

The Development of Maritime Archaeology as a Discipline and the Evolving Use of Theory by Maritime Archaeologists

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Scientific archaeology developed largely in the nineteenth century, slowly emerging from the unrestrained curiosity of antiquarians into a systematic, disciplined, and research-oriented study. Maritime archaeology went through a similar evolution during the first three quarters of the twentieth century, and it was some time before archaeologists working on sites underwater regularly utilized theoretical frameworks to better interpret their work, as were their terrestrial counterparts. As late as the 1970s, Keith Muckelroy (1978:10) noted that maritime archaeology displayed “a remarkable lack of development or systematization,” constituting an “academic immaturity,” when compared to other archaeological sub-disciplines. At that time maritime archaeology was still a relatively nascent study, and was only just approaching a position where its practitioners could make tentative movement towards defining the nature of the discipline and developing a relevant paradigm. In the ensuing decades, the discipline has matured considerably, though the perception of some persists that maritime archaeologists are more antiquarians than archaeologists, with more interest in the particular (and often spectacular) material remains recovered than the use of such material culture to meaningfully speculate on the societies that left them behind. This is in spite of a significant and expanding body of literature published by maritime archaeologists that is both theoretical and thought-provoking. This perception otherwise may be explained by the fact that theoretical engagement in maritime archaeology, like the field itself, is relatively new, and that for much of the history of underwater archaeology effort was focused on methodological advances necessary to safely and efficiently work in a hostile environment, by people who were not always trained archaeologists. Many of the early advances in maritime archaeology were made by avocationalists or professionals from other disciplines, and to this day the field includes a number of individuals working outside archaeological academia and its ongoing theoretical discourse. It is indisputable, however, that at present theory is used in maritime archaeology, and as theoretical approaches continue to develop, the potential for maritime archaeology to interpret past human experience, and to influence broader debates within archaeology, is substantial (Flatman 2003). This paper attempts to provide an overview of the development of theory in maritime archaeology, by evaluating key events, people, and ideas that have contributed to the discipline as it has evolved from the early twentieth century to the present day.

The earliest underwater archaeological endeavors in the twentieth century can be characterized as antiquarian-oriented salvage operations, using traditional (pre-scuba) deep sea diving gear. The divers involved invariably lacked any archaeological training or experience, and the focus was typically on the recovery of objects of art. Probably the best-known example was the 1900-1901 recovery of a spectacular assemblage of ancient Greek bronze and marble statuary from a shipwreck site at Antikythera, a small island between Greece and Crete (Weinberg et al. 1965). The site had been discovered by sponge divers and the salvage was organized by the Greek government, using the sponge divers under the direction of the Director of Antiquities, Professor George Byzantinos, from the diving vessel. A rare example of an underwater excursion from the

same era that was focused on research rather than collection of artifacts was conducted by a priest named Odo Blundell, who in 1908 donned a diving helmet to investigate a crannog (lake dwelling) in Scotland, to better understand its construction and history. Blundell produced drawings of the submerged portion of the artificial island, and went on to dive other crannogs and report his findings (Blundell 1909, 1910).

One of the earliest underwater excavations carried out in a systematic manner was that of the 1564 Swedish warship *Elefanten*, directed by the Swedish naval officer Carl Ekman between 1933 and 1939 (Ekman 1934; Cederlund 1983:46). While not an archaeologist, Ekman's work was thorough and comprehensive, and was carried out for research and heritage preservation purposes (Adams 2003:3). Ekman appears to be the first to use an air lift to excavate a shipwreck site, a tool commonly used by modern underwater archaeologists (Cederlund 1983:48).

Not all of the early work was carried out in Europe. Between 1904 and 1909, American diplomat and avocational archaeologist Edward H. Thompson utilized Floridian sponge divers, and dived himself, to explore a cenote at Chichén Itzá in Mexico, retrieving thousands of objects using a dredge bucket. In Southwest Asia, advances were made by French missionary Antoine Poidebard. In the 1920s and 30s he used aerial photography to locate submerged archaeological remains along the Lebanese coast, and hired divers to investigate the ruins using underwater cameras (Poidebard 1939). Poidebard eventually would supervise operations using a glass-bottom bucket, and related in 1937 that the "sole object of our investigation was to establish a method" (Blot 1996:42-43). A few years after Poidebard's work, American archaeologist Robert Braidwood with the University of Chicago's Oriental Institute also recorded another ancient harbor structure, a jetty at the 9th century BC site of Tabbat el-Hamman on the Syrian coast (Blot 1996:43).

What most of these early excavations had in common was the generally unsystematic nature of recovery on the seafloor, the fact that the divers involved were not trained archaeologists, and that the archaeologists supervising the operations (if there were any) did so from the surface, as they were not divers. This physical separation between the archaeologist and the site could sometimes have disappointing results, even when judged by the standards of the time. In 1950, for example, the Italian government archaeologist Nino Lamboglia watched in dismay as salvage divers using a dredge bucket committed what he later called a "massacre of amphora" on the wreck of a first century BC Roman merchant vessel lost at Albenga off Genoa (Lamboglia 1965; Blot 1996:45-46).

