

A Preliminary Study of Flashes of Light Recorded During the Collapse of the South Tower

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Abstract

Peer-reviewed research has shown that the official U.S. government narrative of the September 11, 2001, terrorist attack needs to be revised. This contribution aimed to determine whether flashes of light captured on video during the collapse of the South Tower were consistent with the detonation of explosives. A linguistic analysis of two eyewitness accounts was undertaken, and videos of the collapse of the South Tower were systematically reviewed and analyzed using the free video analysis tool VirtualDub 2.0. Linguistically, the eyewitness descriptions are consistent with events that included explosive sounds, blast effects, and flashes of light as components. The visual analysis found that the flashes of light at the northeast corner of the South Tower were similar in several respects to those observed during an acknowledged controlled demolition.

1. Introduction

The U.S. government's official account of the September 11, 2001, terrorist attack dictates that 19 hijackers conspired with Osama Bin Laden to hijack four Boeing airliners simultaneously. The hijackers managed to evade all U.S. intelligence systems, including interception by fighter jets, and then crashed Flights 11 and 175, two Boeing 767s, into the North and South Towers, which then collapsed, followed by a third building, World Trade Center 7 (WTC 7), later that afternoon. Fifty-one minutes after hitting the North Tower, the hijackers rammed Flight 77 into the western facade of the Pentagon. Finally, the hijackers brought down Flight 93 in Shanksville, Pennsylvania.

On October 2, 2001, while the fires were still raging at Ground Zero, NATO Secretary General Lord George Robertson declared that the facts were "clear and compelling" that the attack had been directed from abroad.¹ The evidence for this claim was provided in a secret report by Ambassador Francis Xavier Taylor, the United States Department of State Coordinator for Counter-terrorism. NATO's declaration that the attack was directed from abroad paved the way for the invocation of Article 5, NATO's collective-defense provision. Acting swiftly and without hesitation, the U.S.-led invasion and occupation of Afghanistan began on October 7, 2001, and formally ended on August 30, 2021. Thus began the War on Terror – the most expensive military campaign in history.

A 2021 study by Neta Crawford, co-director of the Costs of War Project at Brown University, estimated that U.S. taxpayers had spent \$5.84 trillion on the War on Terror, but when future

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obligations of the wars were taken into account, the financial cost would ultimately exceed \$8 trillion.² In September 2021, Crawford and co-author Catherine Lutz proclaimed in a paper that the War on Terror had, so far, incurred a cost of about 0.9 million lives from violence and about 3.8 million from war-imposed deprivation, while 38 million people had become refugees or been displaced.³ Although the estimated death toll is high by any standard, there is evidence that the study understated the actual number of deaths.^{4,5,6} For example, Crawford and Lutz claimed that the total number of violent deaths in Iraq from March 2003 to August 2021 amounted to 275,000-306,000. To arrive at this estimate, which even included the deaths of U.S. military personnel, they relied on the Iraq Body Count, a government- and Pentagon-contractor-funded organization that primarily records casualties based on press reports from English-speaking newspapers.⁷ However, using a passive, media-based measure of war-associated mortality has long been discredited in the scientific literature as it understates mortality.^{8,9} Furthermore, Crawford and Lutz excluded important peer-reviewed studies, including a large cross-sectional cluster sample survey published in the *Lancet*. This study estimated a total of 601,027 violent Iraqi deaths as of July 2006.¹⁰ Subsequent follow-up surveys by ORB International found that 1 million Iraqis were killed violently by the invading forces between March 2003 and August 2007.¹¹ While the true human cost of the War on Terror may be understated, it is, by all estimates, colossal.

With these mortality figures in mind, we should recall that the Afghanistan war was perpetrated on the basis of secret evidence. In the case of the Iraq war, the basis has been conclusively proven to be deception and false accusations.¹² Among others, a two-year investigation led by Charles Lewis, a professor of journalism at the American University School of Communication, uncovered that the Bush administration told 935 lies and falsehoods about Iraq between September 11, 2001, and March 2003.¹³ If the Bush administration was willing to deceive the public nearly 1,000 times and the result was hundreds of thousands of deaths, there is ample reason to question all matters related to 9/11 – the foundational event that directly or indirectly served as the pretext for all post-2001 U.S.-led invasions.

Another reason to question 9/11 is that the official account has been challenged by numerous peer-reviewed studies, which have found that the Twin Towers and WTC7 were brought down by pre-planted explosives.¹⁴ The U.S. government's technical investigation into the collapse of the Twin Towers and WTC7 was conducted by the National Institute of Standards and Technology (NIST). NIST concluded that explosives did not cause the collapse of either building. Instead, the Twin Towers allegedly came down as a result of fire-induced structural weakening subsequent to mechanical trauma. NIST officials later admitted that they did not test for explosives or residues of explosives.¹⁵ Furthermore, NIST admitted in the final report that the investigation did not include the actual collapse of the Twin Towers. On page 83, footnote 13, the final report merely asserts that "collapse became inevitable."¹⁶ Later, NIST officials admitted that they were "unable to provide a full explanation of the total collapse."¹⁷ In lieu of investigating the structural behavior of the buildings as they collapsed, the report cited a highly contested paper. This paper concluded that the top section of each building acted as a pile driver,

crushing the much larger and stronger section below before the pile driver destroyed itself.¹⁸ In the case of the North Tower, the top 12 stories are said to have acted as a single block, crushing the 98 stories below before crushing itself. To make matters worse, almost all of the steel and other materials were disposed of shortly after the event. According to NIST, only 0.25-0.5% of the 200,000 tons of steel used in the construction of the Twin Towers was recovered.¹⁹ Unlike NIST, which provided no analysis of the structural dynamics of the collapse of the Twin Towers, those who argue that they were demolished have analyzed the structural behavior of the buildings as they collapsed. They point to several lines of evidence, including these six points:

