

Examining A Peculiar Series of Photographs Shot During the Belgian UFO Wave of 1989-1991

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with Vicente-Juan Ballester Olmos

In *Vague d'OVNI sur la Belgique*¹, in a chapter devoted to the study of photographically documented UFO reports from the much-publicized Belgian UFO wave of 1989-1991, SOBEPS collaborator Patrick Ferryn discusses a set of color photographs taken by a 15-year old boy from Moignelée-Sambreville, a community about 10km east-northeast of the city of Charleroi. The captured images distinguish themselves from the bulk of UFO photos that surfaced during the Belgian wave, in that they contain more than just a couple of luminous blobs against a uniform dark background. What they show are distinct spherical shapes in the sky with various landscape elements underneath, notably parts of a greenhouse and two fences. In a paper² that, among other things, assesses the quality of the photographic evidence gathered during the wave, long-time SOBEPS member Franck Boitte referred to the photos as the only ones good enough to replace the Petit-Rechain slide³. The reality, however, is that the Moignelée case too suffers from ambiguities. Key in that regard, as we will see, is the date, initially stated to be “a weekday in the third week of August 1990”, but later specified as “between August 13 and 17, 1990”.

At least five pictures were taken. Scanned versions of four color prints were sent to us by Ferryn in April 2017. It is believed that these prints were made directly from the color negatives. Of one photo (photo #1) only a black and white print is available. The negatives themselves could not be recuperated. The photos are shown below, each with a corresponding (unscaled) close-up. According to Ferryn, one photo had “photo 3” written on the back, and another “photo 4”. They are correspondingly labeled here as photo #3 and photo #4. The rest of the numbering is based on the way in which the images were published by SOBEPS. One photo (photo #5) is shown here for the first time.

An on-site investigation was carried out in the spring of 1991. SOBEPS members on duty were Denis Moinil, a professional photographer for the Belgian Railways, and the late Gérard Grède, a long-time investigator of UFO reports. In the aforementioned SOBEPS book, Ferryn summarized the case details and the men's findings as follows:

¹ FERRYN, Patrick, “Vidéofilm et photographies,” in *Vague d'OVNI sur la Belgique*, Société Belge d'Etude des Phénomènes Spatiaux (SOBEPS), 1991, pp. 412-413 and photo section.

² Franck Boitte, *UFOMania Magazine*, No. 68, Autumn 2011, pages 20-21. An extended English version of this paper can be found at: http://www.cobeps.org/pdf/belgian_wave_130310.pdf

³ Taken at Petit-Rechain, near Verviers, this widely published slide was long regarded as the best evidence for unknown triangular craft maneuvering in the Belgian skies between 1989 and 1992. In 2011 its author of the slide revealed that he had fabricated the shot using a Styrofoam model with small lights screwed into it. The full story can be read at: <https://www.caelestia.be/article05ad.html>

It was around 10:30 p.m. when David T., aged 15 and a half at the time, was sitting on the terrace in the garden of his grandparents' house. The sky was clear that summer evening, with zero wind and mild temperatures. At about 40° of elevation, David noticed a shape of a white-yellowish color "stationary but not immobile" (later on, he specified that the "thing" remained at the same spot but was animated with a rotational movement from left to right). It was in the sky, in the East; altitude and dimensions of the phenomenon could not be estimated, but the witnesses felt it was very far away.

David immediately called upon his grandfather, Mr. Marcel T. [72], who hurried to the first floor, took a photo camera equipped with a 50mm objective and handed it to him. During this short time lapse (less than one minute), the phenomenon had "extinguished" a first time to reappear a little bit to the left. Four [sic] successive shots were taken, with each interval being the time it took for the flash to recharge (approximately 4 seconds), and this during a total of approximately 30 seconds. Meanwhile, the phenomenon "extinguished" a second, then a third time, always to "lit up" again, more to the left. It then disappeared on the spot for good.

Our two investigators had several meetings with the witnesses and vouch for their perfect credibility and honesty. Moinil examined the negatives very attentively and carried out several tests and reconstructions at the site. He offers the following arguments in favor of the authenticity of the documents excluding the idea of a hoax or a misinterpretation evoking "something" small in size positioned close to the lens:

- 1. With the focus set at infinite, the subject is definitely more than 20 meters away. This can be gleaned from the blurred foreground: greenhouse at 10 meters from the witness, fences, closures and a wire put up for a game of badminton running horizontally across the document;*
- 2. The latter elements appear double because of the light emitted by the flash (synchronized at 1/30th of a second);*
- 3. The luminous phenomenon (or the "spheres" that it seems to be made up of) is clearly illuminated from the side, which would not have been the case if the flash had illuminated it and, in consequence, if it was close to the camera.*

Camera and film data were found in a SOBEPS field inquiry form compiled by the investigators on June 11, 1991. It tells us that the camera used was a *Praktica MTL 50* equipped with a *Pentacore 50mm* lens. Aperture was 1.8; shutter speed presumably 1/30sec. Inside the camera was a 24x36mm *Spector* color film of 200 ASA. All shots were taken with the flash fired. No tripod was used. The form also states: "The witnesses have no good recollection of the number of shots that were made. In fact, at present, only one piece of film (4 frames) has been found. Yet, there definitely is a fifth picture because there are 5 positives". Unfortunately, it is not specified what the order was of the photos on the negative strip.

