is his sketch of the object which he made on April 22, 1991. He remarked that it was round with at least six round white lights around its edge. These edge lights were white or yellowish. Note that he only drew three of the edge lights in his sketch for some unknown reason.

As previously described, Mr. Pierre Caumartin, a film and video producer, also sighted the object while driving home after 10:00. He drew two sketches of the object (Figure 6) which represents its appearance over a 10 to 15 minute-long period at a location about 7.4 miles ENE of the BH.

Figure 5

Drawing of aerial object viewed by Mr. J. Béliveau, made on April 22, 1991.

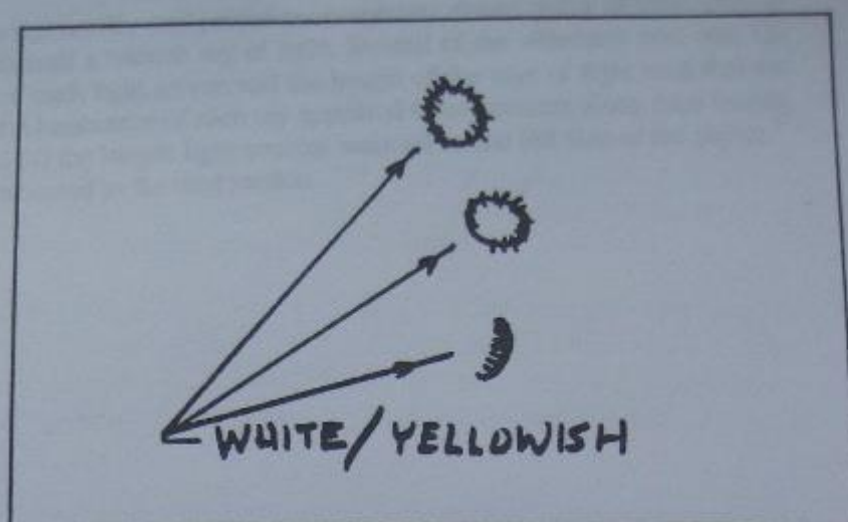


Figure 6 (A)

Drawing of aerial object, made on October 31, 1991, as seen by Mr. Caumartin during his first sighting.

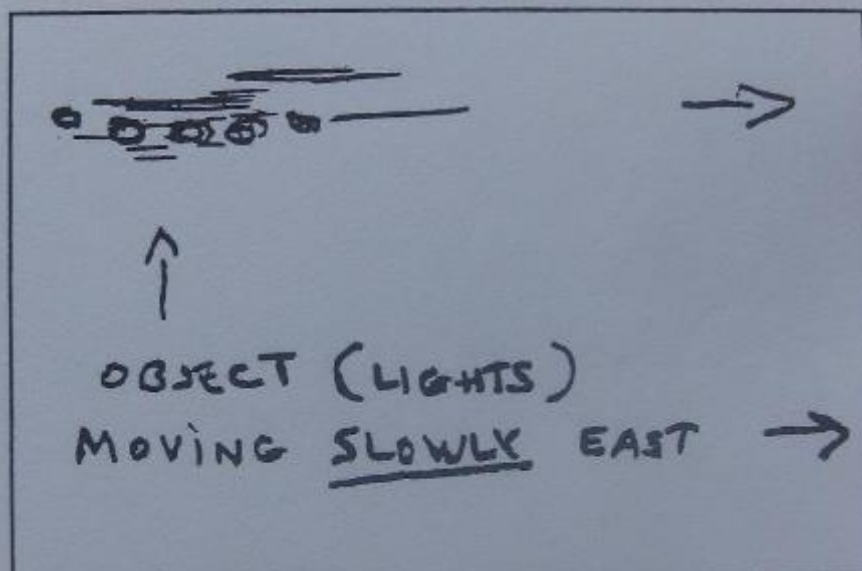
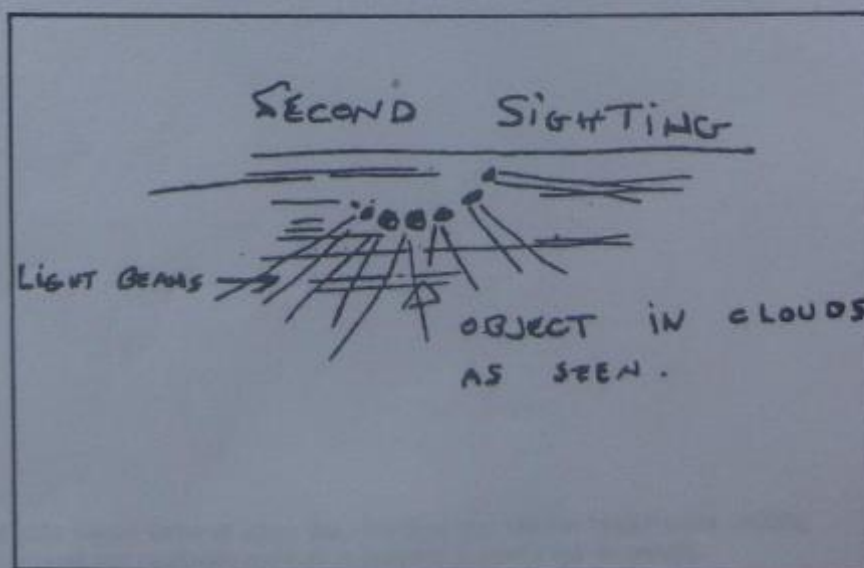


Figure 6 (B)

Drawing of aerial object, made on October 31, 1991, as seen by Mr. Caumartin during his second sighting.



When all of these directions have to coexist in a generally well-ordered or completely ordered stage of three there is slight small round light sources each of which emit a white ray of light. Instead of the continuous ray that (1) there was a direct relation between the size of each light source and the length of the ray of light such that the larger the diameter the longer each ray (2) the brightness of each ray appeared to be constant along their length, (3) each ray began and ended "abruptly", and (4) the longer light sources were all on the left side of the stage. See what the photographs show? This is discussed in the next section.

10. Of course, which is the left or right side would depend upon the direction the vessel moved while rotating vertically upward. That is, these statements are mutually consistent in helping to orient the drawings.