In 1946, a practical system of scuba (self-contained underwater breathing apparatus) developed by Jacques-Yves Cousteau and Emile Gagnan became available to the public. Known as the aqualung, the popularity of this untethered system, which allowed far greater freedom of movement for the diver, led to the discovery of many new shipwreck sites, particularly in the Mediterranean. More and more ancient shipwreck sites were encountered that yielded vast numbers of intact artifacts of the similar types, from narrowly dated assemblages, which led to more complete typologies and more accurate dating of classical sites in terrestrial contexts (Blot 1996:47-48; Muckelroy 1978:12). The potential of using data from shipwreck sites to inform archaeologists working on land became increasingly apparent to classical archaeologists. At the same time, it became obvious that the access to these sites afforded by scuba led to a dramatic

increase in looting, resulting in a tragic loss of heritage as well as early laws protecting submerged cultural resources (Dumas 1972:72-73; Muckelroy 1978:14; Blot 1996:32-33; Tuddenham 2010:6).

The first shipwreck site to be subjected to a major excavation by untethered divers using scuba took place in the early 1950s at the island of Grand Congloué near Marseilles (Costeau 1954; Benoît 1961). This expedition was led by Cousteau himself, with a non-diving team of archaeologists headed by Fernand Benoît advising on board the diving vessel *Calypso*. With almost ten thousand specimens of amphora, dishes, lamps, and other ceramics recovered, the operation was a logistical success, but the project was subsequently criticized for inadequate archaeological standards, even for the time. No site plan was produced, two disparate shipwrecks were mistakenly interpreted as one, and Cousteau's (1954:13) own words made even contemporary archaeologists cringe: "when an amphora neck jammed in the [airlift] pipe mouth, another diver with a hammer pulverized the obstacle." The project did feature some important technical innovations, including an underwater video camera with a live feed so that archaeologists on the boat could witness the diving activities. But this was still essentially armchair archaeology, as American archaeologist John Goggin (1960:350) noted, "comparable to the archaeology of some years ago when the archaeologist 'Bwana' sat in the shade and examined the antiquities his foreman brought in from the dig." Benoît himself would remark at the second International Congress in Underwater Archaeology at Albenga in 1958 that "we know, from experience on *Calypso*, how difficult it is precisely to establish and chart the distances and the position of wrecks and isolated objects" and that "the excavation of an underwater site is not about fishing for amphora" (Blot 1996:50). One of Cousteau's divers at Grand Congloué, Philippe Tailliez, would shortly thereafter lead his own excavation of a first century BC Roman wreck at Titan Reef off France's Provence coast. Tailliez, who was the chief of France's naval diving school but is today considered by his countrymen to be the true pioneer of French underwater archaeology, did not shy away from self-criticism, writing "[w]e have tried sincerely, to the best of our ability, but I know how many mistakes were made . . . If we had been assisted in the beginning by an archaeologist, he would surely have noted with much greater accuracy the position of each object; by personal inspection he would have drawn more information from the slightest indications (Tailliez 1965:91). The methodological problems of underwater archaeology were becoming apparent, and were being explicitly expressed by both professional and avocational archaeologists.

The benefits of archaeologists participating directly in underwater surveys were demonstrated by Honor Frost, a native Cypriot and diver who studied archaeology in London. Her first work on a shipwreck was in 1959 with Frédéric Dumas, another of Cousteau's divers at Grand Congloué, along with the American journalist and avocational archaeologist Peter Throckmorton. She participated in many projects in the Mediterranean, focusing more on survey and recording than excavation (Frost 1963). One of her many accomplishments was to correct misinterpretations of harbor features made by Poidebard due to erroneous descriptions provided him by his divers (Frost 1972:97,107). Despite these successes, Frost believed that it was impossible for one to be both a professional diver and a professional archaeologist, and thus felt that archaeologists would have to work with professional salvage companies in order to conduct major excavations (Frost 1963:xi). This notion, which seems absurd by today's standards, would be put to rest by archaeologists from the United States.

In the U.S., the spread of the aqualung was also having an impact on maritime cultural resources and a few pioneering archaeologists. Florida, like the Mediterranean a popular region for recreational divers, became an early focal point for underwater archaeology, and it continues to be so through the present (Fischer 1999; Smith 2002). In the initial decades, underwater archaeological investigations in Florida tended to be multidisciplinary in nature and, like those of Frost in the Mediterranean, were survey- and documentation-oriented rather than large scale shipwreck excavation efforts. Indeed, virtually all of this work focused not on shipwrecks but other types of maritime sites. Early investigations of submerged prehistoric sites featuring megafaunal remains were carried out starting in 1947 by Stanley Olsen, originally of the Florida Geological Service and later with the Florida State University (FSU) Department of Anthropology (Olsen 1958, 1959, 1961). In the late 1950s, FSU archaeologist and Anthropology Department Chair Dr. Hale G. Smith became interested in the potential of underwater archaeology, learned to dive, and began informal investigations in local bodies of water. Along with fellow FSU professor Charles Fairbanks and various students, Smith oversaw numerous surveys of rivers and sinkholes through the 1960s, resulting in the documentation of a number of submerged historical sites, many of which were refuse or wharf sites related to adjacent forts or shore facilities (Fairbanks 1964; Fischer 1999:80).