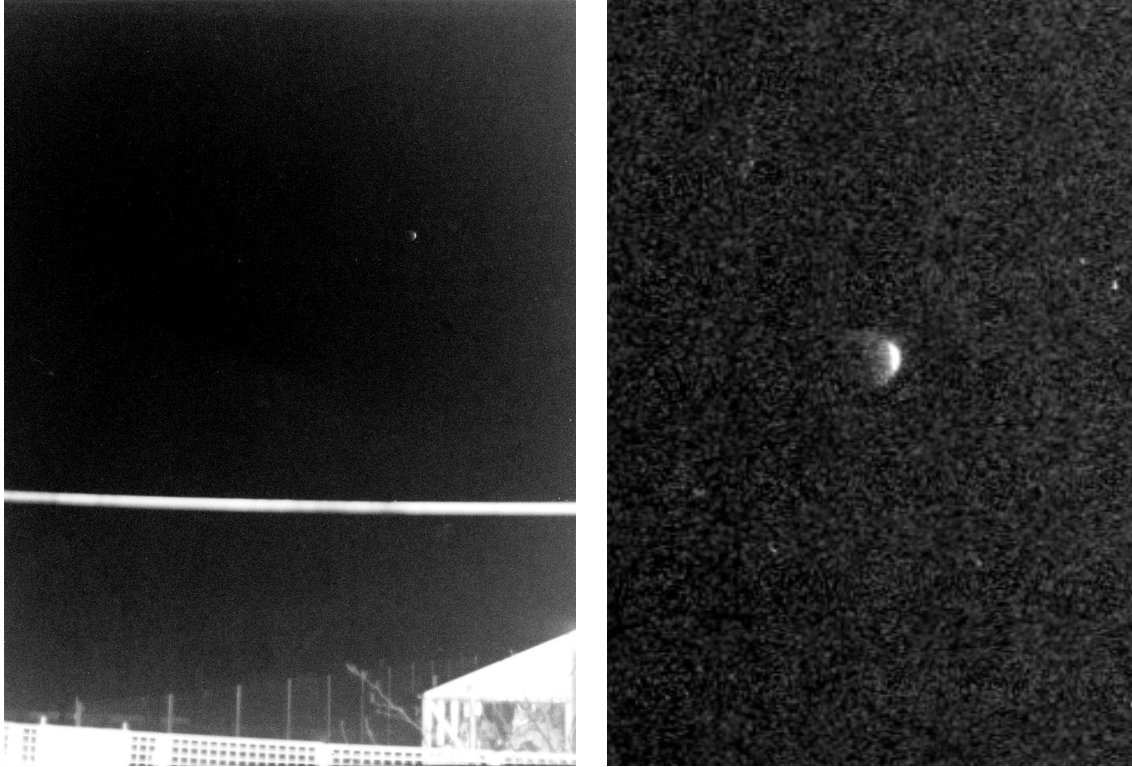


Fig. 1. Moignelée, August 1990. Photo #1 by David T. showing an object in the sky that resembles a waxing crescent moon. Only black and white versions of this photo are available. Courtesy of Patrick Ferryn.



Fig. 2. Moignelée, August 1990. Photo #2. The phenomenon appears as two roundish blobs of light touching one another. Courtesy of Patrick Ferryn

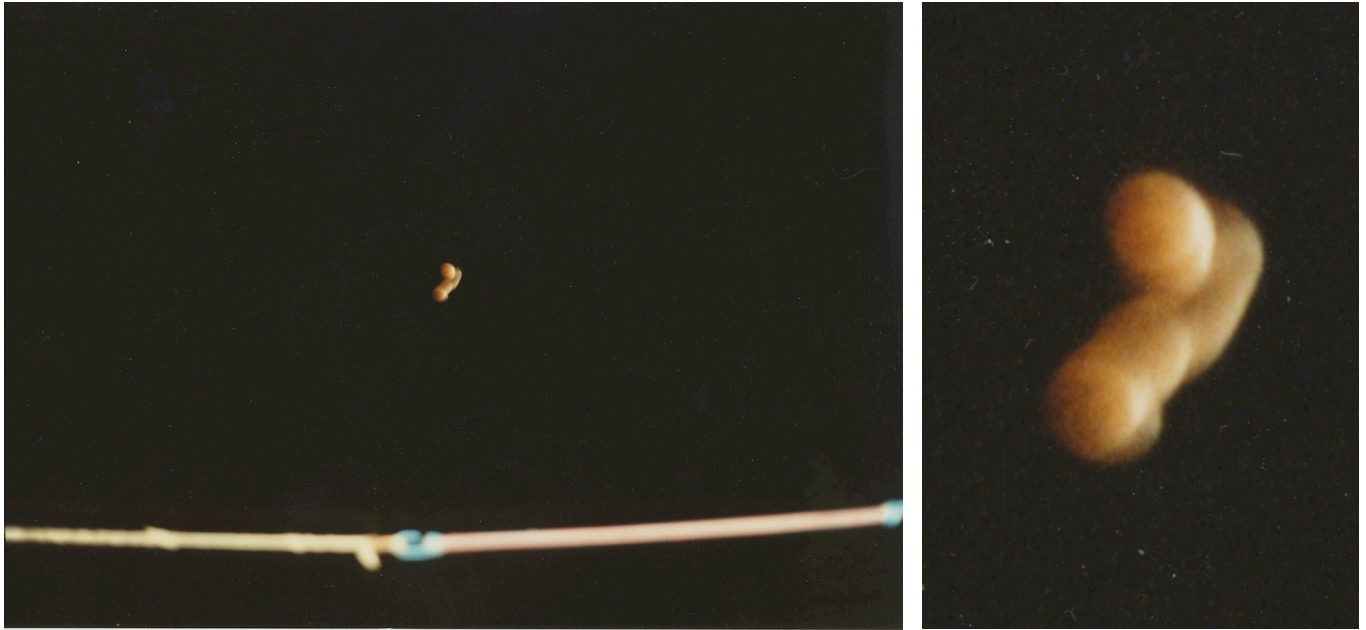


Fig. 3. Moignelée, August 1990. Photo #3. The phenomenon has taken the shape of a cluster of clearly outlined spherical objects. Courtesy of Patrick Ferryn



Fig. 4. Moignelée, August 1990. Photo #4. Similar as in photo #3, but with the spheres arranged differently. Courtesy of Patrick Ferryn.

