Episode 3, 2005: Civil War Balloon Midland, Michigan

Wes: Our next story examines the rise of U.S. military air power. It's July 24, 1861, the early days of the War Between the States. The nation's capital is panicked by rumors of Confederate troops advancing. Professor Thaddeus Lowe was ordered aloft in his balloon, the Enterprise, for a crucial mission. In what is one of the first instances of American military air reconnaissance, Lowe hovers directly above enemy lines and reports on any threatening troop movements. While Lowe's eye in the sky protected the Union, the fate of the Enterprise itself remains in question. Thomas Cullgren, of Midland, Michigan, believes he has the only remnant of this historic military balloon.

Thomas Cullgren: Well, I get a number of catalogs in the mail, and a lot of political items, a very small number of military items actually, a lot of coins and buttons and that sort of thing. And I had never seen anything from Civil War ballooning, and I knew that there could not be too many pieces like this around.

Wes: I'm Wes Cowan, and I've come to meet with Tom to take a look at his unusual find and uncover the truth behind the fate of the Enterprise. Wes Cowan. [introducing himself]

Tom: Hi, Tom Cullgren; let's go inside.

Wes: Hey, Tom. Okay, Tom, what do you got for me?

Tom: Well, I brought you something I think is very, very interesting. I collect World War I aviation, but this is something that was in a catalog that jumped out of the page at me that goes back much earlier.

Wes: "A piece of Professor Lowe's aeronautical balloon Enterprise taken by Lieutenant S. Millet Thompson of the 13th N.H.V.I. after it was destroyed upon landing near his camp on the Peninsula in 1862." Professor Lowe has got to be Thaddeus Lowe, the Civil War balloonist, right?

Tom: Well, I think so, yes.

Wes: Wow! That's a neat thing! So, what is it that you want me to find out?

Tom: Well, obviously I'd like to know if that could be a piece of balloon fabric and could it be from the Enterprise. And, secondly, the story on the back, could that be true, and how would S. Millet Thompson have acquired this relic?

Wes: It gives me a lot to go on. You know, the walnut frame that this is framed in is -- is not going to help us too much. I mean, it's the kind of frame that was used from the 1840s up to the present day. On the other hand, this label is just...great! It's -- it's typed, and, of course, the typewriter didn't come into common usage until the mid-1870s, early 1880s, so it could have been put on anytime, but the information on the -- on the label is really pretty great. So exactly who was Professor Thaddeus Lowe, and what was the Enterprise? I decide to get a unique perspective on Lowe's role in the Civil War...from 2,000 feet up. My companion is Tom Crouch, an author and historian of ballooning in America. So, Tom, tell me about this guy Thaddeus Lowe.

Tom Crouch: Well, Thaddeus Lowe really was, in a lot of ways, the founder of American Air Power. During the American Civil War, he commanded the Balloon Corps -- created it -- which made military observations for the Union Army. Told them where the enemy was, what the positions were, that kind of thing.

Wes: For the first time in U.S. history, an army could spy on enemy troop movements and plan their own surprise counterattacks. So threatening were Lowe's balloons to the Confederate soldiers, the great poet and Civil War historian Carl Sandburg once wrote that "Lowe was the single most shot-at man in the war." Well,

how did he get Lincoln's ear? I mean, I heard that that -- I understand that that's part of the story.

Tom: Joseph Henry, who was the head of the Smithsonian, arranged for Lowe to make a demonstration flight right on the Mall where the Smithsonian is. And Lowe took a telegraph key up and, you know, he could telegraph down to the ground exactly what he could see.

Wes: so, on June 18, 1861, within full view of the white house, Lowe inflates the Enterprise and ascends 500 feet. From his bird's-eye perch, Lowe sends President Lincoln a historic message. Lowe writes, "From this point of observation we command an extent of country nearly 50 miles in diameter. I have the pleasure of sending you this first telegram ever dispatched from an aerial station. I am your Excellency's obedient servant, T.S.C. Lowe."

Tom: And Lincoln was so taken, he invited Lowe into the White House, and they had a great discussion that evening. Lincoln was fascinated and...