Photographic Evidence

Camera, Lens, and Settings: A Nikon model FS 35mm single lens reflex camera was used. It was fitted with a 50mm (f 1/1.8) Nikon series E lens (S/N 2876286) and set to infinity focus. The relatively dark sky required that a long exposure be used with the camera stabilized on a bench during the exposure.

Film and Processing: A roll of Astral color 35mm film (ASA100) was in the journalist's camera before he arrived at the BH. Frames # 1-3 contained scenes of a laborer working. Frames # 4-12 and # 15 were underexposed and showed nothing. The remainder of the roll wasn't exposed. Figure 7 shows the spectral density (A) and characteristic curve (B) for this film. The film was processed at the La Presse facilities at between 10:00 and 11:00 on November 7th as the story was being written.

Figure 7 (A)

Spectral density for Astral color film

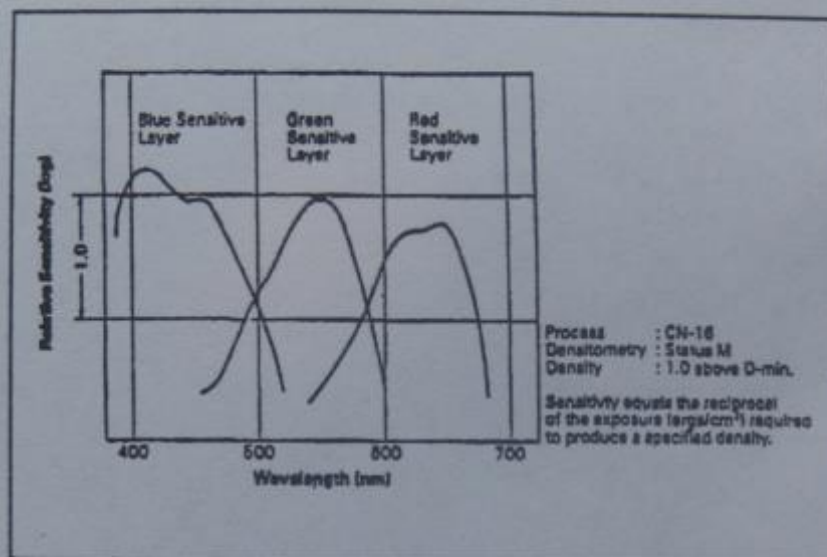
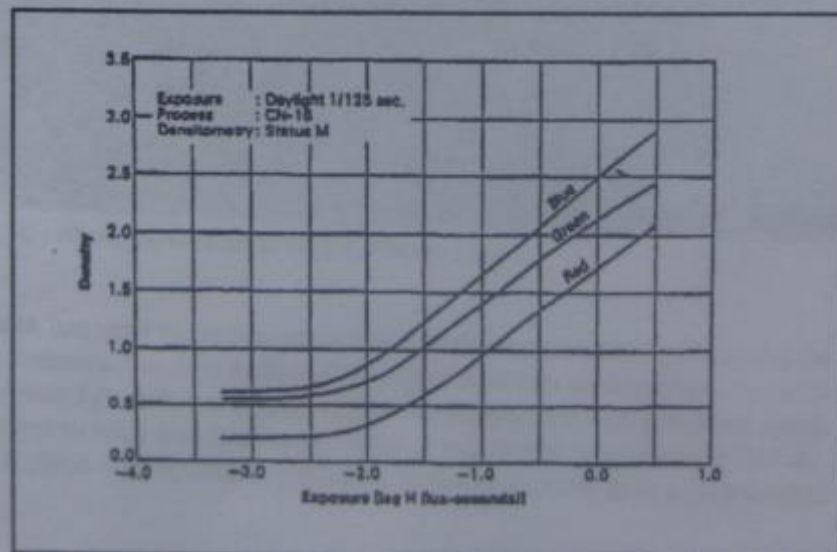
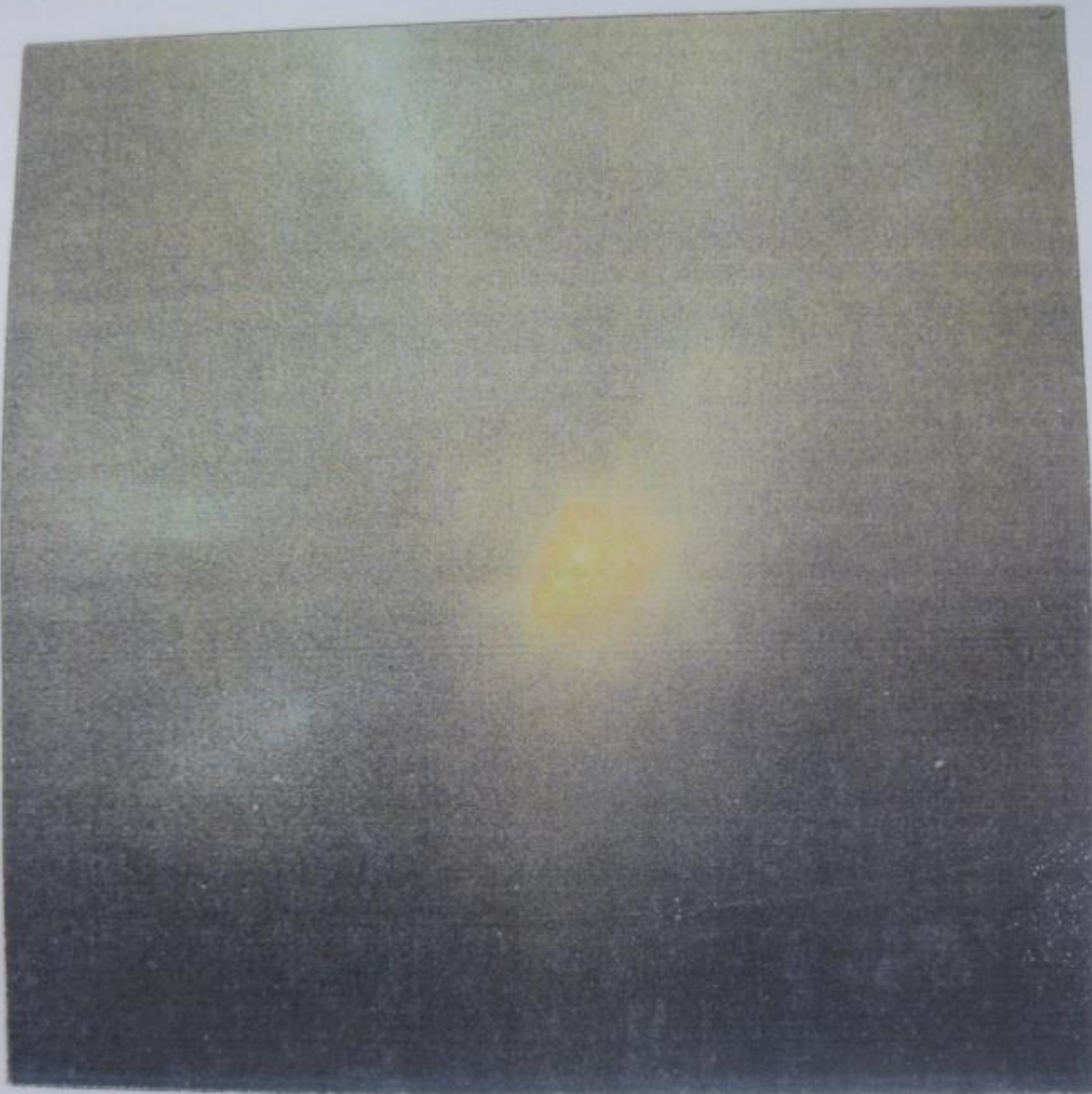