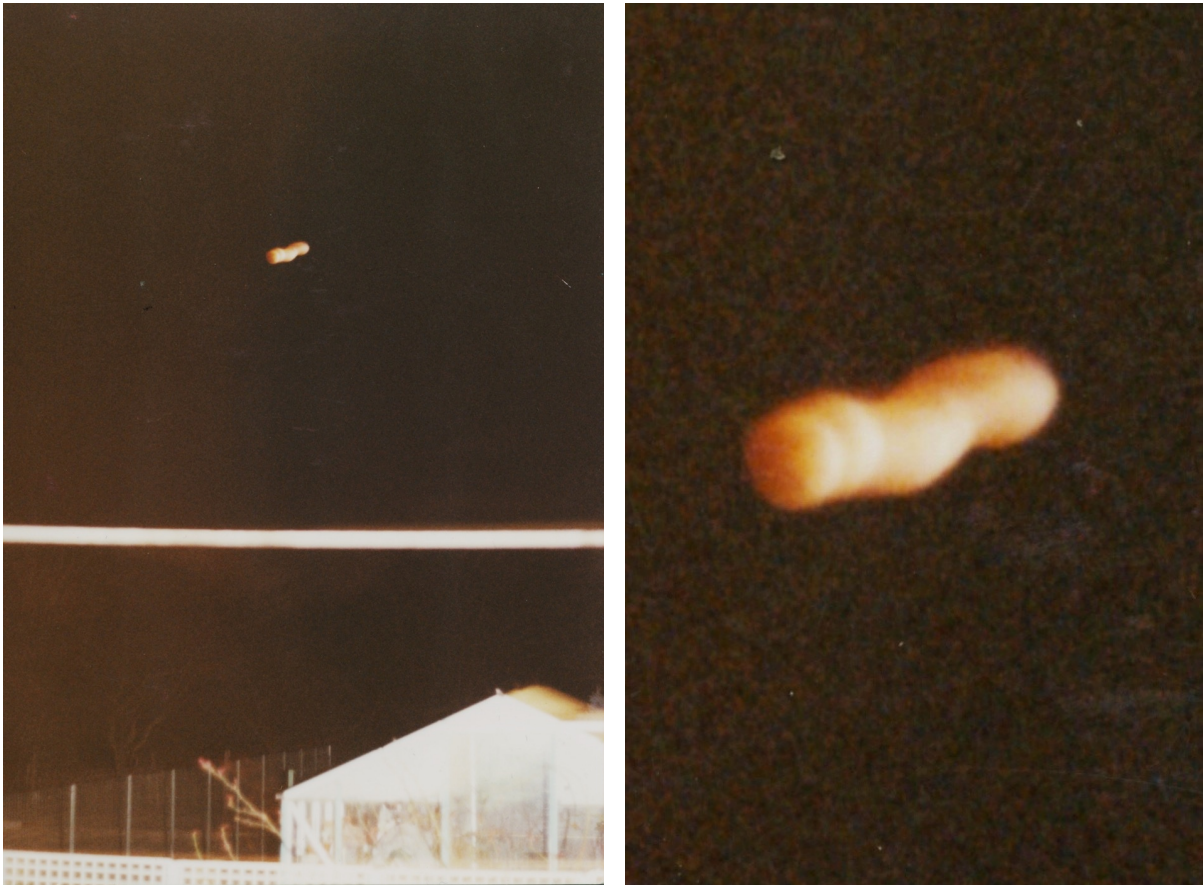


Fig. 5. Moignelée, August 1990. Photo #5. The spheres have spread out in the shape of a worm.
Courtesy of Patrick Ferryn.

The description given by the eyewitnesses (a white-yellowish round shape that disappears and reappears in about the same place in the night sky) reminds of the moon seen through a veil of translucent, stratiform clouds of changing thickness. Photo #1 is the sharpest of all five photos, and it is probably not a coincidence that it is the only one that shows not a cluster of rounded blobs but only a single, curved streak of light decreasing in brightness to the left. In the other shots that include parts of the garden, the edges of the greenhouse and the fences are affected by motion blur. Closer examination reveals that the spread function of the blur (i.e. the recorded response of the camera to the photographed subject) appears to be related to the way in which the “spheres” are grouped in these shots. In short, what photos #2, #3 and #4 show may well be multiple images of a single “object”, possibly the moon.

Experiments serve to prove theories. Below is a series of photographs taken with different focal lengths and different exposure times (the majority at or close to 1/30 sec). They show a gibbous waning moon with deliberately induced camera shake. The streak in the bottom part of each image is from a streetlight and serves to illustrate the way in which the camera moved. The test images compare well with what photos #2, #3 and #4 show. But there’s one important difference: the shadow side of the moon remains invisible in our shots. We will get back to that later.



Fig. 6. moon (on top) and streetlight with camera blur. Photos by Wim van Utrecht.



Fig. 7. More photographic tests, this time showing a waxing crescent moon shot with deliberate motion blur. (Exposure time: 1/3 sec at f/18.)

Clouds moving from left to right in front of the lunar disc may not only have caused the illusion of a rotational movement from left to right, they may also account for the apparent displacement of the disc in the opposite direction. As the brain follows the movement of the clouds from left to right, an observer will expect to see the moon reappear more to the right after the clouds momentarily obscured it. This may have created the illusion that the moon reappeared left of where it first was. Actually, the overlay below shows that, if there were any movement, the displacement would have been to the right rather than to the left.