At the same time, University of Florida archaeologist John Goggin was conducting underwater surveys of similar scope, including a refuse dump associated with a Spanish mission at Fig Springs in the Ichetucknee River. Goggin (1960) published what is one of the earliest theoretical discussions of underwater archaeology, though in retrospect his paper focused less on developing a theoretical framework and more on the basic definitions of and methodological standards for this specialized sub-discipline of archaeology. “Underwater Archaeology: Its Nature and Limitations” appeared in *American Antiquity*, and for most anthropological archaeologists in the U.S. was the first formal introduction to the concept of conducting archaeology underwater. Goggin (1960:349) criticized the lack of fieldwork standards and reporting—both “unacceptable to professional archaeologists”—in projects such as the Smithsonian’s work under Mendel Peterson on the 1744 wreck of HMS *Loo* (Peterson 1955), and Cousteau’s work at Grand Congloué. Dismissing these efforts as salvage rather than archaeology, Goggin (1960:350) defined underwater archaeology “as the recovery and interpretation of human remains and cultural materials of the past from underwater by *archaeologists*” and appears to have preceded George Bass in stating “[i]t is far easier to teach diving to an archaeologist than archaeology to a diver!” Goggin went on to discuss the unique preservation prevalent on underwater sites, the nature of submerged stratigraphic contexts, and definition of four basic types of sites found underwater (refuse sites, submerged sites of former human habitation, shrines or places of offering, and shipwrecks).

Despite Florida’s role as an early leader in maritime archaeology, in no small part due to Goggin’s work, it ironically also became the capital of treasure hunting in the U.S. Looting in Florida waters, like those of the Mediterranean, became a significant problem with the advent of scuba, particularly because Florida’s coastline laid along the traditional Spanish treasure fleet routes (Burgess and Clausen 1976). Spectacular finds of gold and riches (cf. Wagner 1965) entrenched the idea of professional treasure hunting in the state, both by law and in the mind of the general public, before enough archaeologists were engaged with underwater research to

create an effective lobbying force regarding legislation. The difference between treasure salvage and archaeology, purposely blurred by those in the former camp, has continued to confuse the public to this day, despite the obvious differences between scientific study and commercial exploitation, or the ever-increasing sophistication of maritime archaeological methods, theory, and analysis. Over the ensuing decades many archaeologists became increasingly critical of the destructive nature of profit-motivated shipwreck salvage, culminating in the U.S. with the imperfect yet still beneficial Abandoned Shipwreck Act of 1987 (Cockrell 1980; Gould 1983; Giesecke 1985; Fenwick 1987; Meide 1991).

The rise of legalized treasure hunting in the U.S. was in part due to the fact that no archaeologist before the 1970s undertook a major, comprehensive, research-oriented excavation of a shipwreck in American waters. The first such systematic, professionally directed excavation of a shipwreck would be carried out by an American archaeologist, but in the Mediterranean. George Bass, often referred to as the “Father of Underwater Archaeology,” would conduct such an excavation on the 1200 BC Bronze Age wreck at Cape Gelidonya, Turkey, in 1960, the same year Goggin’s seminal paper was published (Bass 1966, 1967). Bass’ widely renowned work would meet any professional standard to this day and, as Muckelroy (1978:15) noted, “allowed few if any concessions to the fact of being underwater . . .” His team was recruited on the basis of archaeological rather than simply diving skills and experience, echoing Goggin in his belief that it is easier to teach someone with professional skills to dive than it is the other way around (indeed, this mantra would become associated with Bass). No longer would underwater excavations display a separation between divers working on the bottom and archaeologists supervising or observing from the surface, though avocationalists continue to play an important role in the discipline when working in conjunction with archaeologists, often with training provided by such groups at the Nautical Archaeology Society in the UK and the Institute of Maritime History in the U.S.

Bass’ work at Cape Gelidonya heralded a series of major excavations in Turkish and Cyprian waters, including full scale excavations of the fourth and seventh century AD wrecks at Yassi Ada (Bass and Van Doorninck 1971, 1982) and the fourth century BC Kyrenia wreck, whose hull was completely recovered, conserved, and reassembled for study and display (Katzev 1974). These impressive projects also led to the foundation of the Institute of Nautical Archaeology and the Nautical Archaeology Program at Texas A&M University, one of the leading academic institutions in the field.

The 1960s were an exciting and formative period in the development of the discipline, and not only in the Mediterranean. Momentum had been building particularly across Europe and a series of important discoveries and major investigations took place in a relatively brief period. In Switzerland, Ulrich Ruoff (1972) conducted systematic excavations at a number of prehistoric sites submerged in lakes. In Denmark, the discovery of five partially intact Viking ships at Roskilde in 1957 led to a meticulous excavation and recovery, at first conducted underwater but after 1962, through the use of a cofferdam, in a semi-wet setting (Olsen and Crumlin-Pedersen 1967).