Figure 7 (B)

Characteristic curves for Astral color film.



The Photographs: Figure 8 (A) is a color reproduction of the first photograph taken by Mr. Laroche at 9:10 .



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Figure 8 (A) - Photograph of aerial object (Frame 13A).

Referring to part (B) of Figure 8, the faint, luminous radial rays are clearly lens flares (reflections) produced at the air-glass interface of the objective lens elements. The faint outline of the object itself can be determined by virtue of the location of the innermost ends of each light area and is estimated by the dashed oval with a width to length ratio of about 0.66. This ratio is equivalent to what would be seen if a circle was tipped at an angle of 33.5 degrees arc to the line of sight. This oval shape corresponds in general to at least six of the drawings presented above.

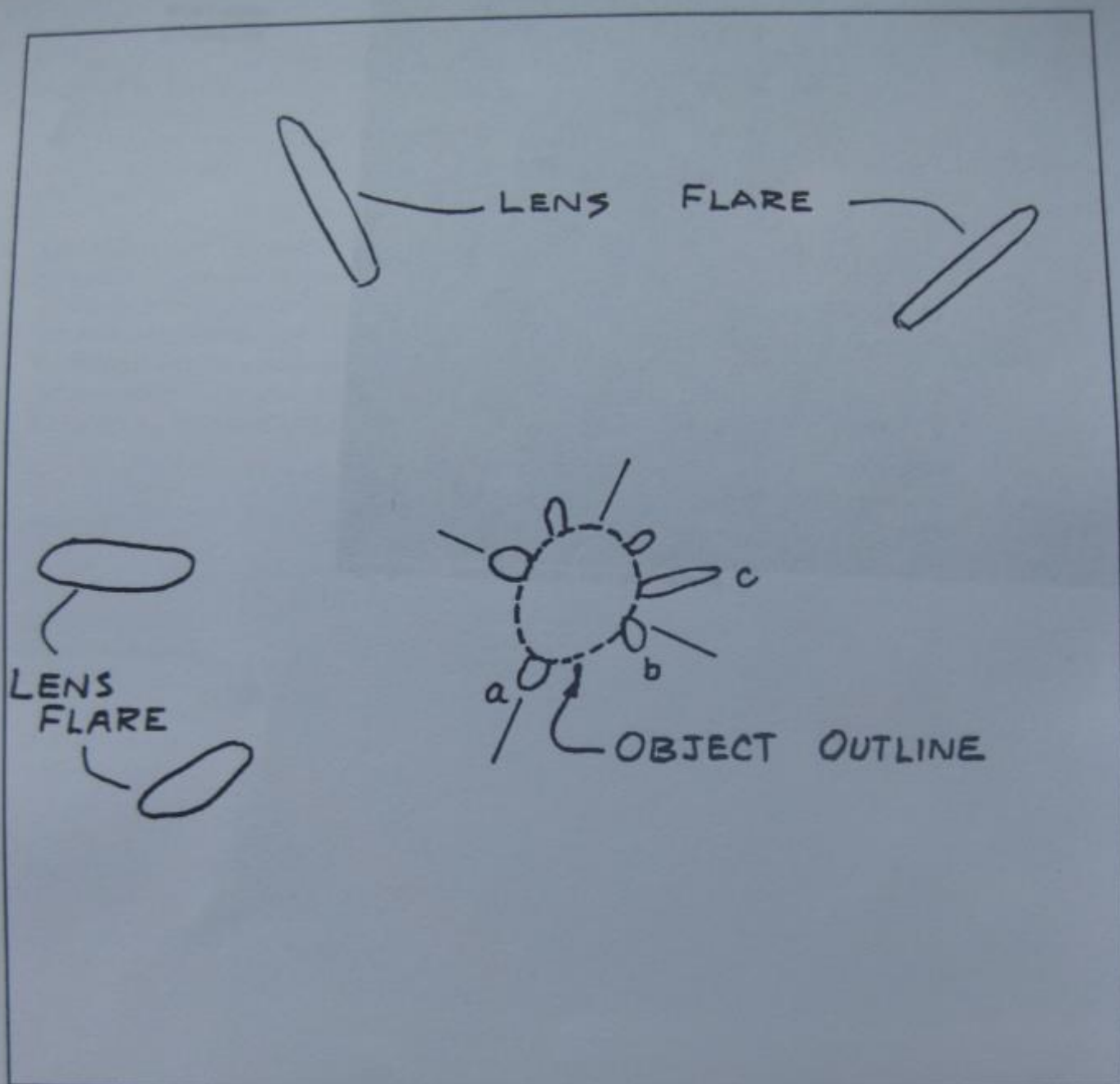


Figure 8 (B) - Descriptive drawing of probable object outline (on Frame 13A).

The second photograph taken by Mr. Laroche is presented in Figure 9 from the original color negative. It was taken at about 9:12, again with the camera shutter held open manually for slightly less than 30 seconds. It clearly shows the three luminous sources on the same side of the object and with the same relative luminosity as shown in Figure 4 but without the prominent lens flares.

