

Deep Sea Exhibition

Renewed interest in the wreck of the Titanic has been sparked by recent recovery expeditions to the site as well as the Oscar-winning movie. Making the most of that public interest, artifacts from the vessel are currently on display in Asia, Europe and the US. Marcia Jedd delves deep to bring to the surface the complicated logistics story that lies behind the retrieval and subsequent display of these artifacts.

On the evening of April 14, 1912, the 882-foot passenger ocean liner, the Titanic, struck an iceberg. The subsequent sinking of the ship became the most famous sea disaster in history, and although there has been an abiding interest in the catastrophe ever since, widespread public interest was recently refueled by Titanic, the award-winning movie.

For George Tulloch, president of RMS Titanic, Inc., a New York-based company granted salvor-in-possession rights to the wreck by the US Federal Court, the retrieval, archival and exhibition of Titanic artifacts has turned into a life's mission. Yet when he first became involved in the project, he says, "I knew nothing about the ocean other than I was afraid of it. It was a great lesson for me to go in the submarine for the recovery expeditions."

Working with the French government oceanography agency and the US Navy, scientist Robert Ballard found the Titanic wreck site in 1985. Tulloch, a BMW dealer based in the US, was asked to speak to American and French groups involved in the exploration about strategies for bridging communication differences between the US and European parties. He quickly became fascinated by the mission to explore the ship's remains, which were submerged 2.5 miles down in the Atlantic, 400 miles south off the coast of Newfoundland.

Various expeditions have recovered almost 5,000 artifacts from the wreck. RMS Titanic, Inc. has been awarded exclusive rights to the site of the wreck in order to preserve its archaeological and historical integrity.

Tulloch went on to participate in five Titanic expeditions from 1987 through 1998, spanning an average of six weeks each. The result of such expeditions has been the successful recovery of nearly 5,000 artifacts from the Titanic, and the work is still on-going.

RMS Titanic, Inc., was founded in order to explore and preserve the history of the Titanic. In 1994, the Federal District Court in Virginia which was dealing with the complex international laws and salvage laws surrounding the wreck, granted RMS Titanic, Inc. exclusive rights to the site because of its interest in preserving the site's archaeological and historical integrity. "For example, every object we recover has to be still- photographed and videographed before and after recovery," explains Tulloch.

One of the organization's objectives is to share the vessel's precious artifacts with the public. Previous exhibitions of such materials have been hosted in the National Maritime Museum in Greenwich, UK; in Memphis, Tennessee; and in St. Petersburg, Florida; and there are currently major Titanic shows running on three continents.

The U.S. version, *Titanic: The Exhibition*, opened in St. Paul, Minnesota on January 1, 1999, and follows the success of a similar exhibition in Boston, Massachusetts last year. Another exhibition is due to move on to Hiroshima, Japan, later this year when it completes its current run in Osaka. A third collection, involving 300 Titanic artifacts, is on display through April 1999 in Zurich, Switzerland. In addition, a smaller exhibition that deals only with the expeditions is currently on show aboard the Queen Mary in Long Beach, California, after a similar run in Norfolk, Virginia last year.

Items on display in St. Paul include passenger and crew clothing found preserved in leather trunks, and an extraordinary collection of jewelry and personal items. Parts of the ship are also on display, including massive mooring posts, a Doulton & Co. porcelain sink, and the exhibit showpiece: the Big Piece, the 20-ton hull section.

Audio-visual presentations flesh out the Edwardian era for the benefit of visitors, and replicas of the wreckage and expedition equipment including the three-man Nautilic submarine are also featured.

The logistics and staging behind putting the Titanic show on the road are complex and fast paced. By February of this year, for example, it wasn't yet known which U.S. city the St. Paul exhibition would move to following the end of its run in April. A kind of routine has emerged, however, in terms of how recovered objects are handled and transported from the wreck site itself.

Once retrieved from the Atlantic, artifacts are documented on board the expedition recovery ship, the Nadir. Here, they are put into locked plastic tubs filled with water, locked into a sea container and transported, as a general rule, to the port of Brest, France.

From the French coast, containers are transferred by truck to the laboratories of LP3 Conservation in Semur en Auxois, in the Burgundy region of France. This facility specializes in handling marine archaeological objects, ethnographic materials, metals, textiles, wood and paper. It is here that the items, which have been subjected to considerable material stress, are stabilized and ocean deposits removed.