Perhaps the most spectacular nautical archaeology project ever undertaken was the raising of the 1628 warship *Vasa* intact from the depths of Stockholm Harbor in Sweden in 1961 (Franzén

1961). A team of eleven archaeologists led by Per Lundström was assembled to excavate the interior of the recovered vessel, and to conduct excavations on the seafloor to recover associated remains. These and subsequent generations of *Vasa* Museum researchers have made significant strides in the interpretation and conservation of this massive and complex ship (Hafors 1985; Cederlund and Hocker 2006). The year after *Vasa* was raised another important find was made in Germany, where a ca. 1380 medieval vessel known as a cog was discovered in the River Weser at Bremen, and completely recovered over the following three years.

In Australia, the wrecks of the Dutch East Indiamen *Batavia* (1629) and *Vergulde Draeck* (1656) were discovered in 1963. A period of heavy looting led to preservation legislation and the formation of the Maritime Archaeology Department at the Western Australia Maritime Museum, which sponsored excavations of both shipwrecks. *Batavia*'s hull was disassembled on the seafloor, recovered, conserved, and reassembled for display (Green 1977, 1989). In 1968-1969 in the U.S., National Park Service archaeologist George Fischer supervised the excavation of the steamboat *Bertrand*, lost in 1865 (Fischer 1993:5). Virtually the entire vessel and its cargo of foodstuff, medicines, clothing, tools, supplies, and personal possessions were completely preserved, buried in a cornfield as the Missouri River had shifted from its original course. While the hull was recorded and left in situ, over two million artifacts were recovered, in what was the most extensive project of its kind in the country up to that time.

In Ireland, a number of individuals in the late 1960s set out to find wrecks from the 1588 Spanish Armada (Martin 1975). In 1967 Robert Sténuit discovered the galleass *Girona* off County Antrim in Northern Ireland, excavating it over the following two years (Sténuit 1973; Flanagan 1988). In 1968, Sydney Wignall searched for and found *Santa Maria de la Rosa* in Blasket Sound (Martin 1973). *La Trinidad Valencera* was discovered in Kinnagoe Bay, County Donegal by a group of sport divers in 1971, and subsequently excavated by Colin Martin through 1984 (Martin 1975, 1979). Another Armada wreck, *El Gran Grifon*, was discovered north of Scotland in 1970, and excavated by Martin in 1977 (Martin 1972, 1975). In England, a most extraordinary discovery was made in 1967, that of King Henry VIII's 1545 well-preserved warship *Mary Rose* off Portsmouth. Almost six hundred archaeologists and avocationalists working under Margaret Rule staged a complete excavation of the vessel through the 1970s, conducting 30,000 dives to recover over 22,000 registered finds, culminating with the raising of the mostly intact hull in 1982 (Rule 1982; Marsden 2003; Marsden and McElvogue 2009; Hildred and Fontana 2011).

In the wake of these sensational discoveries, there was an increased effort between professionals from various countries to coordinate efforts, share information, and solidify lines of communication. In the U.S., a group of archaeologists, historians, and avocational divers formed the Council on Underwater Archaeology, and sponsored its first meeting in St. Paul, Minnesota in 1963 (Fischer 1993:2). Among the presenters were not only American researchers but archaeologists involved in the ongoing projects at Yassi Ada, Roskilde, and the *Vasa*. The Council has survived in the form of the Advisory Council on Underwater Archaeology (ACUA), now a committee of the Society for Historical Archaeology, whose 2013 conference will commemorate the fiftieth anniversary of that original meeting. In 1972 the *International Journal of Nautical Archaeology* was first published, which remained the primary (English language) professional journal in the field until the advent of the *Journal of Maritime Archaeology* in 2006.

By the 1970s, underwater archaeology had captured the public imagination, and maritime archaeologists across the world were an energized community with a distinct identity and a strong belief that their work had the potential to make meaningful contributions to archaeology as a whole. At the same time, however, there was often a sense of exclusion from the greater archaeological community. Some of this segregation, to a certain degree understandable given drastic differences in methods and working environments, was perhaps made worse by the formation of specialized journals and societies. Underwater archaeologists rarely attended mainstream archaeological conferences, and vice versa, and even when the ACUA in 1970 incorporated its meetings with the Society for Historical Archaeology, underwater participants tended to stick to their own sessions within the conference (this practice to some degree continues to this day, despite explicit efforts by conference organizers to integrate the two groups). “The result was that to much of the European and American academic community, ‘underwater archaeology’ was variously seen as synonymous with treasure hunting, the lunatic fringe or at best, a somewhat esoteric pursuit of little interest to central archaeological research agendas” (Adams 2003:8). Even George Bass (1983:91,93) faced these prejudices:

As a nautical archaeologist I have been on the defensive for more than twenty years. . . . Was I simply being paranoid? Not when a leading classical archaeologist spoke to me about this “silly business you do under water.” Not when anonymous anthropologists reviewing my grant proposals wrote that it “sounds like fun but has nothing to do with anthropology.” . . . [Not when a professor said] that we were good at tagging and mapping amphoras and other artifacts on the seabed, but that our interests seemed to lie mainly with techniques of excavation and with the artifacts simply as artifacts.

