

RESEARCH  
ARTICLE

# A Grounded Theory Update on the Roswell UFO Incident

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## HIGHLIGHTS

Two recent lines of hard evidence do not support the latest official explanation for the mysterious debris from the Roswell UFO case. The source or nature of this 1947 crash event thus remains an elusive but important question worthy of further investigation.

## ABSTRACT

Something unquestionably strange fell southeast of the tiny New Mexican town of Corona in the summer of 1947—an event that has become an iconic case in ufology and part of mainstream culture. Documentation and eyewitness testimony prove that rancher William Ware “Mack” Brazel took samples of that debris into the Roswell, New Mexico, sheriff’s office, who in turn reported the situation to Roswell Army Air Force officials. Controversy around the incident has always centered on the identification of the recovered debris versus its existence. Photographs of the purported debris have suggested a terrestrial explanation, while eyewitness descriptions have supported either that explanation or something much more exotic. Attempts to decipher text from a photographed document known as the Ramey Memo have not provided definitive results that would rule out any explanations. Still, there are two areas in which empirical studies can be conducted and advancements possibly made. These involve (a) strides to clarify the operational and logistical details of “Project Mogul,” which is the US military’s claimed source of the debris, and (b) new efforts to read the Ramey Memo from higher-quality digital scans. A grounded theory (or deductive) examination of these two lines of empirical evidence fails to clearly support the military’s latest “official explanation” and thus leaves open the extraterrestrial hypothesis for the debris. Future directions for research are therefore discussed.

## KEYWORDS

Empiricism, Project Mogul, UAPs, UFOs, Roswell Incident, Ramey Memo, trace cases

Unidentified flying objects (UFOs)—now commonly termed *unidentified aerial phenomena* (UAPs)—are an enduring enigma, although mass media depictions of UFOs (Sparks et al., 1998) and government attempts to manage national narratives (Haines, 1999) have stifled serious research reports in this domain. However, Sturrock’s (1994a, 1994b, 1994c) survey of the American Astronomical Society found that many of its members were surprisingly open-minded about the topic when asked to reply anonymously.

This same study further found that 4.6% of respondents reported witnessing or recording UAPs, whereas, more broadly speaking, five percent of all reports are never definitively explained (for a discussion, see Kean, 2010). In fact, recent government disclosures have affirmed both the anomalous and physical nature of many UFO sightings by military pilots (Office of the Director of National Intelligence, 2021). These trends agree with independent scientific panels that concluded UFOs deserve continued and



**Figure 1. Map of New Mexico with the various points of interest and locations of important events involved with the Roswell incident noted. Credit: National Atlas of the United States.**

in-depth study, even if the physical evidence does not necessarily indicate violations of known natural laws or the involvement of an extraterrestrial intelligence (Greenewald, 2019; Kuettner et al., 1970; Sturrock, 1999; Sturrock et al., 1998). This latter idea is known as the extraterrestrial hypothesis (ETH), which contends that some UFO/UAPs represent spacecraft occupied by extraterrestrial life or non-human aliens, or non-occupied alien probes from other planets visiting Earth.

One of the most famous and arguably complex UFO occurrences is the 1947 “Roswell Incident” (Figure 1) involving physical debris with supposedly peculiar appearance and properties. The government has offered multiple explanations for the debris, and UFO investigators have conducted perhaps the most extensive investigation of a single case in UFO history. For those unfamiliar with the Roswell incident, Table 1 lists important investigations by both advocates and detractors of ETH interpretations of this historical event. Qualitative methods, such as witness interviews, have most often featured in these authors’ inquiries. However, there is also some tangible information in the form of official government records and other documentation of undisputed provenance. This paper assesses two key pieces of empirical data relative to the US

Air Force’s official explanation for Roswell. Specifically, the contexts and implications of these pieces of evidence are critically reviewed and evaluated via a grounded theory approach. This refers to the construction of hypotheses or theories through the collection and analysis of data, i.e., the research does not begin with a theory, but rather the theory is the outcome of the process (e.g., Chun et al., 2019). In this way, the author aims to give readers an update on the status of this undoubtedly significant case and identify the most promising directions for future research.

## CASE BACKGROUND: BASIC FACTS AND CURRENT CONTROVERSIES

### Beginnings of an Iconic Case

Early in July 1947, William “Mack” Brazel (Figure 2) discovered a field filled with metallic debris that interfered with ranch management and care of livestock. Suspecting that it had something to do with the military, and believing they were responsible for cleaning up the debris, he made the four-hour trip into Roswell to speak with the Chaves County Sheriff, George Wilcox. After interrogating Brazel, Wilcox placed a call to the Roswell Army Air Field. Major

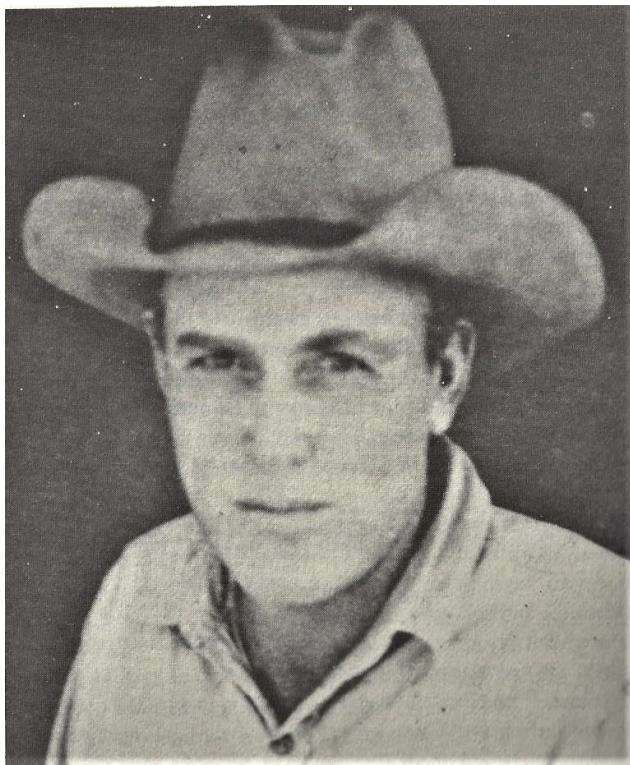


**TABLE 1. Chronological List of Seminal Investigations on the Roswell Incident**

Advocates	Detractors
Berlitz, C., & Moore, W. (1980). <i>The Roswell incident</i> . Grosset & Dunlap.	Carrion, J. (2010). <i>The Roswell Deception</i> . CreateSpace.
Blum, H. (1990). <i>Out there</i> . Simon & Schuster.	Clary, D. L. (2001). <i>Before and after Roswell</i> . Xlibris.
Bourdais, G. (2004). <i>Roswell: Enquêtes, secret et désinformation</i> . Dilisco.	Dietrich, D. (2021). <i>The Roswell deception and the demystification of WW II</i> . Sky Books.
Bullard, T. (2010). <i>The myth and mystery of UFOs</i> . University Press of Kansas.	Frazer, K., Karr, B., & Nickell, J. (1997). <i>The UFO invasion</i> . Prometheus.
Carey, T. J., & Schmitt, D. R. (2009). <i>Witness to Roswell</i> . New Page Books.	*Jacobsen, A. (2011). <i>Area 51: An uncensored history of America's top Secret military base</i> . Orion.
Carey, T., & Schmitt, D. (2022). <i>Witness to Roswell: 75<sup>th</sup> anniversary edition</i> . Red Wheel Weiser.	Klass, P. J. (1997). <i>The real Roswell crash saucer coverup</i> . Prometheus.
*Clark, J. (2018). <i>The UFO encyclopedia</i> . Omnigraphics.	+Korff, K. (1997). <i>The Roswell UFO crash: What they don't want you to know</i> . Dell.
Corley, L. (2007). <i>For the sake of my country</i> . AuthorHouse.	Lawson, G. (2021). <i>Roswell: The after-action report</i> . Amazon Digital Services.
+Corso, P. J., & Birnes, W. J. (1997) <i>The day after Roswell</i> . Simon & Schuster.	Mantle, P. (2012). <i>Roswell alien autopsy: The truth behind the film that shocked the world</i> . Independently published.
Eberhart, G. M. (Ed.). (1991). <i>The Roswell report: A historical perspective</i> . J. Allen Hynek Center for UFO Studies.	McAndrew, J. (1997). <i>The Roswell report: Case closed</i> . Good Press.
*Edwards, F. (1966). <i>Flying saucers—Serious business</i> (pp. 41–42). Lyle Stuart.	*Peebles, C. (1995). <i>Watch the skies</i> . Smithsonian Institution Press.
Friedman, S., & Berliner, D. (1992). <i>Crash at Corona</i> . Paragon House.	Pflock, K. (1994). <i>Roswell in perspective</i> . Fund for UFO Research.
*Good, T. (1987). <i>Above top secret</i> (pp. 254–7, 261–2, 333, 407, 434, 547–8). Quill.	Pflock, K. T. (2001). <i>Roswell: Inconvenient facts and the will to believe</i> . Prometheus.
Harris, P. L., & Salla, M. (2017). <i>Conversations with Colonel Corso</i> . StarworksUSA.	Redfern, N. (2005). <i>Body snatchers in the desert</i> . Pocket Books.
*Hastings, R. (2007). <i>UFOs and nukes</i> . AuthorHouse.	Redfern, N. (2017). <i>The Roswell UFO conspiracy</i> . Lisa Hagan Books.
Leacock, C. P. (1998). <i>Roswell: Have you ever wondered?</i> Novel Writing Pub.	Saler, B., Ziegler, C., & Moore, C. (2008). <i>UFO crash at Roswell: Genesis of a modern myth</i> . Smithsonian Books.
Marcel, J., Jr., & Marcel, L. (2008). <i>The Roswell legacy</i> . RWW New Page Books.	Shawcross, T. (1997). <i>The Roswell file</i> . Bloomsbury.
McAvennie, M. (Ed.). (2004). <i>The Roswell dig diaries</i> . Pocket Books.	Weaver, R. L., & McAndrew, J. (1995). <i>The Roswell report: Fact vs. fiction in the New Mexico desert</i> . Department of the Air Force.
*Randle, K. (1989). <i>The UFO casebook</i> (pp. 5–11). Warner Books.	Weaver, R. (2020). <i>The Roswell report: Fact vs. fiction in the New Mexican desert</i> . A. J. Cornell Publications.
Randle, K., & Schmitt, D. (1991). <i>UFO crash at Roswell</i> . Avon.	
Randle, K., & Schmitt, D. (1994). <i>The truth about the UFO crash at Roswell</i> . M. Evans.	
Randle, K. (2000). <i>The Roswell encyclopedia</i> . HarperCollins.	
Randle, K. (2016). <i>Roswell in the 21<sup>st</sup> century</i> . Speaking Volumes.	
Randle, K. (2022). <i>Understanding Roswell</i> . Flying Disk Press.	
Schmitt, D. (2017). <i>Cover-up at Roswell: Exposing the 70-year conspiracy to suppress the truth</i> . Red Wheel Weiser.	
Schmitt, D. (2020). <i>Roswell: The ultimate cold case closed</i> . New Page Books.	
Spencer, L. (2017). <i>Alien interview</i> . Independently published.	