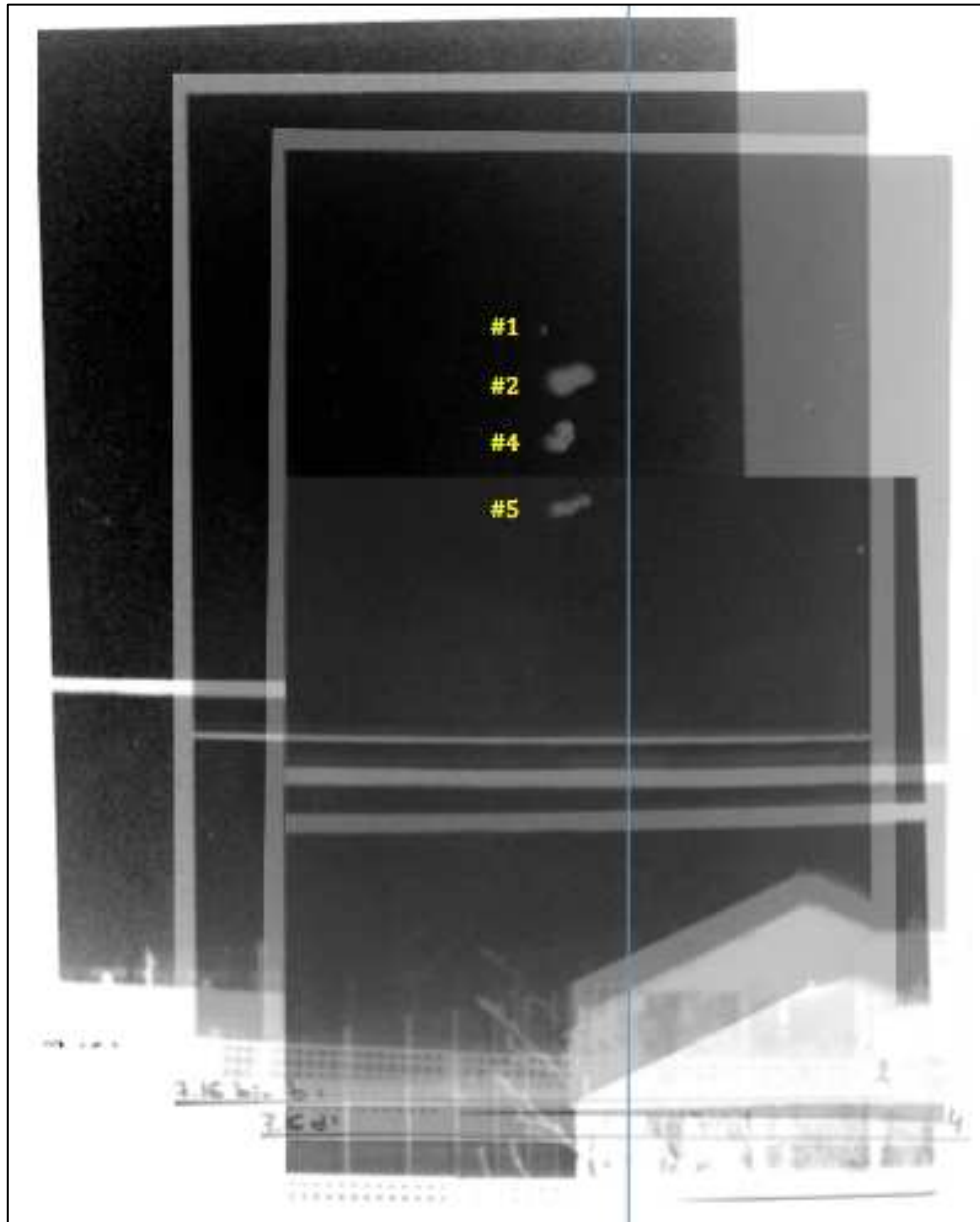


Fig. 8. Horizontally-centered overlay of photos #1, #2, #4 and #5 (vertically displaced for better viewing). Since not all four photos were taken from exactly the same spot, we centered on the more distant features in the shots, like the pole of the fence behind the greenhouse that is furthest away from the camera (marked with a blue line but barely detectable in this composite image). Assuming the order of the shots is correct, and considering a steady, slowly moving object like the moon, the round shape in photo #2 seems to have moved a bit too far to the right.
More on that, too, further down the main text.

To further examine the moon theory we set out to establish the azimuth and elevation of the photographed object. The greenhouse that appears in three of the shots turned out to be a handy feature for doing this. Having retraced the exact sighting location on Google Earth, we first measured the width of the greenhouse with the help of the

Google Earth ruler⁴. The greenhouse, still present as of this writing, was found to be 2.8m wide. The distance between the greenhouse and the terrace is 3m. From the white fence that separates the garden from the terrace to the wall of the house is another 6m. Since the investigators stated that the distance between greenhouse and camera was “10m”, we can assume that the photographer was very close to the wall of the house. We settled on 8.5m. At that distance the greenhouse would have subtended a horizontal angle of 18.7°. Extrapolating these data, we found a horizontal field of view for photos #1, #2, #4 and #5 of 26.1°, which is in good agreement with the 27° horizontal viewing angle of a standard 50mm lens used in combination with a 24x36mm film format and an image shot in portrait mode (most photo labs crop images to make the proportion of the 24x36 negative fit the proportion of the standard printing paper they use). The vertical field of view of the printed images was found to be 38.2° (again very close to the full 39.6° vertical viewing angle covered by a 24x36mm negative).

Next we had to determine where the horizon is in the photos. A daylight picture taken by Denis Moinil in 1991 from almost the same spot as the “UFO” shots was most helpful in this regard. Using, on the one hand, the wires of the garden fence, the roof and the southerly wall of the greenhouse (blue lines in Fig. 9), and, on the other hand, a section of the white fence in the bottom right corner of the picture (green lines in same figure), we found two vanishing points (V1 and V2) that tell us where the horizon is (marked with a yellow line in Fig. 9).