As recently as 1990 Gibbins (1990:383) noted “the relative scarcity in this field of scholars who are strongly conversant with prevailing archaeological method and theory.” Such theory-minded underwater archaeologists were even scarcer in the 1970s, and many were probably not even aware of the aggressive, ongoing debate between traditional archaeologists and processualists as “New Archaeology” spread across American campuses (Caldwell 1959; Binford 1962, 1964, 1965; Bayard 1969; Watson 1972; South 1977). There are several plausible explanations for maritime archaeologists’ apparent lack of theoretical engagement at this time. One is that the early demographics of the field were dissimilar to those of mainstream archaeology. Many of the established practitioners in the 1970s had their origins as avocationalists or had joined the field from other, non-archaeological disciplines. Of the twenty-one authors in the 1972 edited volume *Archaeology Underwater: A Nascent Discipline*, more than three quarters were not archaeologists by training (UNESCO 1972). Historians, geologists, paleontologists, engineers, and other scientists made up the ranks. While the multidisciplinary nature of early underwater archaeology was a strength rather than a weakness, it did result in a community less conversant with or even totally unaware of current anthropological debates. Compounding this situation was the fact that many of those without archaeological training modeled their research on their colleagues who were trained, who more often than not were classicists or medievalists. Neither group was particularly engaged with anthropological discourse at the time, with the latter described by Johnson (1996:xii) as “pre-processual” even as late as the early 1980s. With these influences, and the simple fact that maritime archaeology had only just come on the scene a decade or so before, discussion among maritime archaeologists tended to focus on methods, new technologies, historic ship construction, and artifact typologies (Adams 2003:7). Techniques and

technology are of obvious importance for a new area of study entailing work in an alien environment with life-support equipment, and, as Bass (1983:97-98) pointed out, data collection and classification to build a sizable body of knowledge is a prerequisite for any useful theorizing.

Jonathan Adam's (2003:6) evaluation of the state of maritime archaeology at this point in its evolution is of interest:

In this environment it is not surprising that there was a lack of any coherent body of theory and practice. By the late 1970s, if there was any identifiable paradigm, in Kuhn's sense of an "entire constellation of beliefs, values, techniques and so on shared by the members of a given community" (Kuhn 1970:10), it concerned methodology. The assumption being that there was a link between field techniques—designed to ensure the successful collection of data—and subsequent analysis and interpretation. In other words the only basis on which the new "sub-discipline" could successfully contribute to archaeology as a whole, breaking free of association with antiquarianism and outright treasure salvage, was to firstly develop an appropriate methodology. This was not confined to the art of digging neat holes in the seabed, but embraced every aspect of excavation strategy and procedure including excavation and recording, to post-excavation analysis and conservation of recovered material. This was the prevailing ethos on the *Mary Rose* project in the late 1970s. In a very real sense many of those who were involved in this and other excavations at that time were conscious of the need to "catch up" with land archaeology and demonstrate credibility through controlled excavation and recording, and the acquisition of high quality data. This, it was assumed, was a key, the passport to academic acceptance of archaeology under water as valid research, rather than "lunatic fringe." This "method-centered" approach was a positive side of what was otherwise a somewhat rudderless progress and it can be argued that this was an inevitable and even necessary stage in terms of the subject's general development. Gosden (1999:33-61) has made a similar point with reference to the development of archaeology itself, citing the work of Pitt-Rivers, and of anthropology through the fieldwork of Malinowski.

The white knight who would emerge from the ranks of underwater archaeology heralding new ideas and alternate research approaches, and who would provide a link between maritime and processual archaeology, was Keith Muckelroy (Harpster 2009). The impact of his thinking and seminal publications (Muckelroy 1975, 1976, 1977, 1978, 1980) on the field of maritime archaeology, both past and present, is remarkable, especially when considering that his tragic death at age 29 due to a diving accident in 1980 came only six years after his graduation from the Department of Archaeology at Cambridge, and only nine years after he learned to dive (McGrail 1980). Instead of the traditional particularist or historiographic approach, Muckelroy's ideas were new to the field, influenced by the prehistoric and analytical archaeology he learned under Grahame Clark and David Clarke at Cambridge, the tenets of New Archaeology gaining traction in the U.S., and his own experiences on shipwreck sites in British waters, notably the 1664 Dutch East Indiaman *Kennemerland* (Adams 2001:5; Harpster 2009). It is probably because of Muckelroy's influence, through the title he chose for his most substantial work and the discussion within regarding a more holistic definition for the discipline, that the term "maritime archaeology" has largely replaced others that were once more commonly used, such as nautical

archaeology, underwater archaeology, or marine archaeology (Muckelroy 1978:6; McGrail 1980).

One of his notable contributions was towards the more systematic understanding of underwater site formation processes, a concept that was certainly shaped by his work on scattered and discontinuous wreck sites such as the *Kennemerland*, *Trinidad Valencera*, and *Dartmouth*. He introduced the terms “extracting filters” and “scrambling devices” into the lexicon, and used statistical models to clarify large bodies of data in order to discern patterns in the wrecking process, ideas that had never been proposed before (Muckelroy 1975, 1976, 1978:157-214). These concepts coincided nicely with New Archaeology’s call for a more scientific, analytic methodology. Muckelroy’s other prominent contribution was a three-part interpretive framework for better understanding the ship in its original social context. The three aspects he proposed were 1. The ship as a machine designed for harnessing a source of power in order to serve as a means of transport; 2. The ship as an element in a military or economic system, providing its basic *raison d’être*; and 3. The ship as a closed community, with its own hierarchy, customs, and conventions (Muckelroy 1978:216). This basic model has proven useful to many maritime archaeologists seeking to explore the role of ships as part of a greater cultural system (Murphy 1983:83-89; Gawronski 1991:83; Fischer 1993:5-6; Adams 2003:25,31-33; Flatman 2003:149).

