Sinking Of The Lusitania

Martin Owen Cahill, Itsstillthinking and Titanic Animations

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On May 7th, 1915 on a calm and sunny sea off the coast of Ireland, a family by the name of Henderson was on the coast having a picnic. One of the children named George who was six at the time watched in amazement as a large four-funneled ocean liner approached them. When the unknown liner was opposite of them, a large explosion of water appeared followed by a large bang. “Even on the land it seemed that the ship shuddered, then very quickly afterward there was a second explosion,” within 20 minutes, the ocean liner sank beneath the waves and changing the world forever.

Right to the end of his life, George remembered the event’s thoroughly, “As a six-year-old boy, it is something which has stuck in my mind as it has done, for the rest of my life. Although time fades and the little grey cells wear out, I can still sit here now and see that liner just sliding below the waves.”

Since that fateful day countless books, reports, documentaries, and films have been produced about the Lusitania tragedy. Some told the story well and others spreading misinformation. This document aims to once and for all settle the fine technical details of sinking based on public resources.

It should be noted that while this document will cite its resources and provide the best answer available to the public, some questions will never have an answer and will be left open for the reader to make up their mind based off the evidence. Also, most of the key resources to some questions are located in private archives or collections like extensive wreck documentation in the National Geographic archive and Ken Marschall while Bill & Eric Sauder have an extensive private collection on the sinking.

In the public domain, primary source information can be found. Technical information about the ship and plans are held in the University of Glasgow. Mersey Inquiry depositions and proceedings should be found in the Public Record Office. The proceedings of the Limited Liability Hearings before Judge Meyer in New York can be found in the Library of Congress.
Sinking Theories

One of the most complicated parts of the Lusitania sinking that is still up for debate is the manner in which the Lusitania sank. Unlike the Titanic, the Lusitania is not as thoroughly studied and examined in the manner of its sinking. And unlike the Titanic, no modern sinking analysis has been done on the ship in recent years.

Here are the two main theories on how the ship sank.

1. The ship slowly settled by the bow before doing a motion similar to the Britannic and striking the bottom while the stern as above the water. ([Figure 1 & 2])
2. She settled nearly horizontal with the Funnels being the last to disappear. ([Figure 3])

(Figure 1 Cahill)
Theory 1 is typically the way most people associate with how the ship foundered, with the bow settling lower and lower in the water and with a pivot point just under funnel number 4. The ship then strikes the bottom with her stern in the air before settling down.

This theory certainly seems the most logical, most ships like the Titanic and Britannic sank in a manner similar to this as water fills the forward sections with the air in the stern the only thing holding the ship up, the bow then strikes bottom and causes the major section seen in the bow today as it breaks and
twist’s. (See the wreck section for more details). Not to mention there are some eyewitness that seem to confirm this.

George Henderson claimed that he said he saw the ship reach, “about 45 degrees then she seemed to pause, then slowly as if just on a slide, slowly slipped through the waves, quite dramatically below the waves.”

Turner claimed the ship struck the bottom, “I noticed it because the sinking of the hull stopped for a few seconds with the stern in the air, quivering her whole length of 800 feet, and then down she went.”

With all this evidence and more it would certainly seem that this would be the most logical sequence of events and an open and shut case. However, there are several major issues with this theory that ends up being a red herring.

Theory 2 involves a stark contrast to how people generally conceive ships to sink. This theory is that the Lusitania, for the most part, remained on a fairly even keel with the maximum trim angle being only 6-8 degrees at around the time the bridge goes under. After that, the ship will settle to a lower trim as the ship, in turn, sinks lower in the water. The final parts of the ship visible are the aft funnels and the masts. This on paper seems to make no sense, as it goes against all logic for when a ship sinks.

During the sinking, remaining air inside tries to compensate for the loss of buoyancy as the flooded portion of the ship sinks. This, in turn, allows for that portion of the vessel to remain afloat the longest as it’s still buoyant. With the Lusitania, the ship was struck in the bow section in Boiler Room 1 (as discussed in the “Second Explosion” section) which allowed for the forward compartments to flood first. It’s clear, however, from eyewitness testimony that there is very little evidence for the ship to be dragged down completely by the bow as seen in the following interviews.
First off, starting with one of the many interesting aspects of the Lusitania that other major maritime disasters from the time lack, drawings and lots of them. For some reason, despite its fame the Titanic only ever had one drawing done by a passenger, done in later years and shows the sinking fairly early and not in the critical final moments. The Lusitania had several published fairly quickly after the disaster and a few more in private letters.

This first set of images were created by survivor Oliver Bernard, his actual job was an artist and as such was able to translate what he saw fairly well to paper.

This article to the right was published on May 15th, 1915 and shows three sketches of the ship sinking. What’s great about these shots is that Oliver was in presence of all three of them and so this provides a good basis of factuality on them. What’s clear about the middle one though is that the ship is shown sinking on a fairly even keel with a lifeboat just missing the funnels. This matches almost perfectly with the occupants of boat 15, who describe a funnel (Most likely #4) almost crushing them, but at the last minute the ship started to return from her starboard list and as such the funnel moved away from Boat 15.

This also matches perfectly with Charles Lauriat, who left the most detailed account of the sinking. Lauriat writes on the specifics on the trim he feels the ship attained during the sinking in his book

“The Lusitania did not go down anything like head first: she had, rather, settled along her whole water line. This convinces me that practically all the ports must have been open, even those as far down as E Deck. The stern did not rise to anything like a perpendicular, nor did it rise so high that I could see a single one of the propellers or even the end of her rudder. Not one of her funnels fell”

While Lauriat’s position at the time the ship did the final plunge might bring some doubts to this claim, as he was starboard of the First-Class entrance on A Deck only about 50-100 yards away. There is no question had it been theory one, he would have had an easier time of seeing the propellers or rudder. In fact, there is a good chance Lauriat did not see the propellers or the rudder simply due to him jumping off the ship too late to see them, as the starboard’s second propeller would have been already submerged by that time (had he been in the water a few minutes earlier like Dwight Harris he would have gotten a better view)

While some might question Bernard’s sketches in the London News, he made two more sketches for the News again (seen below)
We again clearly see the near same image, just in a closer shot. This essentially sets in stone what Bernard saw in the final moments of the sinking.

Another drawing, done by Dwight Harris in a private letter, is a rough sketch of his journey during the sinking and even the condition of a lifeboat.

(Dwight Harris)
The second drawing depicts Dwight leaving the ship, as he journeyed to the forecastle with his custom-built life jacket and waited until the deck was level with the water before jumping into the sea. The arrow indicates the ship traveling past him as the Lusitania was still traveling at around 5 knots at the time and watched the ship sail away from him. He ended up a decent distance from the ship during the final plunge. The bottom right illustration on the second page seems to show the ship reaching a high angle, however when someone sits in the same general angle that Dwight was in during the sinking (see image to the right) then one finds that the perspective can be misleading and even a shallow angle looks far higher than it is. Given the fact that Boat #1 is still in position at the time of Dwight’s leaving, this matches perfectly with Boat #1’s story, in that it was launched when it was only a few feet from the ocean, which was just a few minutes after he left.