Once stable, the artifacts are dispatched once more. "There are times when we have to use ocean, times when we have to use air, and times when we use truck. It all depends on the timing, cost and the weight. And, of course, the paperwork has to follow," Tulloch explains.

He cites the example of a 14-foot lifeboat recovered from the wreck. This was moved from LP3's premises to Paris by truck, and thereafter "we moved it by airfreight from Paris to Boston for the Boston exhibit, wrapped in a special wooden crate." The handling of especially high-value items has demanded extra-special care, not to mention speed. "Some objects are so desirable that every continent wants to see them at the same time," explains Tulloch. Such is the case with a bronze cherub (pictured), which once held a lamp at the base of the first-class staircase. This had to be transported from Osaka to St. Paul in order to meet the St. Paul premiere date.

Memphis-based art shipping company Alexander & Co. assisted. "The idea of entrusting the cherub solely to an air carrier on a shipping basis seemed irresponsible," Tulloch says. Alexander devised a special bag using a form of bubble packaging. Media Rare, the St. Paul-based company handling the production of the exhibition, then arranged for a courier to hand-carry the item back from Osaka on a passenger flight just days before the January 1 opening in St. Paul.

Insurance is critical. "Insurance has to follow the freight as well as the venue itself," says Tulloch. The St. Paul exhibit is insured at \$10 million, although this indeed seems to be a drop in the ocean given what exhibits would be worth were they allowed to reach the open market. In fact, the only Titanic artifacts which can be sold are chunks of the coal that powered the Titanic's steam engines (selling for under \$20 per chunk). Nonetheless, it is estimated that the cherub alone might bring in \$10 million were it ever to be auctioned.



The Big Piece – apart of the hull section of the ship, which weighs in at 20 tons – during recovery and transportation.



The Big Piece during recovery August 10, 1998.

In order to stage the St. Paul exhibition, thirteen truckloads of display materials and artifacts were transferred from Boston and St. Petersburg, including one air-ride trailer which carried the high-value, delicate articles. The trucks delivered to a Minneapolis warehouse in December, and the exhibits were stored there prior to being moved to the exhibition hall where they are now displayed in humidity- and temperature-controlled Plexiglas cases.

"The display items were unloaded from sealed, numbered and locked cases. Numbers were tagged to an identification system and the entire exhibit area was under guarded security," reports Roger Curtis, exhibition manager for Media Rare.

The St. Paul exposition marked the first time that a new packaging system, developed by a Twin Cities firm SCS Cases, had been used. The system departs from the customary method of packing high-value art items in wooden boxes, styrofoam and styrofoam peanuts. SCS designed custom-fabricated cases using a combination of air-tight and water-tight cases which resemble trunks.

"We take temperature, humidity and the elements into consideration. The cases can even be left outside," says Jeff Walter, president of SCS Cases. A case packed with small items, such as a figurine and children's marbles, is packed into a larger case.

The logistics behind moving the massive 20-ton hull section (the Big Piece) from Boston Port to the Boston World Trade Center, and then on to St. Paul, were almost as complicated as extracting it from the ocean floor, reports Tulloch wryly. Measuring some 26 feet by 19 feet at its largest point, the section formed part of the passenger staterooms and pantry (see picture). Since exposure to air draws out the iron and the deterioration process begins, the piece had to be kept wet or otherwise moist during transfer and storage. For example, it was swathed in shrink-wrap and the transportation cradle coated in a special vinyl product during truck transits.

Commercial steel and construction firm Daniel Marr & Son of Boston was engaged to create an exhibit easel for the piece as well as its transportation cradle. "We handled the piece on an emergency basis," says Steve Marr, president of Daniel Marr. He adds that the traditional skills of rigging supervisors were put together with computer-aided design (CAD) technology to originate the 3-D drawings needed to give the hull section optimum support.

Marr calls the handling process a 'white-glove' operation. Tensions rose after the firm discovered a fracture on the bottom side of the hull, and swift, corrective action was taken. "It was a footnote for future handling," recalls Marr. "We made delicate maneuvers with the rigging because of the crack. It all had to be documented electronically."

Heavyweight trucking company D'Addario of Milford, Connecticut was called in to haul the piece on Marr's 40foot air-ride trailer. "Some states have a width limit of 12 feet, and the dismantled pieces measured over 13 feet. We therefore required special permits," explains Tim Morris, operations manager at the company.

