Saving the Titanic
Could Damage Control Have Prevented the Sinking?

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It’s a story everyone knows. At 11:40 PM, on 14 April 1912, the passenger liner Titanic collided with an iceberg in the North Atlantic. Two hours and forty minutes later, at 2:20 AM, the Titanic slid beneath the waves. Out of a total of 2,201 passengers and crew, only 711 survived. But was the sinking inevitable? Or could it have been prevented? In the nearly hundred years since the sinking, and especially since the discovery of the wreck in 1986, there have been a number of theories offered as to why the ship sank. But interestingly, there has been almost no investigation into how the sinking could have been prevented. The purpose of this article is to offer a new theory on how the Titanic could have been saved and why she foundered.

The Titanic, contrary to the belief of most people, is not the worst disaster in maritime history. In terms of loss of human life, the loss of the liner Wilhelm Gustloff, torpedoed in the Baltic by a Soviet submarine in 1945, is far worse. Over 7,000 refugees fleeing the Russian advance into East Prussia died during the sinking. Yet unquestionably the Titanic is the best-known shipwreck in maritime history. Ask any random stranger to name a disaster at sea and chances are they will name the Titanic.

In part our fascination with the ship lies in the circumstances under which she sank. She took over two hours to sink on a flat calm clear night, and yet only 32 percent of the passengers and crew survived. It seems incredible that under those circumstances the accident occurred at all and the death toll was so staggering. Since oceanographer and explorer Robert Ballard and his team discovered the wreckage of the Titanic in 1986, there have been dozens of television programs dedicated to the wreck, plus a feature film. The wreck has been examined in detail and artifacts have been recovered. And yet the questions persist. How could such a ship as the Titanic, brand new and incorporating safety features such as a double hull and watertight bulkheads, sink? The two most popular theories seem to be that the steel was flawed or made brittle by the cold temperatures, or that the rivets were faulty. To the author, both these theories are nonsensical. By modern standards, both the steel and the rivets might not be up to par, but by the standards of 1912 they were perfectly adequate. The truth is much simpler. No ship, regardless of the quality of her construction, displacing 50,000 tons and moving at 22 knots, can collide with a solid object with a mass of several million tons and not sustain serious damage.
The collision between *Titanic* and the iceberg resulted in the plates of the hull buckling, which opened a seam and allowed the damaged compartments to flood. At the inquiry in 1912, Edward Wilding, a naval architect employed by Harland and Wolff, calculated that the opening in the hull was about 12 square feet (about 3 feet by 4 feet). A continuous opening 200-feet long would be about ¾-inch wide. Wilding concluded that the damage was probably not one continuous opening. When Robert Ballard discovered the wreck in 1986, much of the damage was concealed beneath the mud, but in the areas that were visible the gap varied from one to six inches wide. The damage, continuous or not, extended from the forepeak through Hold Numbers 1, 2, and 3 and Boiler Rooms 5 and 6, a distance of about 250 to 300 feet. The *Titanic* was designed to float with any two or even the first four compartments flooded. No one at the time conceived that a civilian ship could suffer more damage than that. But the collision damage extended past Hold Number 3 into Boiler Room 6, meaning that five compartments were now flooded (the damage to Boiler Room 5 was relatively minor). Apart from the collision bulkheads forward, most of the watertight bulkheads did not extend above E Deck. Therefore, once the forward compartments flooded sufficiently to drag the ship’s head down to the point where the water level was above E Deck, the water naturally overflowed into the next compartment and the next – somewhat like filling an ice cube tray by pouring water into the first cube compartment and letting it overflow into all the others. Clearly, the damage to the ship was fatal.

Or was it? Any examination of the history of marine salvage reveals many other ships equally badly damaged that survived. On 15 September 1942, the USS *North Carolina* was struck by a torpedo from the Japanese submarine *I-19*, which blew a hole 32-feet wide and 18-feet high in her port side. That is a fair resemblance to the damage done to *Titanic*. Yet the *North Carolina* was still able to maintain her position in formation at a speed of 26 knots. True, the *North Carolina* contained many more watertight subdivisions than *Titanic*. But the real reason that the *North Carolina* and many other ships survived damage equal to or worse than that suffered by *Titanic* lies not simply in their design and/or the quality of their construction. The...
answer lies in the efforts at damage control made by their crews and directed by their captains to save their ship.