Another convincing piece of evidence of a shallower angle is in the Lifeboats. Lifeboat’s 15 & 21 are launched during the final plunge, with the ship sinking faster than the crew lowering the lifeboats with them meeting the water, then rising right back to the boat deck level. It seems highly unlikely that the crew has been able to launch these boats on an ever-increasing angle of about 20 degrees, and more people would have noticed the contrast of angles.

Some may cling to the fact that on the wreck (see the wreck section for more details) the bottom of the bow is missing and the whole forward section is twisted in a bending motion, much like the Britannic’s wreck. However, the damage to the bow is not nearly as severe as the Britannic’s, with the damage only extending as high as E deck on the bow. This seems to be in line with a smaller “stub toe” effect that seems to have occurred at a smaller angle, but that would be impossible to have happened with the stern still in the air.

With all this evidence it seems that while there where a few people that claimed the ship reached a high angle before sinking, the vast majority of evidence seems to point to the fact that the Lusitania for one reason or another had lost so much buoyancy that even her stern could not stay up, but in fact sank so fast as to only leave the mast’s and Funnels left above the surface when they decks went under.
Ship’s Trim & Heel

This section will discuss the reasoning behind the angles chosen for the real-time sinking animation. Please note that all smoke and other effects were removed for the following images.

2:10

This is the ship just prior to impact, it is on an even keel moving approximately 18 knots.
2:10:02

It was noted by those on land that upon the initial explosion, the ship “shuddered”, which collaborates with passengers that were near impact as they felt the ship tremble slightly. However, those in the stern noted that it was not that noticeable, due to the complexity of having the ship vibrate slightly, and for animation proposes, a simple slight list to port was only added.
2:10:22

It was noted very quickly afterwards that the ship began a noticeable list to starboard, with Lauriat also commenting that the ship also went down by the head. Here we have the ship at 5 degrees to starboard.
2:10:43

The ship at this point has reached a 15-degree list to starboard, as noted by those on the bridge. While the initial list forward is unknown, 1 degree seems to fit the timeline. Lauriat also mentioned that after the ship reached this angle, that the ship righted herself slightly with the bow even coming up again. It can easily be seen that the port boats at this point are useless, with the starboard ones quite far away from the ship.
2:15:01

The ship at this point has returned to its initial 15-degree list but holds it. The ship has been slowly settling down by the head with a 2-degree list forward.
It was noted by several that roughly 5 minutes after the collision the ship righted herself quite significantly. While the timing on how long this lasted for is unknown, it was long enough to people like Lauriat to venture down to their cabins to receive their lifebelts. They were able to walk down stairs
with little issues, however by the time they were making their way back, up the ships starboard list was increasing again. Since Lauriat mentioned that while he was on B deck, and water was close to an open porthole on the starboard side, this can help us to estimate the time.
2:19:58

The ship is still on a fairly even keel and has been dropping in the water at a fairly significate rate.

2:22:09

This is about the time that Lauriat is returning from his cabin and sees the water about to reach the B deck portholes. This list will continue until the final recorded rate from the bridge of 25 degrees.
The ship at this point has reached a 25-degree list to port. This is the final reading from quartermaster Johnston before he is ordered to leave the bridge by Turner. He simply walked to the starboard bridge wing and was washed away from the ship. This is also about the time when the ships stern is at its absolute maximum height. Anything more than this and the ship with a starboard list is far too high out of the water with the amount of water the ship has taken. This is also the moment when the ship most likely fractured between the third and fourth funnels.
The ship is now sinking quickly back to an even keel. This is supported by the fact that very few people survived from the port side in this stage of the sinking. With the ship dropping quickly and correcting the starboard list it is sinking faster than the water can cover the port-side, causing a mini waterfall.
The ship is now dropping so fast that windows are reported to be blowing from their frames
2:27:43

The ship has now sunk so far that only the funnels remain, allowing several people to be sucked into the them and then blown out. The righting motion the ship had been experiencing stops, with the starboard list increasing again. This causes fourth funnel which had been moving away from boat #15 to then
move back towards it and just missing it, it then ejects a cloud of soot as it descends into the water. The ship has now sunk, its only been 18 minutes from initial impact.
The following table contains all of the key frames used for the sinking, it is measured in seconds following the initial impact.

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**Miscellaneous Notes**

It should be noted that there are several inaccuracies with this animation. Some of these were due to a lack or information or were done intentionally due to technical reasons. The following list are some of the known errors and a brief explanation on why they were left in.

The main ship model has some issues, if one looks really close at rail posts and other small objects on the Port side, then you can see that most of the posts are not were they should be. This is because UE4 moved them randomly, and despite repeated fix’s, the problem continued.
Those familiar with the bow of the ship will notice that some of the bollards are not correct and the cone of the foredeck is lacking the entrance door. Some of these were chosen to help with performance and others were discovered too late in the process to be changed.

There is a lack of fabric on railings throughout the ship, this was done due to it requiring thousands of extra polygons and needed to be cut due to performance.

There are windows and shell doors along the hull missing.

The coast of Ireland is seemingly very small and not entirely accurate. Originally, a very accurate coastline was created that spanned as far as the engine would allow it, however it ran so terrible that it was shortened to only a few kilometers.

The forward splash on the ship is far larger than it should be, this was done due to technical reasons.

The ships rudder only turns around 11 degrees, when it was stated on her trials that it could turn 33.5 degrees. This was changed due to the fact that it was discovered that the rudder post is a few feet from were it should be. As such, if it was turned 33.5 degrees, the post would no longer line up with the rudder.

Lifeboats lower too fast when compared to archival footage of Aquitania’s lifeboat drill and Titanic’s 2017 lifeboat launching times. This was changed as if the boats were left at a more realistic time frame, the ship sinks too fast for them to be given the appropriate time. As such due to how the ships time matches with a lot of testimony, it can be argued that the time frame of the ship is accurate. Without other evidence to help argue the earlier lifeboat launching times, they were left as it.

The ship during the final plunge and after should have very turbulent water, which is lacking in the animation. This was cut due to time and technical limitations and the water shown here is not an accurate representation on how it was during the sinking.

If one study’s the way the ship sinks in the end, then you might notice how the bow seems to rise slightly before plunging down. This is not an inaccuracy, but it was thought it should be brought out. Following the ships maximum angle of trim, it starts to ease slightly and the ship rights herself slightly. This causes the most forward part of the bridge to seemingly rise ever so slightly, even though the ship is dropping in the water if one focuses on the stern. This gives the illusion that the ship is rising in the water, its not easy to see in close up angles but in the programming of the animation it is easier to see.

The steam and smoke emitting from the forward vents should continue for most of the sinking, however after 5 minutes weird artifacts started to appear on screen. As such it was shortened to only around 30 seconds.
One of the hardest challenges of creating a Real-Time Sinking animation is that one must show everything, and most of the time there is no actual precise evidence or testimony depicting what you need to know. This means one must cross reference everything to make sure that there is nothing conflicting against the way you are depicting, and you end up having to just make the best guess on it. This can be a tricky line to follow as you might end up being wrong and telling the story wrong. However, in some situations, there is simply no way of knowing exactly what happened, and this is the case of the lifeboats.