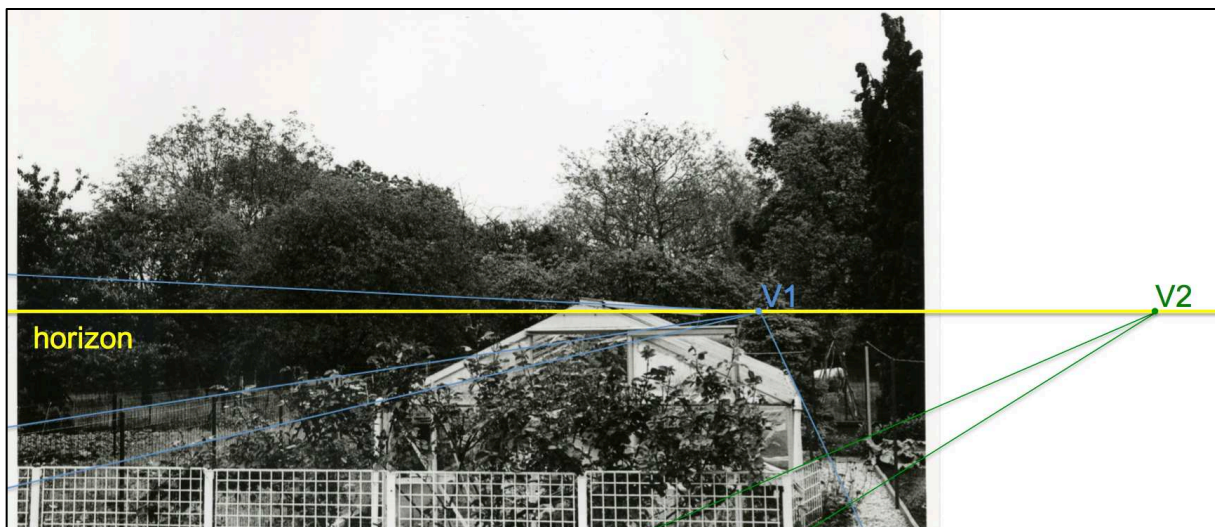


Fig. 9. Determining the position of the horizon on a daylight shot of the garden and greenhouse. Photo by Denis Moinil.

⁴ Readers may have reservations about how accurate sizes are when measured with the ruler tool on Google Earth satellite images. To reduce any errors that may have been introduced by projection, orthorectification, geo-referencing and general blur (making it difficult to determine the exact edges of buildings and features), we measured sizes and distances on different satellite images from 2007, 2009, 2012 and 2015 (the greenhouse and the terrace still being there as of this writing). All gave the same result. We also used the ruler tool to measure buildings and other landscape features of similar dimensions and of which the exact width or length is documented. It was found that the results were good. Note also that in our case the measured distances and sizes are confirmed by the angular data obtained through the camera’s horizontal and vertical viewing angle.

The result is approximate since the wires of the northerly fence (here on the left) may not have been running exactly parallel to the ground, while the garden fence itself may not be perfectly parallel with the longest axis of the greenhouse. Still, relying on what the satellite photo shows, we don't think the error margin is bigger than 1°.

We then transferred the horizon line to photo #1. With the vertical width of the print subtending an angle of approximately 38°, this gave the following:

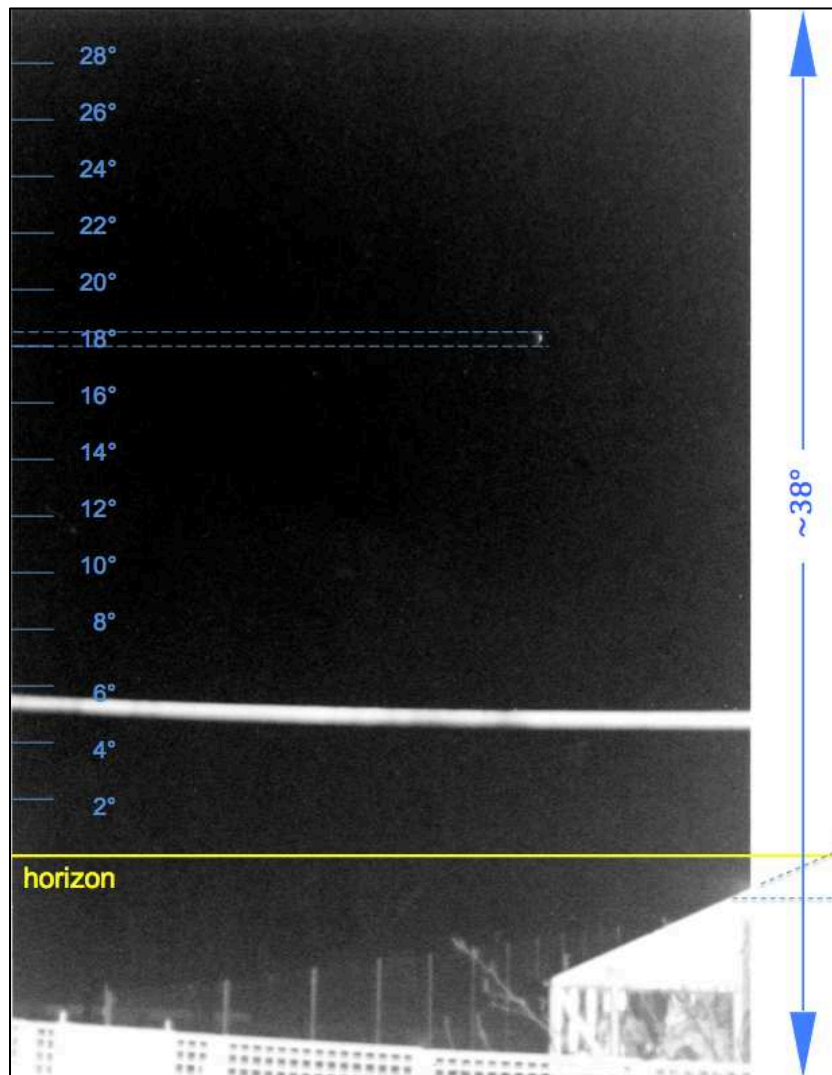


Fig. 10. Photo #1 with elevation scale superimposed.

The elevation for the phenomenon is thus found to be close to 18°. Taking an error of 1° into account for the perspective distortion caused by the camera lens, 17° is probably a more accurate figure⁵. These findings are even more approximate considering that we don't know exactly how big a part of the image we used was cut

⁵ In a correct rendering there would be more space between the degree markings in the center of the shot than those closer to the upper and lower edges where the distortion is more pronounced.

off when the print was manufactured. What immediately strikes the eye, though, is that the elevation angle – estimated by the witnesses to have been 45° , and “corrected” later by the investigators to “ $35/40^\circ$ ” – appears to have been overestimated by both parties by a factor of about 2!

Fig. 10 also reveals a new particularity in support of the moon theory, namely that the angular size of the crescent shape in photo #1 is approximately 0.5° , i.e. the same size as the moon’s diameter.