Figure 9

Photograph two of
aerial object
(Frame 14).



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Photo-Negative Analysis and Results

Frames # 13 and # 14 were enlarged to 8" x 12". The distance between the two luminous areas that are farthest apart from one another on the image = 0.370" and 0.384", respectively, suggesting either that the object decreased in altitude, tipped in angle, or physically changed in size between the time the two photographs were taken. For a lens focal length of 50mm, the angular width of the frame = 40 degrees (Neblette, 1965, pg. 13). Thus, the angular distance between the two farthest light sources on the object = 1 degree 14" arc in frame # 13 and 1 degree 17' in frame # 14.

The original color negatives were digitized using a Perceptics "NuVision" image scanner/digitizer system, manipulation program and dedicated processor. Figure 10 is a photograph of a color enhancement which emphasizes subtle image brightness differences using two primary colors (green for background brightness and reds for object-related luminance). It shows clearly that the three brightest lens flares on the left side are only about 1/10th the brightness of the central area. A Nikon 50mm (f/1.1) lens contains nine separate glass lens elements which can yield numerous internal reflections (Neblette, 1965, pg. 106). The central area of maximum luminance is on the right in the form of an oval surrounding the disc's image.

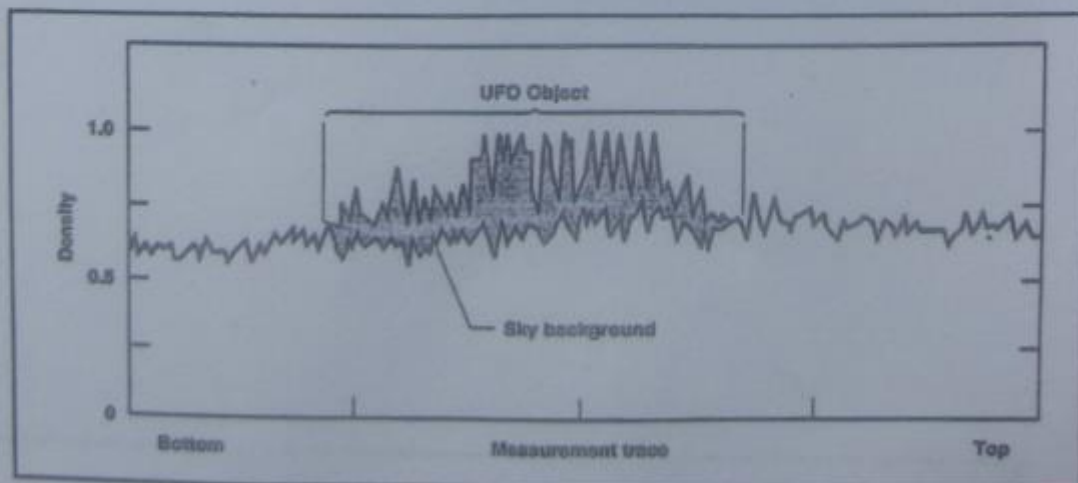
Figure 10

Computer enhancement of Frame #13 to emphasize subtle image brightness differences using a three dimensional luminance array.

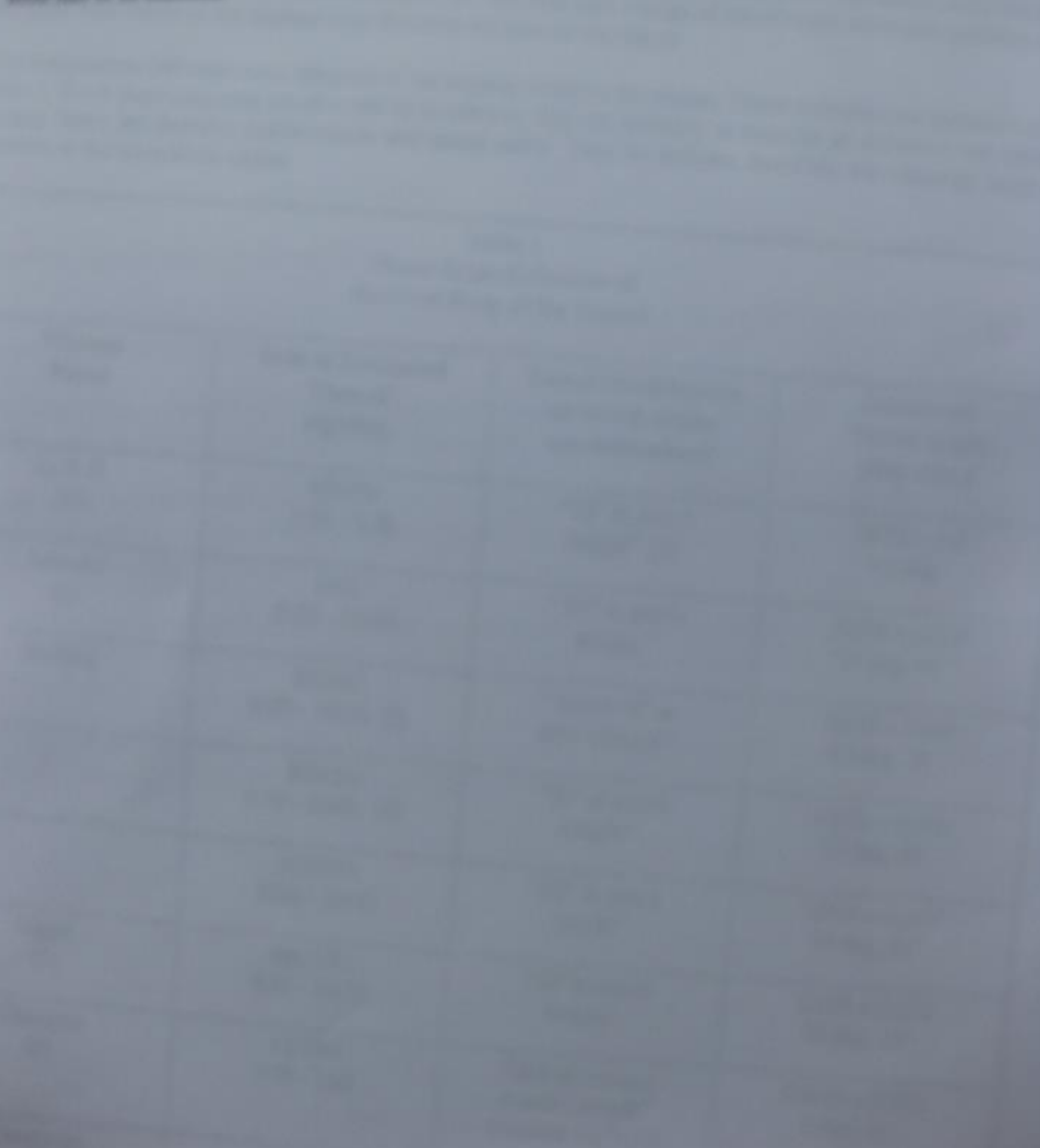


Figure 11

Densitometry scans across sky background and through object.