- The Twin Towers collapsed exceptionally fast. NIST's final report on their collapse admitted on page 146 that they "came down essentially in free fall."²⁰ It has been argued that near free fall acceleration through the path of most resistance, i.e., through 100,000 tons of structural steel, concrete, and other building materials, violates Newton's Third Law of Motion.²¹
- World Trade Center 7 collapsed at complete free fall acceleration for more than two seconds. NIST's final report on the collapse of WTC7 acknowledged on page 45 that it "descended at gravitational acceleration."²² When an object descends at gravitational acceleration, all of its potential energy has been converted to kinetic energy. There is no energy left for crushing.²³ A collapse by natural forces involves buckling, crushing, collisions, and weakening that would have slowed the fall. In a natural gravitational collapse, there are large forces of interaction. In 2020, a four-year investigation by Hulseley *et al.* of the Department of Civil and Environmental Engineering at the University of Alaska, Fairbanks, concluded that WTC 7 collapsed due to a "global failure involving the near-simultaneous failure of every column in the building."²⁴
- Numerous eyewitnesses heard, felt, and experienced explosions.²⁵ These eyewitness accounts were ignored by NIST.
- A 2009 publication in the *Open Chemical Physics Journal* concluded that dust samples associated with the collapse of the Twin Towers and/or WTC7 contained unreacted nanothermite, a novel high-energy material that can be used as an incendiary or explosive, depending on how it is synthesized.²⁶
- Prior to September 11, 2001, no steel-framed high-rise had ever collapsed for any reason other than due to controlled demolition.²⁷ The NIST investigators went so far as to admit that WTC7 was the "first known instance" in history of a building collapsing primarily due to fires.²⁸
- Although the NIST investigators expressed confidence in their conclusions, they also stated that "no part" of their reports may be "admitted as evidence or used in any suit or action for damages."²⁹ They are also not allowed to testify as expert witnesses.

The focus of this contribution is on a seemingly minor component of the overall 9/11 event, but it is nonetheless significant because NIST conducted "no analysis" of the collapse of the Twin

Towers, which means that videos and eyewitness reports of flashes of light and their significance were ignored.

2. The Oral Histories

In August 2006, Dr. Graeme MacQueen published a paper showing that many first responders reported hearing, seeing, or experiencing explosions before or during the collapse of the Twin Towers.³⁰ MacQueen relied on a large dataset collected by the WTC Task Force, which conducted over 500 interviews with firefighters, emergency medical technicians, and paramedics between October 2001 and February 2002. In the paper, MacQueen quoted two first responders, Captain Karin Deshore and Assistant Commissioner Stephen Gregory of the New York City Fire Department (FDNY), who independently testified to seeing flashes of light seconds or minutes before the Twin Towers collapsed.

To confirm that only two such accounts exist, a PDF of all the eyewitness accounts was compiled, a total of 501 interviews totaling 7,081 pages. A search was performed using the keywords flash, flicker, and light. Only the two eyewitness accounts mentioned above were identified. However, the search did identify several eyewitnesses who reported that the lights went out when either of the buildings went down. Firefighter Keith Murphy told the Task Force on December 5, 2001: “I had heard a distant boom, boom, boom, sounded like three explosions. I don’t know what it was. At the time, I would have said they sounded like bombs, but it was boom, boom, boom, and then the lights all go out.”³¹

While it could be argued that seeing flashes of light was a rare event, we should keep in mind that the interviewer never asked the first responders if they saw flashes of light before or during the collapse of the buildings. We should also keep in mind that the first responders were fleeing when the Twin Towers began to collapse. In addition, the interviews were not conducted immediately after the event, but weeks or months later. By this time, it is likely that the perceptions of the first responders had been significantly influenced by numerous media and government reports that 19 hijackers and Osama Bin Laden were responsible and that the Twin Towers collapsed as a result of a fire-induced pancake collapse. Years later, the NIST investigation ruled out the pancake collapse hypothesis.³² A search for the term “pancake,” revealed that 19 out of 501 first responders used the term to describe the collapse of either tower. The Task Force interviewed Lieutenant Robert Bohack on January 9, 2002. He said, “We walked maybe half a block and that’s when the building pancakes down.”³³ Contamination of eyewitness testimony occurs when an eyewitness is exposed to information or suggestion that creates a bias in their memory or perception of events. In this case, the media and/or the government may have influenced the perception of the first responders with the pancake collapse hypothesis.

Beginning in the 1970s, studies have consistently shown that human memory is *malleable*. For example, in controlled studies of memory, experimenters have been able to make participants believe that they saw a different object than they actually did, or even that they experienced an event that never happened.³⁴ It should be noted that there is evidence that eyewitness

contamination already began on September 11, 2001. With WTC7 in the background, Paul Lemos was interviewed for nine minutes about what he saw as the South and North Towers went down. Regarding the North Tower, he said in part: “As the bombs were going people just started running, and I sat there and watched a few of them explode and then I just turned around, and I just started running.”³⁵ After describing his experience, Lemos remarked that the authorities had summoned an “architect” who told him that he hadn’t really seen any explosions: “Now, they told me afterwards it wasn’t explosions. I was talking to one of the architects that they pulled in.”³⁶

It should also be considered that hypotheses running counter to the official narrative, especially those involving the use of pre-planted explosives in the three buildings, were met with extraordinary hostility by the U.S. government and its collaborators, especially immediately after the event and for several years afterward. President George W. Bush famously declared: “Let us never tolerate outrageous conspiracy theories concerning the attacks of September the 11th; malicious lies that attempt to shift the blame away from the terrorists, themselves, away from the guilty.”³⁷

These factors may have led the first responders to downplay the significance of their experiences and perceptions, causing them not to mention seeing flashes of light in their interviews. For example, they may have feared that to do so would constitute an “outrageous” conspiracy theory, resulting in self-censorship.