Having determined an approximate elevation angle for the phenomenon, we then proceeded to determine the azimuth angle. To accomplish this we compared the way various features (greenhouse, fences, trees) are positioned in Moinil’s photograph with their emplacement in the satellite images. It was found that photos #1, #3, #4 and #5 were taken one or two meters more to the left (north) of where Moinil took his daylight shot. The following diagram shows the situation:

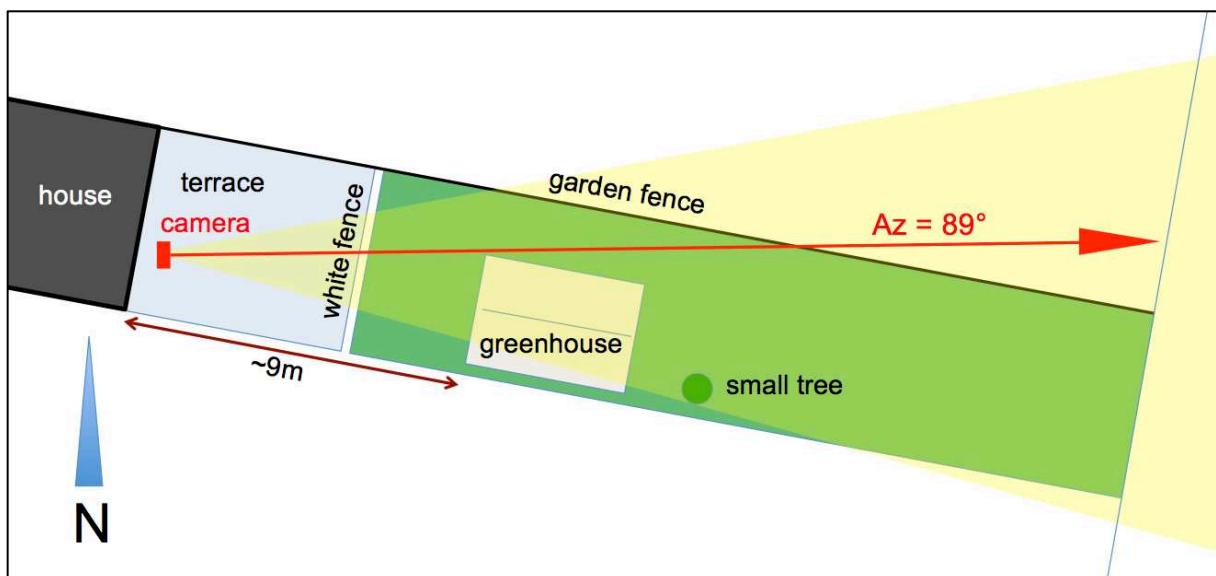


Fig. 11. Simplified diagram of the sighting location with red arrow revealing an azimuth angle of approximately 89° for the photographed object.

The next step to take was to find a date on which the moon, viewed from Moignelée-Sambreville, was in a position close to an azimuth of 89° and an elevation of 17° . In a questionnaire compiled on June 11, 1991, Grède and Moinil write that, after having consulted several family members, it was established that the photographs were taken:

- after David’s return from summer holiday (which was on Saturday, August 11, 1990);
- prior to roof repair works at his parents’ house in Beez (Saturday, August 25, 1990);
- not during the week prior to August 25, because it would have taken about a week to have the pictures processed at the lab and recuperate them;
- not on Saturdays and Sundays because David’s grandparents always spent the weekend in their caravan outside Moignelée.

The witnesses provided the investigators with various documents that backed up these claims.

We might add to this that the weather station at Charleroi Airport, which is 10.5km West-Northwest of Moignelée, recorded chilly temperatures and/or rainy weather in the evenings of August 15, 16 and 17⁶. So that would leave Monday, August 13 and Tuesday August 14, 1990 as the most likely dates the pictures were taken. On both of these nights, temperatures were just over 20°C. Visibility was good and the moon was visible in the eastern sky, but not at 10:30 p.m. In fact, at that time, the moon was still well below the horizon. On August 13, the lunar disc approached the 89°/17° azimuth/elevation coordinates between 01:25 and 01:50 a.m., and on August 14, it reached that position between 02:05 and 03:05 a.m. Worse still, not only the time is off, the aspect of the moon is wrong too. On the aforementioned dates the moon was in its waning gibbous phase (57% of the lunar disc illuminated on August 13; 45% on August 14), whereas four out of five photos show perfectly round spheres with brightly lit edges on the right-hand side.

Throughout the summer of 1990, there was one other day the moon passed close to the azimuth and elevation angles we found, namely Friday September 7. That night, at 10:28 p.m., the nearly full moon (phase 0.90) was positioned at azimuth 89° and elevation 16°. As for the weather on September 7, 1990: at 10:30 p.m., the synoptic station of Charleroi recorded temperatures of 13°C and a moderate breeze blowing from the west. After a rain shower at 6:00 p.m. the clouds became thinner and visibility gradually returned to 12-13km⁷. Soundings carried out at Uccle, Brussels, by balloons released at 2:00 p.m. (September 7) and 2:00 a.m. (September 8), both confirm that there was a moderate wind from the west with the wind at higher altitudes coming from the northwest⁸. A situation that is compatible with semi-transparent clouds drifting in front of the moon from left to right. But several problems remained, like the brightly lit, sharply defined right edge of the spherical shapes in photos #1, #3, #4 and #5, and the change in appearance with positional shift to the right of what can logically be considered to have been the same phenomenon in photo #2.

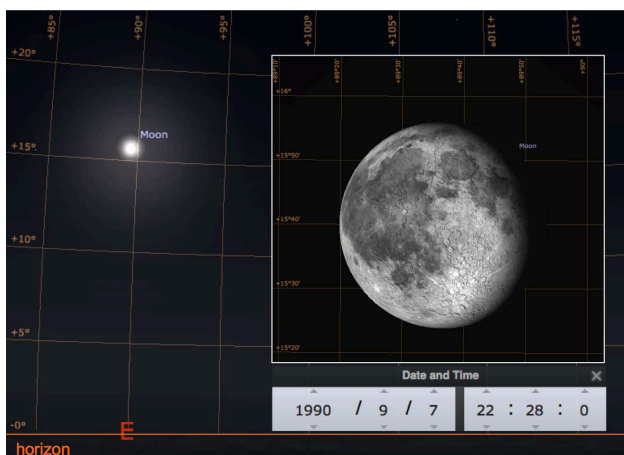


Fig. 12. Position and aspect of the moon for Friday, September 7, 1990 at 10:28 p.m., with sharply defined edge on the left and fuzzy terminator on the right. In other words, quite the opposite of what photos #1, #3, #4 and #5 show.