The profile of optical density was determined for the film photograph taken by the camera along the specified angle from the camera across the sky background in half of the time interval after sunset is shown in Figure 10. The resulting optical density for this "sky background" is shown by the broken curve in Figure 11. Note that the sky density ranges from 0.2 to 0.7 while density ranges from 0.5 maximum thickness to 1.0 maximum brightness and is relatively flat indicating that the thickness of the film was almost constant. This is what would be expected from ground light reflecting off fog and clouds. The second curve passed through the three constant areas in Figure 8. The broken curve shows the change in optical density produced by the ground object and is shown by the shaded area in Figure 11. It can be seen that the object is so bright that it obscures the sky and is even half of its diameter.



Comparison of Visual and Photographic Measurements of the Object's Visual Angle

If the angular size and distance to the aerial object can be determined then its physical size can be calculated. While humans are not good estimators of distance or angles when using their memory of an earlier event (Haines, 1980), knowledge of approximate cloud height (+/- 500 feet) and a range of visual angle estimates establish useful upper boundaries on the distance (and therefore the size) of the object.

Five independent estimates were obtained of the angular width of the object. These estimates are summarized in Table 1. Since these estimates are all made from memory they are probably in error by an unknown but variable amount. Some are probably overestimates and others under. They do indicate, however, the relatively large appearance of the silent aerial object.

Table 1
Visual Angle Estimates of
the Oval Body of the Object

Witness Name	Date of Estimated Time of sighting	Stated Size/Distance on which angles are determined	Calculated Visual Angle (deg. min.)
L. S. P. (1)	9/24/91 7:30 - 9:30	"18" at arm's length" (2)	$18/18 = 1.0$ 45 deg.
Laroche (1)	9/91 8:00 - 10:00	"10" at arm's length"	$10/19 = 0.526$ 27 deg. 45'
Sterling	8/23/91 8:00 - 10:00 (3)	"about 18" at arm's length"	$18/19 = 0.947$ 43 deg. 28'
	9/24/91 8:00 - 10:00 (4)	"10" at arm's length"	$10/19 = 0.526$ 27 deg. 45'
	10/29/91 8:00 - 10:00	"18" at arm's length"	$18/19 = 0.947$ 43 deg. 28'
Lippé (5)	10/15/91 8:12 - 10:30	"12" at arm's length"	$12/19 = 0.632$ 32 deg. 19'
Guénette (6)	11/7/90 7:30 - 7:45	"one or two cm at arm's length" (assume 0.6") (7)	$0.6/19 = 0.032$ 1 deg. 50'
Caumartin (8)	10/31/91 10:30 - 10:45	"3 or 4 inches at arm's length"	$4/19 = 0.211$ 11 deg. 55'

The large differences in estimated angle is not uncommon in sighting cases such as this one and is the result of one's emotions at the time, prior training and experience in making such estimates, and errors in carrying out the estimating procedure. Nevertheless, it is believed that a reasonable lower bound for the angular size of the object's central "oval body" as seen from the roof of the BH is 27 degrees arc. If the main body of the object subtended an angular width of 27 degrees and was at 3,500 feet altitude it would be 1,783 feet across! If it was at 9,000 feet altitude when the Air Canada pilot saw it at 9:30 it would have been 4,586 feet across, however, the clouds were becoming thicker and lower and probably would have prevented it from being seen at such a great altitude.

Notes:

- (1) Both witnesses estimated that the total distance from one end of a light ray to the end of the opposite light ray was 54" to 60" at arm's length which is equivalent to 112 degrees 40' arc!
- (2) Assume arm length = 19" (males); 18" (females).
- (3) Assume angle estimate is made at 8:00.
- (4) He estimated the total distance from one end of a light ray to the end of the opposite light ray was 54" to 60" at arm's length which is equivalent to 112 degrees 40' arc.
- (5) The visual angle equivalent to the entire luminous phenomenon (ray tip to ray tip) was about 36" at arm's length which is equivalent to an angle of 87 degrees arc!
- (6) Witness was at Saint-Sulpice and de Brésoles Streets at ground level about a mile from the BH and the aerial object was seen directly above him. This visual angle is remarkably close to the measured visual angle obtained from the two photographs.
- (7) It is likely that the witness only saw one of the pencil rays due to his vantage at street level where the nearby buildings blocked his view. He described what he saw as a light green stationary area something like an Aurora Borealis.
- (8) Viewing location was at the corner of St-Donat Avenue and Roi-René Boulevard about 7.4 miles from the BH. He estimated that the object was only 7 or 8 blocks away from him at that time.

Locale Details

As shown in Figure 12, the city of Montreal lies on Montreal Island at the confluence of the Saint Lawrence River and Ottawa River and stretches generally NE to SW. Its highest point is Mount Royal (altitude = 1,200 feet MSL with a radio tower at its top). It is located in central Montreal only 1.3 miles N of the BH. Dorval International Airport is located about 8 miles SSW of the BH and Mount Royal.

Figure 12

Map of Greater Montreal Area.



Radar

The Dorval International Airport radar (type ASR5) was operational on the evening of November 7th, according to Mr. Alain Jacques, Director of the control tower. Its nominal range is seven miles between an altitude of 1,200 to 2,000 feet altitude, 40 miles between 2,000 feet and 17,000 feet, and 125 miles above 17,000 feet. If the object had been below an altitude of about 450 feet AGL at the BH it would have been hidden from the radar beam by hills and buildings situated between the airport and the BH. Measurement of the cloud base altitude showed that the object must have been at or below about 6,000 feet altitude at 7:30 when it was first seen which would have made it well within the radar range coverage. The minimum beam elevation angle for this altitude would only be 8 degrees 10' arc.