This then is the real reason the Titanic went down that fateful night. She collided with an iceberg due to recklessness on the part of Captain Smith and sank because Captain Smith made no real effort to save her. Despite the severe damage to the ship, a concerted effort at damage control on the part of Smith and his crew could well have saved the ship or at least kept her afloat long enough for the Carpathia to reach her. In either case, the loss of life would have been far less and it is quite possible that everyone on board would have survived.

Could the Collision Have Been Prevented?

Almost certainly, yes. The collision occurred because the Titanic was moving far too fast for the conditions. A calm clear night may seem ideal weather conditions for making a fast passage, but in fact it increased the risk of collision considerably. The most common tell-tale sign for a lookout on iceberg watch is the surf along the waterline of the iceberg. On a calm night such as that of 14 April 1912, this tell-tale clue would not have been present. Without it, the lookouts did not sight the iceberg until it was quite close. Captain Smith and his officers were well aware of the danger of ice that night. Apart from the fact that ice is to be expected in the shipping lanes at that time of year, the Titanic had received several warnings of ice in her vicinity. Both Smith and his officers were also well aware that icebergs were much more difficult to spot under the conditions present that night. In fact, in testimony before the Court of Inquiry, Second Officer Lightoller mentioned discussing this problem with Captain Smith at about 9:00 pm. Yet Smith gave no orders to reduce speed. Bruce Ismay, managing director of the White Star Line, has often been accused of telling Smith not to reduce speed so that the Titanic could make a record passage. Ismay was cleared of this charge by the formal investigation, but even if it were true, Ismay had no right or authority to make such a demand and Smith would have been completely warranted in ignoring it. The decision to maintain 22 knots was Smith’s and Smith’s alone. The Board of Inquiry demurred from blaming Smith for this decision, citing the fact that it was standard practice for liners under such conditions to maintain speed and trust to their lookouts. Undoubtedly their decision was influenced by a desire not to tarnish Smith’s reputation since he was looked upon as having died a hero’s death. However, getting away with a dangerous practice is not an excuse to repeat that practice. There is no question that Smith was well aware of the danger and chose to ignore it.

It is uncertain how far ahead of the ship the iceberg was when Frederick Fleet reported it. The estimation of the Court of Inquiry was approximately 500 yards (1,500 feet). As soon as Fleet rang the bell, the First Officer, Mr. Murdoch, ordered the helm hard to starboard (turning the ship to port) and ordered the engines to be put at full astern. At the same time, Mr. Murdoch also pulled the lever to close the watertight doors. Although a natural reaction, this was absolutely the wrong thing to have done. At 22 knots, the ship was moving far too fast to make the turn in time. All that Murdoch accomplished was to turn the collision from a head-on to a side
impact, which resulted in the damage described above. In addition, ordering the engines reversed may well have helped swing the stern of the ship closer to the berg, adding to the impact.

Almost certainly Murdoch should have held his course and reversed the engines to lessen the impact, or put the helm over and kept the engines full ahead, which would help the ship turn. In the first case the ship would have collided head on with the iceberg – probably the optimum solution. This would have demolished the bow of the Titanic, but she was built to survive such an impact; remember, she was designed to float with the first four compartments open to the sea. A head-on collision would have destroyed the forepeak and possibly Hold Number 1, but it is unlikely that the damage would have extended any further aft than that. In the second case, she might have missed the iceberg or at least have confined the damage to a smaller area. This solution is more problematical, since we know nothing of the underwater configuration of the iceberg – the ship might well have suffered the same damage only further aft. In either case, it is hard to fault Murdoch for his decision. At 22 knots, he had only seconds to react to an extremely hazardous situation. The fault lies not with Murdoch for being unable to avoid the collision, but with Smith’s decision not to reduce speed in a known danger area.

