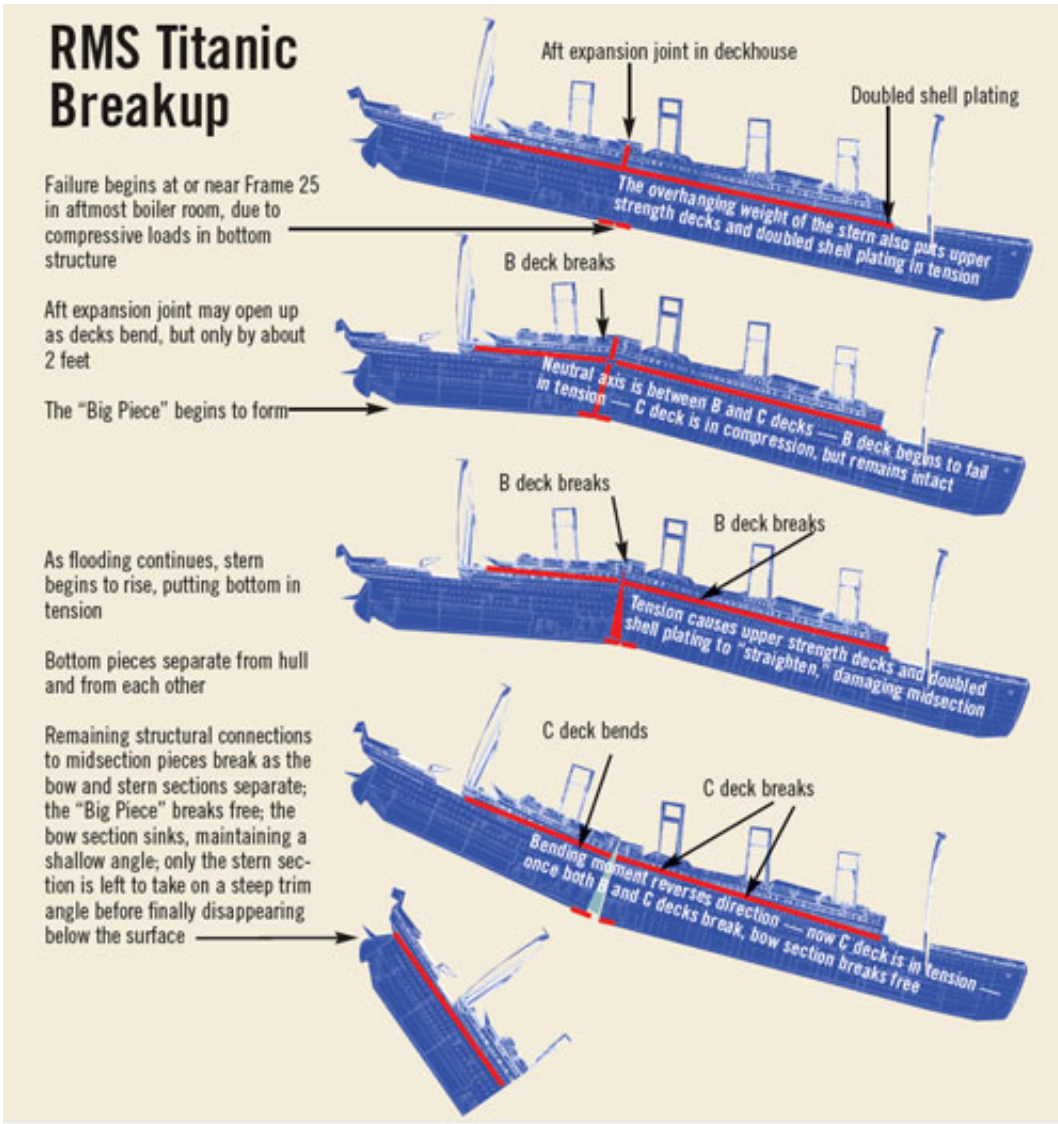


Grappling with a Titanic mystery

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A century after the sinking of the Titanic — a disaster retold and reconstructed in films, books, art and science — a City Tech professor has presented a new theory about how the doomed luxury liner broke apart, giving credence to the accounts of survivors that were dismissed at the time.