"The overwidth dimension meant we also had to use a certified, auto escort to travel behind the two-man driver team at all times during the Boston-St. Paul journey. In Ohio, the unit received a police escort."

Permits were also needed to keep the truck running ten hours a day because night driving was involved. In all the transfer took three days during December. A special sub-level exhibit area and pool was built at the St. Paul site to accommodate the Big Piece. A 70-ton crane raised the sections from the truck before lowering the piece into the water, to which soda ash and other chemicals had been added in order to avoid further deterioration.

While the Big Piece is likely to be the largest Titanic artifact ever to be recovered, Tulloch stresses that most of the wreck and her contents are still lying on the ocean floor, most awaiting discovery. Even with high-tech probing equipment, the largest intact portion of the ship is unlikely to be fully explored thanks to diving impracticalities and advancing deterioration caused by iron-eating bacteria.

Undaunted, Tulloch and fellow explorers are planning another expedition this summer, and ultimately their idea is to house all recovered artifacts in one museum.

LOST CARGO

Commissioned by the British Monarchy and the United States to carry mail, on the day it met its fate, the Royal Mail Steamer (RMS) Titanic was carrying some 3,400 mail bags containing six million regular letters, plus another 200 bags containing registered mail. Located toward the bow of the ship, the mailroom was one of the first areas to take on water during the disaster.

In *Titanic: Destination Disaster*, published in 1987 by W.W. Norton, historians John P. Eaton and Charles A. Haas note that purser Herbert McElroy was heard to say of the cargo, "Nothing special here. Just routine express cargo. Certainly nothing that's heavily insured. One good thing, it won't take long to unload."

Explains George Tulloch, president of RMS Titanic, Inc., "There was a post office for both the United Kingdom and the United States and this was the first damage problem. The five postmen on board, three Americans and two British, all died trying to drag mail bags to safety."

No mail from the ship's post office has been recovered from the site, although mail bags have been identified and letters and other correspondence have been found in passenger luggage. A tour guide at the St. Paul exhibit noted that the expedition camera equipment retrieved photos of the submerged mail bags showing unusual sea growths.

Although air mail services weren't generally available until a later age, ironically aviation was represented on board the Titanic – it was carrying early aircraft engines as cargo. "Two engines from a 1888 Hiram Maxim airplane were in transit from the British Museum to the Smithsonian. So the beginning of aircraft history was on board," explains Tulloch.

The aircraft engines, listed as machinery on the cargo manifest, were part of nearly 12,000 pieces of commercial freight carried in the ship's seven cargo holds. The cargo is listed as weighing 559 tons, and was valued in 1912 currency at 84,000 British pounds or \$420,000. Other cargoes included a gramophone, cheese, potatoes, silk, orchids, pharmaceuticals, books, linoleum, rabbit hair, potatoes and periodicals. Four cases of opium – not unusual cargo for the era – were also on board. Cases, bales, barrels and packages are the packaging units cited. Some 40 tons of potatoes and three tons of butter alone were listed among the provisions for the fateful maiden voyage. (A jar of jumbo stuffed olives was included in the St. Paul artifact display.)

Accompanied or passenger cargo was primarily carried in separate holds and consisted of luggage and packages, but also included a 25-horsepower red Renault automobile, oak beams, and ostrich plumes. Of the tens of thousands of bottles of wine and beer on board, many still reside on the bottom of the ocean floor, some with corks fully intact. Some of the bottles are included in the Titanic artifact collection, along with other glassware and dinnerware.

The Titanic's cargo manifest reveals the typical assortment of forwarding and trading companies. Some recognizable names are shown, including American Express Co. (the company started by supplying immigrants with documentation), National City Bank, retailer Marshall Fields, Tiffany & Co. and several investment banks.



Bronze cherub statue, probably from the Grand Staircase in the First Class area of the ship.

RAISING THE TITANIC

At nearly 12,500 feet below the ocean's surface, the Titanic lies in a dark, hostile environment. Water pressure amounts to some three tons per square inch and is a deadline consideration for those involved in searching for and retrieving artifacts: at these depths, the tremendous pressure crushes bones. Iron-loving bacteria slowly devours the wreck and objects flirt with odd chemical reactions.