Mr. Jacques said that his personnel had been contacted (by the RCMP) about possible radar contact with an airborne object over Montreal to the east of the airport. He said that no radar contact was made at any time that night and, "...if an object was present...it must have been stealth."¹¹ Nothing was seen on the radar controlled by the Montreal (Air Traffic) Control Center.

Table 2
Related Weather Conditions
at Dorval Airport

Time (GMT)	Temp. (deg C)	Pressure (deg Hg)	Wind Direction	Wind Speed (km/hr)	Relative Humidity (%)	Cloud Height (ft)	Cloud Type
2000	-10	1013.0	040	10	95	400	CU
2100	-10	1013.0	040	10	95	400	CU
2200	-10	1013.0	040	10	95	400	CU
2300	-10	1013.0	040	10	95	400	CU
0000	-10	1013.0	040	10	95	400	CU
0100	-10	1013.0	040	10	95	400	CU
0200	-10	1013.0	040	10	95	400	CU
0300	-10	1013.0	040	10	95	400	CU

¹¹ This comment was made in February 1991 by telephone to author B.G. The object could not have been a U.S. stealth type aircraft because there are no such vehicles that can hover silently, the U.S. F-117A airplane is only 65.92 feet long and would subtend an angle of 0.00015 degrees at 100 miles.

Weather and Astronomical Conditions

The weather was generally clear at 7:30 around greater Montreal on the night of the event with a thin layer of scattered clouds at 6,700 feet above ground level. Visibility was 15 miles. At 8:00 the air temperature was -1 degree C near the ground and the wind was 4 km/hr out of the West. While the temperature only dropped one degree over the next two hours the wind increased to 9 km/hr from the North-West (variable). A cold front, featuring a narrow band of snow, was approaching Montreal from the West. This weather system passed through Montreal overnight and moved rapidly to the East. Air pressure remained at 101.53 kilopascal between 8:00 and 10:00. By 8:30 there was a scattered layer of clouds at 3,000 feet and an overcast layer at 4,500 feet. By 9:30 the cloud ceiling had lowered to 3,400 feet and continued this way with only minor variations until 11:00. It had not rained at the Dorval airport since noon on the previous day (a total rainfall of 0.84 inches; the ground was still damp on the seventh). Light snow began to fall at 10:21 and continued for several hours at Dorval Airport.

Table 2 presents a summary of key weather details for November 7, 1990 at Dorval International Airport which is located about eight miles West of the BH.

Table 2
Selected Weather Conditions
at Dorval Airport

Time (local) (p.m EST)	Air		Wind	Humidity		Dew Pt.	Cloud
	Temp. (deg. C)	Pressure (kpascal)	Direction	Speed (km/hr)	Relative (pct.)	0.1 deg. C	Base (AGL)
6:00	4		W	4	64	-56	sct. clouds
7:00	-3		W	6	64	-59	5,200 ft.
8:00	-6	101.53	W	4	69	-57	5,200 ft.
9:00	0	101.53	WNW	4	69	-52	4,200 ft.
9:30							3,500 ft.
10:00	0	101.53	NNW	9	69	-52	3,600 ft. (1)
11:00	-2		NNW	9	74	-41	n/a

(1) The clouds were developing into very opaque, thick snow clouds from 4,000 to 5,000 feet thick.

Figure 13 presents atmospheric data collected on November 8, 1990 obtained from the Atmospheric Environment Service - "Environment Canada" for the Maniwaki station (7034480) located 206 km NW of Montreal. As can be seen, air pressure decreased regularly with increasing altitude while air temperature shows a decrease from

ground level up to about 26,000 feet altitude followed by a small (five degree C) increase over the next 12,000 feet altitude. Relative humidity decreased from 89 percent to 22 percent somewhat irregularly from ground level to 35,000 feet altitude. Winds shifted gradually from the NW to WSW and increase in magnitude with increasing altitude. There is nothing about these particular meteorological conditions that could produce an optical effect of the kind described by these witnesses. No lightning was reported at any time in the entire region.¹²