Unlike Titanic there was no leisure time for people to check their watches on a regular basis and take it all in, people had less than 20 minutes to make decisions and one’s mind tends to focus on more important things. And unlike the Titanic, there was no “Archibald Gracie” in this story.

For those unfamiliar, Archibald Gracie was a survivor of the Titanic, knowing the importance of the event he tracked down all the survivors he could and eventually was able to create the timeline of the Lifeboats we know today, right down to the minute in which each boat was launched. The Lusitania while a popular subject, never had anyone who did the same work as Gracie when the disaster was new and interviewing lots of people. Thus, the list below is not 100% definitive on what happened, through the research of many people one is able to get a good idea of what happened to each boat, but outside from one boat an exact time will never be known for all. There may be more evidence out there that could prove this list inaccurate but at the time of writing this, this is a fairly good idea on what happened.

Lifeboat’s Stories

This section will go into each of the main lifeboats and if there is information, go into the story and it’s collapsible as well if the information exists

**Lifeboat 1**

A lot of the information for this boat can be traced to Leslie Morton. After the incident with lifeboats 9 & 11, he saw his brother lowering boat #1, and went over to help him. “I took over the after fall and together we managed to lower away and get No. 1 boat into the water, Lusitania by this time had slowed down to about one or two knots,” He noted that the water was only a few feet from the deck. This would put it around the time B deck was submerging under which was around the 14-15 minute mark. This also goes alongside Dwight Harris sketch of boat #1, as the forecastle was slipping under and him seeing #1 two people in it. The timing also helps to find out the times of the boat’s 9 & 11 since it happened just before 1.

As Leslie put it
“I suddenly saw my brother at the for’ard end of the boat deck at No. 1 lifeboat which they had lowered halfway down to the water, full of people, so I went along at the ‘double’ and joined him and, finding that he had no one at the stern end of the boat to assist him, I took over the after fall and together we managed to lower away and get No. 1 boat into the water, Lusitania by this time had slowed down to about one or two knots. We immediately went down the falls into the boat which was full of passengers with no crew members in it and time was running extremely short.

Having got into the boat my brother at the for’ard end tried to push off with the boat hook and get her away from the ship. I was trying to do the same thing at the after end of the boat, but many of the passengers were hanging on to bits of rope from the side of the ship and the rails, which were now level with the water, in some mistaken belief that they would be safer hanging on to the big ship rather than entrusting their lives in the small lifeboat. Despite all our efforts we could not get her away from the ship’s side and, as Lusitania started to heel over a little more, just before starting to settle by the head for her final dive, a projection on the side of the boat deck, which was nearly level with the water, hooked on to the gunnel of the boat we were in and inexorably started to tip it inboard. The time for heroics was obviously past and my brother yelled at the top of his voice, “I’m going over the side, Gertie.” I replied, “So am I,” and we waved and both dived over the outboard side of the lifeboat.”

Lifeboat 2

Lifeboat #2’s story is somewhat unknown, but it did end up as one of the boats carrying a fair amount of people. According to Martin Cahill and J. Kent Layton, boat #2’s falls where released at the last moment allowing it to float, its collapsible stored under it also managed to float free, this is one of the only known collapsibles to survive as the rest were destroyed when the ship foundered.

It should be noted there has also been a huge misconception of the port boats, many authors and historians have talked about how the port boats were in a chaotic mess, with a bunch of the port boats falling inwards and the crew working the whole time to push them back up. This seemingly comes from Junior Third Officer Bestic’s account in later years, however he never mentions this in his original testimony. Not to mention, no passengers seemingly talk about this either, it seems at some point when Turner ordered the launching of the lifeboats to halt, most of its occupants were ordered out and awaited instructions to reload, which for the most part never came.

Lifeboat 3

Boat #3’s story is rather small, it was simply never released and went down with the ship.

Lifeboat 4

Again, much like # 3, there is little information about this boat, it seemingly was never released and thus destroyed when the ship sank.

Lifeboat 5

When the torpedo stuck, several people were showered with its remains and it disappeared in the geyser of water (which reportedly was as high as the funnels) from the blast. Lookout Thomas Quinn in the crow’s nest Cleary saw it, he says “It struck right amidships near No. 5 boat and splintered No. 5 boat to pieces”
Lifeboat 6

Much like #4 there is no direct information on #6’s story, someone has stated the chain’s snapped and it fell in the water, but the source of this information is unknown. As such it’s safe to say it suffered the same fate as #4.

Lifeboat 7

We once again have Lauriat to thank for the story of this boat

“As I came out on the starboard side, I saw, a little aft of the main entrance, a lifeboat well filled with people, principally women and children, that no one had attempted to clear from the davits" After failing to free the boat to the davit he jumped out "The last I saw of the lifeboat out of which I jumped was that she was being pulled down, bow first, as the tackle had not been freed and the stern of the boat was rising high in the air"

This also seems to go along with James Leary’s account of a lifeboat on the starboard side.

Lifeboat 8

This boat was supposedly was never launched, however lots of people say that the boat in one way or another upended and its human cargo was thrown into the sea (with the stern of the boat falling vertical) and some of its former passengers being squashed by boat #10 when it falls.

Lifeboat 9

Boat #9 has an interesting story, there are some who say it was loaded but the falls jammed and subsequently never released. However, Leslie Morton’s famous story of a lifeboat falling on top of another may be boat #9. Morton claims that it was #11 that got squashed, but since that boat made it and no one in it reported anything of the sort it seems that it was not the one.

As the RmsLusitania.info puts it: “Leslie’s naming of lifeboat 11 and 13 was the one that fell on top of it does not match the testimony occupants of lifeboat 13, who do not mention anything extraordinary in the lowering of their boat. It is likely, then, that the boat Leslie lowered as lifeboat 9 and lifeboat 11 was the one that fell on top of it. Lifeboat 11 had spilled earlier in the sinking before it was filled again and cast away safely.”

Lifeboat 10

Bestic was working on boat #10 and had this to say, “Captain Anderson was beside me and he said, ‘Go to the bridge and tell them they are to trim her with the port tanks.’ I made my way to the bridge and sung out that order to Mr. Hefford, the second officer. He repeated it and came back again and no. 10 boat was on the deck, we tried to push it out but could not.”

Due to the list they could not get it safely lowered, it is said to have eventually flipped and dumped its human cargo into the sea.

Sometime after this the boat was self launched and lost control, and landing on some of boat eight’s passengers, then sinks and is lost.
**Lifeboat 11**

Much like the reasoning behind #9, this seems to be the best boat to fit the description for falling on #9, Morton’s words on the story (ignore the naming of the boats)

“...with Lusitania still moving ahead through the water in the great circle which she was by this time describing and still travelling at four to five knots through the water, this presented a problem. Finally, we lowered her into the water by letting the falls run for the last couple of feet. Immediately the boat dropped back on its painter (which was fast for’ard); that is the common practice in these circumstances. She fell back one boat’s length, came up alongside the heavily listing Lusitania and was directly under No. 13 lifeboat which was still in the davits. This lifeboat had been filled and I was about to go down the ropes, as was my duty, to try and get No. 11 lifeboat away from the sinking ship. The falls or tackles on No. 13 lifeboat, for which instructions had been given to lower away, were both handled by inexperienced men from one section or another of the catering or stewards’ department and, instead of being lowered away the ropes went with a rush and No. 13 lifeboat, full of people, dropped twenty-five or thirty feet fairly and squarely into No. 11 lifeboat which was also full of people.”

