

Underwater museums and parks, replicas and digital reconstructions of wrecks are all ways to encourage the public to discover our underwater cultural heritage without damaging it. Some cost more than others, but they may also be more magical. Take the museum in the Bay of Alexandria, for example.



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Greek bronze representing a young athlete, Vele Island (Croatia).

Visiting submerged treasures

Stonehenge, Chartres cathedral, the pyramids of Egypt, are all evidence of the power of human creativity. They need to be protected and preserved, but not locked away, so that everyone can marvel at their heritage.

This is not a great problem on land. But how can the public discover the ruins of the Alexandria lighthouse, or Cleopatra's palace, the wrecks of Greek and Roman ships, or the sphinxes and other statues found beneath the waters of the Bay of Alexandria?

This is one of the purposes of underwater archaeology, a discipline that requires good diving skills and

expensive equipment. But it takes a great number of dives and sophisticated technology - and therefore a lot of money - to bring treasures to the surface, or to decide to leave them where they are and preserve them.

After all, if these wooden wrecks have survived for centuries, it is precisely because the darkness and lack of oxygen in deep water have allowed their preservation. Once exposed to the air, the saturated remains have to be treated to stop them deteriorating. "Conservation takes a lot of work, over many years, and is very expensive," says Florian Huber, underwater archaeologist at

the University of Kiel (Germany).

Irena Radi-Rossi, one of his Croatian colleagues, is a specialist in Roman shipwrecks carrying large cargoes of amphorae. "When you raise that number of objects," she explains, "you run into all sorts of problems, like storage, conservation, treatment and exhibition space." And, on some sites, the amphorae have melded with the seabed. "Any attempt to free them could easily end up by destroying some of the finds."

The easiest solution, concludes Huber, is to leave the sunken object where it is. This is what the Convention on the Protection of

the Underwater Cultural Heritage, adopted in 2001 by the UNESCO General Conference, recommends. But how can these submerged treasures then be made accessible to the public?

Underwater museums

The ideal solution would be to build an underwater museum that could be visited without even getting one's feet wet. No need, then, to be able to dive to admire the exhibits in situ. But building such a museum is itself a highly complex and costly technological feat. The question is, how complex and, above all, how expensive?

"Finding answers to these questions was one of the aims of a feasibility study for an underwater museum in the Bay of Alexandria," explains Ulrike Koschtial, of UNESCO's Division of Cultural Objects and Intangible Heritage. Launched by the Egyptian authorities with support from UNESCO, the pilot project is under the direction of French architect, Jacques Rougerie. Not lacking imagination, he envisages a museum complex in two major parts. Not far from the new library of Alexandria visitors will enter the first

part, above ground, with its glass walls. They will then go deep underground via a tunnel until they reach a 40-metre diameter underwater terrace, in the centre of the Bay. There, seven metres down, behind glass windows, they will be able to admire the many finds dating back to ancient Alexandria. The museum would boast a total surface area of 22,000 square metres and receive some three million visitors a year.

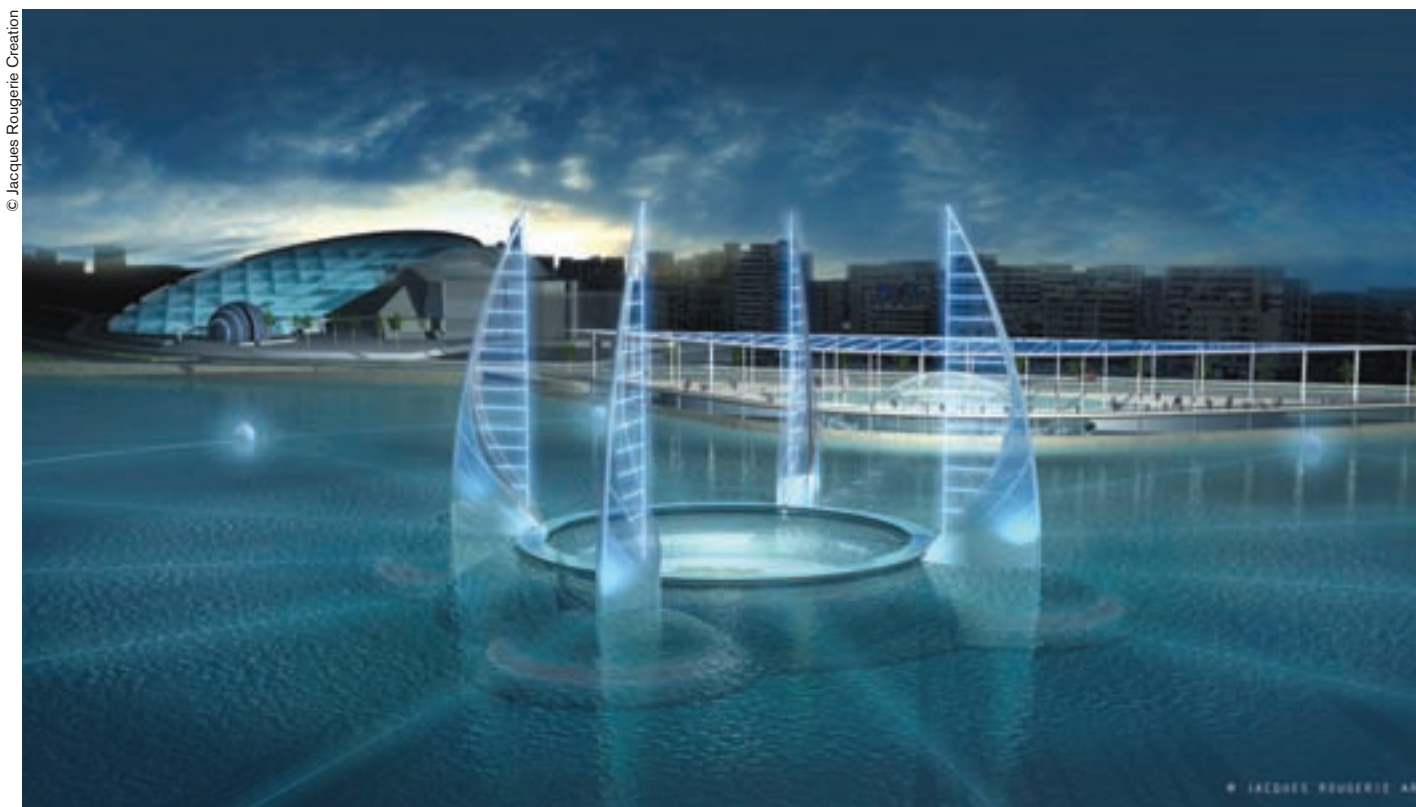
Apart from its probably prohibitive cost, this captivating project would have to overcome other obstacles, like the Bay's pollution. Before visitors can appreciate the treasures in their underwater setting, a way has to be found to purify the seawater and keep it clear, while not hampering the operation of the port. Another challenge is that Egypt is in a seismically active area, with the Red Sea lying on a fault line between the Arabian and African tectonic plates.