⁶ <https://www.infoclimat.fr>

⁷ Ibidem

⁸ <http://weather.uwyo.edu/upperair/europe.html>

So not the moon after all? Photo analysis expert Andrés Duarte suggested that, if the moon would turn out to be an unlikely candidate explanation for the object in the photos, we might explore the possibility of a fuel dump or chemical cloud release by a rocket. Following Duarte's suggestion, our Spanish correspondent Vicente-Juan Ballester Olmos contacted Dr. Jonathan McDowell of the Harvard–Smithsonian Center for Astrophysics. McDowell is a worldwide-recognized expert in space issues. Asked about the spherical objects in the photos, he replied:

There are no plausible rocket candidates for this event. I strongly suspect it is the moon, and the date or some other detail of the report is wildly wrong.



Fig. 13. Two examples of spherical chemical clouds released by sounding rockets. LEFT: colorful, glowing clouds triggered by chemicals in canisters carried more than 90 miles aloft by a rocket launched from NASA's Wallops Flight Facility, and photographed from Williamsburg, Virginia by Christopher Becke. Image borrowed from <http://www.weatherboy.com/nasa-successfully-launches-rocket-glowing-clouds/>. RIGHT: Deep red blob and other chemical trails created during another rocket flight from Wallops Island to help researchers track wind movement and how it affects charged particles in the atmosphere. Image borrowed from https://www.nasa.gov/mission_pages/sounding-rockets/news/electrical-dynamo.html. Images by NASA.

Spanish researcher J.C. Victorio Uranga agrees with McDowell. Having examined our preliminary findings, he wrote:

What was photographed clearly resembles a nearly full moon obscured by the clouds. The problem is the uncertainty with the date making it difficult to determine the exact phase of the moon.

So with all the experts agreeing that the shots look very much like blurred images of the moon,⁹ we were back at square one. One of the major problems that remained was photo #2, which clearly shows a luminous blob with rounded edges on both sides, not a brightly lit waxing or waning crescent. So how is it that the moon changed its aspect from a crescent shape to a round ball during one night, let alone in just half a minute? And that's when it dawned on us: there's only one occasion on which the moon does exactly that: an eclipse! Andrés Duarte was the first to point out to us that the images strongly reminded him of a lunar eclipse, but since there had been no eclipse visible from anywhere in Belgium during the summer of 1990 we had eliminated that idea in the early stages of our analysis. Too hastily, it would seem because, as we were pondering about the issue of the date, we noticed something peculiar: in the daylight photos taken by Moinil in the spring of 1991, the shrubs in front of the greenhouse have plenty of foliage. Yet, in David's shots, the twigs are stripped of their leaves. The same rings true for the faintly visible trees and shrubs in the background (best seen in photo #5). This could only mean that David's pictures were not taken during summer season but in a much colder period of the year.

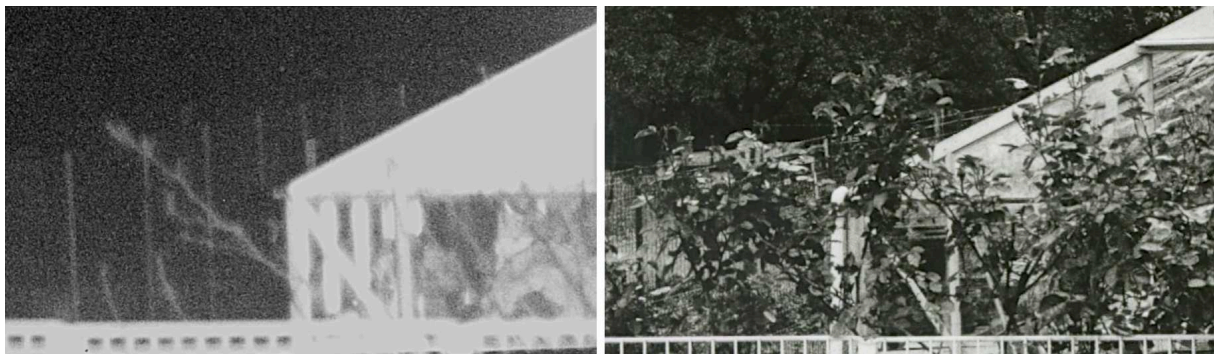


Fig. 14. LEFT: blow-up from photo #1. RIGHT: photo taken in the spring of 1991.

It seemed that we had a breakthrough, and despite what the witnesses had said about the date, we decided to also check the moon positions for the winter months of 1990. The effort proved worthwhile and we finally found a perfect match: a total lunar eclipse on Friday February 9. By 7:40 that evening the moon had entered the Earth's shadow almost completely, with only a small brightly lit crescent segment still visible on the right-hand side, just like can be seen in photos #1, #3, #4 and #5. As the Stellarium images below show, at that precise moment of the eclipse the center of the lunar disc was exactly where we want it to be: at azimuth 89° and elevation 17°.

⁹ All experts but one, actually. On pages 122-123 of his book Le phénomène OVNI: Un autre regard (available at: [https://www.academia.edu/35723954/R. Paquay LE PHENOMENE OVNI. UN AUTRE REGARD. pdf](https://www.academia.edu/35723954/R._Paquay_LE_PHENOMENE_OVNI._UN_AUTRE_REGARD.pdf)), physicist Roger Paquay, not in the possession of all the data, proposes out-of-focus images of the star *Altair* as an explanation. Objections to that theory are threefold. First, the camera was set at infinity (otherwise the greenhouse would have appeared less sharp than the wire closer to the camera). Second, images taken with a 200 ASA film, a shutter speed of 1/30sec and an aperture set at 1.8 would never have captured a 0.75 magnitude star with such clarity and size. Third, at 10:30 p.m. on August 17 (date picked out somewhat arbitrarily by Paquay) *Altair* was in the Southeast (azimuth 152°) and too high in the sky (elevation 45°).