Consistent with eyewitness contamination, first responders interviewed by the WTC Task Force consistently second-guessed their own experiences. On October 12, 2001, Battalion Chief Dominick DeRubio told the Task Force: “It looked like it was a timed explosion, but I guess it was just the floors starting to pancake one on top of the other.”³⁸ On January 25, 2002, Firefighter Craig Carlsen said, “There were about ten explosions. At the time I didn’t realize what it was. We realized later ... it was the floors collapsing.”³⁹ When the Task Force interviewed Firefighter Edward Cachia on December 6, 2001, he recounted his experience of the demise of the South Tower: “We originally had thought there was like an internal detonation explosives because it went in succession, boom, boom, boom, boom, and then the tower came down.”⁴⁰ The eyewitness testimony should be analyzed in the context of the potential biases that could have been introduced between the time of the event and the interviews.

Although human memory is imperfect, it is nonetheless crucial to systematically analyze eyewitness testimony and, ideally, correlate it with physical evidence. A paper by Yuille and Cutshall in the *Journal of Applied Psychology* underlined the importance of eyewitness testimony.⁴¹ Their study showed that the recollections of 21 eyewitnesses to a shooting incident were “highly accurate” over a 5-month period. Yuille and Cutshall stressed that their findings differed from many laboratory studies of memory, suggesting that controlled experiments are not always applicable to real-life situations.

3. The Testimony of FDNY Captain Karin Deshore

The Task Force interviewed Captain Karin Deshore on November 7, 2001. Regarding the North Tower, she recalled:

Somewhere around the middle of the World Trade Center, there was this orange and red flash coming out. Initially it was just one flash. Then this flash just kept popping all the way around the building and that building had started to explode. The popping sound, and with each popping sound it was initially an orange and then red flash came out of the building and then it would just go all around the building on both sides as far as I could see. These popping sounds and the explosions were getting bigger, going both up and down and then all around the building.

I went inside and told everybody that the other building or there was an explosion occurring up there and I said I think we have another major explosion. I don't know if we are all going to be safe here. I told them I can't force you, but I don't know if we are going to be safe here. I'm going to try to get as far away from this building as possible.

Unbeknown to me, a half a block down was the water.

At this point in the interview, Deshore went on to describe assisting injured people and then going to the Hudson River to begin evacuating by boat. She then said:

So here these explosions are getting bigger and louder and bigger and louder and I told everybody if this building totally explodes, still unaware that the other building had collapsed, I'm going in the water.⁴²

We will now break down the statement into key elements to gain insight and see patterns or connections that may not be immediately apparent.

A. Spatial References. Deshore stated that the first flash occurred “somewhere around the middle of the World Trade Center.” This would translate to “somewhere” around the 55th floor of the North Tower. Furthermore, the flashes continued “all the way around the building.” Since she was positioned near the Hudson River, she most likely observed the west side of the North Tower.

B. Temporal References. These can help us narrow down the sequence of events and provide a timeline of the observations. Deshore's language suggests that the event she observed preceded the actual collapse by several minutes. Thus, if the event occurred as described, the cause of it would have been a mechanism other than the collapse.

C. Descriptive Language. Deshore described the first flash as “coming out,” suggesting movement or action from an internal or hidden state to an external or visible state. This indicates that the flash was a dynamic and active process. This would distinguish the flash from the

flickering lights, which were observed by several eyewitnesses.

Deshore's use of the term "popping" suggests that the flash had a sonic component. According to dictionary.com, the definition of "pop" is "to make a short, quick, explosive sound."⁴³ She used the term four times. In her testimony, she also associated the popping sounds with explosions, recalling that "these popping sounds and the explosions were getting bigger." An explosion, as opposed to the sound of an explosion, is defined as "a sudden, violent burst of energy, for example one caused by a bomb."⁴⁴ Therefore, it would appear that the flashes were associated with both sonic and physical components.

As for the colors, Deshore described them as "orange and then red." She mentioned that "each popping sound" was accompanied by an orange flash and then a red flash. These colors are consistent with high temperatures.

We can surmise that when she said that the "popping sounds and the explosions were getting bigger," the flashes also increased in magnitude. Her language clearly implies a progression of events and an escalation in intensity, including when she stated that the North Tower "started to explode." This is also reflected in her concern for safety.

4. The Testimony of FDNY Assistant Commissioner Stephen Gregory

On October 3, 2001, the Task Force interviewed Assistant Commissioner Gregory. He described flashes of light in connection with the demise of the South Tower, but in considerably less detail than Deshore. He mentioned that Lieutenant Evangelista corroborated his account.

Unfortunately, the Task Force did not interview him. Here are the key parts of the interview:

Gregory: I don't know how valid this is with everything that was going on at that particular point in time, but for some reason I thought that when I looked in the direction of the Trade Center before it came down, before No. 2 came down, that I saw low-level flashes. In my conversation with Lieutenant Evangelista, never mentioning this to him, he questioned me and asked me if I saw low-level flashes in front of the building, and I agreed with him because I thought – at that time I didn't know what it was. I mean, it could have been as a result of the building collapsing, things exploding, but I saw a flash flash flash and then it looked like the building came down.

Interviewer: Was that on the lower level of the building or up where the fire was?

Gregory: No, the lower level of the building. You know like when they demolish a building, how when they blow up a building, when it falls down? That's what I thought I saw. ...I don't know if that means anything. I mean, I equate it to the building coming down and pushing things down, it could have been electrical explosions, it could have been whatever. ... This was like eye level. I didn't have to go like this. Because I was looking this way. I'm not going to say it was on the first floor or the second floor, but somewhere

in that area I saw to me what appeared to be flashes. I don't know how far down this was already.⁴⁵

A. Spatial References. Based on the eyewitness testimony, Gregory observed flashes much lower on the face of the South Tower than Deshore observed on the North Tower. Although he was reluctant to specify the exact floors, he did mention that they occurred at “like eye level” and “somewhere” in the area of the first and second floors.