So far, almost 5,000 items have been recovered from the site of the wreck, work which has only been made possible by the French oceanographic agency, Institute Francais de Recherche pour l'Exploitation des Mers (IFREMER) and equipment from the U.S. Navy including advanced video and lighting equipment were key to the discovery of the Titanic in 1985.



Yellow Submarine: Front shot of the submersible Nautilus before launch.

IFREMER's Nautilus submersible – basically a small yellow submarine – is launched by an A-frame off the scientific vessel Nadir for the 90 minute journey to the floor of the Atlantic. At 2.1 meters in diameter, it holds three people: one seated and two standing. Only a thin titanium alloy covering separates occupants from the harsh environment outside.

The wreck site spans several miles, although the most concentrated debris site covers about a 1.5 mile circumference between the relatively intact bow and the imploded and scattered stern sections. George Tulloch of the RMS Titanic says the composition of a given object, its weight and fragility, are the key determinants to how artifacts can be recovered. The positioning of recovery equipment at critical, says Tulloch, and a bit of a guessing game, since the retrieval process requires a lot of maneuvering of receptacles, chains and ropes, above and below the ocean surface.

Nautilus's two hydraulic arms lift items off the seabed, which is satisfactory for a 50-pound object that isn't very fragile. The left arm is like a deft wrist, able to pivot and turn 360 degrees, while the right arm lacks dexterity but has considerable strength. Artifacts are placed in a sample basket, large enough to carry several objects, attached to the front of Nautilus.

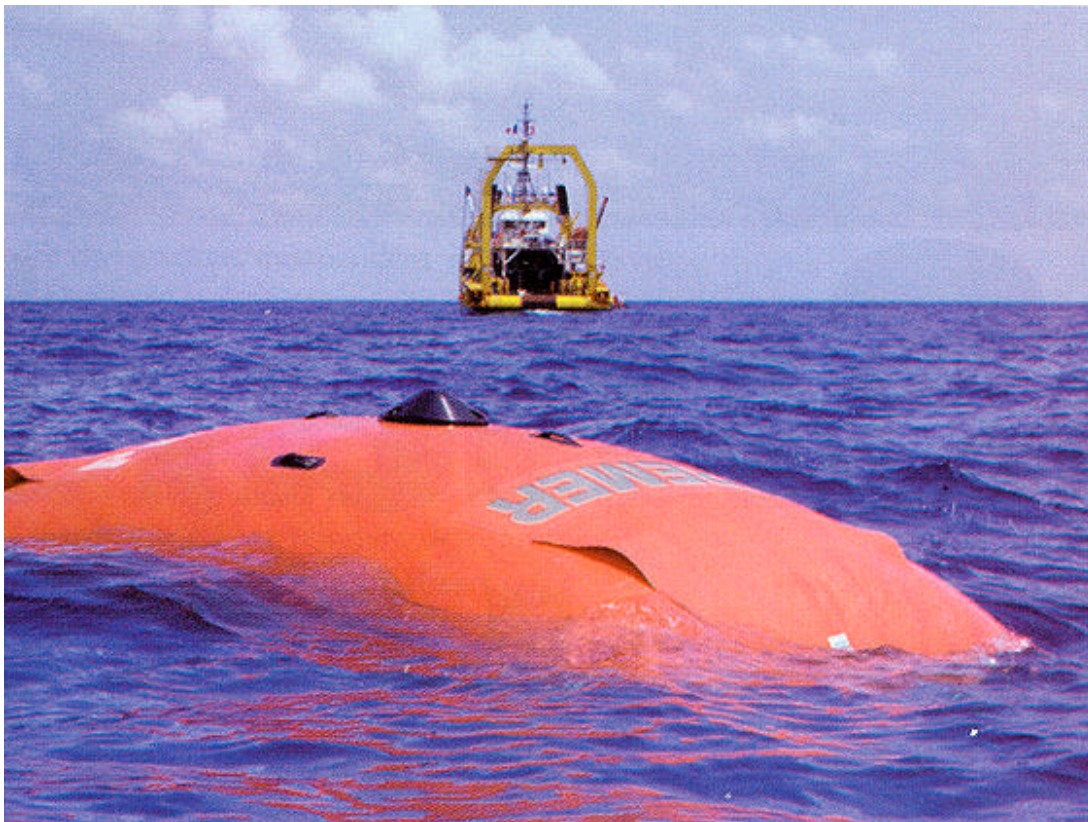
For a small crystal flower vase, pressure exerted by the equipment as well as the ascent to the ocean's surface could easily shatter the fragile glass. Explorers therefore use reverse turbine power to create a water vacuum cleaner to pick up delicate items. "We attached a cup to a hose and attach it to one of the arms of the Nautilus. The reverse suction of the turbine pulls the item off the seabed," says Tulloch.

