

# Deterioration of the RMS Titanic

by Stephanie Clements

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The *RMS. Titanic* has laid 2.5 miles below the surface of the Atlantic Ocean since her sinking, on her maiden voyage from Southampton to New York on April 14, 1912. Many questions were raised on the state of the vessel condition and how she would fair over time, some being as bold as to speculate there being no deteriorating due to oxygen depleted waters (Wels). However this belief was put to rest in the early morning of September 1, 1985 by Dr. Robert Ballard and a team of both French and American scientist aboard the US Navy Vessel *Knorr* (Wels). Since then it has been a race against time to study the *Titanic* in her final resting place before she completely disappears from the world.

When people begin to discuss the topic of the *Titanic* deterioration, the first to be blamed is generally the rusticles, a term coined by Dr. Ballard when he first discovered them growing on the hull, rusticles being complex communities of bacteria which live upon the ship feeding on her iron deposit in the steel (Wels). However there are many more effects on the *Titanic* which is leading to her deterioration. They can be broken down into three main categories, which I will be covering: Chemical, Biological, and Physical.

The chemical aspect of the deterioration can be further broken down into the topics of biochemical and rusticles. In the biochemical since, you have galvanic coupling. Galvanic coupling is when there are two similar metals together, such as the steel plates and the iron rivets, and one is rusting faster then the other. Since the rivets have the higher iron content they have been deteriorating at a faster pace then the steel plates (Weirich INTERVIEW). This is leading to an over all weaker structure, because of that the decks of the *Titanic* are on the verge of buckling down onto each other (Ballard and Sweeney).

Rusticles are one of the least understood forms of deterioration, yet believed to be one of the largest affecters. Rusticles, as mentioned before, were first discovered by Dr. Ballard on his first journey to the *Titanic* back in 1985. For nearly ten years no studies were able to be preformed on the rusticles. Finally Dr. Roy Cullimore, a Canadian microbial ecologist got his chance to start studying. Since the start of his studies estimates on the deterioration have started to arise (Weirich INTERVIEW). An organism that was once thought to be a non-complex, has been found to be an extremely complex topic in which scientists such as Dr. Roy Cullimore are still trying to fully understand.

Dr. Cullimore and Lori Johns started studying rusticles gathered from the *Titanic*, and found that the rusticles weren't just one form of bacteria, but five different species living in one complex biological community (Weirich INTERVIEW). Not only are rusticles complex in the sense of species numbers, but they are complex based off of their large surface area which are formed by water channels, ducts and cavities. (Wels). The rusticles form into icicle-shapes ranging in many different sizes, the largest around 10 meters in length. Rusticles also pose the potential problem of "flooding" in which they not only cover the steel of the ship, yet go down and slightly across the sea bed floor. Dr. Cullimore left large steel platforms around the *Titanic* back in 1998 in order to gather data to estimate the deterioration of the *Titanic* (Weirich INTERVIEW). That data is still being gathered today and put to use.

Another aspect of the deterioration is biological. Biological deterioration consists mostly of the

deterioration of human remains, wood products, clothing, and food. Human remains were never found around the *Titanic* site due to an estimated deterioration of them by the 1940's. Around the 1940's it is also predicted that the wood products in the *Titanic* also disappeared (Weirich INTERVIEW). The wood products were most likely eaten away by deep sea worms.

Clothing becomes an interesting issue, due to the rate of some of the deteriorations on certain items and the lack of deterioration on others. Generally items of clothing that were in the higher decks that were not tanned have deteriorated by now (Weirich INTERVIEW). Clothing such as hats have been found in lower decks in near perfect condition. This is believed to have occurred because of the small amounts of electrical currents that are released which discourage microbial activity (Ballard and Sweeney).

The last major topic of deterioration on the *Titanic* is physical. Physical deterioration can be broken down into two subtopics of natural physical deterioration and human impact deterioration.

Natural deterioration mostly deals with turbidity and the effects of the two knot current that travels along the ocean's bottom (Weirich INTERVIEW). Turbidity currents are generally powerful currents in which sediment is carried along once it is suspended into the water column (Pinet). This has the same effect on the sides of the ship as it would on a rock in a stream. After many years of traveling over the surface it begins to wear it down and weaken the structure which can result in a collapse.

Human impact deterioration comes in generally three forms. The first one would be people removing objects from the *Titanic* site. *RMS Titanic INC* has rights to removal of anything in the debris field from tea cups to pieces of the hull which have fallen away from the ship (Weirich INTERVIEW). Once these objects are removed, maintained, and carefully cataloged on their location found and condition, they are put on display in a world traveling exhibit.

Not only are items removed from the wreck site, but they are also left behind in the form of memorial plaques. Which dive teams have left cluttering the brass telemotor (Weirich).

The next two forms of human impact deterioration go hand in hand. Numerous research crews and film crews go down to the *Titanic*. Due to the depth that the *Titanic* is at lighting needs to be supplied by the crew that is going down. To keep the lighting from moving around in the 2 knot current generally sand bags are brought. Once the filming crew is done getting the footage they need the lighting is grabbed and the sand bags left behind. Lead weights are also attached to submersibles such as *Alvin*, and left along the bottom when they are ready to resurface (Weirich INTERVIEW).