**Lifeboat 12**

Boat #12 went vertical by the stern, Mackworth & Conner state this was around the time the ship righted herself while they waited for Howard Fisher to return

**Lifeboat 13**

First officer Arthur Jones was in charge of loading boat’s #13 & #15. He talks about #13’s loading at the inquires.

“922. Then did you lower her down?  
- Yes, I lowered her down.  
923. And did she get away all right?  
- No. 13 got away first.  
924. Did she get away all right?  
- She got away with about 65. “  
Thanks to this we know #13 was lowered just before #15 was with roughly 65 people on board.

**Lifeboat 14**

Boat #14 was the only lifeboat from the port side to be lowered successfully, but either because the plug was not in the lifeboat (that is supposed to drain water when not in use) or from damage from scraping with the ships side, the lifeboat leaked considerably and eventually capsized but supported some of its occupant’s upside down. The boat was also lowered a bit too quickly towards the end and as Charles Hill put’s it. “She dropped almost vertically, spilling out into the sea all those near the stern”.
Some of the known passengers of this boat where Virginia Loney, Master George, Percy Rogers, Annie Sharpe and George Wynne to name a few.

**Lifeboat 15**

As mentioned with boat #13, First officer Arthur Jones was in charge of #15 and it was launched so late in the sinking that within around 15 seconds of landing in the water, the boat was already back up at the boat deck level. The lifeboat was loaded with as many as 80 people when it left the ship and continued to be filled until there were over 100 people in it.

What’s interesting with boat #15 is that it helps to understand the Lusitania's last moments, after the boat hit the water the ship was sinking very fast. One of the funnels (most likely number #4) loomed overhead and with the heavy list to starboard looked like it was going to crush them. In fact, it was so close some survivors said they could touch the funnel. At the last minute, the ship recovered from her list and the funnels missed. They were close enough for Thomas Docherty to say, “but it just missed us. It came so close though, that the sharp gust of air took off Millie’s [sic] loosely tied bonnet and covered her [sic] hair with soot.”

Then as the Lusitania disappeared, the aerial wires that were originally high above the air where coming down rapidly, they caught boat 15 but luckily got free fairly quickly. (On a side note it seems that there were quite a few people in the water that were caught by cables as well)

**Lifeboat 16**

Boat #16 seemingly has two stories behind it. One side of the story is that towards the end the boat was lowered but the men lost control of the lines and it smacked the water hard enough to become waterlogged and eventually sinks.

The other side of the story is that nothing happened and this boat was destroyed in the final plunge. People for the first theory often cite Charles Hill for this, but others state that his experience is more likely boat #14 and not #16. With seemingly no other witness it is likely that nothing happened with this boat and was never launched, or if it was no one survived to tell about it.

**Lifeboat 17**

This lifeboat was being lowered by first officer Arthur Jones, and it contained the famous Avis Dolphin in it. This lifeboat was successfully lowered until about 12 feet when two men jumped in it, the boat overturned, and the ropes snapped. Ian Holbourn at the time looked at his watch and it was roughly 2:22 when this occurred.

**Lifeboat 18**

Lifeboat #18 in the last few minutes was apparently reloaded, though there was no hope of getting it down to the water. A seaman was standing by with an axe ready to knock out the pin holding the boat down should the order come.

Isaac Lehmann, who was getting restless seeing water advancing in the bow of the ship decided to take matters in his own hands. With revolver in hand he confronted him, “It is the captain’s orders not to launch any boats,” the sailor responded, “To hell with the captain,” Lehmann said. “Don’t you see the
boat is sinking?” He drew his revolver and said, “And the first man that disobeys my orders to launch the
boat I shoot to kill!”

The sailor understandably did as ordered, the pin was knocked out and with nothing holding the boat
down it slipped down the deck with the starboard list. Crushing anyone in its path to the wall just
forward of the veranda café and was pinned up against the wall. Many people were severely injured and
two sisters’ in their fifties were killed instantly, Lehmann himself was injured in the foot and limped
away. There are accounts that attempted to move the boat back into the launching position but ran out
of time.

There is very little to no evidence of anything happening with boat #19. Some claim it was lowered but
they do not cite their sources so there is no way of confirming. As it stands nothing major happened
here

**Lifeboat 20**

Ogden Hammond had just put his wife in boat #20, the boat was filled and then attempted to be
lowered. As Hammond put it, “The boat was half filled, about 35 people in it. They started to lower the
boat, and the man at the bow let the tackle slip, and I remember I grabbed it and that it pulled all the
skin off my right hand. The bow dropped, the stern tackle held, and everybody fell out of that boat from
the top deck, which I think is about 60 feet above the water.” The stern falls then slip, and the boat
landed on its former passengers.

**Lifeboat 21**

This lifeboat was lowered about the same time as 15 and was fairly full. When it’s fall’s where released
the aft docking bridge was nearing the water and was fairly close to the ship when it went under.

**Lifeboat 22**

There are not many convincing sources on what happened to this boat the collapsible, however J. Kent
Layton’s research shows that boat 22 actually floated off the deck upside down with some of the three
collapsible boats floating off as well.

**Lifeboat Launch Order**

From all the evidence on the lifeboats, the timeline looks something like this

**2:10**-Explosion

Boat #5 Destroyed

One can write off any specific timeline for the first few port boats (i.e 4-6-8) as all these boats were lost
with ship
2:15- Most people say that the ship "Righted" herself around 5 minutes in and stayed like this for several minutes. Allowing people to go below and get lifebelts, by the time they were returning to the boat deck the ship was listing again to starboard where it to ultimately achieved a 25-degree angle.

Boat #12 went vertical by the stern, Mackworth & Conner state this was around the time the ship righted herself.

2:15

The fiasco with boat #8, #10 and #20 seems to have happened between this time point and boat 17s launched.

In short #8 upends spilling its human cargo in the ocean, at this same time #10 was being launched and falls out of control and lands on 8's passengers.

#20 falls bow first spilling passengers before landing on its former passengers. Gauntlett says after this, he went to the starboard side and the bow was "very low in the water". This would place it around 10 minutes or later [2:20+]

2:22- Boat #17 is launched with Avis dolphin in it, it flips when two men jump into it about 12 feet above the water bow first. Holbourn at this time looked at his watch and its was roughly 12 minutes past the first explosion.

Crewman Leslie Morton says the ship was moving at 3-4 knots as he launches lifeboat# 9 which slides under #11, after some difficulty #11 loses controls and lands on boat and the it disappears.

Boat #1 is launched just before water reaches the A Deck, ship slows to [about] 1-2 knots

Boat #13 is launched after boat #1

Lifeboat #14 is launched in the later stages of the sinking and clears the ship. A missing plug leads to it swamping and the capsizing several times.