B. Temporal References. Gregory's testimony is clear that the flashes preceded the collapse. Furthermore, the time between the observation and the global collapse seems to have been short, i.e., he said, “I saw a flash flash flash and *then* it looked like the building came down.”

C. Descriptive Language. Since flashes can be purely visual phenomena, it is significant that Gregory associated them with demolition and possibly electrical explosions. With respect to demolition, he remarked, “That's what I thought I saw.” Thus, he initially believed that the building had been blown up and that the flashes were part of it, but something later caused him to change his mind. His change of mind should be viewed in the context of the previously mentioned factors. Furthermore, the fact that Gregory initially associated the flashes with a demolition may indicate that they were not random, but perhaps harmonious or coordinated. In any case, the fact that he associated the flashes with building demolition and electrical explosions suggests that they were explosive in nature.

D. Self-Censorship. It must be pointed out that there are contradictions in Gregory's testimony. First, he made it clear that “before it came down ... I saw low-level flashes,” but he also offered this explanation for them: “I equate it to the building coming down and pushing things down.” This could not have happened if they occurred prior to the collapse. We should note that he repeatedly distanced himself from his observation and his initial impression of it. For example, he said, “I don't know how valid this is,” “I don't know if that means anything,” “it could have been whatever,” and “at that time I didn't know what it was.” He admitted, however, that his first impression was that the flashes were associated with building demolition. “That's what I thought I saw,” he said. These are signs of self-censorship; unfortunately, the interviewer did not pick up on them and urged Gregory to tell him more about his experience.

E. Conclusion of the Linguistic Analysis

The two eyewitness accounts are consistent with events that included explosive sounds, blasts, and flashes of light.

5. Introduction to Visual Analysis

Before turning our attention to the Twin Towers, we should familiarize ourselves with the dynamics of flashes of light during an acknowledged building demolition. On May 19, 2019, the 21-story Martin Tower in Bethlehem, Pennsylvania, was demolished. Many onlookers recorded the demolition. One of the videos was shot from a considerable distance with a handheld device, similar to most footage of the Twin Towers (fig 1).⁴⁶ The video was analyzed frame by frame in VirtualDub 2.0.



Figure 1: The Martin Tower moments before it was demolished by explosives.

Even a casual review of the video reveals that the implosion was preceded by multiple flashes. Figure 2 shows frames 189-196, which highlight a sequence of flashes moving upward along the corner, visible through the windows. There is no visible structural damage to the exterior of the building. This is either due to the resolution of the video or that the charges were placed deep inside the building. Flashes that occurred later were clearly accompanied by structural damage, e.g., see figure 3.

Most of the flashes were only visible in a single frame, e.g., see frame 396, while a few others were clearly visible in three frames and barely visible in the next one. We should therefore be aware of the temporal differences in the flashes of light associated with demolition charges. Since the video was recorded at 30 frames per second (fps), we get times of 0.033 and 0.133 seconds for the shortest and longest flashes observed.

In terms of color, the one at the bottom in figure 2 is consistently yellow, but the one above is yellow at first and then becomes increasingly red or orange in the subsequent frames. This is similar to Karen Deshore's testimony. We should also note that there is a certain symmetry or pattern to the flashes of light during the demolition of the Martin Tower.

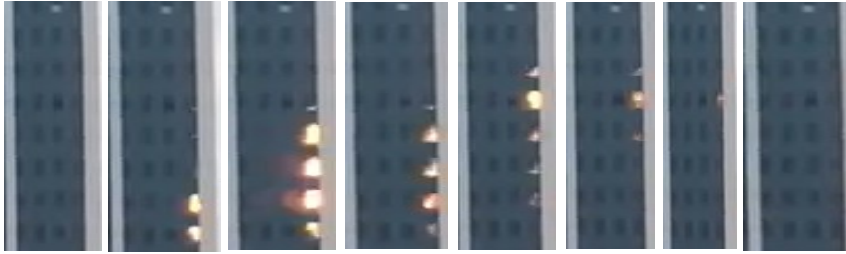


Figure 2: Frames 189-196. A sequence of demolition charges. Zoomed view.

Just before the building began its controlled descent, a charge detonated close to the corner column, as shown underneath. Significant structural damage is immediately apparent. Note that the flash is only visible in a single frame.

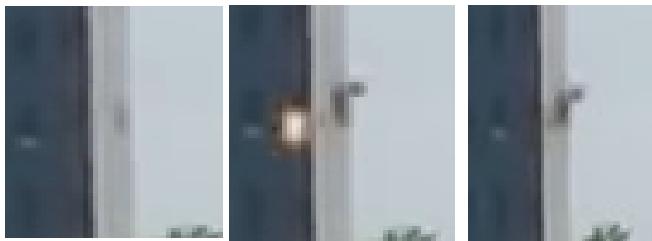


Figure 3: Frames 395-397 show an explosive charge detonating close to the corner column of the Martin Tower. Zoomed view.

Assuming that the dynamics of the demolition of the Martin Tower apply to the Twin Towers, it follows that if they were brought down by demolition charges, any visible flashes of light would be seen within the interval of 0.033 to 0.133 seconds and may or may not be accompanied by observable structural damage on videos. When a demolition charge is detonated, its purpose is to cut through structural elements of the building in order to weaken them and facilitate the planned collapse of the structure. The flash is a secondary effect.