By the 1980s there were an increasing number of maritime archaeologists in the U.S. who enthusiastically embraced processualism. Generally the products of anthropology departments in universities where New Archaeology had matured, these scholars were also undoubtedly influenced by Muckelroy. It is not surprising that among these researchers were students of George Fischer at Florida State University, which from the 1970s through the late 1990s was the only traditional four-field anthropology department with a full-scale program in underwater archaeology. In 1983, Fischer led the systematic test excavation of the 1748 British warship HMS *Fowey* in Biscayne Bay National Park, using a grid system and stratified sampling strategy to identify artifact patterning, much as Muckelroy (1978:196-214) had done on the *Kennemerland* (Skowronek 1984b; Skowronek and Fischer 2009:81-123). Fischer’s students would go on apply other aspects of processual theory in their study of shipwreck sites, including statistical analyses pioneered by Stanley South (1977) to seek quantitative patterning in comparative shipwreck artifact assemblages (Johnson and Skowronek 1984; Skowronek 1984a; Meide 2001).

Another well-known proponent of anthropologically-oriented shipwreck archaeology is Richard Gould of Brown University (Gould 1983, 1997, 2000:12-20). In May 1981 he organized a seminar titled “Shipwreck Anthropology,” which produced an influential book by the same name (Gould 1983). Muckelroy had been scheduled to present but was prevented by his untimely death. The majority of the participants were avowed processualists, advocating anthropological, nomothetic research agendas, or approaches that sought to discern general laws of human behavior applicable cross-culturally. Attendees included National Park Service underwater archaeologists Daniel Lenihan and Larry Murphy (both former students of George Fischer at FSU) as well as some prominent terrestrial archaeologists such as Mark Leone and Patty Jo Watson. A vigorous critique was leveled at the particularist or historiographic qualities of maritime archaeological research up to that time, and at the discipline’s lack of explicit, hypothetico-deductive research designs (Watson 1983:27,35; Lenihan 1983:43-44; Murphy

1983:70,84,88-89; Stickel 1983:219-222). The lone dissenting voice was that of George Bass, whose paper was an overt “plea for historical particularism” (Bass 1983). He questioned some of the basic tenets of processual archaeology, such as the use of formal research designs and quantitative sampling, and stressed the need for highly detailed, particularistic study, even if it meant “almost blind and thoughtless cataloguing of types of artifacts frequently encountered on New World shipwrecks” (1983:98).

Bass’ criticisms would foreshadow the next great paradigm shift in archaeological thought. In 1982 Ian Hodder published two important papers, “Symbols in Action” and “Symbolic and Structural Archaeology” (Hodder 1982a, 1982b). Ironically appearing the year before Gould published *Shipwreck Anthropology*, these papers marked the opening salvo in a concerted challenge to the rigid nomothetic approach of processualism, and heralded in a heterogeneous movement which would come to be known as post-processualism. This term is a broad one that unifies a variety of different perspectives, such as the role of material culture as a “text,” the existence of multiple valid “readings” or interpretations given cultural subjectivity, the acknowledgment of different levels of hidden meaning in material remains, the impact of symbolic and ideational forces, the use of engendered critique and Marxist perspectives, and the acceptance of the need for self-reflexive behavior among archaeologists (Leone 1984; Wylie 1985; Leone et al. 1987; Shanks and Tilley 1988, 1992; Baker and Thomas 1990; Patterson 1990; Bintliff 1991; Hodder 1991a, 1991b, 1997; Johnsen and Olsen 1992; Knapp 1992; McGuire 1992; Johnson 1996). The idea that social factors or cognitive aspects of past societies can be inferred from their material culture went beyond the limits of what processualists felt archaeology could accomplish, as expressed by Muckelroy (1978:216) when he wrote “[o]f course, archaeological evidence possesses its own inherent weakness, notably in being unable to shed light on people’s motives or ideas . . .” What was once an impossibility was now a legitimate challenge.

It was ironic when Gould (1997:110) wrote “it remains to be seen whether or to what extent maritime archaeologists will embrace the post-processual approach,” as maritime archaeologists in Europe were already exploring aspects of this new rationale (Flatman 2003:156), along with at least a few voices in the U.S. (Spencer-Wood 1990). These new ideas would lead to a period of intense stimulation regarding the use of theory in maritime archaeology, which continues to this day (Gibbins 1995; Blackman 2000; Gibbins and Adams 2001; Adams 2003:14, 2006; Flatman 2003). This is not to say that processualist or even historical particularist approaches were abandoned by maritime archaeologists; indeed, Australian archaeologist Mark Staniforth (2003:18) has suggested that *Shipwreck Anthropology* may have been the single most important work to appear in the preceding 20 years (see also McCarthy 2001:14-15). As with any social science, useful ideas persisted and were adapted to new problems, while less worthwhile ideas were rejected. Despite the positivist convictions expressed at Gould’s seminar, few if any major shipwreck excavations have been explicitly driven by hypothesis testing along the rigid models demonstrated by Stickel (1983) or Babits (1998). Processualism ultimately has had limited influence on the entirety of shipwreck investigations, though some notable studies stand out (Souza 1998), and as a step in the evolution of theory, it has been as important to maritime archaeology as it has been to archaeology in general (Gibbins and Adams 2001: 285). The most enduring aspects of processualism in maritime archaeology have been the site formation ideas of Muckelroy, the use of experimental archaeology with quantifiable testing (cf. McGrail 1977,