\* Mentions the Roswell case in connection with other UFO sightings.

+ Discredited book based on contradictions, poor research, and other distortions.



**Figure 2. Mack Brazel, the rancher who found and reported the debris to Chaves County Sheriff George Wilcox.**

Jesse A. Marcel, Sr. (Figure 3), the Air Intelligence Officer at the base, responded to the call, and determined that an investigation should be undertaken. Captain Sheridan Cavitt, the officer in charge of the counterintelligence detachment in Roswell, was alerted and joined Marcel at the sheriff's office (Berlitz & Moore, 1980; Carey & Schmitt, 2009; Friedman & Berliner, 1992; Randle, 2018). Both Marcel and Cavitt had the opportunity to examine samples of the metallic debris brought in by Brazel (McGuire, 1990).

Although it was late in the day on Sunday, July 6, 1947, both men accompanied Brazel back to the ranch. Marcel said,

We took off cross county [from the sheriff's office] behind this pickup truck this rancher had. He didn't follow any roads going out . . . so we got to his place at dusk. It was too late to do anything, so we spent the night there in that little shack and the following morning we got up and took off.

Later he would tell Linda Corley (2007) who reported it in *For the Sake of My Country*,

I went to his house. I followed him. We left Roswell in the afternoon and got there at dusk . . . so we couldn't do anything that evening. So, we stayed



**Figure 3. Major Jesse Marcel, the Air Intelligence Officer of the 509th Bomb Group and the officer who took samples of the debris to Roswell and Fort Worth.**

at his house that night with Cavitt . . . [We] spent the night at his house. We were treated with a can of pork and beans and crackers.

### The In-Field Observations

The next morning Brazel took them to the field filled with the metallic debris that Marcel would later say was about three quarters of a mile long and about 200 yards wide. Cavitt would later tell Air Force Colonel Richard Weaver the debris was spread out in a much smaller area (Weaver & McAndrew, 1994). According to Marcel, he and Cavitt collected some of the material. Marcel then sent Cavitt back to the base to brief Colonel William Blanchard, the commanding officer in Roswell. Marcel stayed on the field, filling his car with the debris. He would later tell investigators he left a great deal of it behind. Late in the afternoon, he left the field, driving back to Roswell. On his way to the base, he stopped by his house to show his wife, Vaude, and son, Jesse Jr., the strange metallic debris. Jesse Marcel, Jr., pointed to some strange symbols on one of the small beam-like members. Marcel, Jr., later said it was purple and looked like hieroglyphics (Marcel & Marcel,

2008). Marcel eventually returned to the base and briefed the commanding officer on what he had seen on the ranch.

### The First Official Response

At some point on the morning of July 8, Blanchard called his public affairs officer, First Lieutenant Walter Haut, telling him to issue a press release saying that the 509th Bomb Group was in possession of a “flying saucer” (Carey & Schmitt, 2009; Randle, 2018). Haut, in various interviews with UFO investigators, said that he was unsure if Blanchard had dictated the press release to him over the telephone, if he had given Haut the information so that he could write the release himself, or if Haut had actually gone to Blanchard’s office (Friedman & Berliner, 1992; Randle, 2018). Haut said that he then had either driven into town to deliver the press release to the four media outlets or he had called them and dictated it to them over the telephone. Given the timing, and the slight variations in the wording, it is most likely that Haut had called both newspapers and both radio stations rather than physically handing the press releases to the reporters and editors.

According to some newspaper reports, Marcel, who had been ordered to take samples of the debris to the Fort Worth Army Air Field in Texas, left in a B-29 at 10:30 that morning. Marcel suggested it was just after lunch. The important point here is that Marcel, on orders from Brigadier General Roger Ramey, the commanding officer of the Eighth Air Force, and the senior headquarters, left Roswell on July 8th, removing him momentarily from the story. There is a 1947 document that provides the exact times for much of this reporting. According to *The Daily Illini*, the first of the stories on the Associated Press wire appeared at 4:26 p.m. on the East Coast. That would mean that the stories went out from Albuquerque sometime prior to 2:26 p.m. (MST). This is more or less consistent with what both George Walsh of radio station KSWS and Frank Joyce from radio station KGFL remembered.

### The Military's Subsequent Chain Reaction

At 4:30 p.m. (EST), there is the first “add” to the Associated Press story, which mentioned “Lt. Warren Haught [Walter Haut],” who was described as the Public Information Officer at Roswell. This new information suggested that the object had been found “last week” and that the object had been sent onto “higher headquarters,” which in this case meant Fort Worth. When the aircraft carrying Marcel and three packages apparently containing wreckage landed in Fort Worth, the enlisted soldiers had been ordered to remain with the plane until a guard was posted. Marcel disembarked with the packages he had been carrying. Marcel was driven to Ramey’s office, where he spoke

to the General. He set the debris on Ramey’s desk and then followed Ramey to what was called the map room to show Ramey exactly where the debris had been found. While Marcel was in the map room with Ramey, according to what Marcel would say later, the debris was removed from Ramey’s office and a torn-up weather balloon (Figure 4) was substituted, spread out on the floor. Later Marcel would tell Linda Corley (2007) that the debris had been concealed under the brown paper that now held the remains of a badly degraded Rawin radar target.

In Fort Worth, Texas (3:30 p.m. CST, 4:30 p.m. EST), Cullen Greene, an editor at the *Fort Worth Star Telegram*, read the story as it came over the news wire. J. Bond Johnson, who worked at the newspaper in July 1947 said in an interview, “I don’t know the mechanics. We’d get those alerts. The bells would ring, and it would be an attention thing. It would be an editor thing.” As a reporter/photographer, he would not have worried about those “things” (Randle, 2018). Greene asked Johnson if he had his camera with him and then told him to interview Ramey at his



**Figure 4. Major Jesse Marcel with the balloon and Rawin radar target wreckage in Brigadier General Ramey’s office at the Fort Worth Army Air Field. Examining the photographs decades later Marcel said that this was not the material he had escorted to Fort Worth. Photograph courtesy of the University of Texas at Arlington Special Collections.**

Headquarters. It was after 4:30 p.m. (CST, 5:30 EST) when Johnson arrived at the Fort Worth Army Air Field. Johnson said that it was about a twenty-minute trip from the newspaper office out to the airfield. He said that he routinely covered activities at the airfield, so when he reached the gate, he showed his press pass. He also had a Civil Air Patrol sticker on his car, which would have made it easier for him to enter the airfield. He had been told to go to Ramey's office, though he normally would visit the Public Information Officer rather than the Commanding General (Shandera & Moore, 1990).

Johnson said that when he entered the office, he was met by Ramey and Colonel Thomas DuBose, the Eighth Air Force Chief of Staff. According to Johnson,

I posed General Ramey with this debris piled in the middle of his rather large and plush office. It seemed incongruous to have this smelly garbage piled up on the floor . . . spread out on the floor of this rather plush, big office . . . I posed General Ramey with this debris. At that time, I was briefed on the idea that it was not a flying saucer but in fact was a weather balloon that had crashed.

### Photographs from General Ramey's Press Conference

Johnson took a series of photos in Ramey's office; specifically, there were two of Ramey and two of Ramey and DuBose (Figure 5). He also took two photographs of Jesse Marcel crouched near the remains of a weather balloon and holding a large fragment of a Rawin radar reflector. General Ramey saw the debris and identified it as nothing more than a mundane weather device. To reinforce this opinion, he ordered an officer from the base weather office to appear while Johnson was in the office to confirm his identification. Documentation proves that Warrant Officer (later major) Irving Newton was a weather officer at the base in 1947. Newton told the author in a letter dated July 21, 1994, that he was alone in the base weather office when he received a call ordering him to General Ramey's office. Newton said that he was the only one there, in his office, and could not leave. General Ramey then called and told him to "get your ass over here now. Use a car and if you have to, take the first one with the keys in it."

Newton wrote to me,

I was met at the General's office by a Lt. Col. or Col. who told me that some one [sic] had found a flying saucer in New Mexico and they had it in the General's office . . . but the General suspected that it might be meteorological equipment or something

of that nature and wanted it examined by qualified meteorological personnel. (Newton, 1991)

Newton said that when he entered the office there were several others there, including reporters. He said, "...when I went in . . . [there were] a couple of press people, a Major, I learned to be Major Marcel and some other folks. Someone introduced Major Marcel as the person who found this material."

However, Newton added something new to his interview when he spoke to the Air Force officers conducting a new investigation in 1994. He told the Air Force investigator,

While I was examining the debris, Major Marcel was picking up pieces of the target sticks and trying to convince me that some notations on the sticks were alien writing. There were figures on the sticks lavender or pink in color, appeared to be weather faded markings with no rhyme or reason.

The problem is that Newton's testimony in the mid-1990s does not agree with what he had said in the past. In his interview with Bill Moore, he was asked, "But wouldn't the people at Roswell have been able to identify a balloon on their own?" Newton said, "They certainly should have. It was a regular Rawin sonde. They must have seen thousands of them." In 1994, he would tell Air Force investigators that "We did not use them at Fort Worth . . . These were used mostly on special projects and overseas."

### An Evolving Official Narrative with Two Controversies

Then, at 7:29 p.m. EST (6:29 p.m. CST) came another new lead for the wire story. It said, "Procede [sic] Washington. Lead All Disk." This meant, simply, that the lead on the story that had been transmitted prior to this would be changed and the new lead substituted. This was interrupted with another bulletin almost immediately. It said, "Fort Worth—Roswell's celebrated 'flying disk' was rudely stripped of its glamor by a Fort Worth army airfield weather officer who late today identified the object as a 'weather balloon.'" At this point, two of the ongoing controversies were created. Johnson had photographed Ramey as he crouched near the debris. He held a document in his hand (Figure 6) in the four pictures taken of him. In one of them, the paper, though slightly crumpled, obviously contained something written. Many years later, photographic enlargements of that portion of the picture revealed some of the words. Even the most casual examination reveals enough of the wording to suggest that the



**Figure 5. Brigadier General Roger Ramey and Colonel Thomas DuBose posed with the alleged wreckage of the balloon and Rawin radar target in General Ramey's office. This is the first time that the print has not been cropped and shows the full picture. Photograph courtesy of the University of Texas at Arlington Special Collections.**



**Figure 6. Closeup of Brigadier General Roger Ramey holding the document that has been described as “The Ramey Memo.” Photograph courtesy of the University of Texas at Arlington Special Collections.**

document concerns the recovery in New Mexico. The document came to be labeled “The Ramey Memo.” It has since been scrutinized by a variety of methods, and controversy still rages about the entire contents of the memo. If it can be read, then the truth about the Roswell retrieval might be discovered.