6. Scope of the Investigation

First, an attempt was made to find visual evidence consistent with the testimony of Deshore and Gregory, but a review of several videos and many photographs of the South and North Towers was inconclusive. Next, the focus was shifted to the collapse of the South Tower which, taken at face value, was accompanied by numerous flashes of light that are easily seen in an NBC video that captured the north and east sides of the building.⁴⁷ These flashes occurred at the so-called collapse zone, as well as multiple floors below and above it. In the early stages of this investigation, the focus was narrowed down to events that qualified as flashes that occurred at the northeast corner column. A flash was defined as a sudden, brief, and intense burst of light. The rationale was twofold. First, one or more of them appeared to be associated with structural

damage to the building. Second, one of them was recorded from multiple vantage points, allowing for detailed visual analysis.

7. Structural Characteristics of the Northeast Corner

Since this paper focuses on the flashes at the northeast corner of the South Tower its structural characteristics will be briefly outlined. According to the NIST report, the width of the chamfered corners was 2.11 meters, while the width of the Twin Towers was 63.65 meters (fig. 4). The corners consisted of two 36-cm wide steel columns. From left to right, NIST labeled these two columns as numbers 301 and 259. A large center column between the two was labeled column number 300. The aluminum cladding over each floor of the corners consisted of three equal-sized panels.⁴⁸



Figure 4: On the left, the northeast corner of the South Tower with columns labeled. Photographed by Gulnara Samoilova. On the right, a close-up of one of the chamfered corners of the North Tower. Photographed by Jose Jimenez.

8. Cross-Referencing Flashes

With few exceptions, most of the available videos of the collapse of the Twin Towers are of suboptimal resolution, it is therefore important to rule out reflections, video anomalies, and other innocuous explanations with a reasonable degree of certainty. This was accomplished by cross-referencing flashes between videos recorded from different vantage points. Using VirtualDub 2.0, videos of the collapse of the South Tower were analyzed frame by frame and carefully synchronized using a variety of features, including falling objects, shadows on the east side of the North Tower, the position of the South Tower's collapsing top section, the exact duration between flashes, and other easily measurable events. A number of the flashes were judged to be real visual phenomena. The case of the Clear (C) flash is shown below.

This flash is visible in multiple videos from different vantage points. It is visible in frame 1782 of the aforementioned NBC video (fig. 5). Figures 6-8 show the flash in videos recorded by CBS, Cindy Weil, and Onno DeJong.^{49,50,51} It is also visible in several other videos, and is either not visible or barely visible in some poor quality footage.⁵²



Figure 5: Wide shot and zoomed view of frame 1782 from the NBC video.



Figure 6: Wide shot and zoomed view of frame 148 from the CBS video.

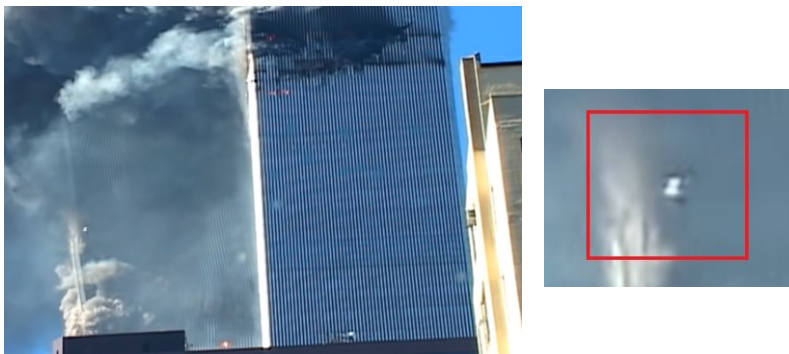


Figure 7: Wide shot and zoomed view of frame 102751 from the Cindy Weil video.

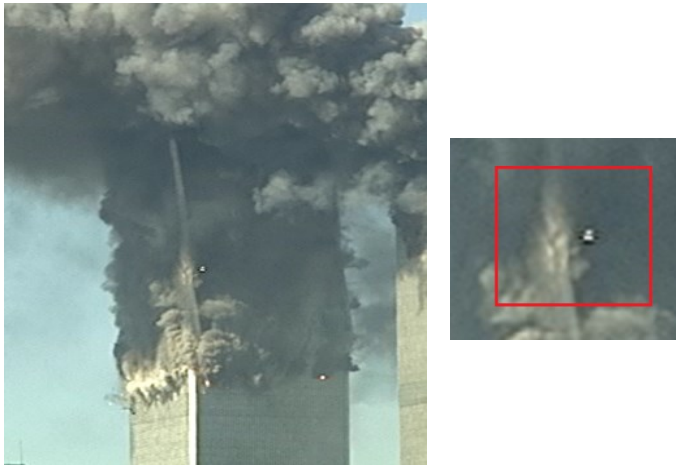


Figure 8: Wide shot and zoomed view of frame 6834 from the Onno DeJong video, taken at 9th Street and 1st Avenue.

9. Characteristics of the C Flash

Anthony Rosario was positioned east-southeast of the South Tower when he recorded its collapse.⁵³ The C flash is clearly seen in frames 703-704 (fig. 9). Upon closer examination in VirtualDub, it became apparent that the size of the flash decreased slightly between the two frames.

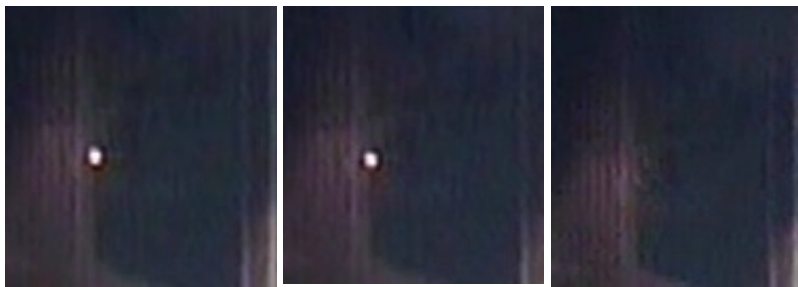


Figure 9: Zoomed view of frames 703-705.