1998; Sauer 2011), scientific tools such as statistical analysis, and the use of stratified sampling or limited excavation. It must also be said that shipwreck scholars today commonly develop their research within a broad socioeconomic or cultural perspective, akin to the generalist approach advocated in *Shipwreck Anthropology*. That being said, the historiographic or particularist approach pioneered by Bass, in its ultimate expression focusing on the total excavation and meticulous analysis of a single, well-preserved shipwreck and entire artifact assemblage, including the recovery and reconstruction of the hull (Steffy 1994), will likely—to some degree at least—always remain a part of maritime archaeology, given the potential of some shipwreck sites to produce momentous bodies of new information (cf. Bass and Van Doorninck 1982; Pulak 1998; Marsden 2003; Bruseth and Turner 2005; Cederlund and Hocker 2006; Grenier et al. 2007). This type of project, while not usually financially feasible, has produced revolutionary new understandings of the past, making shipwreck archaeology relevant to a wider scholarship, and providing the rich contextual information to make broad, meaningful socioeconomic and historical enquiries, a result which should please processual generalists like Patty Jo Watson (1983:28-29). Archaeologists working on less grandiose projects than the complete excavation of a shipwreck have also been able to effectively occupy the “middle ground” by using particularism while also accommodating more recent developments in archaeological thinking (cf. Martin 2001).

Since the 1980s maritime archaeologists have become increasingly receptive to the symbolic, contextual, and critical archaeologies associated with post-processualism:

It was almost as though having gone underwater in bewilderment at the New Archaeology, we surfaced in the mid 1980s and found that a concern with the historical and the specific event were legitimate after all. Not only that, but as many had always felt, successful archaeological interpretation needed to consider both the specific and the general. A re-assertion of the role of the individual in the past and of archaeology's links with history was greeted with sighs of relief. The proposed “symbolic” or “contextual” archaeology, at least its more up-front, bullish clarion calls resonated much more with the general profile of underwater research. The assertion that material culture was not simply functional, a passive reflection of the past, or ‘fossilized action’ (Hodder 1982b:4) but was ‘meaningfully constituted,’ active and possessed of more than one meaning depending on context (echoes of Hasslöf), fitted very well with the contextually rich assemblages so often found in shipwrecks . . . (Adams 2003:14)

By the 1990s maritime researchers were adapting these ideas to develop approaches focused on the unique characteristics of maritime archaeological data. Many of these advances were associated with scholars of Northwest Europe and Scandinavia exploring symbolic meanings in ship design and structure, or the multivariate expressions of the ship-as-symbol (Cederlund 1994, 1995; Crumlin-Pedersen and Munch Thye 1995; Wedde 1996, 2000; Adams 2001, 2003). Jonathan Adams, who is influencing a new generation of students at Southampton University, and who was instrumental in establishing the more theoretically-oriented *Journal of Maritime Archaeology* in 2006, may have produced the most developed of these studies (Adams 2003). He is concerned with boats and ships as material culture and expressions of the societies that built them, and with wrecks as archaeological source material. He argues that watercraft are conceived and designed in accordance with various mental templates and ideologies, then built, used, and

discarded within a complicated and interrelated set of social, economic, environmental, and technological constraints (Adams 2003:25-30). Because of these factors, Adams believes that the material culture of water transport provides one of the best ways to study innovation and change in past societies. His dissertation research focused on a series of late medieval and post-medieval shipwrecks from Northwest Europe and the Baltic, not as technological phenomena *per se* but by examining them in the contexts of their production, to reveal causal factors, explanatory relationships, and new perspectives into European societies over several centuries of technological change.

What has proven to be perhaps the most popular area of theory in maritime archaeology, also spearheaded by scholars from Scandinavia and Northwest Europe, is the concept of the maritime cultural landscape (Myhre 1985; Westerdahl 1986, 1992, 1994; 1995, 2008; Jasinski 1993, 1999; Hunter 1994; Cederlund 1995; Crumlin-Pedersen and Munch Thye 1995; Firth 1995; Maarleveld 1995; McErlean et al. 2002; Tuddenham 2010; Ford 2011). This term, which has become a dominant theme of modern maritime archaeology, was coined by Christer Westerdahl, who had been developing his ideas as early as the late 1970s, though it was 1992 before he published in English and they became accessible to a wider scholarship (Westerdahl 1986, 1992, 1994, 1995, 2008). The concept of the maritime cultural landscape originated as a reaction to particularism in underwater archaeology, with its intense focus on shipwrecks (Westerdahl 1986:11). Even when Muckelroy (1978:4-6) proposed a broader definition of what he preferred to call maritime archaeology to include “the scientific study of the material remains of man and his activities on the sea” he explicitly ruled out “related objects on the shore” and “coastal communities.” It was not long before others began to see this focus on ships and shipboard communities as still too narrow, as it excluded cultural remains on shore and in lakes and rivers that might also contribute to the study of maritime lifeways. Westerdahl (1986, 1992) proposed the maritime cultural landscape as the model to achieve a more holistic understanding of the subject.