Boat #18, Isaac Lehmann threatens the seaman with his revolver to launch boat 18 as he is seeing water nearing or entering the forecastle (possible around 2:25 as that’s when the forecastle was seriously slipping under) the seaman releases the pin holding the boat and it swings in killing about 50 people.

Boat is then attempted to launch again before being dropped

Boat #2 falls released as the forward boat deck submerges but swamps later. Collapsible A2 also floats clear.

Boat #11 floats off as the water rises faster than the crew can release it, then #15 is launched shortly after

Boat #21 is launched as the ship sinks

A stack of three collapsible boats located under the docking bridge float clear as the ship goes under. Several crew and passengers have managed to release the gripes [fastening chains]

2:28- Ship founders with a considerable vortex of water emitting from the ship, causes almost mini geysers to erupt from the wreck
Miscellaneous Notes

There is also the possibility that some of the stored collapsible boats just forward of the docking bridge may have slid off the deck in the final minutes, this is found in an interesting detail from Carl Foss

“Finally I managed to get one of the lifebelts from a box on deck and jumped over the starboard side aft into the water about nine minutes after the explosion. There was only room in the boats for women and children. I had hardly hit the water when a lifeboat crashed down beside me, narrowly missing my head, and seemed to have the bottom stove in by the fall. The five men in it were pitched out and one of them got caught in the swirl of the starboard wing propeller and had both his legs almost severed when I managed to get him clear and put a rope in his hand. The poor fellow was bleeding terribly and could not have lasted much longer.”

This could only have occurred in the final moments of the sinking as the propellers only came clear just before the final plunge, the most exposed propellers where the one of the port side so its possible one of the collapsible from the port side fell.

Second Explosion

Basic Facts

When the first explosion occurred at 2:10 PM, it was obvious what was the cause of it. U-20 fired a signal torpedo at the Lusitania, with a high chance it would not detonate (German Navy did its own study and found a many as 60% of torpedo’s failed to detonate on contact with its target). While the official British inquiry concluded that the Germans fired two torpedo’s, this was not the case.

Some 30 seconds after the initial torpedo had struck as Lauriat put it “a second explosion quickly followed, but I do not think it was a second torpedo, for the sound was quite different” & was “very muffled”. Whatever this second explosion was, it has caused historians to debate for decades on the possible source of this explosion, and if it was the cause for the ship to sink so suddenly. While many different theories have come up over the past century, the basic fact was that there was a secondary explosion of some sort that caused most people to notice it. Even Schwieger noted it in his log “an unusually heavy detonation’ had taken place and noted that a second explosion had also occurred which
he put down to perhaps, “boilers, coal or powder”. In fact, the second explosion was powerful enough for a former U-20 crew member in an interview with CBC that it caused U-20 to rock back and forth.

Since we know for certain that only one torpedo was fired in intercepted telegrams from U-20 to her home base, this means that this explosion must have occurred from something originating within the ship, and it was fairly quickly after the first one, with passenger William McMillan Adams timing this at thirty seconds after the first on his watch.

**Theories**

There have been multiple theories over the years on what could have caused the second explosion. Some of them are the following:

1. **The ships “Secret” (Was not secret, was far more known that typically believed at the time) cargo of munitions exploded and caused the ship to sink.**

   This first theory can be put to rest, as regardless on what was put in the hold, it did not explode. in 1993 and 2015 it was explored and found to still be intact, so intact that in 2015 a team was able to get a ROV into the cargo hold and recover some bullets from the cargo. Bob Ballard in 1993 was also able to explore the then exposed Starboard side of the hull in the vicinity of the hold that would have stored the munitions, and no damage was seen outside of the slight twisting of the hull in this area (More detail in the wreck section)

2. **A newer theory in recent years is that the damage from the one torpedo alone caused enough damage to sink the ship in the short time she did, and the second explosion is nothing but a red herring.**

   This theory emerged in the late 90’s and early 2000’s, with the popularity of the Titanic Forensics Analysis by William Garzke and others, one was commissioned for the Lusitania. The study found that the ship sank by the flooding caused by the lone torpedo and open port holes, and any damage by whatever the second explosion was not the reason the ship sank in 18 minutes.

   This seems like a open and shut case on the matter, however if one looks closely then one can finds enough problems that this theory may be outdated.

   The first issue is the date on which this was done, which was 1998. This in of itself might not be a problem, however this was done around the same time and using the same technology as the Titanic analysis during the same time period. Unlike the Lusitania, the Titanic has had dozens more conducted in the 20+ years since the first one’s, and as time and technology goes along it has shown a huge difference in data from those first one’s, and has had historian’s rewrite the history books on several general ideas on the sinking. If the Titanic has shown significant change over the years, it is likely that the Lusitania would also show the same changes. The main difference in the Titanic analysis is the showing on how the ship sinks, her draft, trim and heel angles and at what angle did the stresses
become too much, the earlier analysis seem to indicate major issues with the Titanic’s design and build quality resulting in rumors on the matter. However, with each new study it has shown the opposite, with the angle of the ship growing each time and showing the incredible strength of the ship. This alone would cause one to second guess on the accuracy of the data but there are more issues. The paper also had many issues with just the basic facts, these range from spelling the name of the Mauretania incorrectly to calling William Turner the captain of Titanic, not to mention the same issues with the Titanic papers. They also have the point on which the Torpedo strikes to be completely wrong, which would also dramatically change on how the ship sinks.

This report also made the assumption that all the watertight doors were in the open position, contrary to the order Turner had given earlier in the day to have all of them that did not interrupt the main duties of the crew closed and testimony from survivors in the forward boiler rooms that say they closed them, again this would dramatically change the outcome of the analysis.

With all of this put into question it can been seen that this data should at the very least considered unreliable at best and should not be used in the argument of this theory.

There however no question that the Torpedo did cause major damage to the ship, however one must also look at other ships struck or sunk in the first world war. Ships like the Britannic, which had far more damage/flooding on her and even sailed under her own steam during much of the sinking. And yet she lasted a near full hour, and this was with most of her portholes open. There were also other smaller ships that were struck with more than one torpedo and still took hours to sink in the days before the Lusitania’s sinking.

With all this evidence it seems that the idea of that the ship sank in 18 minutes from only 1 torpedo seems unlikely, however the question if the ship could have survived indefinitely remains unknown.

3. **The Torpedo caused a main steam line to fail, causing a rupture**

This theory states that when the Torpedo struck the ship, it caused one of the main lines carrying the steam from boiler room 1 to the engine room to fracture, causing a steam line rupture/explosion.

This theory certainly seems to make the most sense, this would explain how quickly the steam pressure dropped in the lines, dropping to 50 PSI in a matter of minutes according Third Engineer George Little. James Brooks, who was on deck immediately above the site where the torpedo hit, was enveloped in a cloud of steam so dense that he found difficulty in breathing, not to mention the same story repeated in the bridge.

However outside of this fact, there is no other direct evidence for this theory. However, it might coincide with the next theory.

4. **The cold Atlantic water entered the boiler rooms came into contact with boilers still at full steam and caused one or more to explode on contact with the sea water, or possibly some flying metal ruptured one.**

This theory is what most survivors seemed to think occurred, certainly we know from history that boiler explosions can be deadly and cause significant damage to a ship. We do know that there were some
explosions of some sort as several people who were sucked into the funnels where blasted from them from explosions.