The other issue is the identity of the wreckage. It is clear from the photographs, as well as the testimony of those present in 1947, and from Jesse Marcel, that the debris in the photographs are the remnants of a weather balloon and a Rawin target. The balloon envelope, though blackened, is in the picture. The Rawin radar target is badly degraded but can be identified as well. The questions raised at the time and later echoed by UFO researchers was (a) Why there had been such a Herculean effort to retrieve the remnants of a common balloon, and (b) Why there was

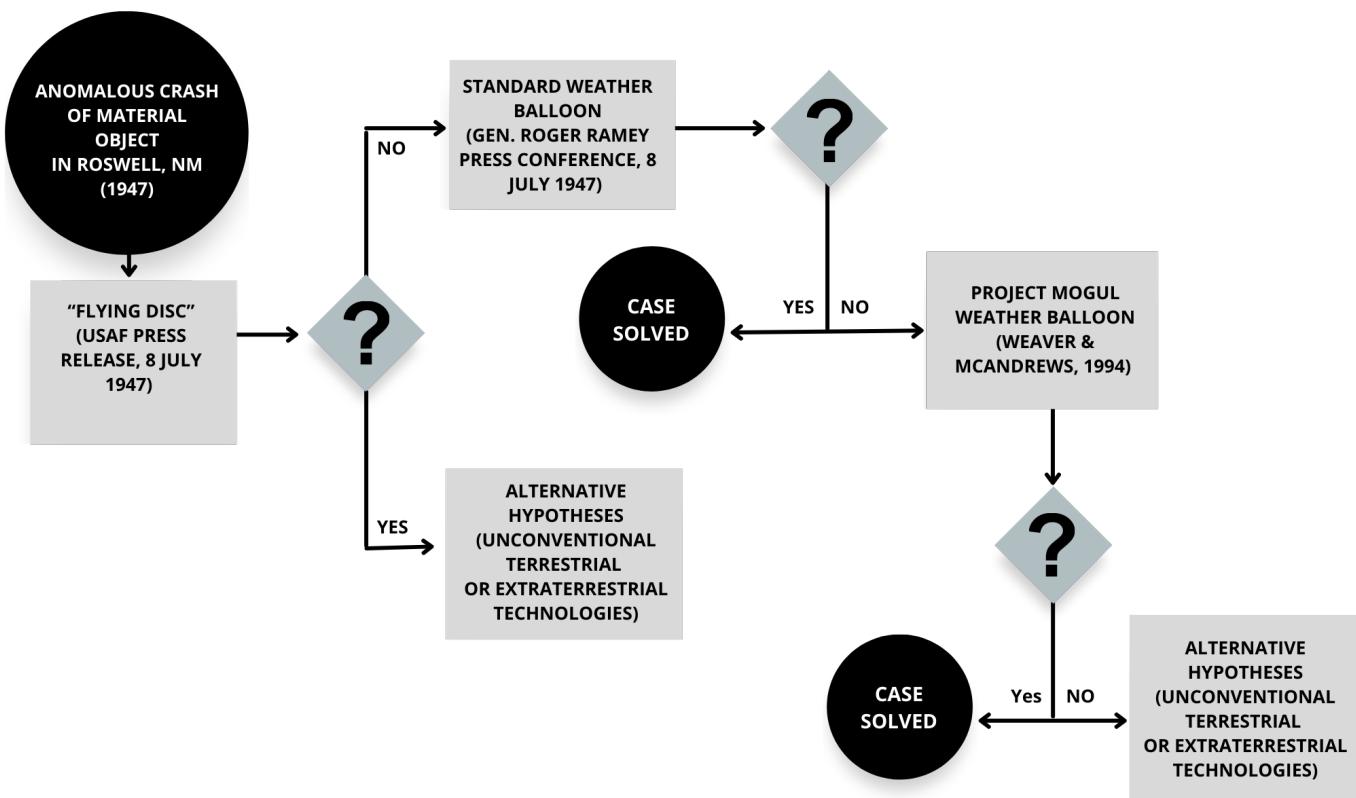
no one in Roswell who could identify it for what it apparently was? During the Air Force search for records in the mid-1990s, an answer was offered. This was no ordinary weather balloon, but part of the top-secret “Project Mogul,” designed to spy on the Soviet Union (Weaver & McAndrew, 1994). Given the top-secret nature of the project, it was necessary to collect all the remnants and important to divert attention from the ultimate purpose.

## THE PRESENT PAPER

Sturrock et al.’s (1998) scientific panel review of UFO evidence recommended that “studies should concentrate on cases that include as much independent physical evidence as possible” (p. 184). To that end, the remainder of this paper reviews two core controversies in the Roswell Incident as outlined above. The preceding background demonstrates that Roswell has involved no less than three “official explanations,” with the government’s latest solution being that the UFO debris was weather balloon material from the top-secret Project Mogul activity (see Figure 7). The Part 1: Review section scrutinizes this claim based on both previously known and new documentation. As is discussed below, the cumulative evidence plainly contradicts this proposed resolution. This raises the question of the actual identity of the debris if it was not from Project Mogul. Part 2: Review explores this issue by assessing new photographic evidence (with accepted provenance) from General Ramey’s press conference. This update and synthesis of important empirical data subsequently forms the basis of a grounded theory for the debris, as well as recommendations for future research.

## PART 1: REVIEW OF THE “PROJECT MOGUL” CONTROVERSY

In February 1994, the Secretary of the Air Force, Sheila Widnall, responding to a Government Accounting Office plan to “ascertain the facts regarding the reported crash of an UFO in 1949 (sic) [1947] at Roswell, New Mexico,” tasked the Administrative Assistant to the Secretary of the Air Force (SAF/AA) to lead the Air Force search. Colonel Richard Weaver and First Lieutenant James McAndrew were the officers in charge of the effort. They determined that this was one area in which there is sufficient documentation to draw the preferred conclusions. The Air Force officers then began looking for a terrestrial explanation for what fell at Roswell. Civilian UFO researchers had spent decades attempting to find such a solution. All parties had been able to rule out aircraft accidents, rockets, or missiles from White Sands Proving Ground (later the White Sands Missile Range), and normal weather balloons. However, some civilian researchers, including Robert Todd and Karl Pflock,



**Figure 7. Flow diagram of competing explanations for the Roswell UFO debris (courtesy of Beth M. Houran).**

pointed to a special project that had operated out of Alamogordo Army Air Field in June and July of 1947 (Pflock, 2010, pp. 144–165). They believed that one of these flights might account for the debris found by Mack Brazel.

Although now known in the Roswell literature as Project Mogul, in June 1947 scientists were conducting unclassified experiments to create a constant level balloon under the guidance of New York University. The theory was that an acoustical level existed in the upper atmosphere that would conduct sound waves a long distance. If a balloon could be placed in that acoustical level for an extended period of time, it might be possible to detect the Soviets' detonation of an atomic device from a great distance. Spying on the Soviet Union was the ultimate, and highly classified, purpose of the experiments in New Mexico. Called Project Mogul at the highest levels, those working in New Mexico called it the New York University high-altitude balloon experiments (Pflock, 2010; Randle, 2018; Weaver & McAndrew, 1994).

All flights of the Mogul arrays, or as Charles Moore, a team member, called them, the New York University balloon project balloon flights, were accounted for in the records, with few exceptions. The first few flights, through Flight No. 3, took place on the East Coast before they moved their

experiments to New Mexico and are irrelevant to this discussion. Flight No. 4 was the first scheduled flight in New Mexico, planned to launch early on the morning of June 3, 1947. According to the diary kept by Dr. Albert Crary, the project leader, it was cancelled because of cloudy weather. Another attempt was made the following morning. Crary's entry for this attempt said:

June 4 Wed  
Out to Tularosa Range and fired charges between 00 and 06 this am. No balloon flight again on account of clouds. Flew regular sonobuoy mike up in cluster of balloons and had good luck on receiver on ground but poor on plane. Out with Thompson pm. Shot charges 1800 to 2400.

Charles Moore, attempting to interpret what this meant, later wrote, "Crary's diary entries for June 4 are puzzling because they are contradictory." Moore suggested that Crary had copied his field notes into the diary later and that the events of early June, including the critical entry on June 4, had been copied in one sitting, which Moore believed might account for the seeming contradictions. Moore wrote:

One interpretation of the June 4 entry is that the launch scheduled for making airborne measurements on Crary's surface explosions after midnight was canceled because of clouds but, after the sky cleared around dawn, the cluster of already-inflated balloons was released, later than planned. The initial cancellation and later launch were recorded sequentially, as they occurred, in his field notes which he later transcribed into his permanent diary, without elaboration.

Moore suggested that they had just arrived in Alamogordo and would not, at that time, have "improvised." He said that after they had rigged an entire array, "I think . . . we would have launched the full-scale cluster, complete with the targets for tracking by the Watson Lab radar." However, documentation uncovered by the Air Force investigation, including an illustration of Flight No. 5, showed no Rawin targets were used, either on the full array flights or the cluster of balloon flights launched for additional experimentation when full array flights were cancelled. As Moore told the author during a discussion in his home in Socorro, New Mexico, in 1991, they couldn't put the helium back in the bottles (see also Weaver & McAndrew, 1994). Moore added:

I have a memory of J. R. Smith watching the June 4th cluster through a theodolite on a clear, sunny morning and that Capt. [Larry] Dyvad reported that the Watson Lab radar had lost the targets while Smith had them in view. It is also my recollection that the cluster of balloons was tracked to about 75 miles from Alamogordo by the crew in the B-17. As I remember this flight, the B-17 crew terminated the chase, while the balloons were still airborne (and J. R. was still watching them), in the vicinity of Capitan Peak, Arabela, and Bluewater, New Mexico. I, as an Easterner, had never heard of these exotically-named places but their names have forever been stuck in my memory. This flight provided the only connection that I have ever had with these places. From the note in Crary's diary, the reason for termination of the chase was due to the poor reception of the telemetered information by the receiver aboard the plane. We never recovered this flight and, because the sonobuoy, the flight gear, and the balloons were all expendable equipment, we had no further concern about them but began preparations for the next flight.

Although Moore claimed that "this flight provided the only connection that I have ever had with these places,"

this is simply untrue. Flight No. 17 from September 9, 1947, flew along the same trajectory and passed over the same exotically named landmarks Moore associated with the alleged June 4 project flight. In addition, they lost tracking of it in the exact same vicinity of Capitan Peak that Moore said happened for Flight No. 4. It is quite possible that Moore's 50-year-old memory of "No. 4's" flight path is really a badly distorted recollection of the real Flight No. 17 three months later.

Years later, according to Moore, he heard about the debris found by Brazel and thought it was a good description of the debris that would have been produced by one of their balloon trains. He thought that as the train dragged along the ground, kept partially aloft by the few balloons that had not yet burst, it would have shed debris, creating the mess that Brazel described. He said, "It is possible that Brazel found some of the wreckage from the NYU Flight No. 4." However, the train being dragged by still-inflated balloons to create such a debris field implies the rigging holding everything together to be still there. Yet Brazel, when interviewed by the *Roswell Daily Record* the evening of July 8, 1947, indicated he found no balloon rigging of any kind. A real Mogul constant-altitude flight of this period would have left hundreds of yards of rigging mixed in with the other crash debris it held together in flight. This discrepancy was noted by Lt. James McAndrew in his interview with Moore, but then the issue was dropped when Moore could not come up with an explanation. The other flights, from Flight No. 5 until the first week in July, were accounted for in the history of the balloon project. No other flight disappeared in this fashion in the relevant time frame. The records are quite clear on that. If Flight No. 4 does not account for the debris found by Brazel, then Project Mogul is not the answer.