The Rosario video, recorded at 59.97 fps., showed some subtle changes in the two frames immediately before the C flash (fig. 10). Note that in the Cindy Weil video (fig. 7), recorded at 29.97 fps, the flash appeared in two frames (102751-102752), indicating that it lasted about 0.067 seconds. The flash is only visible for a total of 0.033 seconds in the Rosario video, no doubt because it was shot from the east-southeast.

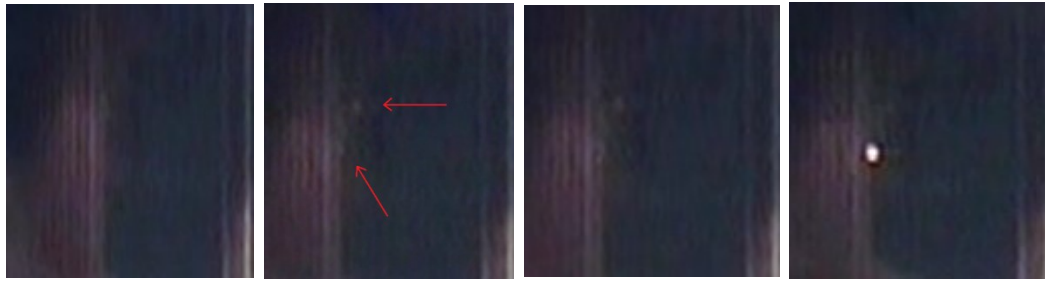


Figure 10: Frames 700-703. Zoomed view.

Although the Rosario video can give the impression that the C flash occurred directly on the corner column, figures 5-8 show otherwise. Considering that the flash was visible from the east-southeast, it was likely a three-dimensional event that protruded significantly outward from the point of origin. In the case of a reflection of the sun on a window, the reflection itself would be confined to the window, which is a two-dimensional plane.

Another important characteristic of the C flash is that a substance, which may be smoke or pulverized building materials, remained suspended in the air after the flash had disappeared. This phenomenon is clearly visible in the Cindy Weil video (frames 102753-102754) (fig. 11).



Figure 11: Frames 102751-102754.

In videos and photos of the collapse of the Twin Towers, high velocity bursts of debris from point-like sources can be seen, such as the one shown in Figure 12. This one emanated from floor 77, just above the mechanical floors on floors 75-76 in the North Tower.⁵⁴ Due to suboptimal resolution and the position of the camera operator, it is not known if these high velocity bursts were accompanied by flashes of light. However, there are similarities to what is seen in figure 11, although on a significantly smaller scale.

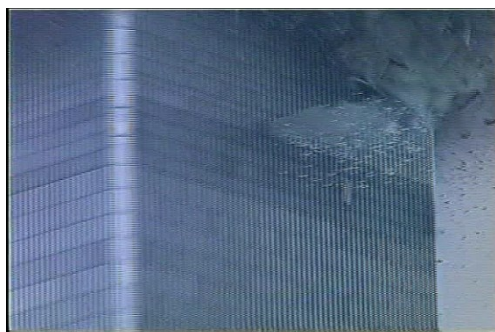


Figure 12: A high velocity burst of debris during the collapse of the North Tower.

In summary, the C flash appears to have been an extremely fast, three-dimensional event that may have been accompanied by pulverized building materials or smoke.

10. Additional Flashes in the area of Interest

In addition to the C flash, videos show other events that qualify as flashes occurring on or near the northeast corner column of the South Tower, including multiple stories below or above the so-called crush zone (examples shown in figs. 13-19). With respect to demolition hypotheses, these have been interpreted as explosives detonating prematurely, which are sometimes seen in controlled demolitions. While a naturally collapsing building could conceivably produce a visual spectacle that includes flashes of light at or near the crush zone, it is less clear how they could occur many stories below or above the so-called crush zone. Aside from claims of video anomalies, which is a possibility, those who support the official narrative have not provided a plausible mechanism for how this could be accommodated by a gravity-driven collapse model.

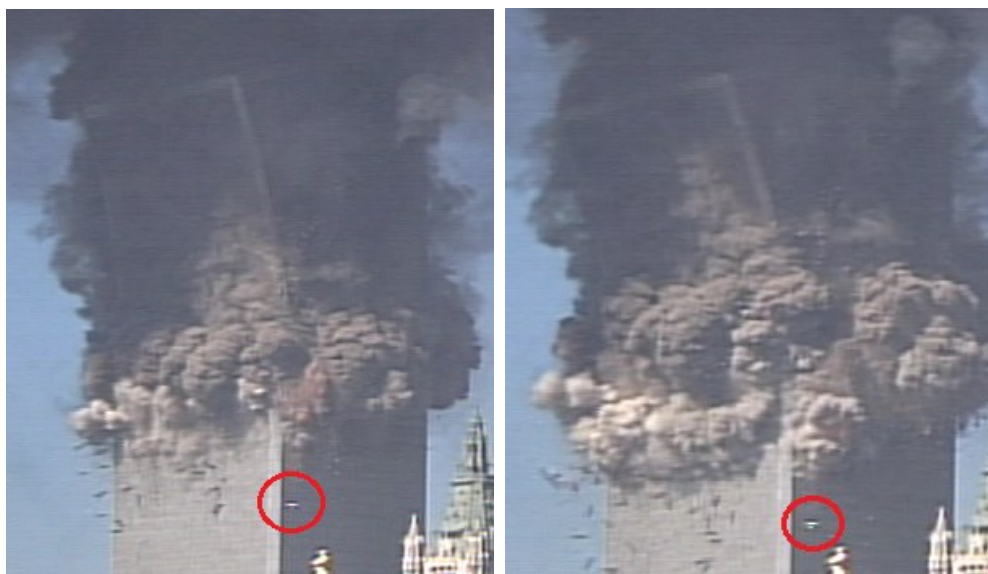


Figure 13: NBC video, frames 1826 (left) and 1849 (right). Since both flashes were observed in a single frame (frame rate = 29.97), we get a duration of approximately 0.033 seconds.