The only problem with this theory is that no one from the boiler rooms states they saw or experienced it.

As we can see from Figure 1, we have several survivors from boiler room 1, and yet none of them report anything very extraordinary, yet many people in other places clearly report that something happened in the forward most boiler room. What’s even more interesting is that fireman Thomas Madden said that he had time from the explosion to go close a watertight door. “Well, I ran to the watertight door, that was shut down. And by the time I got back it was coming though the boilers. There would be about a foot and a half then” This would go nicely with the people from up top with people like Lauriat in which he says “but then she stopped suddenly as if the sea had met the water-tight bulkheads and she seemed to right herself and even raise her bow a little” after the starboard coal bunker filled and then the main boiler room, the flooding of the port bunkers would help right the ship briefly.
This would still not explain why there seems to be a severe lack of testimony from down below of anything major happening. But what may have been possible is a combination of the steam line rupture and a boiler explosion. While it is not known what of these two might have occurred first, a rupture in the line may have in turn caused a boiler explosion on its casing on the starboard side, thus the lack of people seeing anything. Even debris might have ruptured one or the other, as trimmer Frederick Davis reported “There was loud bang, and there were objects blowing about, and the lights went out”. While the power of a boiler explosion has been shown to be not as much as people generally believe, its combine forces with a ruptured line may have caused enough damage to a bulkhead somewhere or more shell plaiting.

(Figure 2 Cahill )

5. In 1993 during the Bob Ballard expedition, a new theory was placed forward when they noticed some large amounts of coal in the seabed, that a coal dust explosion in the starboard bunker occurred causing massive amounts of damage.

This theory gained serious traction during the 1990’s and early 2000’s due to it being in the movie “Last Voyage Of The Lusitania” along with its companion book and Ghost Liners. This theory states that since the Ship was at the end of her crossing, the bunkers would naturally be almost empty except for a fine line of dust, which is from the more combustible type of coal known as Bituminous that the Lusitania used. This dust during normal operation was at no risk of igniting, but when the Torpedo struck the ship it shook the bunker, got the coal dust in the air and with a mixture of oxygen became highly combustible and ignited, destroying the shell plaiting along the bunker.

This theory has been heavily criticized by most historians and experts, with most stating that the bunkers would have been too damp for this to occur. This also does not comply with the generally accepted fact there was a delay from the first explosion to the second, by that time the fireball from the
TNT of the torpedo would have been long gone and replaced with thousands of tons of sea water pouring in at an alarming rate.

With no eyewitness and physical evidence to back it up it seems that this version of events is most likely not true, to Ballard’s credit he himself did not come up with this theory (Retired munitions expert Cyril Spurr did) and by 2000 he himself backed away from the theory stating “there is no other record of any coal dust explosion on any other ship during WW1” It should also be noted the amount of coal they said they found was blown out of proportions as most divers state there really is not a whole lot to be found.

There are several other theories out there like that there was aluminum dust aboard that ignited, there is no evidence to support most of these theories and as such they were not included in this discussion.

With all this evidence at hand, it seems that the source of the second explosion will never be 100% known, while most “theories” can be extinguished of its source, the actual cause will never be known unless ROV’s or divers can get into boiler room 1. It seems that whatever caused the second explosion caused her to lose steam pressure, thus the effect to stop and to supply electricity. While the true extent of damage will never be known, it seems that this explosion also helped the ship sink as quickly as she did.

When flooding occurred, it most likely occurred in this manner within a few minutes of the Torpedo’s impact as seen in figure 3.

With the flooding of the port bunkers, the ship would have somewhat recovered from a starboard list, we also know that within around 5 minutes Howard Fisher went to go get lifebelts on E Deck only to find already underwater and D Deck rapidly filling.

This helps point to the fact that whatever happened, there was some serious flooding occurring.

(Figure 3 Cahill )
Much has been made about the fact portholes where open all along the ship, this would quickly allow the total square footage of area exposed to the sea to increase dramatically, thus hastening the ship’s destruction. This popular theory has been talked about since the ship sinking, with the inquiry’s asking people if they saw any port holes open when the ship sank. Most do not say if they did, due to them focusing on other things at the time. Again, Charles Lauriat provides some possible amount of evidence, in his book he states

“The portholes along both sides of the dining saloon were open. I had special reason to notice this, as my seat was directly under an electric fan, and several times on the voyage when the portholes were open and the fan going the draught was so strong that I had been obliged to request the steward to shut off the fan. This was the case this noon.” And it was his opinion on the way the ship sank “Just before the steamer sank she seemed to right herself and go down on quite an even keel. She settled by the stern, and that is another reason that convinces me that if her portholes had been closed she might have stayed afloat after her bow struck bottom.”.

But is there any physical evidence on the wreck? While not all photos and videos of the wreck are available to the public, all footage that has been shown of the port side have shown that very few if any are open.

In fact, a great deal of them along the bow and stern seem to be missing, if one looks at the damage around where the port holes where, it becomes pretty clear that they were probably destroyed when that part of the hull bent. But Lauriat also make this comment “I passed I saw that the portholes were open and that the water could not have been more than a few feet from them” this is when he was on B deck on his way back to his cabin. However, we know some of the portholes in the dining room where closed as John Wilson and Herbert Ehrhardt noticed and proceeded to close them.

While it certainly seems that some portholes where indeed open, it seems that it was largely confined to the upper decks. By the time the Dining room windows would have been submerged the forecastle have already reached the sea, this would be the same story with the B deck. This would have been more than 10 minutes in, by that time the ship was doomed regardless if portholes in those locations where open. Lauriat also suggested that the F deck portholes might have been open but was not 100% sure, it also
should not be understated how much water a porthole could add to the sinking. Under the right circumstances a porthole could allow 3.75 tons of water a minute. It seems that although some portholes where indeed open and maybe some even lower, it most likely was not the smoking gun everyone thinks it is in determining if the ship was going to make it or not.

In 1918 the Mayer Limited Liability hearing convened in New York. One of the specialist witnesses called was Professor Hovgaard of Massachusetts Institute of Technology. He was questioned extensively about the ship. His testimony runs to 30 pages of transcript.

His baseline was 3.75 tons per minute if an open porthole was submerged 18 inches below the sea surface. By extension, he argued 70 portholes would admit about 250 tons of water per minute or nearly 5000 tons in 18 minutes. When asked about the impact of this Hovgaard said it would ultimately cause the ship to capsize. [Ramsay- p164,165]

We know this didn’t happen as the list corrected, worsened then corrected several times. Counter flooding came from coal bunkers, portholes and open promenades on the portside of the ship.
Once the Lusitania slipped away in 1915, she lay largely undisturbed until the 1960’s, her wreck was finally documented to some extent in the 1930’s and she was found on her starboard side. Diver John Light during the 1960’s started to extensively dive on the wreck to find out why she sank. Taking diving to its extreme limit, he spent only very short periods of time at the wreck at any one time, and incorrectly believed he found evidence of a large internal explosion with shell plaiting on the port side blown outward.