Richard Woytowich, a mechanical engineer, marine forensics specialist and a professor of computer technology, says that after the Titanic hit an iceberg off the Newfoundland coast on its maiden voyage on April 15, 1912, it initially tore at the bottom before breaking apart. That doesn't quite jibe with prevailing theories — such as the depiction in James Cameron's blockbuster movie "Titanic" — that the ship broke first at the uppermost decks before it sank in the icy North Atlantic, taking the lives of more than 1,500 of some 2,200 aboard.

Woytowich and a colleague have developed a computer model — presented in April at the International Marine Forensics Symposium in Maryland — showing that the impact first caused bottom pieces to separate from the rest of the ship before it cracked crosswise and upward. This vindicates witnesses who painted a picture of the mighty steel vessel noisily breaking — accounts dismissed as not credible by the American and British politicians who led probes of the tragedy and sided with the Titanic's top-ranking surviving officer, who said the ship sank in one piece.

"In a sense," said Woytowich, "the 15 who said that the ship broke up got their vindication when the wreck was found (in 1985), when the first engineering models were made suggesting the ship broke from the top down, and especially when the movie came out showing dramatically the ship splitting apart," said Woytowich. "I think a lot of people wondered, 'How could anybody have possibly said that this ship went down in one piece?'"

Woytowich, however, believes the survivors' accounts begged for further inquiry. The Staten Island resident first read about the Titanic in a magazine when he was "6 or 7." He was "kind of a nerd" growing up, reading sci-fi and sea stories in his local library. "I wound up with a job in the ship design business," he said.

"I never really called myself a Titanic buff," Woytowich added, "but I was interested in investigating ship disasters."

He started researching the Titanic in the late 1990s. In 2003 he presented a paper on its riveted design. And a few years later, he saw pieces of the Titanic wreck in photographs taken on a History Channel expedition. "I felt, this is something I just have to work on."

Those photos "showed the keel of the ship bent in an 'S' shape," Woytowich said, "and it occurred to me that that could most likely be explained by having the parts of the ship ahead of and aft of that bent part pushed together. That led me to think that the bottom broke in compression, not tension."

There were other clues to the Titanic puzzle. The edges around the bottom pieces "looked pretty neat," suggesting "that that was the first thing to fail, not the last." Another clue: Another part of the wreck known as the "Big Piece" seemed to have failed along three edges, indicating bottom-up breakage.

"The only thing that was holding up the works was the lack of any evidence that there was a weakness in the bottom that could have led it to break first," he said.

The evidence came when Woytowich, working with a technical historian from Texas, Roy Mengot, devised a computer model of the portion of the ship's bottom "where we thought the break started. ... I ran the

computer simulation, and sure enough, there were some regions of high stress.”

He explained that the Titanic’s double bottom was deeper “under the main engines to give more support because they’re very heavy. ...At each end of the deeper part there was a tapering portion. The end of one of those tapering portions appears to coincide with the spot where the two pieces of the bottom broke — and sure enough, my computer analysis showed that as a region where the stresses were higher than elsewhere.

“So now that we had an understanding of what we thought should have happened and a computer model that said it could have happened, we were able to go out and start presenting it.”

Woytowich says his bottom-up breakup theory has not been challenged in professional circles. He noted that at the recent Marine Forensics Symposium, engineers with James Cameron’s recent TV special on the [Titanic](#) also presented their latest findings. “They actually made a model of the complete ship,” Woytowich said. “The results confirm most of my numerical findings. But all they did was present the numerical results. They left it to other people to present conclusions as to what may have happened first, second and third.

“It seems to be a subject that professionals are a little bit reluctant to engage, possibly because it’s almost impossible to prove anything analytically.”

Mysteries remain, Woytowich said, in part because with a bottom-up breakup, “most of the interference of steel on steel would have happened under water,” unseen.

“Most people above the water would have seen the ship give a little

bit.... With most of the actual metal breakage happening below water in compression, really nobody said that they saw the ship split in two and open up. ... All of their testimony, I think, becomes more credible when we have in our minds the picture of the bottom-up breakup.

“Time will tell whether this turns out to be a significant change, or whether people will come up with yet another explanation for how the ship broke up,” Woytowich said, noting that new data gathered for recent TV programs have made him think the breakup “was a little more complicated than I thought” and may eventually lead him to revise his own theories.

“My biggest concern now,” he said, “is that we try to come up with a resolution that is in a tradition of scientific and technical inquiry. I hope that by the 200th anniversary we’ll finally have an answer.”

Provided by The City University of New York

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