Such items are directed into a basket and must be surrounded by sand or other protective material to avoid being crushed on the ascent to the ocean's surface. The basket is tightly sealed for the journey. In fact, if an item has survived the increasing pressure on the way down, then it should survive the change of pressure on the way up.

In the case of a 200-pound object, the recovery process can take a couple of days. The recovery of a fragile six-foot-by-eight-foot stained glass window is one such example. “We take and build a sandwich with wood doors, bigger than the window and put it in Nautilie’s hand. She then went down to the bottom and lifted it under one piece, like a pizza tray,” explains Tulloch. “The next day we bring down two inches of foam, and make a sandwich from it, put another door on top on it, and secure it with cleats.”

Thus encased, the window was put into a gondola-like receptacle, a 55-gallon drum. Once anchoring chains were removed from the drum, it floated to the ocean surface where a recovery team waited in Zodiac boats to retrieve the material and bring it to the Nadir.

All recovered items are brought to the Nadir where they are meticulously entered into the inventory, measured and photographed. They are then typically packed in tubs of foam and fresh water, and those tubs are placed in a locked 40-foot sea container. “That sea container is the vault for the conservation team, locked up with two locks. We have a responsibility that these items belong to the public,” says Tulloch. The Nadir captain must sign off on the Customs Declaration for all recovered objects, among other documentation.



Lift bag used to raise the Big Piece at the surface before recovery of the piece (recovery ship Abeille Supporter in background).

Raising the massive 20-ton hull section presented the recovery team with the most challenges to date, says Tulloch. Diesel fuel is incompressible and lighter than water. Using a principle developed by Auguste Piccard (1884-1962), the Swiss scientist, balloonist and deep-sea explorer (and, apparently, Herge’s inspiration for Tin-Tin’s friend Professor Calculus!), the French Navy constructed several rupture-proof rubber bags which were subsequently filled with 5,000 gallons of diesel fuel (lighter than water) apiece, creating a lift capacity of up to three tons. Next the bags were loosely tethered to a 90-ton capacity nylon cable – similar in appearance to a balloon bouquet. This device was then pulled down to the seabed using heavy chains.

Cables, chains and ropes were linked to the hull section, and the connectors were attached to the bouquet of fuel-filled lift bags. By releasing the anchoring chains, the bags then rose to the surface (about 2.5 miles), dragging the hull section with them.

That was last summer's success story, but in fact a similar attempt had failed two years earlier when six, rather than seven, bags had been used. Although the piece was successfully raised to about 200 feet below the surface, rough weather proved too much for the effort, and the ropes holding the piece snapped.

A similar process was undertaken to raise two 4-1/2 foot high mooring bits, each weighing some 5,500 pounds. Those bits, like the 20-ton hull piece, must be kept submerged in a chemical bath for about a year before they can be properly stabilized.

TITANIC FACTS

- ✍ Weighing in at 66,000 tons, the Titanic was built in Belfast over a period of two years. Following sea trials, its fateful maiden voyage departed Southampton, England on April 10, 1912. The ship made stops in Cherbourg, France and Queenstown (now Cobh), Ireland, before heading off for the port of New York.
- ✍ The ship hit an iceberg 400 miles south of Newfoundland in the Atlantic late on the night of April 14. It sunk in two and a half hours.
- ✍ Legislation at the time ensured that 20 lifeboats were on the ship, although three times this number would have been needed to accommodate all the passengers. Subsequently, legislation changed.
- ✍ Of a reported 2,228 passengers and crew, more, only 705 survived. The sea gave up only 300 bodies.
- ✍ Five expeditions have recovered nearly 5,000 items from the vessel with another expedition planned for summer 1992.
- ✍ Among many Titanic-related Websites, official information from preservation company RMS Titanic, Inc. is found at www.titanic-online.com

Marcia Jedd (www.marciajedd.com) wrote and researched this article. This article first appeared in the March 1999 edition of Cargovision, sponsored by KLM Dutch Airlines.

Photos by RMS Titanic, Inc, except Big Piece truck photo by Richard Crowther.