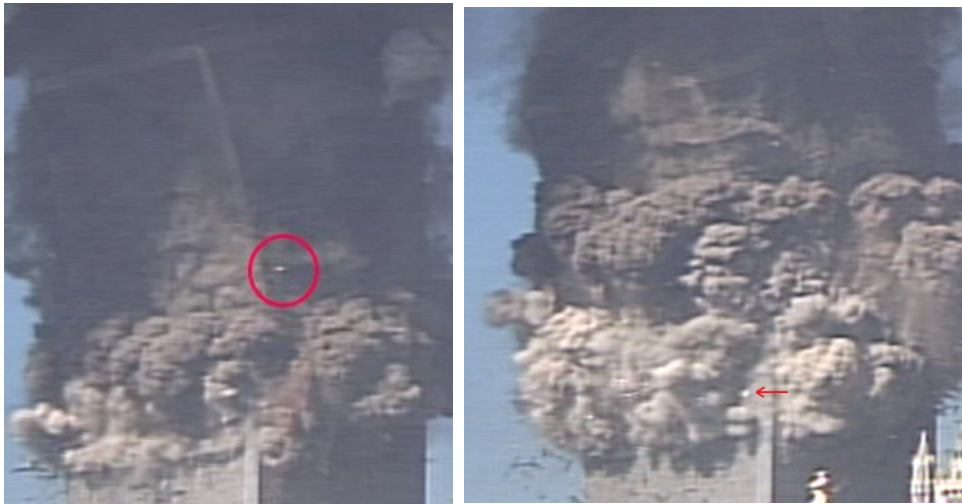


Figure 14: NBC video frames 1832 and 1875. The duration of these flashes were also approximately 0.033 seconds.

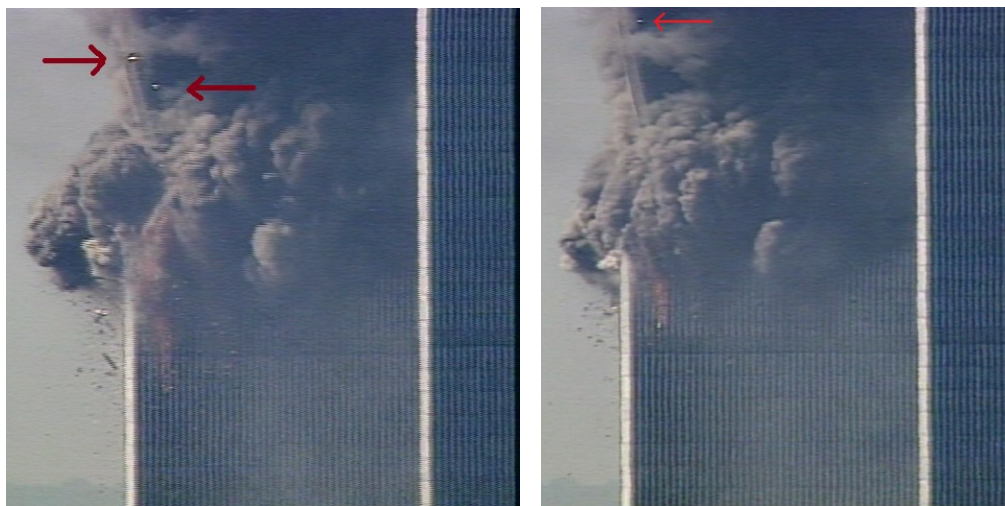


Figure 15: Video recorded by the ABC.⁵⁵ In the image to the left, we see two flashes occurring simultaneously (frame number frame 2927). The flash to the left lasted for a total of 7 frames (2925-2931) or approximately 0.234 seconds. In the image to the right (frame number 2909), the flash lasted a single frame or approximately 0.033 seconds.



Figure 16: Onno DeJong video, frames 6854 (left) and 6867 (right).

It is significant that the flashes described in this paper began at the onset of the collapse and continued afterward. Whatever their cause, it is suggested that they, as a minimum, are not incidental to the collapse. A careful review of several videos suggested that the first flash in the area of focus occurred within half a second of the onset of the collapse, approximately 0.67 seconds prior to the C flash. Although this flash is visible in at least three videos, there is, unlike the C flash, more room left for interpretation due to its small size and low intensity levels. Hence, it is named the Suspected (S) flash. It is visible in frames 1762-1764, 6812-6813, and 102732-102734 of the NBC, Onno DeJong, and Cindy Weil videos, respectively (figs. 17-19).

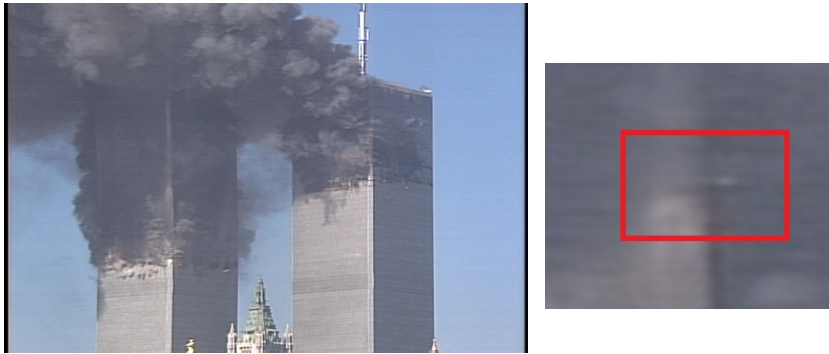


Figure 17: Wide shot and zoomed view of frame 1762.