## PART 1: CONCLUSIONS AND CONSIDERATIONS

To fully consider whether Flight No. 4 could have been the source of the retrieved debris, we need to delve into various details of the operations of balloon projects, and Mogul, specifically. Balloon flights at the time were cancelled for a variety of reasons, including high winds and cloud cover at the time of the launch. While it does not seem that clouds would affect balloons, CAA (FAA) requirements require cancellation in those conditions. As the balloons ascended and descended, and given the length of some of the arrays, these could be a hazard to aerial navigation because they would be invisible in the clouds. This is described in *Technical Report No. 1, Balloon Group, Constant Level Balloon Project*, dated April 1, 1948 (covering the period from November 1, 1946, to January 1, 1948), which said

that one of the requirements was that the weather be relatively clear so that the balloons could be seen.

That same report also stated, "Notices to airmen [NOTAMs] are to be issued if the balloon is descending within designated regions of dense air traffic." This establishes a requirement for NOTAMs, both for the launch, as the arrays climbed through the civil air space, and then another for the arrays as they descended. Once at altitude, which would have been somewhere above 50,000 feet, or far above the levels where civilian aircraft operated in 1947, they would no longer be a hazard. Flight No. 5, launched on June 5, eventually came down in the vicinity of the Roswell Army Air Field, which suggests a NOTAM would have been required, and everyone in flight operations at the base would then have been aware of these long arrays, if they had not encountered information about them earlier.

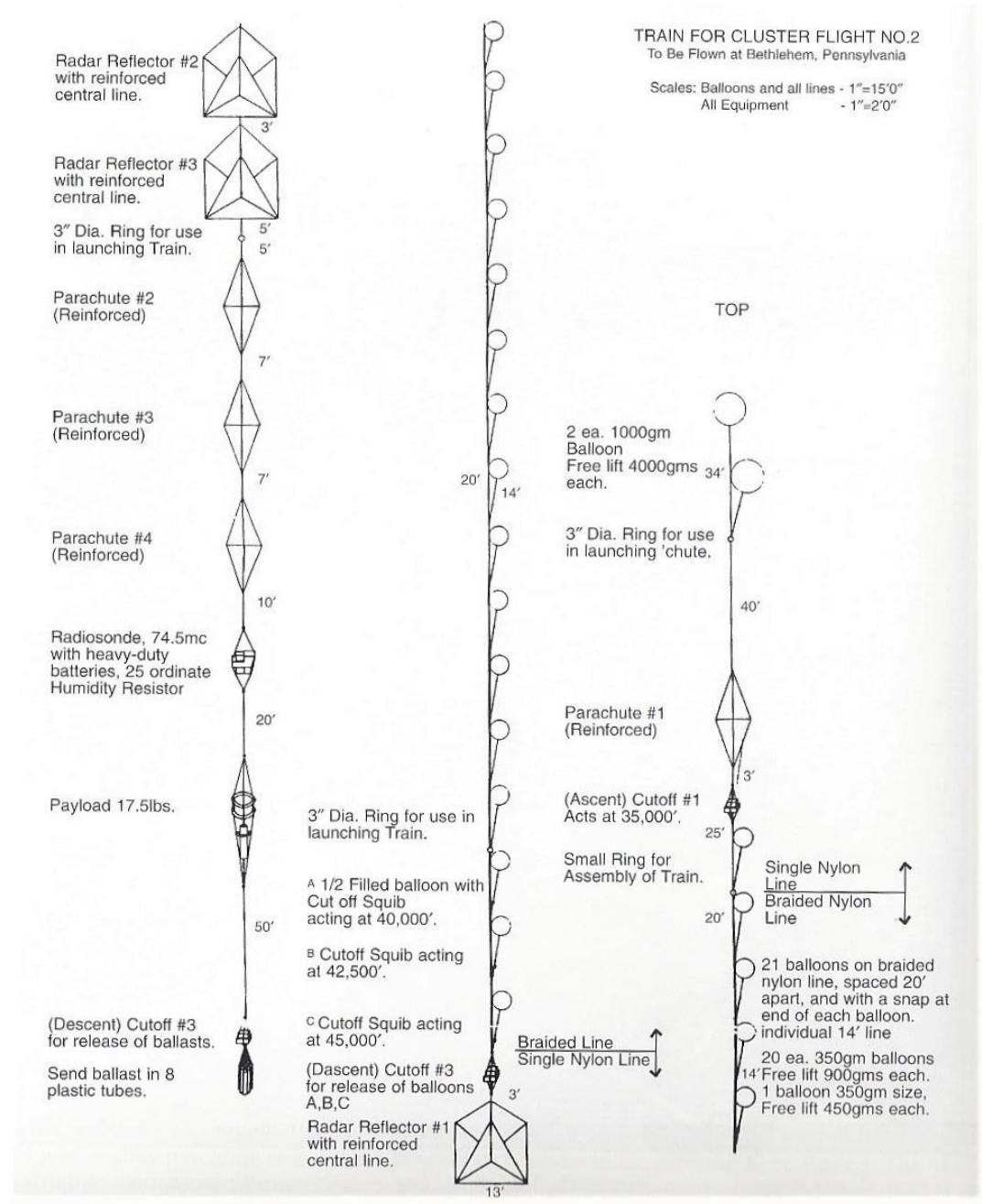
Another strong indication that a NOTAM should have been issued comes from Flight No. 5's tracking data. This shows it passed only 4–5 miles south of the Roswell base as it was descending. In addition, it lingered less than a dozen miles south and west of Roswell air space for over an hour during its slow stratospheric backward drift while a B-17 chase plane circled underneath. The B-17 followed it all the way to its crash site, marked as only 16–17 miles due east of the base. It is difficult to believe that air controllers, plane spotters, or security guards could all have failed to notice the 400-foot-long balloon train and chase plane. In fact, Mogul flight summaries indicate it was tracked optically through theodolite from Alamogordo for 90% of its flight clear to Roswell. It was only lost from sight during its descent phase, when it fell below the horizon formed by the Sacramento Mountains east of Alamogordo. It is not likely that it could be optically tracked for almost 100 miles from Alamogordo yet remain invisible only a few miles away from Roswell base. Moreover, the B-17 should have been in contact with flight control to explain their presence in Roswell air space.

While all this might suggest that those in Roswell would have been aware of the long balloon arrays, Moore made it even clearer in various interviews. He told the present author that he and one or two others had driven to Roswell to ask for assistance in tracking their balloon arrays. He has written that he had been at the base after retrieving debris from Flight No. 5, and that he had "an interview by the Officer of the Day to whom I showed the recovered equipment [emphasis added] from Flight 5." This means, of course, that Moore and his colleagues would have explained what they were doing in Alamogordo and what the arrays would have looked like for those in Roswell. This is crucial because if the personnel at Roswell were aware of the Mogul balloon arrays, they should have also been able to identify Mogul as the source of the mate-

rial recovered and brought to the base a month or so later. There is another fact that shows there was nothing unusual about these arrays. Crary's diary for Sunday, June 8, indicated that "Rancher Sid West found balloon train south of High Rolls in mountains. Contacted him and made arrangements to recover equipment Monday. Got all recordings of balloon flights . . ." No heavy secrecy was involved, and West appears to have known that what he found was not extraordinary debris.

Concerning the secrecy of the project, Moore has claimed that "at that time, the term MOGUL was not known" to those outside the project, even to the New York University balloon crew. The implication is that the project was so secret and compartmentalized that information about it was not widely known. The problem is that this is entirely false. Crary, in his diary, mentions the name Mogul more than once. As one example, in an entry from April 7, 1947, Crary wrote "Talked to [Major W. D.] Pritchard re 3rd car for tomorrow. Gave him memo of progress report for MOGUL project to date . . ." Furthermore, regarding those far removed from Mogul operations, a report from Wright Field on August 25, 1947, classified only "Confidential," concerned a suspected hoax crash disc from Illinois sent to them by the FBI for analysis. The term "Project Mogul" was explicitly used, saying that the object had nothing to do with it. Another FBI memo a month later, referencing the Wright Field report, uses the term "Operation Mogul" four times, even though this memo also had a low classification. What was secret was the goal of the project, not that there was such a high-altitude balloon project.

It is also important to reiterate that, as explained above, the photographs from General Ramey's press conference clearly show the remains of a neoprene balloon, and the very degraded pieces of a Rawin radar reflector made of aluminum foil and balsa wood sticks. There is nothing in the photographs to suggest that the material was exposed to the high desert for over a month, nor was there any obvious dirt clinging to it. There was also no evidence of the strings or other items used to construct Mogul arrays, or the presence of other materials besides a single balloon and a single target. These points are interesting but do not prove that the debris was unrelated to Project Mogul—though they certainly suggest that. However, the photographs lack enough information to conclusively identify a Mogul balloon, and some testimony indicates that this debris was not part of a Mogul array. Indeed, there is no evidence that Rawin radar reflectors were used in those first flights in New Mexico. Moore himself supplied an illustration for Flight No. 5, dated June 5, 1947 (again, the repurposed Flight No. 4). There are no radar reflectors on this flight. There is no mention of radar tracking until Flight No. 8, launched on July 3. An illustration for Flight No. 2,



**Figure 8. Illustration of the composition of Flight No. 2 that was launched from Bethlehem, Pennsylvania, before the project moved to New Mexico. This array, which included three Rawin radar targets, was more than 600 feet long and was compared to the Eiffel Tower and the Washington Monument to provide scale. Credit to the United States Air Force and New York University.**

which provided no data, did contain radar reflectors (see Figure 8), but again, there is no evidence they were used in New Mexico until later.