Items such as beer bottles, soda cans, and trash have been found to have littered the bottom the sea floor around the *Titanic*. The origin of where these items came from isn't completely known. While some argue that the items were dropped away from the wreck site and drifted towards the *Titanic*. Most accuse the film crews and the research crews for tossing their trash over board (Weirich INTERVIEW).

The last form of human impact deterioration is caused by the submersibles themselves. Conditions are sometimes unpredictable leading the submersibles to get too close to the sides of the vessel disrupting the rusticles and making the stability of the remains even weaker (Weirich INTERVIEW). Many submersibles have damaged the *Titanic* not from being pushed into it by current but from actually docking on the decks deliberately (Ballard and Sweeney). The ironic thing about this comment is in the *A&E* documentary on the *Titanic*, Dr. Ballard, who states in his recent book damage has occurred due to submersibles docking on *Titanic's* deck, admitted to having the submersible he was in dock on the deck of the *Titanic* the first time he went down there. The Russians, who own *Mir 1* and *Mir 2*, typically rent out their submersibles

to anyone who wants to travel to the *Titanic*. It is believed that during one of their visits 1991 to 1995 there was in incidents in which *Mir 1* hit one of the walls of the *Titanic* leaving fiberglass remains behind (Ballard and Sweeney).

However all of these forms of human impact face guidelines to try to limit their effect, under the authority of the RMS *Titanic* Maritime Memorial Act. The RMS *Titanic* Maritime Memorial Act was passed by congress in 1986 shortly after Dr. Ballard first discovered the wreck site; in order to create a memorial site for the hundreds of lives that were lost and to maintain the historical site of the ship itself. The main goal is to encourage international support to approve the *Titanic* as a Maritime Memorial. As international support is gained guidelines on what can be removed and from where are made.

With all of these factors in the *Titanic* deterioration the next debate that arises is how long with the *Titanic* last with all of these affects on it? Recent data gathered by a team of Canadian research scientists predict that starting from the deck working back the wreck will deteriorate around 2028 (Butler). However Lt. Jeremy Weirich from NOAA states that even though the deterioration of the *Titanic* is occurring at an exponential rate, the *Titanic* should still remain 50 years from now (Weirich INTERVIEW).

The question then arises should we cease going down to the wreckage site in order to avoid more damage? Or should we work faster to gain as much knowledge as we can before she disappears for good? This question along with whether or not salvaging should be allowed has started to divide the *Titanic* community into two parts. Those who wish to leave the *Titanic* as a memorial site, and those who feel that it could be turned into a profit site.

Steps have been made in order to try to protect the *Titanic* and not cause her any further damage. As mentioned earlier in 1986 the RMS *Titanic* Maritime Memorial Act went into affect. This memorial act is to protect the remains of the *Titanic* from unwanted looting. The only organization that is allowed to remove objects from the *Titanic* is RMS. *Titanic* INC. they, however, must follow strict guide lines. Such as whenever they remove objects though the location of where the objects were found must be recorded. And the location of where objects can be taken from is only the debris field (Weirich LECTURE).

There are also numerous scientific studies that have been conducted and are in the works of being preformed. A study that is in the works is looking at the affects of plankton on the deterioration rate. David Bright and collages believe that the increase in plankton that sometimes occurs around the remains of the *Titanic* is increasing the microbes in their consumption of the *Titanic*. (Bright et al.)

In 1998, four IPSCO steel platforms were left around the *Titanic*. Each steel platform represented steel in different levels of fatigue. There is debate on whether or not the *Titanic* broke due to "brittle" steel. By placing different levels of steel fatigue by the *Titanic* they are hoping to calculate the rate in which deterioration is occurring on each piece of steel. From this data they have found that the rusticles appear to be extracting iron, phosphorus and sulfur from the steel. In 2004, two of the four platforms were replaced with newer ones while the older ones were shipped to a lab in Canada for Dr. Cullimore to study (Weirich).

However, no matter what these test result in the fact is almost inevitable that the *Titanic* is going to deteriorate, such as her fate of sinking was inevitable. The rate in which this happens will continue to be affected by the conditions which I set forth in this paper. There are conditions such as current that we have no control over. Yet conditions such as human impact we can change. This is where I feel the debate of "to salvage or not to salvage" starts to become an ethical debate. We know that humans going down are adding in her deterioration, yet is it worth stopping in order for her to sit at the bottom as a lone ship with all her lost souls? Or should we just work in a faster pace to gather more artifacts. To continue feeding the *Titanic* frenzy in

which her sinking caused.

No matter how often we go down to the Titanic in the remaining years there is always going to be a question here or there which remains unknown. Survivors have long ago started passing on. Those few that are left know were so young that most only “know” what happened by being told from other family members which survived. All crew members are lost now leaving us in the Maritime world to only speculate what went through their heads and if the right actions were actually the actions performed.

We will never know what fully happened that night. The only thing we will know is what we know now. Speculations and theories will continue to grow however evidence to support them will quickly fade. There needs to come a time where we decide to take what we know now and learn from it and not try to seek greater truth.

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[Biodeterioration of the RMS Titanic](#) by Roy Cullimore & Lori Johnston

URL : <http://www.encyclopedia-titanica.org/deterioration.html>