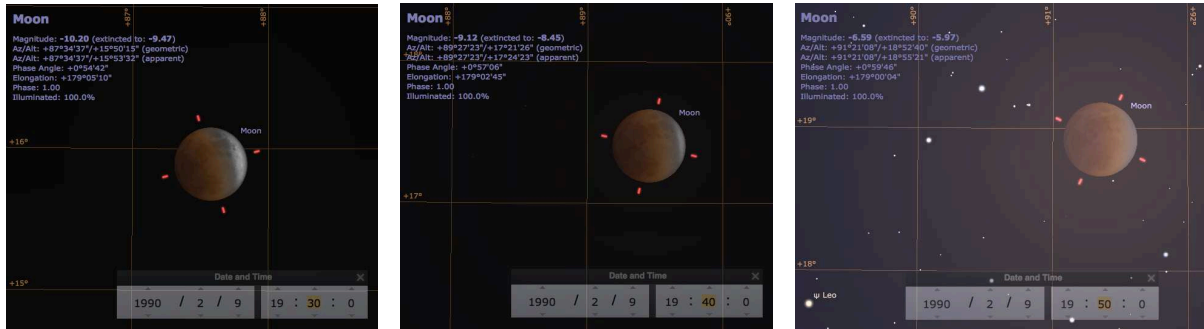


Fig. 15. Stellarium rendering of the various aspects of the moon between 7:30 and 7:50 p.m. on February 9, 1990. In the last image the moon has entered the Earth's umbra (the shadow's darkest central part) completely.

The image above right shows the aspect of the moon at 7:50 p.m. We think this is when photo #2 was taken. It explains why the moon, now looking like a more uniformly-lit sphere without the bright white patch on the right, is more to the right on this photo. Photo #2 would then have been the final shot of the series.

The orange color is typical of the “Blood moon,” a peculiar reddening of the moon during eclipses that is caused when blue light is strongly absorbed by water vapor and dust in our atmosphere while red light with a longer wavelength passes through more easily and is bent into the Earth's shadow. The phenomenon is known as *Rayleigh scattering*¹⁰.

How a lunar eclipse looks when photographed with an unstable camera is nicely illustrated in Fig. 16. UK amateur photographer Chris Bushe took the one on the left. It shows the shaken image of the lunar eclipse that occurred during the Super moon of September 27, 2015. (We mirrored the image for ease of comparison.) The image on the right is from the April 15, 2014 eclipse seen from Winnipeg, Canada, and captured on film by a photographer who goes by the pseudonym “Coolquilting.”

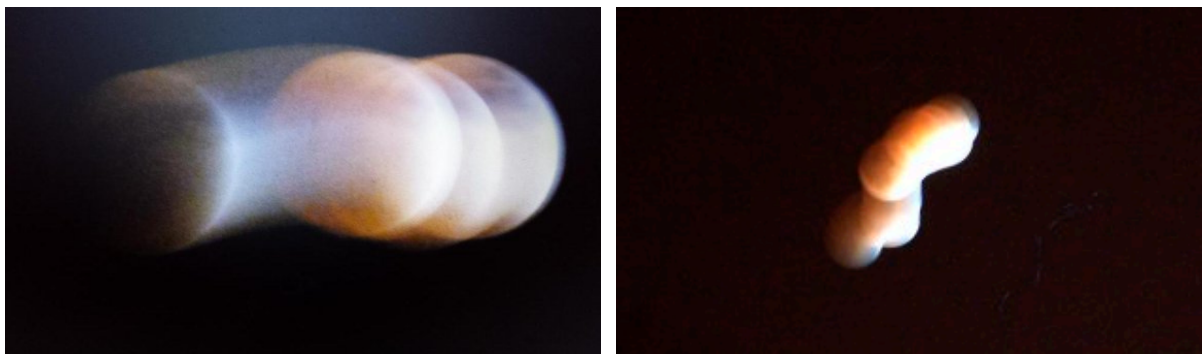


Fig. 16. LEFT: borrowed from <https://twitter.com/cherieblenkin/status/648336019004215296> RIGHT: borrowed from <https://marshaleith.wordpress.com/2014/04/15/lunar-eclipse-winnipeg-back-yard-view/>

¹⁰ See <https://www.timeanddate.com/eclipse/why-does-moon-look-red-lunar-eclipse.html> for a more detailed explanation.

The weather report from Charleroi for February 9 mentions a clear sky with temperatures close to 7° and a moderate breeze coming from the SSW. Visibility was excellent (20km). So no clouds to account for the rotational movement, but it is not difficult to see how the thinning of the brightly lit crescent limb, followed by its total disappearance, may equally well be interpreted as a rotational movement from left to right.

Unfortunately, there were no bright stars in the photographed part of the sky that evening. If there had been, and the camera had captured them, their positions could have confirmed the newly found date. Still, the fact that a lunar eclipse occurred earlier that year and at exactly the same place the spherical object was photographed seems too much of a coincidence.

So, did these witnesses deliberately lie about the date and the time, and did they knowingly mix up the order of the shots to conceal what they had really photographed? It certainly looks that way. On the other hand, and despite the efforts made by the SOBEPS investigators to determine the date, grotesque errors in remembering the correct sequence of events always remain a possibility, especially if the inquiries are carried out many months later, as was the case with this report. We have seen similar scenarios of trustworthy witnesses completely missing the date in other UFO reports. Perhaps David and his grandfather mistook a lunar eclipse for a rotating ball and got the date wrong. Or, perhaps, with everybody talking about UFOs, they found they had impact-prone images and wanted to capitalize on the situation, merely as an innocent prank. Whatever the case, it were the daylight photos taken at the site by Denis Moinil that were instrumental in solving this UFO report, thus, once again, underlining the importance of in-situ inquiries.

Acknowledgements

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