Most critically, the overwhelming evidence points to Flight No. 4 as being cancelled, which immediately rules it out as a candidate for the source of the debris. Interestingly, in the final report on NYU's balloon activities there is a tabulation of all the flights. Both Flight No. 4 and Flight No. 9 are missing. This tabulation also notes regarding Flight

No. 5, "First successful flight carrying a heavy load." Multiple official Air Force and other histories also state that a June 5 flight (i.e., No. 5) was the first AAF research balloon in New Mexico (see Figure 9). None mention a balloon flight the previous day. This would suggest that the cluster of balloons launched the day before was not a full Mogul array. Moore, however, with no documentation to support the conclusion, wrote, "I think that Flight No. 4 used our best equipment and probably performed about as well

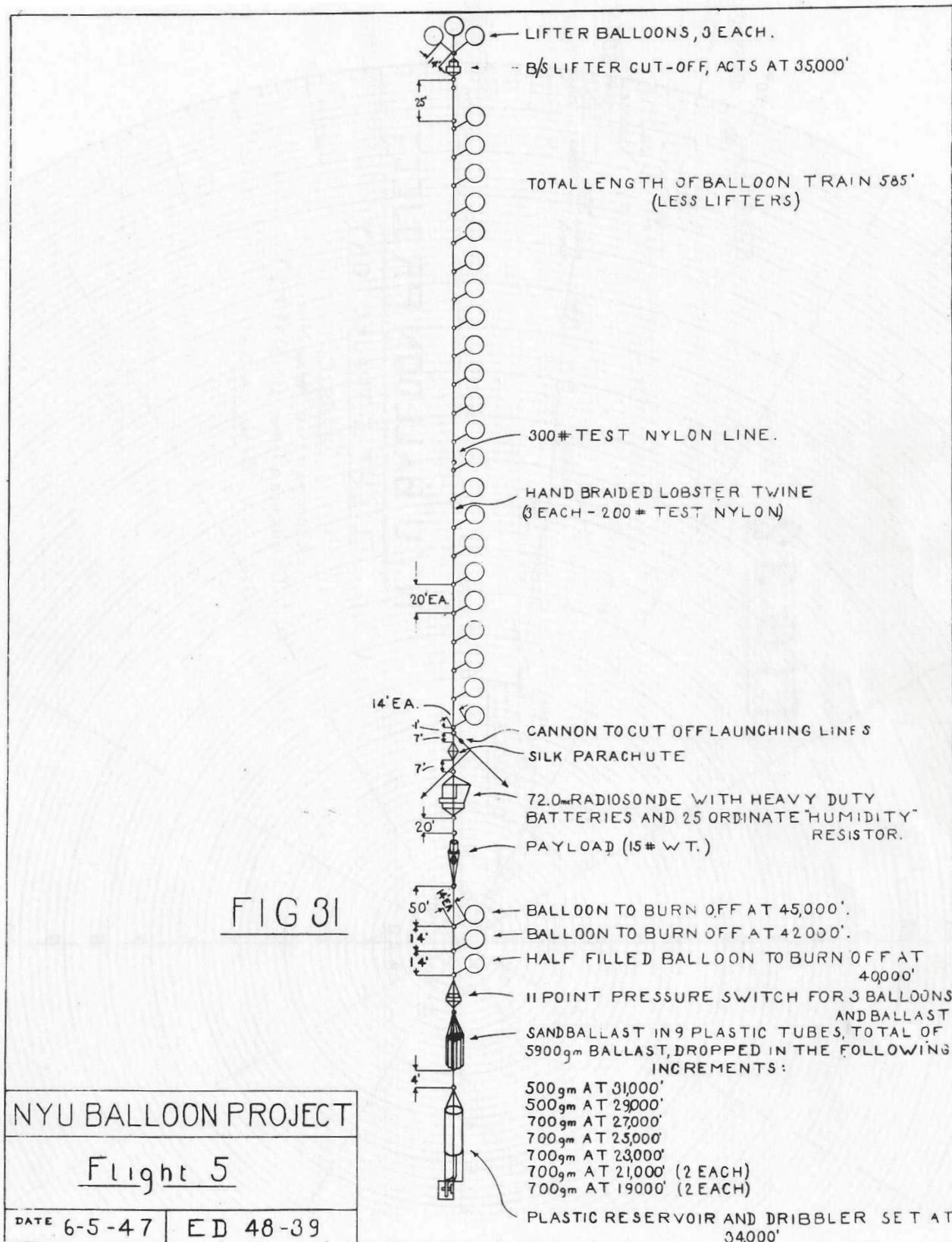


Figure 9. Flight No. 4, which had been cancelled, was made up like Flight No. 5, shown in this illustration and listed in the records as the first successful flight in New Mexico. Flight No. 5 was two-thirds the length of the arrays launched on the East Coast and contained no Rawin radar targets until sometime after July 8, according to the available records. Credit to the United States Air Force and New York University.

as or better than Flight No. 5." The logical question to be asked is if Flight No. 4 performed as well as or better than Flight No. 5, then why was it not listed in the tabulation or in official histories? It would have been the first successful flight, unless, of course, it wasn't a full Mogul array.

Given the time it took to build the full array and prepare it for launch, it would not have been possible to build a new array for Flight No. 5 and launch it that day. Crary's diary is clear on the point. Flight No. 4 was delayed by weather. Flight No. 5 was, in fact, Flight No. 4, using equipment stripped off of the cancelled No. 4 and reattached to a new balloon cluster redesigned and launched on June 5 (much like is indicated happened for No. 3, using equipment stripped from the canceled No. 2). Flight No. 5 was recovered, as Moore noted and records document. In contrast, there is no documented record of a Mogul balloon recovery of a flight from the previous day.

Many of the participants in Project Mogul, both those working on the New York University project, and in the military, were contacted and provided statements about their work. Dr. Crary's field notes and diaries provided on-the-scene documentation and later reports were filed with the proper authorities. Access to that documentation has been available since the publication of the Air Force report on the balloon activities. Other documents related to various other balloon projects, including those by the Navy, also have been examined for additional information. Given the work done by many UFO researchers, including Robert Todd, Karl Pflock, Robert Sheaffer, Don Schmitt, and Tom Carey, it is unlikely that today any new knowledge will be gained about Project Mogul and the activities surrounding it. There is a possibility that somewhere in the various archives and government agencies there could be additional information about balloon operations in the 1940s. However, the best estimate is that all such documentation has been released into the public arena.

## PART 2: REVIEW OF THE "RAMEY MEMO" CONTROVERSY

### Early Deciphering Attempts

In 1980, Brad Sparks (Pflock, 2010, p. 209; Randle, 2016, p. 293) obtained an enlarged copy of the photograph taken of General Ramey, in the attempt to read the document he held. Sparks was able to read the word "BALLOONS." Five years later, in 1985, after careful examination of the photograph, Sparks perceived additional words that are now "unanimously or almost unanimously agreed-up-on" including "weather balloons," "Fort Worth, Tex.," and "disc." Barry Greenwood made an independent but unsuccessful attempt to read the memo in the mid-1980s. In

1991, Don Schmitt sent a copy of the photograph to former NASA scientist Richard Haines and asked if he could interpret anything on the paper. Using a microscope to scan the photograph, he could reportedly see vague words but not discern individual letters. Haines thought that a better-quality enlargement might reveal more of the message.

An official attempt to read the message was made by the Air Force during their investigation into the alleged Roswell UFO crash ordered by then Secretary of the Air Force, Shelia Widnall. According to the Air Force:

Additionally, the researchers obtained from the Archives of the University of Texas–Arlington (UTA), a set of original (i.e., first-generation) prints of the photographs taken at the time by the *Fort Worth Star-Telegram*, that depicted Ramey and Marcel with the wreckage. A close review of these photos (and a set of first-generation negatives also subsequently obtained from UTA) revealed several interesting observations . . . In an attempt to read this text to determine if it could shed any further light on locating documents relating to this matter, the photo was sent to a national-level organization for digitizing and subsequent photo interpretation and analysis. This organization was also asked to scrutinize the digitized photos for any indication of flowered tape (or "hieroglyphics," depending on the point of view) that were reputed to be visible to some of the persons who observed the wreckage prior to it getting to Fort Worth. This organization reported on July 20, 1994, that even after digitizing, the photos were of insufficient quality to visualize either of the details sought for analysis . . . (Weaver & McAndrew, 1995, p. 29)

### Other Interpretations of the Ramey Memo

That was where the matter rested until 1998, when J. Bond Johnson, who had taken six of the seven existing photographs in General Ramey's office, decided to investigate further. Johnson put together a team to inspect the photographs that included Ron Regehr, a space and satellite engineer. Using a huge enlargement of the photograph, a computer, and a variety of software and camera equipment, they were able to read more of the message. There were, quite naturally, gaps in what they could see, and they noted that the message had been typed in all capital letters. Their interpretation of the message was:

AS THE . . . 4 HRS THE VICTIMS OF THE . . . AT  
FORT WORTH, TEX . . . THE "CRASH" STORY . . .  
FOR 0984 ACKNOWLEDGES . . . EMERGENCY

POWERS ARE NEEDED SITE TWO SW OF MAGDALENA, NMEX ... SAFE TALK ... FOR MEANING OF STORY AND MISSION ... WEATHER BALLOONS SENT ON THE ... AND LAND ... rOVER CREWS ... [SIGNED] ... TEMPLE.

Others began to request copies from the original negatives held at Special Collections at the University of Texas at Arlington Library. They brought their expertise to bear on the message in Ramey's hand. To the satisfaction of many, they could also see letters and images as suggested first by Sparks and then by Johnson and his team. The problem was that many of those doing the work were not seeing the same things as had been published or that others were seeing.

Neil Morris, a technician who was employed at the University of Manchester in England, began to work on the message as part of the team created by Johnson. He broke down the message line by line so that it would be easy to follow his interpretation. He used capital letters to represent the parts of the message of which he was sure, lower-case letters to represent his best guess of some letters, an asterisk to denote a letter he couldn't decipher, and a dash where there was little more than a smudge on the message.

Morris' interpretation of the message was:

(1)-----\*\*\*ARY WERE -----  
AS  
(2)-----fxs 4 rsev1 VICTIMS OF THE WR  
eck and CONVAY ON TO  
(3)-----\*\*\* AT FORT WORTH, Tx.  
(4)-----\*\*\*S\*\* smi Ths \*ELSE\* \*\*\*\*\*  
unus-d\*\*e T&E A3ea96 L\*\*\*\*\*  
(5)-----SO ught CRASHE s pOw\*\*\*\*\*  
N\*\*\*\*\* SITEOne IS envery \*\*\*\*\*  
(6)-----\*\*\*D\* bAsE ToLd \*\*\*a\* for  
we\*\*ous BY STORY are 8\*\*\*\*\*  
(7)-----lly thy even PUT FOR BY WEATH-  
ER BALLOONS n\*d\*\* were  
(8)-----\*\*\*\* \*\*la\*\* l\*\*\*enver\*\*\*\*  
(9)  
(10)

Temple

It was not close to an exact match for what Johnson had released earlier and deviated in several places. In this new version, while the word "victims" remains, as does the Fort Worth, Texas, nearly everything else is different. One of the major points in the Johnson version was the wording that

suggested, "Emergency Powers are needed Site Two SW of Magdalena, Nmex."