Wes: Tom tells me that Lincoln was so enthused that he approved the construction of six brand-new balloons for the Union Air Corps, paid for by the military. You know, Tom, that's an amazing story about how Lowe launched the balloon corps. I want to go in now, though, for a landing because I've got something I want show you. Hold on! I just had a blast! You know, I wanted to show you this, vis-à-vis the discussion we had about Lowe and his balloons, that's purported to be a scrap of the Enterprise. Have you ever seen one of the Enterprise before?

Tom: I've never seen a piece of fabric from the Enterprise, but, you know, it's interesting. There's a long tradition of collecting little swatches of fabric from balloons, going all the way back to the beginning of the balloon.

Wes: Have you ever heard what happened to the Enterprise?

Tom: We really don't know. Lowe stops talking about the Enterprise in the Summer of 1861 when his first -- the Union, his first real military balloon that the government paid for, comes into service, and he just doesn't mention the Enterprise after that.

Wes: So just what happened to the Enterprise? At least I know that it was used for observation flights during the Civil War. To figure out if tom's artifact really is from the Enterprise, I've enlisted the help of a ballooning expert, Maureen Lynch, at the Rensselaer Polytechnic Institute in Troy, New York. She's been a balloon pilot for 30 years and is an expert in the history of American ballooning. What do you think?

Maureen Lynch: The first thing I'm noticing is the color on it, and that is consistent with balloons of the period because the color is drawn mostly from the varnish.

Wes: Why would they use varnish? I always thought that varnish was something used on wood.

Maureen: Well, the varnish was put onto the fabric to make it gas-tight, because the lifting medium of the balloons was hydrogen gas. And because of that, it has to be as gas-tight as possible, so you would use multiple layers of varnish. Um, most of the balloons built back then were made of either cotton or silk material.

Wes: Okay. Next question: do we know what the Enterprise was made of?

Maureen: I figured you were going to ask that.

Wes: Maureen tells me that, according to Lowe's own account, the Enterprise was made of silk. Okay, so what does our fabric look like?

Maureen: Looking at this, there's a couple of threads that are loose on the edge, so I'm looking at those. And I also notice that there's a twist to the threads.

Wes: So what's that twist mean?

Maureen: Cotton material...has a twist in the threads because cotton fibers are short, and you have to twist them together to bind them together and also give them added strength.

Wes: So, if they're twisted fibers, it's got to be cotton.

Maureen: Yes, absolutely.

Wes: Huh! Tom's fabric is made of cotton, not silk, so I assume it couldn't be a piece of the Enterprise. But Maureen explains that the balloons were frequently damaged on landing and carried cotton swatches for repairs and patches.

Maureen: If you take a look at the sample and look closely on the center, you've got overlap here, which would be indicative of a seam. Most likely that would have been caused by a patch or a repair done on the balloon. We know that each of the balloons in Union service was equipped with reinforced cotton for fixing tears on the balloons.

Wes: So Tom's fabric could be balloon material from the Civil War, but I still don't know if it's a piece of the Enterprise.

Maureen: The other possibility that I would want to take a look at, if this is, in fact, a patch or repair piece, then it could have gone to any one of, I believe, three balloons that were in operation on the Peninsula at the time stated. It's entirely possible it's out of one of the other three balloons, but not necessarily the Enterprise.

Wes: Okay, what else do I need to do now?

Maureen: Go find Dr. Priess down the hall and have him run a spectrometer trace on the sample.

Wes: I give the fabric to chemistry professor Dr. Ivor Priess. He's examined the fabrics of other 19th-century balloons and knows their distinct characteristics. I've asked him to examine the chemical makeup of Tom's material using an X-ray spectrometer. Okay, what's this test we're going to be doing?

Ivor Priess: Basically, what – what the instrument does is to fluoresce the sample. That is, we will shine some X-rays on it from this instrument onto your sample. That will excite the atoms in that -- in your sample, and they will give off radiation, and then we'll be able to tell you what chemical elements are there and, relatively speaking, what the amount of those chemical elements is.

Wes: Okay.

Ivor: We can see calcium and iron and a little bit of cobalt and some lead coming up. And you can see that thing climbing there like crazy is zinc.

Wes: Zinc? Dr. Priess explains that the balloon operators in the 19th century used zinc powder to generate the hydrogen gas that inflated the balloons. The gas was then filtered through limestone to purify and clean it. The zinc spike on the screen may be telltale evidence that the balloon was launched by soldiers...in a hurry.