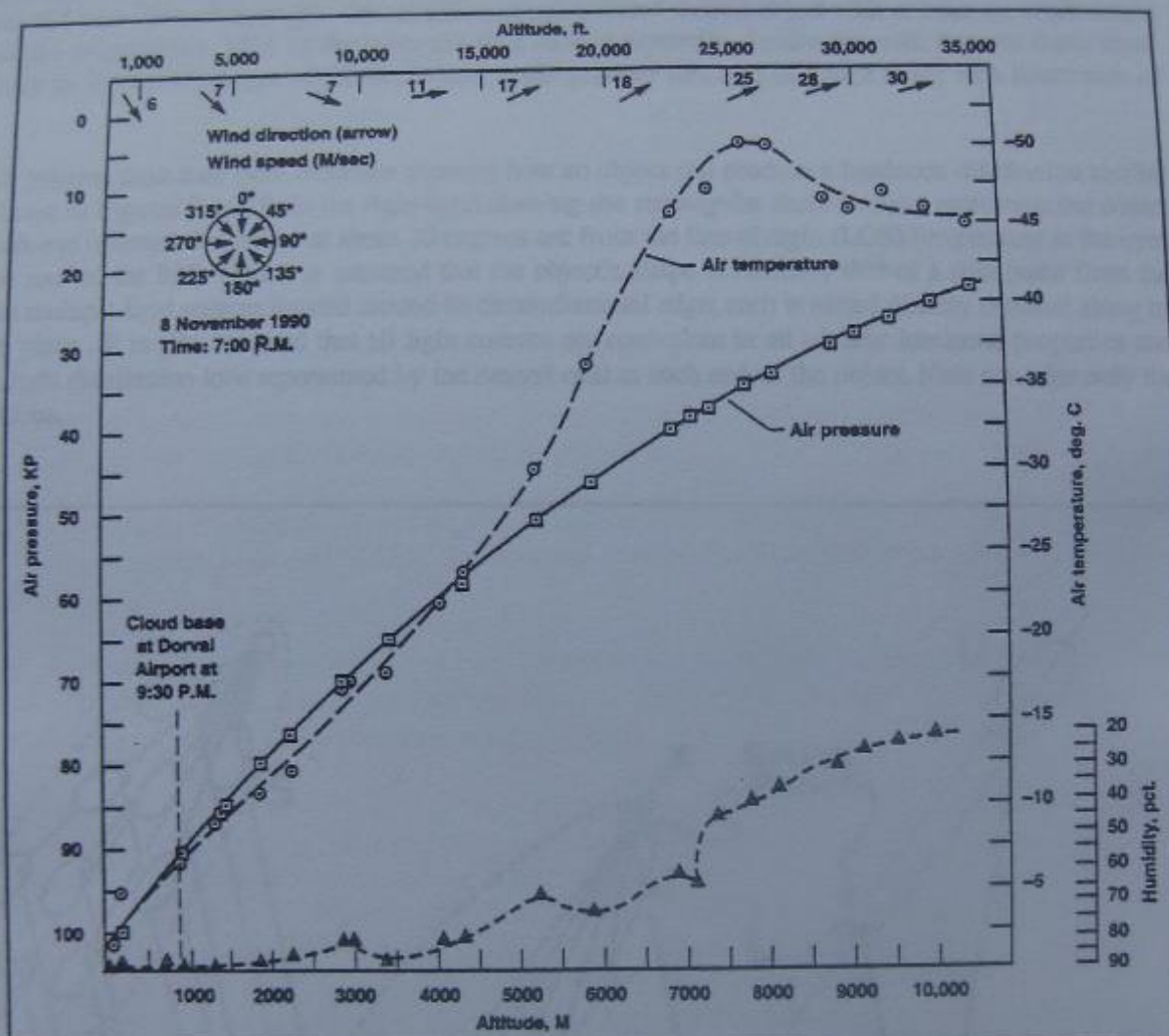


Figure 13 - Temperature, pressure, humidity, and wind as a function of altitude at 7:00 p.m. NW of Montreal.

The moon rose at 9:12 and was near the horizon at a bearing of about 60 degrees from North and was just over half-illuminated. At most it would have produced illuminance of only 0.004 f.t.c. at the ground in clear air. Unfortunately the moon and stars could not be seen due to a growing overcast of clouds at an altitude of between 3,000 to 4,000 feet.

12 We are grateful to Joel Bartlett, meteorologist, for his assistance in analyzing the weather data and for providing this summary.

Discussion

The evidence for the existence of a highly unusual hovering, silent, large object is indisputable as it has been in other such cases (e.g., Anon., 1991). The present evidence includes the testimony of over ten reliable adult eye witnesses and two color photographs. One sketch portrays a round shaped object with at least six small round lights around its perimeter. Most of the other sketches show a generally circular arc with three or more small lights along its length. What type of physical object could produce this type of image along with linear rays of light?

Figure 14 presents three side view diagrams showing how an object can produce a luminous distribution similar to that shown in Figures 8 and 9. In the right-hand drawing the rectangular dashed object represents the object with its left-end oriented downward at about 30 degrees arc from the line of sight (LOS) [originating at the eyes (E) on the roof of the BH]. Here it is assumed that the object's shape is basically that of a coin [seen from the edge] with multiple light sources located around its circumferential edge; each is aimed directly outward along its equatorial plane. It is also assumed that all light sources are equivalent in all of their luminous properties and possess a light distribution lobe represented by the dashed oval at each end of the object. Next consider only the lower (L) lobe.