Gregg Bemis soon bought the wreck from Light, and diving and salvage operation began during the 1980’s on the wreck, some of the things removed where three out of the four propellers (one of which was melted into golf balls) these were recovered by blasting the stern. As with other damage that will be discussed, this has left the ship in very poor shape.

**Status Of The Wreck In 1993**

Until 1993, the Lusitania’s wreck was very poorly documented with only some brief footage in black and white during the 60’s. After finding the Titanic, Bob Ballard went on to find and explore other famous ship’s in history. In partnership with National Geographic, Ken Marschall, and Lusitania historian’s Bill & Eric Sauder he went out in 1993 to do a full survey of the wreck with video and photographs. This consisted of using the submarine *Delta* and the ROV *Jason* to do large sweeps of the wreck to gain photos and video of its condition.

The dives lasted two weeks and in total over three hundred hours of wreck footage and other misc. footage was shot. Among the odd surprises was a visit from Roy Disney and his wife to the expedition. Of Note, Disney almost funded Ballard’s expedition to the Titanic, but was stopped by other studio executives from “wasting” money on the off chance he would find anything.

(Bill Suader)
The ship was found shrunken by more than half her original length. It was not until they went and did extensive video and photo documentation did more damage show itself.

The wreck from a distance seems to be very oddly shaped, almost a box shape and no longer the tear drop shape; this is because due to time and the harsh conditions the ship has essentially collapsed in on itself, now more of a flatten box shape. See figure 1 & 2 to see an idea of the full extent of the damage.

(Figure 1)
(Figure 2)

The ships superstructure is also extensively damaged, so much so that only an area of three davits on the port side are all that remain attached to the ship.

This can often give the ship a very distorted look, with most of the identifiable features simply lost in a mess of metal. The ship is also draped in fishing nets, often adding to the confusion as they are so thick in some sections it hides the wreck. This has led to E deck being the highest deck on the ship that is intact for most of the ship’s length, with D deck missing in sections and anything above that being unrecognizable in most regards.

(Figure 3 Cahill)

The stern section of the ship is now almost entirely unrecognizable, this is due to two things. The main culprit is most likely the blasting that was done on the stern to get the propellers, this is why the docking
bridge lies upside down and why the stern has no form from the rudder up. The other culprit for the poor state of the wreck outside of time is the fact that during WW2 the British or Irish navy depth charged the wreck extensively and is the reason why there are many holes in the shell plating along the ships side.

While the reasons for blasting the wreck have never been known to the public, enough blasting was done that the British government had to issue warnings to diver’s during the 80’s on the possibilities of them going off. Indeed, during the 1993 exhibition and in other dives they have been found to be littered around the wreck as seen in figure 4.

It is unknown how much damage was done to the wreck during the decades after her sinking, or what else happened to the wreck during this time. However, for one reason or another the wreck was disturbed, people have claimed this could be a cover up from, clearing the ship for fishing to using her for target practice for different types of depth charges.

Whatever the reason, it has caused considerable damage to the wreck and has made it all but impossible to discern what was damaged by time or humans. However, one of the interesting things found was the fact that the funnels of the ship where still located in their original locations relative to the wreck. While most of the thin casing of them is was long gone, the waste steam pipes and rings from the funnels remain allowing their funnels outline to be still visible in sonar scans and for Ken Marschall to draw them in his paintings. They show that the num #1 funnel is pointing towards the bow (most likely flung out there with the impact with the bottom) and funnels #2-#4 in close alignment to their original configuration. This supports the testimony of some survivors who claim that not one of the funnels fell during the sinking, the evidence of the wreck as well as theirs seemingly puts an end to the debate.

But by far the most easily recognizable feature of the wreck is the ship's bow, which looks mostly the same as it did in 1915, with one of the anchors still being in place (other one was removed in a salvage exhibition), rope still coiled and some of the teak planking still on the deck. The bow however is also heavily damaged from the impact on the seafloor (see condition plans for where the damage is). In fact the whole bow section is at a much shallower angle to starboard than the rest of the ship, the area just forward of the bridge being heavily bent by the change in angle for when the bow crashed in the seabed. (see Figure 5 for a idea of this)

This same bending in the hull however, has sadly led the wreck in to the condition it is today. Recent surveys of the wreck from 2015 onwards have shown a considerable amount of damage to the wreck in recent years. The area that was twisted with the impact has not collapsed to being only a few feet high, with only the prow of the bow retaining its full height. This as well as the decay of the fracture in the aft hull (talked
about in the next section) have now made the ship essentially three islands or three major sections.

It is unknown how much longer the hull will retain what little shape it has left as more and more structural failures within the ship continue, the last recognizable sections of hull will most likely be the tip of the bow with the forecastle due to them being sheltered from damage and need very little strength to support them, and the area around the engine room due to its initial strength and the refits to the Lusitania strengthen this area.

(Figure 6 Infomar)
The following painting's where drawn by Ken Marschall and help convey the condition of the wreck

Painting by Ken Marschall, courtesy of Madison Press Books
This painting was drawn after Ken was stuck on the wreck after the Delta submarine got caught in the many fishing nets in the wreck.
Painting by Ken Marschall, courtesy of Madison Press Books
Fracture In The Hull

One of the biggest surprises Ballard’s team found was the fact that the ship’s back is completely broken, thus giving the ship a boomerang shape (see figure 1)

(Figure 1 Infomar)

What was even more interesting is the fact that this fracture does not extended past the first-class dining room, which is now the only major piece of wreckage holding the two halves of the ship together. This fracture has allowed divers to peer right into the heart of the ship and see some of the boilers from boiler room 4, and it shows them to be intact. This might give people reason to doubt there was any boiler explosions in the aft boiler rooms but boiler room 4 was shut down during this voyage so there would be no reason for them to be destroyed.

The reason this is surprising is the fact that only the bottom of the ship is broken and that it stopped at one of the largest open areas of the ship, the two-story dining room (all that’s left of the room is the large well for the second floor). Someone actually did see something

(Figure 2 Bill Suader)
that could relate to the break-up, Thomas Sandells stated in the final moments, “Smoke roared through the funnels, and the starboard side of the ship seemed to break right away. It was the strangest thing I ever saw.” It seems that to some extent the ship broke visibly on the surface, and since it was the starboard side, it must have occurred around the time the bridge went under which was also the peak of the ships maximum trim.

It is possible that when the ship was in her final plunge, the odd way in which she settled may have put a huge amount of force in boiler room #4, which was probably still dry and broke along the bulkhead dividing it with #3. This would explain why the break today lies only at the end of boiler room #4 (as shown in figure 3).

There is one other theory that has been placed recently stating the break is sort of a red herring, and it has to do more with time than anything else. To look at this theory, one has to head to the sinking of the Andrea Doria in 1956. The ship since her sinking has been very well documented over the years. And for a good many years the wreck has remained in good condition, however in the last 25 years the wreck has been disintegrating at an alarming rate, with in the early 2000’s her bow snapped off. Sometime in the last few years her back broke, and the ship is almost in two (see figure 4) and the ship looks remarkably similar to the Lusitania’s break. The problem is that its not known with the Lusitania how much damage from hitting the bottom did it stress put on the fracture, and how much has expanded over time.