Ivor: If I were a soldier on the battlefield and some general yelled at me to get that balloon up in the air because there's a thousand guys goin' over the hill, I probably wouldn't bother boiling it through some limestone, and I might have carried over appreciable amount of this very fine zinc powder that got stuck in the fabric itself.

Wes: Wow! That's a tantalizing prospect. Our forensic test suggests that this balloon may have been involved in direct conflict almost 150 years ago. Unfortunately, I'm not any closer to finding out if Tom's artifact is a piece of the Enterprise. Maybe the label can offer clues. The label says that the Enterprise was destroyed "on the peninsula in 1862." that's got to refer to the Virginia Peninsula where fierce battles were fought that year. But is that really what happened to the Enterprise? Author and historian Charles Evans has done extensive research on Lowe and his balloons. [Speaking to Charles Evans] And what I want you to look at on the back is this great label. It says that this was taken by this Lieutenant S. Millet Thompson in 1862.

Charles Evans: From the date on this, Wes, it's not possible. This can't be from the Enterprise.

Wes: Wait a minute. How can you be so sure about that?

Charles: Uh, Lowe used the Enterprise around Washington, D.C., during the summer of 1861 and actually free-flighted the Enterprise near Arlington, Virginia, in July of 1861. During that flight, however, the Enterprise was forced to make an emergency landing with Lowe aboard. When it landed, it was severely damaged by trees in a -- in a forest not far from Union lines.

Wes: So, Charles, what happened to the Enterprise?

Charles: Well, I believe the Enterprise was retired after August of 1861. Lowe obtained funding to have six additional balloons constructed by the end of 1861, so there was actually no more need for the Enterprise by that time.

Wes: So, the label is obviously incorrect. This can't be a piece of the Enterprise.

Charles: Not from the date that we have supplied on the back of this frame, no.

Wes: I wonder if there's any truth to the information on the label. It says the fabric was discovered and saved by someone named S. Millet Thompson. After searching through some online bookstores, I've found a Civil War-era volume published by someone of the same name. A "History of the Thirteenth Regiment of New Hampshire Volunteer Infantry -- N.H.V.I." Those letters match the initials on the label. Finally, I come across something. The book says that Professor Lowe was flying his balloons near where the New Hampshire regiment was stationed on the Virginia Peninsula. Millet Thompson is the regiment's historian, and he makes several references to Lowe's balloons. Listen to this: "the rebels send a small shell at professor Lowe's balloon, and it falls within our camp, makes the mud fly where it bursts..." What I discovered next was a real surprise. I think it's time to give Tom the update. First, I told Tom his relic is not a piece of the Enterprise, because that balloon was almost certainly retired before 1862, the date on the label. But then I tell him what else we discovered. You know, there were about a half a dozen references to Lowe's balloons in -- in the regimental history that Thompson compiled. But there was one in particular that I think you're really going to be interested in.

“While visiting the camp in may, 1885, the writer found a mass of iron filings, nails, et cetera, all concreted by the rust on the spot where Lowe’s balloon was located, and supposed to be some of the ballast or weights used during the ascents of the balloon. It was partly buried in the earth, but after some digging and pounding with a stone, a piece of the mass was secured and brought home.”

Wes: So, you know, the guy was obviously a collector. He was collecting souvenirs.

Tom: Well, soldiers are always picking up souvenirs from the battlefields...

Wes: I told Tom that his swatch of fabric had probably been collected by Thompson and simply been misla-beled the Enterprise over the years. Most likely, it was one of the six balloons commissioned by the Union army after the success of the Enterprise. Great thing, just a great thing.

Tom: Thank you so much.

Wes: It was -- it was great and it was just my pleasure.

Tom: Indeed it has been for me too.

Wes: In 1862, Professor Lowe’s balloon fleet provided valuable information at the battle of Fair Oaks, Virginia, where Lowe continually transmitted information on enemy troop positions. Observations made during this conflict proved to be crucial to the Union victory. Despite his initial success, however, Lowe was frustrated by unsupportive generals and inexperienced crews. The Balloon Corps was quietly dissolved in 1863, two years before the war ended.

ENDS