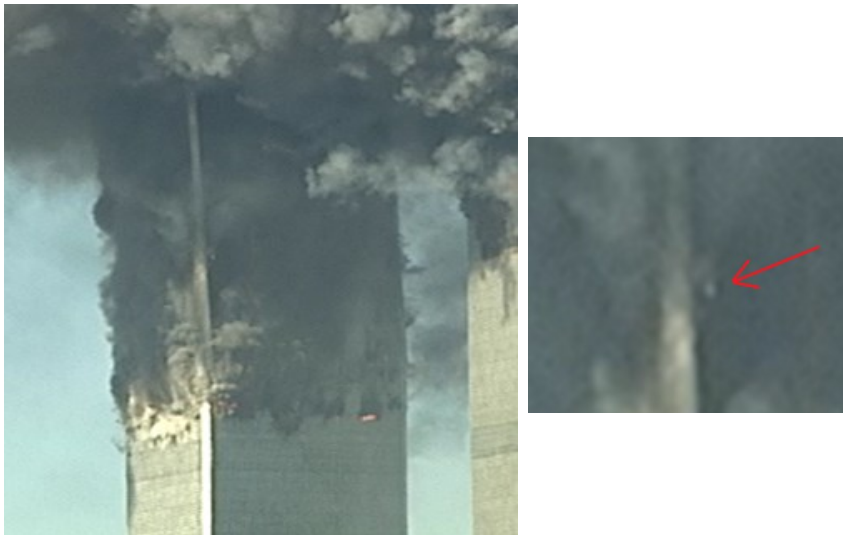


Figure 18: Wide shot and zoomed view of frame 6812.

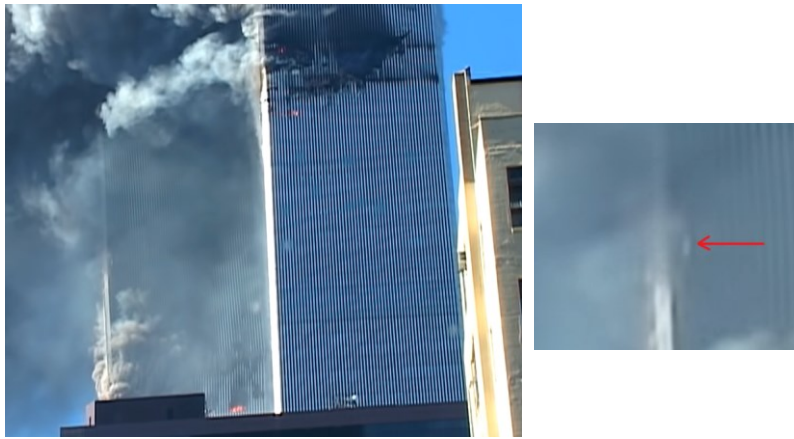


Figure 19: Wide shot and zoomed view of frame 102732.

11. Characterization of the Damage to the Northeast Corner

As the top section of the South Tower moved downward, the area associated with some of the flashes – in particular the S and C flashes – briefly came into view on a number of videos. A video of the collapse, originally broadcast by the German television station Das Erste, captured a clear view of this area (figs. 20-21).⁵⁶



Figure 20: Frames 160 and 165 from the Das Erste video.



Figure 21: Zoomed and enhanced view of the structural damage seen in frame 165.

Judging from these photos, there appears to be a large, irregularly shaped hole in column 300. Columns 259 and 301 are severely damaged; column 301 may even be severed. There appears to

be a large gaping hole to the left of column 259. In a low-resolution video taken by Alfie Alvarado, the damage to the northeast corner is clearly visible in frame 59 (fig. 22).⁵⁷ Note that a significant amount of smoke or pulverized material appears to be coming from the damaged area.



Figure 22: Frame 59 from the Alfie Alvarado video.

In a video recorded from the south-southeast by Dean Riviere, who was on the 25th floor of a building at 14 Wall Street, Manhattan, the damage to column 301 is clearly visible (fig. 23).⁵⁸



Figure 23: Wide shot and zoomed view of frame 34512 from the Dean Riviere video.

In figure 24, we see the area associated with the S flash, approximately 0.63 seconds after it had disappeared. This is prior to the C flash.



Figure 24: Wide shot and zoomed view of frame 1781 (NBC).

In Figure 25, we see the area associated with the S flash from the Onno DeJong video, approximately 0.62 seconds after the flash had disappeared. This is also prior to the C flash.



Figure 25: Zoomed view of frame 6830.

In figure 26, we see frame 102791 from the Cindy Weil video with overlaid lines to highlight the details of the geometry. In addition to the structural damage just described, note that a complex kink has formed around the damaged area, consistent with significant structural weakening. The focal point of the kink appears to be the area associated with the S and C flashes. The NIST investigation, which offered no analysis of the issues discussed in this paper, acknowledged for reasons unknown that a complex kink also formed in the area of the 106th floor at the southeast corner.⁵⁹ NIST also noted that the top section twisted slightly clockwise (as viewed from above).



Figure 26: Frame 102791 from the Cindy Weil video.

12. Conclusion

The flashes of light associated with the South Tower are similar to those recorded during the demolition of the Martin Tower, including possibly being accompanied by significant structural damage. They would, however, appear to be overall less symmetrical than those associated with the Martin Tower. On the other hand, if explosives contributed to the destruction of the Twin Towers, it was done with an entirely different strategy than the one used at the Martin Tower, thus, there are limitations to the number of parallels that can be drawn between the two. Several lines of investigation could be undertaken to further our knowledge, particularly finite element analysis, analysis of audio recordings, interviews with first responders, and modeling studies. A key question that needs to be answered is: if explosive material produced the damage seen on the northeast corner column, what would be the rationale from a demolition standpoint?

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