John Kirby, a researcher who worked for a huge company in the computer field, also looked at the message. Using his expertise and equipment, he was unable to see much of anything. He did agree that the third line read, "At Fort Worth, Tex." The second line, which many consider the critical line, said, "... are the remains of the material you commanded we fly." In still a different version, David Rudiak (Kirby, 1999; Randle, 2016, p. 296) suggested he saw very little of what others had seen. According to him, and using the same mix of capitals for what he was sure of and lower case for what he suspected, he reported that the message read:

- (1) ----- officer
  - (2) -----(july) 4th the VictIMs of tHE weECK you  
fOrWArdEd TO The
  - (3) -----EaM At FORT WORTH, TEX.
  - (4) -----5 pM THE "DISC" they will ship [swap?]  
FOR A3 8th Arrived.
  - (5) ---or 58t(h) bom(be)r sq(?) Assit [Assess] of-  
fices? AT ROSWe(l)l AS for
  - (6) ---54th SAID MIStaken-----[meaning?  
Weather? Balloon?] of [is] story And said
  - (7) news [clip, chat, dirt] out is OF WEATHER BAL-  
LOONS which were
  - (8)---- Add[And, Ask] land d-----[dirt cover?]  
crews.
  - (9)
  - (10)
- rAMEy

Schmitt, Carey, and Don Burleson came up with their own interpretations of the memo. For instance, Burleson (2000a; Randle, 2000) wrote, "A number of attempts have been made to read the Ramey letter. Quite frankly, most of these attempts are amateurish, and even some ufologists have concluded that there is nothing in the Ramey image that advances the case for the Roswell incident. They are MISTAKEN" (p. 15). Burleson stated that he had spent a year working on deciphering the Ramey memo. He claimed that he had the advantage of being the director of a computer lab with a background in cryptanalysis. Burleson stated that he had been using several excellent computer image enhancement software packages, "including LUCIS, the most advanced software used today in such fields as microscopy" (Burleson, 2000b, p. 8).

Burleson wrote, "here is my reading, so far ... [indeterminate parts of words are indicated by hyphens, and missing words are indicated by parentheses.] A few spots are a bit tentative, but essentially the letter reads:

- (1) RE-CO-OPERATION WITH ROSWELL DISK 074
- MJ-
- (2) -AT THE () () THE VICTIMS OF THE WREKCD
- YOU FORWARDED TO THE
- (3) TEAM AT FORT WORTH
- (4) () ON THE "DISK" MUST HAVE SENT LOS
- ALAMOS ADVANCED ()
- (5) URGENT. POWERS ARE NEEDED SITE TWO AT
- CARLSBAD, NMEX.
- (6) () SAFE TALK NEWSPAPER MEANING OF
- STORY AND
- (7) ONLY SHOW () () BY WEATHER BALLOONS ()
- WAVE () ()
- (8) L-DENVER CREWS
- (9)
- (10) TEMPLE (Randle, 2000)

It should be noted that the Ramey memo is not an encrypted message, but a plain-text message that is obscured by the distance to and the angle of the camera, among other factors. In another effort, Stan Friedman contacted Rob Belyea, the owner of ProLab, to examine high-resolution scans made of the negative. Friedman paid someone to take the negative from the Special Collections and have a computer lab make the scans. Belyea said that he could not spend hours examining the message but could rule out or confirm the interpretations made by others by using his software to decide on character count and combinations of letters. Belyea stated that he could not see "Magdalena" in the text as others had claimed. He did say, "They're pulling off all sorts of [readings], but they're making some of it up."

There is an additional problem, only partially addressed in the study of the text. If this was a military message sent to a military installation, there should have been some military jargon in it. The attempts at reading it have failed to account for any military jargon. The closest is Rudiak's (Randle, 2000, p. 303) attempt to place military unit designations into the message. Rudiak noted that what he thought was "5 PM" made no sense because the military would have used the twenty-four-hour clock that would have said, "1700 Hrs." rather than "5 PM." Taken altogether, there is no consensus on what the message says, the best way to review it, or how to resolve the discrepancies. One researcher said that it had to be assumed that the message had something to do with the Roswell case, but there really is no reason to make that assumption. The message could be about almost anything, and the words and images being seen might reflect what the researcher wants to see rather than what is actually there. Analysis suggested that the word "victims" as it appears in the message is the critical word. The problem is that those studying the message do not see "victims" as universal. One researcher said that

he thought that the critical word was "remains." Russ Estes (Randle, 2000, p. 303) noted that it seemed to be a mix of upper- and lower-case letters, with the viewers perceiving what they expected to see. To Estes, the first letter looked more like a "P" than a "V." He stated that there seemed to be a lower case "l" in the word, and that the last letter looked more like an italic "5" than it did an "S."

## PART 2: CONTEXT EFFECTS IN INTERPRETATIONS OF THE RAMEY MEMO

### The Houran–Randle Experiment

Given the preceding observations, Houran and Randle (2002a) were interested in researching the variables that guided interpretations of what was an obviously ambiguous stimulus. The Ramey memo is ambiguous, and it seems clear that the bias of the researchers has crept into their interpretations of the memo. If the document could be more easily interpreted, then this would be a simple task with a consensus regarding its contents, but as demonstrated, even those who have spent months and years in their research do not agree on their interpretations. Houran devised an experiment to test this hypothesis. There were three related studies in which three groups of self-selected participants were asked to decipher the Ramey Memo. The participants were randomly assigned to one of three possible scenarios (or experimental conditions): (a) that the memo dealt with the Roswell UFO crash; (b) that it dealt with the testing of an atomic bomb; or (c) they were "blinded" and not told anything about the contents. The expectation was that each condition would elicit significant differences in the participants' interpretations. They were also interested to see if there was significant agreement in the identity of words in the same locations, regardless of the suggested condition.

Lastly, the study also considered the psychological variables of prior knowledge or interest in UFOs generally and the Roswell case specifically, and the perceptual-personality trait of "intolerance of ambiguity." This variable involves the need for categorization and certainty that often leads to premature closure, and it has been shown to influence UFO-related perceptions (e.g., Houran, 1997; Randle, 1999). However, the roles of expectancy-suggestion and cognitive set are only two examples of potentially many motivating factors. Dewan (2011) found, for instance, that witnesses and proponents are often influenced by

. . . the ubiquitous presence of UFO and alien imagery in American popular culture; broad-based public mistrust in the scientific establishment; the usefulness of the phenomenon in modern

"technospiritual" reconciliations; the occasional presence of a seemingly core experience comprised of near universal characteristics, and the influence of UFO-centric cognitive models in the perceptions, interpretations, and reconsiderations of said experiences. (p. viii)

It is therefore not surprising that participants in the Houran–Randle study who believed that the memo concerned the Roswell crash studied the document for an average of twenty minutes. Those who had been told the memo was about an atomic bomb averaged sixteen minutes, whereas those who were experimentally-blinded spent fourteen minutes. Some words were perceived across all three test conditions, including "Fort Worth TEX," "Story," and "Balloons." Interestingly, those told that the memo was about atomic testing reported seeing "Glasses," "Morning," "Flash," "Atomic," "Laboratory," and "Land." Those who were given no information only saw "Fort Worth, TEX," "Flew," "Story," and "Balloons." The number of words deciphered was further related to the participants' ages, level of intolerance of ambiguity, and their prior exposure to the UFO field and Roswell case. Despite this clear influence of psychological priming on interpretations of the memo, Houran and Randle (2002a) commented that:

The surprisingly high agreement between our participants and previous investigators on specific words in identical locations in the Ramey memo suggests that some of the document is indeed legible, even without computer enhancement. However, the meaning or context of those words remains ambiguous because the degree of interpretation of the document is strongly influenced by suggestion effects and the interpreter's cognitive style. We are inclined to believe that such effects have also tainted the previous studies on the memo using sophisticated software because there appears to be weak interpreter reliability among the earlier analysts. (p. 60)

There is a final complication with the Ramey memo. Johnson several told several investigators that he had handed the message to Ramey. That confuses the source of the document that Ramey is holding, suggesting that Johnson brought the document into the office. Johnson said that he had received it at the newspaper office, which suggests that it was one of the teletype messages that had been sent to the newspaper over the news wire that said debris was being sent to Fort Worth from Roswell. If the document Ramey is holding was provided as a prop as Johnson suggested, then it could relate to the Roswell crash but

would be from a civilian source. It would do nothing to confirm or discredit an ETH view of the event. However, when Johnson was challenged on this point, he then changed his mind and said that he had not brought the teletype message into Ramey's office.

### Houran and Randle—Criticisms and Follow-up

Roswell researchers had mixed reactions to Houran and Randle's (2002a) study. Illustratively, some apparent supporters of the study uncritically accepted its conclusions (e.g., Printy, 2003/2014) or speculated that the presence and glimpse of the Ramey Memo was a disinformation exercise against the Soviet Union (Westwood, 2002). This latter idea is interesting, but Randle and Houran (2002) ultimately disfavored it for various practical reasons. On the other hand, passionate advocates of the Ramey Memo strongly criticized the Houran–Randle study on conceptual and statistical grounds (see, e.g., Rudiak, 2003a, 2003b). For example, David Rudiak argued that the research participants did not spend enough time reviewing the material or were inadequately informed of the context to make a "proper" interpretation of the document's context. In support of Houran–Randle's basic experimental design to test context effects, it has been applied with similar results to examine claims of reputed writing on the Shroud of Turin (Jordan et al., 2015).

It should be noted in fairness that Rudiak did spot a few statistical typos in the Houran–Randle paper that did not alter their previous results or conclusions, but these did underscore that mistakes in reporting are always possible (Houran & Randle, 2002b, 2003). But this criticism equally applies to Rudiak's own work on the memo, which Printy (2003/2014) and others have characterized as being plagued with confirmation biases (for a discussion of this confound, see Nickerson, 1998). Still, ancillary analysis on the Houran–Randle data affirmed the influence of priming effects by showing that: (a) More interesting contexts motivated participants to spend more time trying to read the memo; (b) More interesting contexts produced more perceptions of specific words; and (c) The number of interpreted words exclusive to each experimental condition consistently exceeded the number of words that were commonly perceived across the different conditions (Houran & Randle, 2003).

It is disappointing that critics of the Houran–Randle study did not conduct any direct or conceptual replications to address their claimed weaknesses in the research design. Moreover, Houran and Randle (2002a) offered several suggestions in support of new studies of the memo:

First, to be methodologically consistent we rec-

ommend that standardized computer enhancement be used on the best raw data that we have using comparable software programs. Analysis should be conducted by at least three independent and blind laboratories that specialized in the area of reading and transcribing archival documents. Their only motivation should be payment for providing professional and objective reports. The laboratories could be provided all available scans of the document . . . With this triangulation approach, we can reasonably estimate the inter-rater reliability (and hence validity) of the resulting interpretations (i.e., do the laboratories show statistically significant agreement on specific words in precise locations in the text). (p. 60)

There are certainly challenges with these recommendations, such as securing ample funding, gaining the co-operation of suitable analysts or laboratories, and controlling for priming effects as discussed above. To these ends, Houran (2005) published the results of an unsung project along these lines that was financially supported by the Fund for UFO Research. In a direct follow-up to Houran and Randle (2002a), Houran had the highest-quality memo scans at the time independently evaluated by three qualified laboratories. The idea was for expert analysts to apply different methodologies for the attempted deblurring, restoring, and interpreting of the Ramey Memo photograph. Table 2 summarizes the main findings from this triangula-

ted effort, which included the work from the laboratory that conducted image analyses of the Shroud of Turin (Marion, 1998). The test centers separately reached the same conclusion, i.e., their best techniques only slightly improved aspects of the image but the memo remained illegible because it was severely blurred and corrupted by film grain (or speckle) noise. That said, Andre Marion stated that it was best to obtain new scans under pre-specified conditions.

