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Edited by Robert D. Ballard: Archaeological Oceanography

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INTRODUCTION

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Why the title *Archaeological Oceanography*? Why not *Marine Archaeology* or *Nautical Archaeology* or *Oceanographic Archaeology*? Good question.

The ocean covers 72% of the earth's surface, with an average depth of 4000 m. Since the early 1950s and before, archaeologists have been discovering, exploring, mapping, and excavating ancient shipwrecks beneath the sea. The depths they have been working at, however, are shallow by oceanographic standards, restricted until recently to the inner portions of the continental margins, to depths of less than 100 m. The choice has been ambient diving techniques, particularly the use of self-contained underwater breathing apparatus, or scuba.

Until recently, it was widely believed that the ancient mariner hugged the coastline, seldom venturing into the open waters of the world's oceans. But recent discoveries in deep water far from shore have shown that many ancient mariners were either driven out to sea by storms before sinking or chose for a variety of reasons to take the shortest routes from one destination to the next.

Not only are there many ancient shipwrecks to be found in the deep sea, but various conditions result in those shipwrecks being well preserved. These factors include total darkness, cold temperatures, low rates of sedimentation, and limited human activity, since fishing and diving rarely occur in such remote regions of the world. Ships sink in the deep sea generally due to storm action, which leads to them being swamped instead of striking the bottom, which frequently can tear their hulls open. Deep-water shipwrecks tend to sink in an upright position, coming to rest in a low-energy environment instead of being further damaged in shallow water during subsequent storm periods.

Another critical factor leading to their preservation is the thick layers of soft mud into which they settle when reaching the bottom. Deep-sea sediments commonly consist of fine-grained clay that is saturated with salt water. As a result, shipwrecks sinking into such a bottom commonly come to rest with their main deck near the bottom/water interface. Since deep-sea mud quickly becomes anoxic, the majority of a shipwreck and its contents, including its human occupants, are thrust into highly preserving anoxic conditions minutes after sinking.

Although this is all interesting, let us return to the question of the title: *Archaeological Oceanography*. Oceanography, like marine archaeology, is a relatively new field of research, a child of the 20th century. Unlike marine

archaeology, oceanography is expensive and reliant upon costly resources, such as large research ships, submersibles, and advanced undersea vehicles, including remotely operated vehicles. It is not uncommon for an oceanographic expedition to cost \$30,000 to \$40,000 a day. As a result, one month at sea can cost \$1 million.

To the world of marine archaeology this is prohibitively expensive and even more so when compared to archaeological programs carried out on land. If one were to use these comparisons in making decisions regarding the allocation of scarce resources, the shipwrecks of the deep sea would never be studied—that is, if you expect the traditional archaeological community and its traditional sources of funding to finance work in the deep sea. But that need not be the case since there is no reason why archaeological oceanography could not be supported by the same sources of funding that support other fields of oceanographic research.

It is important to point out that oceanography is not a separate discipline such as physics, chemistry, or geology. It is an arena in which these disciplines work, bonded together by common needs such as the need for unique facilities that are required to carry out these separate lines of research. It is common for these various disciplines to work together on oceanographic field programs, no different than multidisciplinary programs carried out on land or in outer space. Oceanographers come from all fields of research in the physical and engineering sciences, fields of research that could easily be expanded to include the social sciences of maritime history, archaeology, and anthropology.

More importantly, it is a young enough science to be inclusive, commonly accepting new disciplines into its fold. The history of marine geology is an excellent example. It started in the 1930s and was dominated by sedimentologists concentrating on the continental margins of the world. But the evolving theory of plate tectonics in the 1960s took the earth sciences into the deeper ocean basins, bringing in petrologists, volcanologists, and structural geologists. The discovery of hydrothermal vents on the Mid-Ocean Ridge in 1977 saw an influx of chemists, geochemists, and a broad range of biologists entering the field, placing increasing demands on access to the expensive tools of oceanography.

When we first began to discover ancient shipwrecks in the central Mediterranean Sea in 1988, it was thought to be a rare occurrence. But in subsequent years, as this book documents, more and more ancient shipwrecks were discovered in other deep-water locations. More recently, professional salvage companies have obtained the necessary technology to carry out commercial recovery programs.

It has become increasingly clear that the deep sea can be of great importance to the social fields of archaeology, anthropology, history, and art, to name a few. But how can this interest turn into a meaningful and viable research program?

The term “archaeological oceanography” sounds like the former is subordinate to the latter but that is not the case. A geological oceanographer is a geologist working in the ocean. An archaeological oceanographer is an archaeologist working in the ocean as well.

It is encouraging to see the willingness on the part of the leadership of the National Oceanic and Atmospheric Administration’s Ocean Exploration Program to support this budding field of archaeological oceanography and our only hope is that other federal funding agencies that support oceanography will follow suit.