**After the Collision**

The Titanic’s first voyage was to be Smith’s last, even had he survived. At age 62, after a long and sterling career with the White Star Line, Smith was planning to retire. One can only imagine his thoughts as he realized the extent of the disaster. Arriving on the bridge to be informed of the accident, he sought out Thomas Andrews, one of the chief designers of the Titanic, to inspect the damage. After viewing the flooding, it was Andrews’ opinion that the ship was doomed. But Andrews, while an experienced naval architect, was not a professional seaman. He had no experience in dealing with accidents at sea. Even so, Smith seems to have accepted his word. At about 12:30 AM he ordered the boats lowered and loaded with women and children. From then until the ship went down, Smith seems to have primarily wandered around in a daze. The last Second Officer Lightoller saw of Captain Smith, he was walking aimlessly across the bridge shortly before she sank. Smith was undoubtedly in a state of severe shock after the collision, rendering him incapable of effective command. It was that state of shock that doomed the Titanic. If Smith had been able to act quickly and decisively, or had someone else who had not succumbed to shock been in command, the Titanic could have survived.

**What Could/Should Smith Have Done?**

What could Smith have done differently? Several things. First, Smith was quite correct, given the situation, to order the loading of the lifeboats. On a passenger vessel, the safety of the passengers is paramount. However, the strict interpretation of “women and children first,” while laudable, meant in fact a policy of women and children only. Lifeboats were sent away, even though there was room for many more, simply because there were no more women and children in the vicinity. It is
true that Lightoller, Murdoch and the other officers were working under tremendous pressure and feared that the boats would be swamped, but even so, to send a boat away with only half its capacity (or less in some cases) is incomprehensible.

More damning, however, is the complete lack of damage control, of any kind of command authority, exercised by Smith. Many ships have survived much worse damage than that suffered by Titanic. But they survived only because the crews, led by their officers and captain, fought to save their ship. Titanic’s crew did no such thing. Apart from the closing of the watertight doors by First Officer Murdoch, no effort whatsoever was made to save the ship. This must be considered the true cause of the Titanic disaster.

At 11:42 the Titanic hovered on the razor’s edge. The difference between floating and sinking was only 54 feet – the length of Boiler Room 6. The fact that it took over two hours for the Titanic to sink indicates strongly that, had damage control taken place as it should have, the Titanic might well have remained afloat. Without question the leak was a serious one, but not beyond repair. At worst, she could have been kept afloat long enough for other ships to reach her. In that case, most, if not all, would have survived, since many of the deaths were due to exposure in the icy waters rather than from drowning.

So what steps should Smith and his officers have taken? To keep the ship afloat, it was necessary to keep the bow from submerging. If the bow remained afloat, then it would slow or eliminate the flow of water across the bulkheads aft of Boiler Room 6. The forward compartment, referred to as the peak, was subdivided into the peak tank at the bottom and the forepeak directly above it. According to the Court of Inquiry report, while the peak tank at the bottom of the ship was damaged and flooded, the forepeak compartment, directly above the peak tank, was not. This compartment, which extended from C Deck down to G Deck, remained dry until an hour after the collision. At that time, the water in Hold Number 1 reached the level of C Deck (the forward bulkheads were higher than the rest because a bow-on collision was considered the most likely accident to occur). At that point the water overflowed across the bulkhead and filled the forepeak through the open hatch. Clearly, sealing that hatch would have provided a small but important amount of forward buoyancy.

Closing the forepeak scuttle hatch was a first step. The next action to be taken should have been fothering the leaks. Fothering is an ancient practice at sea to stop or slow down a leak. According to “The Sailor’s Word Book” by Admiral W. H. Smyth, published in 1867, fothering is “usually practiced to stop a leak at sea. A heavy sail such as a spritsail is closely thrummed (interwoven) with yarn and oakum, and drawn under the bottom: the pressure of the water drives the thrumming into the apertures. If one does not succeed others are added, using all the sails rather than lose the ship.”

Granted the Titanic was not, as far as we know, equipped with any sails.1 But the canvas hatch covers from the

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1 Interestingly, according to the Court of Inquiry report, the Titanic was rigged with fore and aft sails on both masts – making her the world’s biggest schooner if they were ever set. Whether these sails were ever on board is unknown.
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cargo hatches, mattresses, or even the oriental rugs from the First Class lounges would have served equally well. Assuming that the damage found by expeditions to the Titanic is in fact iceberg damage, as seems probable, fothering would have been fairly effective at slowing if not stopping the leaks. Had Smith retained control of the situation and ordered damage control efforts to start immediately after the collision, it would have been relatively simple to pass lines beneath the ship, take the hatch covers, or carpets and pull them down to cover the damaged areas. Even assuming that the crew did not take time to pitch or tar the canvas or carpets to help waterproof them, a double layer of canvas or thick oriental carpet would have plugged the opening quite effectively. Since the Titanic was designed to float with the first four compartments holed, it was only necessary to seal the 54-foot opening into Boiler Room 6 to save the ship.