### The Greenwood Approach

Barry Greenwood (2009, p. 13) made additional attempts to read part of the memo. He argued that it more closely matched documents transmitted over news wires than it did military teletype communications. He did note that Johnson had said that he had brought the document into Ramey's office and handed it to him, which would mean that it was a news wire teletype rather than a military one. Johnson, however, soon retracted the claim. Greenwood noted that some of the phrases in which there was general agreement were also common to news reports published on July 8, 1947. The phrase, "AT FORT WORTH, TEX," appeared in newspapers just that way. The *Nevada State Journal* on July 9, 1947, reported "... the commanding general of the 8th air force at Fort Worth, Tex."

To Greenwood this seemed to be additional evidence that Ramey was holding a copy of the newspaper teletype, whether handed to him by Johnson or someone else, rather than a classified message that had been delivered to his

**TABLE 2. Summary of Independent Image Analyses of the Ramey Memo (Houran, 2005)**

Ph.D.-Level Researcher/ Laboratory	Findings/ Commentary
<b>Nikolas P. Galatsanos</b> <i>Computer Science Department University of Ioannina, Greece</i>	<b>Method:</b> Blind deconvolution algorithms slightly improved the digital images, but not the restored images.  <b>Conclusion:</b> No clearly interpretable text.
<b>André Marion</b> <i>Institut d'optique théorique et appliquée Centre Universitaire d'Orsay Orsay, France</i>	<b>Method:</b> Fast Fourier transform and inverse FFT, subtracted to enhance signal to noise, non-linear lookup table.  <b>Conclusion:</b> No attempt to read the text. Noise remains problematic as the noise frequencies are on the same order as the text.
<b>Hong Yan</b> <i>Dept. of Computer Engineering and Information Technology City University of Hong Kong Hong Kong</i>	<b>Method:</b> Homomorphic filtering, wavelet-based algorithms, deblurring, and Gaussian shape PDF.  <b>Conclusion:</b> No clearly interpretable text.

office from the military communications center. Greenwood argued that the phrasing in the memo was important. Nearly all military teletype messages of the era did not use punctuation marks but rather wrote them out as "CMA" (comma) and PD (period). He wrote, "The most significant difference is that while newspapers used civilian time formats (AM, PM), the military used 'Zulu,' or universal 24-hour time for their endings."

In 2009 Greenwood began another examination of the Ramey Memo. Once again, he was able to see "AT FORT WORTH, TEX." In the next line, he saw the term, "The 'DISC,'" which also agreed with the consensus. It was in the next line down that he made the important change. He noticed that the letters "GHT" seemed to stand out. Most of those attempting to read the memo interpreted this to be the end of "SOUGHT." Greenwood wrote:

Having previously read clips in between pondering the photo [Ramey memo], I went back and flipped through it again. There was a press clip from the San Mateo CA Times of July 8th. Late edition papers for the 8th had carried the breaking Roswell debris news. Reading down the clip I saw this: "Lt. Warren Haught, public information officer at Roswell said . . ." And the quote continued to his press release. "HAUGHT" stood out like a sore thumb. It was a six-letter word with a "GHT" ending in an article related to Roswell . . . In the Ramey document [Greenwood's name for the memo], we don't see the word "Warren" clearly in the text. But . . . I've determined that the area before "HAUGHT" is a six-letter word and, based on the use of the word, "HAUGHT" in the press coverage, "WARREN" is the most likely fit in that area.

Greenwood's interpretation was not well-received by others who attempted to read the memo. His suggestion that it was a newspaper teletype was rejected by other researchers such as Brad Sparks. Sparks noted that a review of military messages from the era showed that, contrary to Greenwood, the use of periods and commas rather than abbreviations for them were sometimes found in military teletype messages.

Sparks speculated that the memo might be a "general to general" message, which is sometimes referred to as a "back channel." These would be more informal than official communications between commands and were often signed with the originating officer's name rather than the normal date/time group. The argument made by Sparks was that the memo was not a civilian teletype message brought to Ramey by *Star-Telegram* reporter Bond Johnson, but was, in fact, a military memo that referred to the

events that had transpired outside of Roswell. All this demonstrates just how convoluted the attempts to read the memo have become.

## PART 2: MOST RECENT ANALYSES

### A New Approach

Research on the Ramey memo stagnated for a number of years. The scans used for attempted readings had not been redone as the technology improved, and no one had examined the negative in that time. Martin Dreyer, a New Zealand UFO researcher interested in the Ramey Memo, approached a number of experts in photographic enhancement to ask for advice. It was recommended to:

... inspect and re-image the original film negative using a mix of modern analog & digital recording techniques using a digital biological microscope; high-resolution recording film and micro & macro lenses onto a modern digital camera sensor. I sought advice from Mr. J. Morelock in Memphis [TN] USA for his earlier pioneering research work & experience in the development of color microfilm.

There [University of Texas at Arlington], with the assistance of Library Staff and under strict conditions of access and handling of the original film & print materials, work as described commenced on the 21st of April 2015. (Randle, 2016)

The aim of a direct inspection and re-recording of the negative was to:

- Establish physical condition of the negative/s
- Establish definition, resolution, and clarity of target
- Provide a viewing environment for direct reading of text
- Distinguish film base + Fog versus image density/s
- Define silver particles forming individual character-forms
- Identify silver particles (bleed) not forming individual character forms (font letters)—(to be sculpted away from character forms to enhance readability)
- Identify recurring characters among lines of text (aid to readability)
- Identify any "recurring flaws" or mechanical "signatures" among fonts (aid to integrity and readability)
- Determine which details are candidates for enhancement

The dual purpose for re-inspecting the negative was to estimate the extent or existence of sufficient information in the original to warrant further analysis, and if possible, to develop a methodology seeking to apply proven imaging practices to render better images of the text. In February 2020, this work was commissioned by a television production company. Gene Cooper of GIGAmarco, a California company, scanned the Ramey Memo negative using specially designed equipment. Over a period of several hours over two days, a series of photographs were made by stripping away the various levels on the negative, and then rebuilding it one level at the time. The rationale was that the noise that had been introduced to the negative by decades of handling could be eliminated and thus produce a clearer picture of the writing on the memo. To be sure, visual inspection of film negatives revealed signs of normal and robust handling in the form of (minor) chemical stains, dust particles, and scratches consistent with the age and handling to which these negatives had been subjected. What follows in the next section is an edited version of Schollum's (2015) report of the work involving the re-scanning (Figure 10) and analysis of the negatives.

### **EDITED VERSION OF SCHOLLUM (2015) REPORT**

#### **Observations and Conditions of the Photographic Negative**

The densities of the emulsion layers appeared well 'fixed' and readable with no significant damage or degradation of the area of text (memo) which is the focus of the examination. Observable damage to the negatives is consistent both with their age and use prior to being preserved by the Special Collections Library. In particular, the time pressures and techniques of newspaper photographers often required less than optimal processing and drying times before being printed to meet short publication deadlines. Damage consistent with this practice was present. Exposure levels of the film recorded by flash were adequate and no subject or camera shake evident. The camera was well focused on critical parts of the scene and the 'memo' within the focus zone set by the photographer and diaphragm.

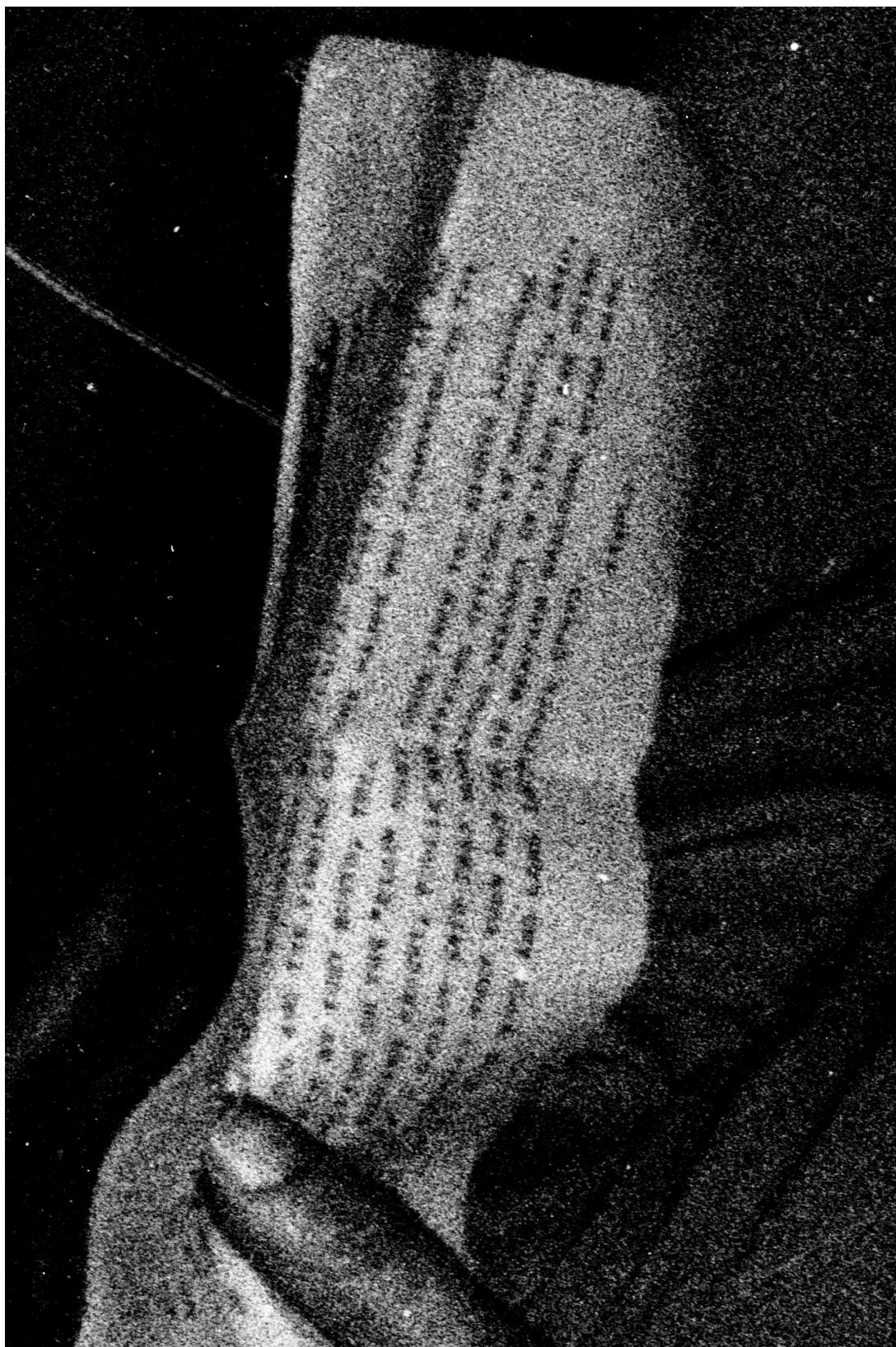
With these negatives in relatively good condition, well exposed, processed, and professionally preserved, the problem of whether the text can be read is one mainly of scale. The height and width of any font relative to the size and distribution of the silver halides on the film is the main determinant of whether individual letter forms can be identified and contribute to a full or partial read-

ing of the memo. For purposes of illustration, the digital file dimensions for the full frame 4x5 negative are 3663.05 by 2743.05 pixels. In comparison, the message length is a mere 148.5 pixels wide. To image the memo in isolation, a Nikon SMZ1500 biological microscope ably operated by a talented graduate student at Arlington's School of Engineering was used to view and digitally record aspects of the 'memo' negative.