While the evidence from the Doria seems to offer a second theory, the fact we have some sort of witness to a break on the surface seems to show right now that the likely cause of the fracture happened during the sinking. How much of the break that is visible now in the result of hitting the bottom and time is not known, but at the very least like the Titanic is seems there were forces that where beyond the strength of the steel and design.
One thing of interest that was found on the ship was that almost all the shell doors along the port side of the ship were open. How these heavy doors found themselves open has never been answered. If these doors somehow came open during the sinking, then it is possible the mirrored ones on the starboard side were open. Regardless on how they opened, if they were ajar or open on the surface, there combined square footage would have been much greater than the initial damage. What their role in the sinking if they had any is still unknown.

It is unknown at this time if more major exhibitions to the wreck will occur, the last major one being in 2015 and 2017 when they were able to get into the forward cargo hold and find some of the bullets stored there. With the centennial of the sinking long ago and the relative interest in history and these ships slowly fading with each year and the overall disintegration of ship, it seems unlikely that any new major expeditions will take place. It seems the only future of the wreck is now the possibility of recovering smaller artifacts from the ship, but the window in which to do this is growing smaller all the time. This includes getting into boiler room #1 to determine if one of the boilers did explode or a steam pipe did to decide once and for all what the second explosion was. The more recent expedition brought for the first time, high definition cameras to complete some photo mosaics of the wreck. And are said to return in 2019 for some further dives to the wreck. It’s clear in the recent 20+ years since the 1993 expedition that the wreck has changed dramatically as discussed before. Many items of the foredeck are now sliding off, though traces of the teak deck are still seen.
These are some of the recent images brought back from the 2017 expedition.
In her prime the Lusitania was the technological wonder of the ship industry, she crossed the Atlantic 201 times with relative smoothness. her second last survivor of her 202nd crossing passed away in 2011, the final witness, the ship herself, will seemingly be around for a few more decades. When the Lusitania sank she changed the world and left it shocked, more than a century later it seems she will pass into obscurity from the general public and remain only as a footnote in history books. It is hoping that this paper and animation will keep her memory alive a little longer and get people interested in the fine details of the ship and wanting to have all the facts, not just a condensed outdated version of her history.

For those interested in learning more about the wreck, it is recommend heading the 1993 dive pages on Marconigraph.com or pick up the books “Exploring The Lusitania” or “Ghost Liners” by Bob Ballard.
Special Thanks

For those who want to explore more of the Lusitania’s history and sinking. An excellent resource for those wanting the most up to date telling of the story is *Dead Wake* by Erik Larson released in 2015. The book is extremely well done in telling the facts about the sinking and the event surrounding her like U-20 and Room 40’s involvement with the sinking.

To read about the survivors and original testimony it is recommended to head to RMSLusitania.info & Titanicinquiry.org to read the original transcripts and most reliable info.

For those wanting to know more about the wreck and expeditions to it, it is recommended reading the 1993 dive pages on Marconigraph.com or pick up the books “Exploring The Lusitania” or “Ghost Liners” by Bob Ballard

The Animation, Documentary, and Paper would not have been possible without the help of Martin Cahill, who’s great knowledge and resources helped make the animation the most accurate one of the ship’s sinking and clear up misconceptions of the sinking. And Titanic Animations for helping out in reviewing documents and footage.

We would also want to thank Lucas Gustaffson for creating the main model of the Lusitania and helping preserve history, and Ken Marschall for being a huge inspiration for doing this project.

Recourses

Books
*Dead Wake: The Last Crossing of the Lusitania* - The “Sea Of Glass” book of the Lusitania. This is the most up to date telling of the ships story and the events surrounding her sinking.
*Lusitania Saga And Myth* – A good telling of the story but has some inaccurate information.
The *Lusitania Story* – A good book but tells the inaccurate account of the port boats
*Lusitania Triumph, Tragedy, and the end of the Edwardian Age* – Contains interesting information but can be a little harsh to captain Turner.
*Conspiracies at Sea: Titanic & Lusitania*, J. Kent Layton. 2016. Chapter 10, which explores in depth the matters around the second explosion.
The *Wilful Murder: The Sinking Of The Lusitania & Remember the Lusitania!* – Both of these books are by Diana Preston and are both well told books. They do however much like Triumph &; Tragedy tell the false story of the port boats.
Exploring The Lusitania – This is the most complete record of the wreck available to the public to date. It has some excellent photos and a large collection of Ken Marschall’s amazing paintings.

Ghost Liners – This smaller book features the Lusitania with some other ships like the Titanic and Empress Of Ireland. It is basically a very stripped down version of Exploring The Lusitania, but it is more affordable.

Websites
www.garemaritime.com- great resource for private letters and info of survivors
British Wreck Commissioner’s Inquiry into the Lusitania Sinking - For the inquiries of the disaster
People - For more complete information of people aboard the ship
Welcome to North Atlantic Run - Great Place for information on portions of the wreck
Lusitania ADVANCED DIVER MAGAZINE By Leigh Bishop - Additional information of the wreck and salvage expeditions
Bathymetric Research - Information of the wreck’s current condition and wreck information of the Andrea Doria.
Team Project 17 – Footage of the most recent Lusitania expedition with some of the best images yet collected!

Lusitania Home | Atlantic Liners Lusitania section at J. Kent Layton’s Atlantic Liners website.

Team Project 17 – Footage of the most recent Lusitania expedition with some of the best images yet collected!

Documentary’s/Video’s

Last Voyage Of The Lusitania – Arguably the best telling of the story in documentary form, contains lots of wreck footage and the last large collection of survivor interviews with many of them passing away before the film was finished

Dark Secrets Of The Lusitania – A mostly forgettable over dramatized documentary, but does contain interesting footage of the wreck and them getting into the forward cargo hold and retrieving some munitions from the hold.

Lusitania: Murder On The Atlantic (1998): A fairly over dramatized documentary that is riddled with misinformation. This is the only way to see part of the sinking analysis talked about in this paper outside of the forensics paper it originated from.
Bibliography

1. Dead Wake: The Last Crossing of the Lusitania
   - Erik Larson
   - #1 New York Times Bestseller
   - Author of "In the Garden of Beasts"
   - "An epic, riveting tale of wartime with a hero you will never forget." - The New York Times

2. The Cunard Turbine-Driven Quadruple Screw Atlantic Liner
   - "Lusitania"
   - Autobiographical account of a rare 1987 commemorative edition of "Engineering" with additional new material selected by Mark D. Warren

3. Exploring the Lusitania
   - Robert D. Ballard with Spencer Dunmore
   - From the author of the international bestseller "The Discovery of the Titanic"
   - "Probing the Mysteries of the Sinking That Changed History"

4. The Lusitania's Last Voyage
   - Charles H. Lauriat Jr.
Remember The Lusitania!

Wilful Murder: The Sinking Of The Lusitania

National Geographic

Last Voyage Of The Lusitania

Lusitania: Saga and Myth

Diana Preston

“A complex story of heroism and courage ... compulsively readable”

Independent on Sunday

David Ramsay