While it is unlikely that fothering would have completely stopped the flow of water into Boiler Room 6, it would certainly have reduced it considerably. The time thus gained could be used to extend the damage control efforts to the other affected areas. Every foot of the opening covered reduced the inflow and gave the pumps a better chance of getting ahead of the leak. Further, controlling the flooding this way would have enabled the crew to reach the leaks from the inside and possibly effect further repairs.

Even if fothering did not slow the leaks sufficiently to keep the ship from sinking, it could only have helped the situation. It might well have kept the ship afloat long enough for the Carpathia to arrive, in which case further damage control could have been performed. Even assuming the very worst, that fothering kept the ship afloat for only an hour or so longer, it still would have resulted in more lives being saved. The Carpathia reached the first lifeboat shortly after 4:00 AM, less than two hours after the Titanic sank. Had the Titanic stayed afloat even an hour longer, it is possible that many of those who died might have been saved. In addition, slowing the rate of sinking might have allowed a more orderly abandonment, meaning that lifeboats would not have been sent away only half filled.

Could the leaks on the Titanic have been fothered? The answer must be yes. The materials necessary were ready to
hand and there were more than enough people to do the work. Why was it not done? Certainly the fact that the Titanic was a new ship with a new crew who were not used to working together added to the difficulties, as did her reputation as “unsinkable,” a claim, it must be noted, never made by the White Star Line.

But the blame, in the end, must lie with Captain Smith. It is easy to judge the actions of a man who lost his life nearly a hundred years ago, but a candid examination of the facts allows no other explanation. The captain of any ship holds the safety of the ship and the lives of the crew and passengers in his or her hands. To use a colloquial phrase, “that’s why they get paid the big bucks.” If they are successful they reap the rewards; if they fail they reap the consequences. By ignoring numerous warnings of ice and maintaining a high rate of speed under conditions where it would be almost impossible to spot an iceberg in time, Captain Smith took an extreme gamble with his ship and the lives of his crew and the passengers in his care.

This should not be construed as saying that Smith was an incompetent. The White Star Line certainly had great faith in his abilities and showed it by appointing him Commodore and giving him command of their most prestigious vessels. On the other hand, Smith had had a relatively uneventful career. The only other serious incident in which he was involved was the collision between RMS Olympic and the cruiser HMS Hawk in 1911. Smith had certainly never faced a challenge like...
the one presented to him on 14 April 1912, and the shock seems to have simply overwhelmed him.

It may be unfair to blame Smith for going into a state of shock after the collision. At 11:39 on 14 April 1912, he was nearing the end of a long and honorable career and due to retire with honors. He was “the Millionaires’ Captain,” a favorite among England’s upper class, many of whom insisted on sailing only with him. At 11:45 he was faced with being remembered not as “the Millionaires’ Captain,” but as the Captain under whose command hundreds of people would die because of his error in judgment. There are few who could fail to be affected by the situation. Nevertheless, had he viewed the circumstances as a challenge rather than a death sentence – or had another captain, less susceptible to shock, been in command – the Titanic might well be a mere footnote in the history of the transatlantic liners rather than the most celebrated shipwreck in history. And 1,500 people would have lived, not died, in the icy waters of the North Atlantic.

About the Author
Joseph M. Greeley is a Maritime Historian and Living History Interpreter aboard the Maryland Dove, a recreated 17th-century trading vessel. He holds a Master’s Degree in Maritime History from East Carolina University. He has been fascinated with the Titanic since he was 8 or 9, especially with the fine line between floating and sinking that doomed the ship. After the discovery of the wreck and seeing pictures of the ice damage, he began to wonder why no efforts had been made by the crew to save their vessel since the damage, although severe, was not beyond temporary repairs. Having also been fascinated by marine salvage since devouring Joseph Gores’ book Marine Salvage: The Unforgiving Business of ‘No Cure No Pay’ at age 11, it occurred to him that the age-old practice of fothering leaks offered a workable solution to stopping or slowing the leaks in Titanic’s hull. It is his hope that this article will offer some new light on what really happened to sink the “unsinkable Titanic.”