The negatives were then examined and recorded using the Special Collections digital microfiche system. David Rudiak with assistance of Library staff took a series of image recordings with bracketed exposures and raw and enhanced copies of these files. The original negatives were imaged using a Canon digital camera with both a macro and micro lens in Canon's proprietary format. I then recorded negatives using a Canon film camera with both a macro and micro lens onto ultra-high resolution Kodak recording film. Films have been sent to Wellington, New Zealand, for processing using Kodak proprietary software.

#### **Method and Results**

Images from microscope, microfiche, and digital camera were processed into groups of RAW and enhanced files. High Dynamic Range photography has been used to harness the range of tones present with negatives and in particular the Ramey memo. The products of HDR imaging have been processed into working files in the form of image stacks where the interaction among pixels among layers has been influenced variously to: (a) Reduce the visual interference of film grain within the emulsion impinging on the character forms (fonts); (b) Separate out the tones of the paper base from the fonts used in the memo to suppress background interference; and (c) To isolate and ('lift') tonal values of the fonts away from the background in order to render character forms more clearly. The end result provides an image with a resolution of over 65,000 pixels per inch (less than 1 micron resolution) and reveals the individual silver halide crystals (film grains) contained in the negative that make up the photograph. Each grain is roughly 3–10 microns in size. The resulting files provided a range of image states ranging from low contrast grey tones to contrasty separated tones for interpretive evaluation (note that pixel destructive approaches using curves or levels has [sic] not been used). Direct examination of the negative rather than viewing positive gen-



**Figure 10.** A high-resolution scan of “The Ramey Memo” obtained during the latest attempt to resolve the text on the document.

erations has allowed a clearer picture of the grain structure. No further increase in visual readability can be achieved. Any additional interpretation of the target message will more than likely be left to the application of adequate search algorithms to differentiate between the type fonts and message background.

### Major Take-Aways

Although the process is ongoing, and new technology was applied to clarify the text, the results were disappointing. The image seemed slightly clearer, but the difference was insufficient to make any definitive statement about the memo's contents, including whether it was of military or civilian nature, or if it referenced an ETH-related event in New Mexico. The memo itself is not legible with any reasonable degree of certainty, so we are left with various interpretations of the memo that possibly suggest something extraordinary, but without the proof that it was. At this point, all that can be said is that the testing will continue with the hope that improvements to the imaging software will advance to the point where the memo can be deciphered reliably and validly. However, it must be noted that those who have conducted the latest scans think that physically scanning the negative—regardless of the quality of the equipment and the innovations in the technology—still will not settle the issue. The next step is thus more likely to be the use of artificial intelligence (AI) or machine learning (ML) methods to discriminate between the remaining noise that conceals the lettering and the actual letters, assuming that sufficient data for this approach can be obtained. As explained by Cooper (2022), next steps could include the following methodology:

1. Photograph with the same lens and film a set of known words/letters at the same distance, lighting, etc., and in a variety of suspected fonts and type styles. This would create a set of content for an examiner to use or for an AI program to use to build a baseline set of knowledge.
2. Then using that known set of data, we can use AI to read the letter/words on the memo.
3. As an example, if in one set of baseline content we know what an "A" looks like with the same lens, distance, angle, film, etc., then we can compare that to the Ramey memo and use it to crack the code, so to speak. While AI could help, it may not be entirely necessary for this particular method; this on its own might do the trick.

4. You could then take it one step further and feed the AI a set of words and vocabulary that we suspect may be in the memo, such as "Fort Worth," etc. This, however, could bias the results toward a particular outcome.

### PART 2: CONCLUSIONS AND CONSIDERATIONS

At this point, given the quality of the scans that have been made and the expertise of those conducting the research, there is no more that can be done. Additional scans arguably will not bring a resolution, and the interpretations of various researchers have reached an impasse. The problem is that the film negative simply did not record the memo text data in a fashion that allows it to be understood. AI and ML techniques could potentially remove some or all of the Ramey Memo's ambiguity to give a dispassionate decryption, but this effort also yields merely an "interpretation" that likewise might suffer from the same inadequacies of the earlier attempts to read the memo using various methodologies. Without technological breakthroughs, there is low probability that the Ramey Memo will reveal anything further, much less conclusive information.

Some words seemingly can be read with near-universal agreement, which suggests that the memo references the Roswell crash debris. Yet, there is no such consensus about the key phrases. Without additional information or a clarification of what the memo says, it does not prove that what crashed had an alien origin. By the same token, there is nothing in the memo—as currently interpreted—that excludes an ETH explanation. The best that can be said is that *the document seemingly shows an interest in the debris recovered at Roswell without identifying that debris*. However, the information, documentation, and testimony about Project Mogul does not provide the ultimate answer. Dr. Crary's field notes indicate that Flight No. 4 was cancelled, and if it did not fly, then there was nothing from the Mogul team that accounts for the debris found by Mack Brazel. Skeptical arguments that a cluster of balloons flown later in the day was the real culprit likewise fail. The best information available suggests that *there were no Rawin radar targets attached to that cluster and that the cluster never left the confines of the various government ranges around Alamogordo Army Air Field*.

### GENERAL DISCUSSION

Critical analysis of two key pieces of empirical information about the Roswell Incident shows that the physical debris found by Mack Brazel in 1947 is neither convincingly explained by Project Mogul nor obviously attributable to an ETH origin. As a result, this case should be character-

ized as “unsolved.” But this does not mean that important insights and learnings have not come from the diligent work of independent investigators (cf. Table 1). To date, much of the information on the case has come from witnesses whose accounts certainly can be skewed through biased agendas or inaccurate memories. Although there are a few statements made on the record in the newspapers of 1947, those statements were mainly limited to the military officers involved in some way, either collecting the debris found near Corona, New Mexico, or identifying the balloon remains displayed in General Ramey’s office. It wasn’t until Jesse Marcel, Sr., went on the record in 1978 that the case began to expand to the point where we find it today. The ages of the witnesses in 1947 ranged from Jesse Marcel, Jr., who was eleven, and Frankie Rowe, who was twelve, to adults in their twenties, senior officers who were older, civilians such as Bill Brazel, Jr., who was twenty-two, and older ranchers and other civilians. The oldest of those interviewed was William Curry Holden, who was 96 when interviewed in 1992. The crucial point is that some of this testimony was gathered more than thirty years after the event, some of it much later than that.

Following the flow diagram in Figure 7, we find that the available empirical evidence does not converge on a clear solution. It is therefore “troubling or telling” that no official documentation or tangible data either exists or has been shared publicly that categorically explains the Roswell debris. It also seems incredulous that Weaver and McAndrew’s (1994) investigation arguably failed to match the diligence and outcomes by ufologists into details of Project Mogul. Still, the empirical evidence yields six key findings for which any comprehensive and valid explanation of the Roswell Incident arguably must account:

- The “UFO” debris was unexpected by the local residents and military personnel.
- A staged press conference was needed to begin controlling the official narrative.
- The official narrative has changed three times over a period of 48 years.
- Project Mogul is now discredited as a viable explanation.
- The Ramey Memo is controversial and ambiguous evidence, but it likely affirms the military’s interest in the debris without identifying its source or nature.
- To date, no known evidence conclusively resolves the case in terms of conventional technology vs. an ETH interpretation.

A grounded theory approach to these facts leads the author to two simple and unequivocal conclusions: (a) *The source or nature of the Roswell debris was something truly unusual or anomalous*, and (b) *The source or nature of the debris*

*had meaningful ramifications for the military at that time*. The continued lack of transparency or resolution in this case might further suggest that those implications remain to this day. Pinpointing Project Mogul as the military’s final answer (Weaver & McAndrew, 1994) implies that the Roswell debris was both US in origin and conventional in nature. Accordingly, two alternative scenarios are introduced by the discrediting of the Project Mogul hypothesis, i.e., the debris instead was either (a) conventional material or technology from a non-US source, or (b) unconventional technology or material of extraterrestrial origin.

Future investigations of these competing views are clearly warranted. Approaches can include searching for previously unknown or unexamined government or civilian documentation about any and all aspects of the event, as well as applying the latest qualitative and quantitative methods and cross-disciplinary efforts to existing evidence with the aim of extracting new insights or information. This case has been traditionally explored by maverick researchers operating individually, but new and significant advancements are perhaps more likely to come from adopting the model of scientific UFO panels that pool resources and apply cross-disciplinary expertise to targeted problems (e.g., Condon & Gillmor, 1968; Clemence, 1969; Kuettner et al., 1970; Sturrock et al., 1998). This tactic has been used to an extent on a smaller scale for Roswell-related research (e.g., Eberhart, 1991; Houran, 2005; Houran & Porter, 1998, 1999; Schollum, 2015), so it might be successful if expanded and supported with adequate resources. An ETH explanation of the Roswell Incident might nevertheless prove incorrect, but research suggests that no sociocultural crisis or collapse would ensue if extraterrestrial intelligence was confirmed (Alexander, 1994; Levin, 2012; Peters, 2011; Peters & Froehlig, 2008). Many people in the general population already believe in the existence of advanced extraterrestrial civilizations (Silva & Woody, 2022), and academics agree that the potential for learnings in this context would be enormous and transformative on both scientific and existential levels (for discussions, see Andresen & Chon Torres, 2022).

## IMPLICATIONS AND APPLICATIONS

Social scientists from various sub-fields might identify and study those who support ETH interpretations of the Roswell “UFO” debris as examples of irrational or quasi-delusional beliefs, conspiracy theories, or ostension (i.e., the acting out of a legend narrative in real life). However, irrational beliefs (including conspiratorial thinking) often occur in healthy people due to improper or biased consideration of information or evidence (Pytlak et al., 2020; Ross et al., 2017; van Elk, 2015). This could likewise describe mainstream researchers who merely argue

from authority (Westrum, 1977) or otherwise uncritically accept problematic government or media narratives. Accordingly, the Roswell Incident might more accurately denote an example of “negative (or rejecting) gaslighting” on a coordinated and mass scale (Drinkwater et al., 2019, pp. 151–152). This term denotes the intentional act of using social conflict or identity forces in an attempt to normalize or demystify a genuinely anomalous event or experience of a witness or observer. Studying the military/government and media’s reactions (both private and public) to the Roswell debris could perhaps serve as corresponding case studies in myth-making and narrative reality, especially as these processes relate to misinformation, disinformation, and so-called “fake news.” In fact, the Roswell event might be a prime example of classic government disinformation, of which dozens of documented examples are known to exist (e.g., Baker et al., 2005; Hanyok, 2001; Wolf, 2001).

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