Another underwater museum is already being built. At Baiheliang (China), there is a 1600 metre-long ridge, on which changes in the level of the Yangtze River have been recorded for 1200 years. Until now, the 'White Heron Ridge', as it is

called, has only partially been submerged by the river. But, when the Three Gorges dam is completed, it will be completely under water. So, in the 1990s, the Chinese authorities decided to preserve the Baiheliang inscriptions by making them part of an underwater museum. This should have been finished in 2007, but is taking longer than planned.

Other solutions

While waiting for these underwater museums to open, the public can enjoy 'underwater parks'. But for this, the visitor needs to be able to dive. Sarah Arenson, a historian from the University of Haifa, is behind one such project in Caesarea, the ancient port city on the Mediterranean coast of Israel, constructed by King Herod to honour the Emperor, Augustus Caesar, in 10 B.C. Some of the problems that still have to be solved in Alexandria are familiar to her. "In the case of Caesarea, there was no option of recovery," she explains, "as the site is mainly composed of architectural remains." But, she adds, "the prospects of damage to the site are slight. The biggest danger comes from use of the area by fishermen and pleasure



Plans for an underwater museum in the Bay of Alexandria, by French architect Jacques Rougerie.



Design for the interior of the future underwater museum in Egypt.

craft.” The only way to prevent this, she says, is through legislation, by prohibiting fishing and boating in the area. But, as for visibility, “the only answer is prayer,” she smiles. Meanwhile, pollution is minimized by periodical cleaning by volunteers, attracted by special events and competitions.

For Daniel Zwick, of Deguwa, the German society for nautical archaeology, underwater parks are a good way to make underwater heritage accessible, while preserving it. “The routes followed by divers are usually designed to avoid exposed relics, which could be damaged by the movement of scuba fins, for example.”

Humans are still a threat, though. There are always a few black sheep masquerading as divers who come to pillage the sites. And, to enable the public to gain a better appre-

ciation of these sites, Florian Huber has set up a study group for maritime and limnic (freshwater) archaeology (AMLA), which offers regular courses for divers. “It is very difficult to protect shipwrecks,” he says. “The only way is to raise public awareness.” Even so, fragile relics can also be damaged by deep sea fishing nets, storms and even the naval shipworm (*Teredo navalis*), a tiny mollusc that bores into submerged wood.

This is why other approaches are being used. One of the most impressive underwater trails, anywhere, takes visitors to the oldest known shipwreck, the Uluburun, which sank over 3000 years ago, off the south-west coast of Turkey. But, since 2006, divers have been unable to explore the original. The archaeological park they come to is, in fact, next to the original site, and

exhibits an exact replica, named Uluburun III.

“Uluburun III was built on dry land,” says underwater archaeologist Guzden Varinliogu, “with a fake cargo of gold and amphorae. It was then laid on the seabed following the archaeological layout of the original Uluburun wreck.” The original is now in the museum for underwater archaeology in Bodrum.

Even less harmful to underwater treasures are virtual visits, where dives are simulated on a screen. This is the aim of the European Venus project, which digitally reconstructs wrecks in three dimensions. Data from sonar scans of the site are combined with underwater photography to provide a realistic simulation of the sunken object, with the same resolution used in the latest computer games. This is one way to allow everyone to see these underwater relics. “It is perfectly clear that not everybody can reach such sites,” says Irena Radi-Rossi. “But you can always create virtual reality spaces on nearby land and offer some of the emotion, pleasure and adventure of diving to people who can’t dive.”

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An underwater museum in the Bay of Alexandria

“It will be a revolutionary museum because for the first time we’ll be able to visit an underwater museum without getting our feet wet!

A feasibility study on the subject is in preparation and a technical management committee led jointly by UNESCO and Egypt will proceed with its evaluation and recommend procedure. Egypt has assigned the study to Jacques Rougerie from France.”

Françoise Rivière,

UNESCO Assistant Director-General for Culture

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