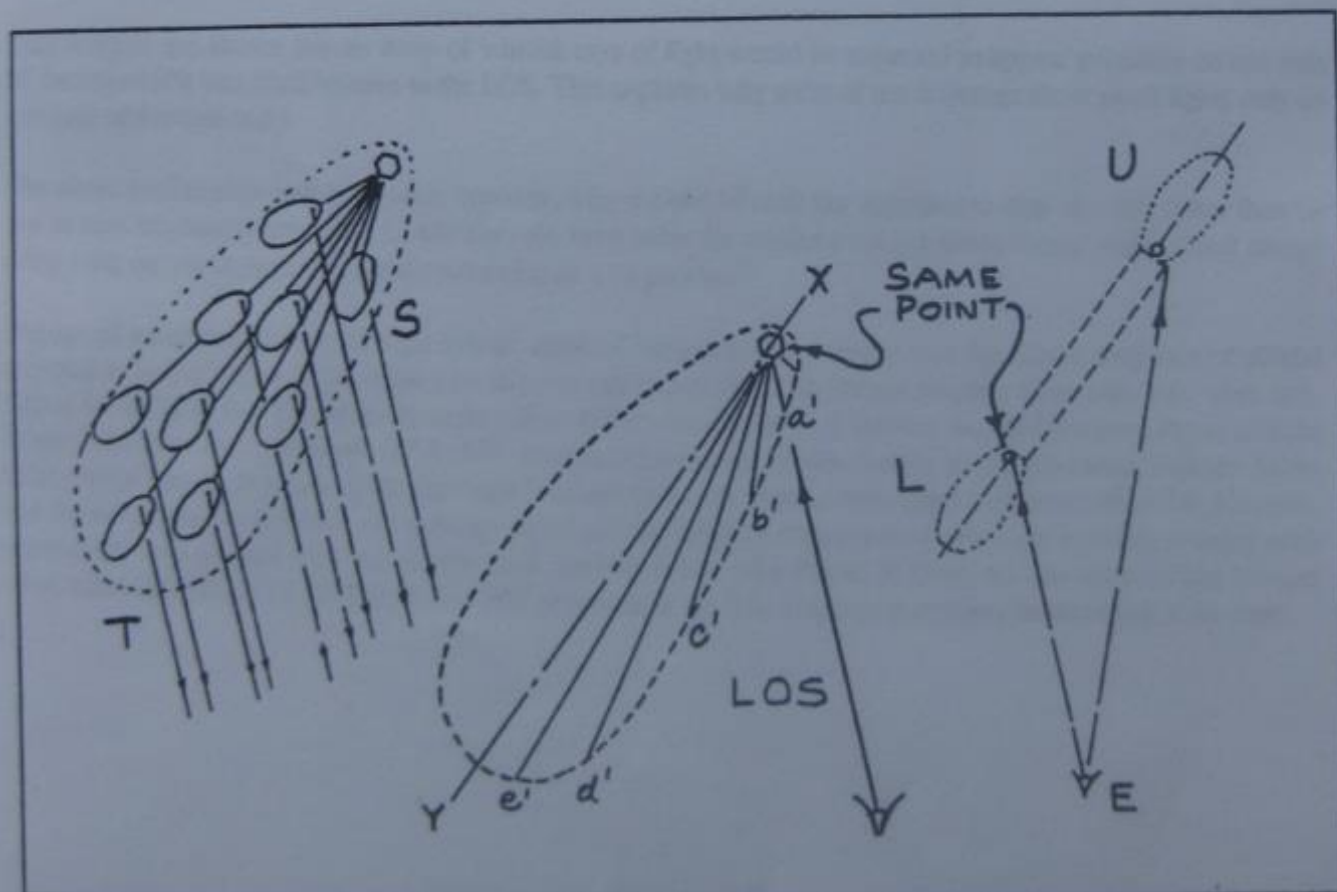


Figure 14 - Hypothetical object orientations

Since the concept of a light lobe (L) is so important it is enlarged in the center drawing of Figure 14. Here the small six sided polygon represents an individual light source whose optical axis is X-Y, inclined at about 30 degrees to the LOS. Its apparent intensity is defined by the direction from which it is viewed; apparent intensity is proportional to the length of the line from the source to the lobe boundary, as shown here from the "source" to a' [corresponding to the camera's LOS]. If the source had been viewed along the line d' to the source or e' to the source it would be about 8.5 times brighter than when viewed along the line a' to the source. In short, the shape of the light lobe defines the apparent brightness of the source as a function of viewing location.

Since the present aerial object was seen within fog and cloud, the light scattering properties of water-droplet laden air also must be considered. It is well known that each microscopic droplet possesses its own light lobe that scatters light with a lobe shape approximately as shown by the nine eggs seen in the left-hand part of Figure 14. The close spacing of all of the droplets integrates the individual reflected rays in all directions defined by the individual lobes. However, we are only concerned with those rays aimed toward the viewers on the rooftop of the BH. Note that the length of each ray aimed toward the eyes from each micro-droplet source is approximately the same. The visual result of this is that the brightness of the entire ray will appear to be relatively homogeneous for all of the rays extending from S to T.

The same general explanation as given above applies to the light sources located on the opposite side of the object (cf. the upper (U) lobe in the right-hand drawing of Figure 14). Here the length of each ray of light from each microscopic particle toward the viewers is so short that the ray becomes almost invisible. This is what the two photographs show as well as most of the drawings by the eyewitnesses.

This analysis has shown that an array of whitish rays of light would be expected to appear primarily on one side of the object if it was tilted relative to the LOS. This explains why most of the drawings show small lights only on one side of the oval body.

The above explanation cannot explain, however, why the end of each ray appeared to stop abruptly rather than taper to zero brightness gradually. Could the rays have been the result of air ionization along well defined energy paths with the visual appearance only occurring as a by product?

Perhaps of equal importance with the overall scope of the aerial phenomenon was the almost total lack of official response to it. No action of any kind was taken by personnel of the St-Hubert Military Base after they were notified of the aerial object hovering above the center of the city. As far as is known, they did not even report it to the North American Radar Defense (NORAD) co-ordination center. Authorization to use Canadian defence forces must come from the Premier of the Province involved (viz., Mr. Robert Bourassa). However, since the phenomenon did not appear to evidence any security threat and the military does not have any clear mandate to study such phenomena they did not seek permission from the Premier to take action. In short, no one did anything beyond some individual efforts by MUCP and RCMP personnel at the BH. The object remains unidentified at this time.

References

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Neblette, C. B., and A. E. Murray, 1965. *Photographic lenses*, Morgan and Morgan, Inc., Hastings-on-Hudson, New York.

Primary information sources

Montreal Urban Community Police (MUCP) report file number 25-901107-059;

Royal Canadian Mounted Police (RCMP) report file number 90-MSEG-13458;

Verbal and written (including drawings) testimonies of the main and secondary witnesses;

Environment Canada, Climatology Center, Montreal (Dorval) International Airport (YUL), Surface Meteorological Observations (from 0063-2330) made on November 7th, 1990;

Environment Canada, Climatology Center, YUL, "balloon exits" data (wind direction ~~origin~~ and speed according to altitude at 19h00 EST November 7th and 03h00 EST November 8th 1990 (00h00 and 08h00 GMT November 8th 1990);

Environment Canada, Climatology Center, YUL, surface air density timetable values analysis ($\text{kg/m}^3 \times 0.001$, EST) for November 7th, 1990 (computer printout);

Environment Canada, Climatology Center, YUL, Monthly Meteorological Summary (providing day by day surface conditions) for November 1990;

Environment Canada, Climatology Center, Maniwaki station altitude sounding data from a 19h00 EST November 7th 1990 (00h00 GMT November 8th, 1990) weather-balloon launch (computer printouts). The sounding data included: temperature, relative humidity and pressure (altitude wind data are also included);

Environment Canada, Climatology Center, East-continent 850 millibar pressure level analysis from a 19h00 EST November 7th, 1990 (00h00 GMT November 8th, 1990) sounding (computer printout). According to data gathered at Maniwaki, that level of pressure was situated at approx. 1,440 meters of altitude;

Environment Canada, Atmospheric Environment Service, Satellite Laboratory, GOES 7 North East Continent satellite (geostationary) photos (visible) at 21h03 and 22h03 EST, November 7th, 1990 (02h03 and 03h03 GMT November 8th, 1990);

Environment Canada, Atmospheric Environment Service, Satellite Laboratory, Tyros cloud cover satellite (circumpolar) photo (infrared) at 17h21 EST November 7th, 1990 (22h21 GMT November 7th, 1990).

Secondary information sources

Bell Canada	Belmont Repair Station, Analysis center
Communication Canada	Jamming/Interference, St-Rémi Listening center
DND	St-Hubert Longue-Pointe and Mtl Bases, DND-FOIA, NORAD-CANADA
Fuji	Toronto Laboratory
Hydro-Quebec	Media Relations, Breakdown Statistics
MRAA	(Montreal Radio Amateur Association)
MUCP	Stations 23, 25 and 53, Documentation center, Director's Office
NOAA	NJ, Washington
QPP	General Inquiries, Emergency
RCMP	General Inquiries, C Division
YUL	Control tower, Aerial Reglementation, Aerial Circulation