Westerdahl’s (2008:212) most recent definition of the maritime cultural landscape is “the whole network of sailing routes, with ports, havens, and harbours along the coast, and its related constructions and other remains of human activity, underwater as well as terrestrial.” It therefore “signifies human utilization (economy) of maritime space by boat: settlement, fishing, hunting, shipping and its attendant sub-cultures, such as pilotage, lighthouse and seamark maintenance” (Westerdahl 1992:5). He also points out that in addition to the physical remains more easily recognizable to archaeologists, cognitive aspects of the landscape, including the so-called “mental map” and place names, are also necessary to understand a maritime culture and its relation to the physical landscape (Westerdahl 2008:213)

Not since Muckelroy has a single archaeologist’s ideas made such a profound impact on maritime archaeology. With this framework the discipline has moved noticeably toward a more holistic understanding of the relationship between humans, land, and sea (Jasinski 1999:9; Tuddenham 2010:7-8). Over the last twenty years the term has proliferated across academic institutions and conferences. Some have used Westerdahl’s ideas to accommodate other theoretical approaches, including structuration, actor-network theory, and metaphysics (Firth 1995; Tuddenham 2010), while to date few if any have rejected or criticized them (though see Horrell 2005:13-18 and Dellino-Musgrave 2006:53-54). A maritime cultural landscape approach lends itself to regional surveys, which have become considerably more common than major

excavations of individual sites. Ben Ford's (2011) *The Archaeology of Maritime Landscapes* demonstrates that recent maritime cultural landscape studies have promulgated well outside Europe, throughout the U.S., Canada, Central America, and Australia. The approach has become especially popular in Ireland, where many features of the landscape are readily apparent. In addition to the exemplary monograph on Strangford Lough (McErlean et al. 2002), there are many other examples of regional maritime landscape studies, including a great body of work out of University of Ulster's Centre for Maritime Archaeology (cf. O'Hara 1997; Kelleher 1998; Bannerman and Jones 1999; McNeary 2000; Pollard 2000; Breen 2001; Conran 2001; O'Sullivan 2001; Corscadden 2002; O'Raw 2003; O'Sullivan and Breen 2007).

In 1995, Anthony Firth published online a paper which had been presented at a session titled "Theoretical Advances in Maritime Archaeology" at the Theoretical Archaeology Group conference in Durham two years before. In it he evaluated the concepts and research potential of society, landscape, and critique in maritime archaeology. The first of his proposed "critical directions" was

a critique of modernity, addressing the origins, dynamics, and global spread of western industrial capitalism and its associated institutions . . . [which] can be pursued by examining the concept of maritime cultural landscape in the early modern period, i.e., from the late medieval period to the industrial revolution. The processes through which modernity developed—such as industrialisation, globalisation, colonialism, capitalism, nation-building and the consolidation of the territorially defined state—each have a maritime component which may be susceptible to a landscape approach (Firth 1995:4).

Firth was one of the first to call on maritime archaeologists to critically address issues such as colonialism, consumerism, capitalism, and modernity, a focus of increasing importance to historical archaeology (Leone 1984; Leone et al. 1987; Johnson 1996; Orser 1996; Delle 1998, 1999; Leone and Potter 1999; Hall 2000; Hicks 2007). Even though it seems intuitive that maritime archaeology and the study of capitalism should be closely aligned—ships were, after all, the primary vehicles for exchange of material goods, and one of the essential tools that allowed Europeans to colonize and exert hegemony over much of the rest of the world—it was a theme that at that time had been rarely explored from a maritime perspective (Leone 1983 being a notably early exception).

That fact was brought abruptly to the attention of the maritime archaeological community with a memorable paper published online by Fred McGhee in 1998 titled "Towards a Postcolonial Nautical Archaeology." McGhee leveled a withering criticism at nautical archaeology: "[it] has not sufficiently problematised the concept of empire; it has not critically engaged European colonialism, its own colonial legacy, nor situated itself, in terms of power, in relation to the human subjects it studies" (McGhee 1998:1). He went on to accuse the discipline of being "scientific" and "practising a limp, lifeless historicity that for various reasons is the by-product of a colonial mindset" (McGhee 1998:1). It is appropriate that McGhee chose the term nautical archaeology, as opposed to that of maritime archaeology with its broader implications, as his criticism was focused on shipwreck archaeologists, specifically those focusing on colonial period vessels in the tradition of Bass' particularistic legacy, exemplified by but by no means limited to those working through Texas A&M University's Institute of Nautical Archaeology (INA). Some

of his criticisms were of course not new: he accused the field of focusing almost exclusively on the particularism of shipbuilding technology at the expense of broader cultural, political, and historical analysis, though he was the first critic to suggest this was due to the “pervasive influence” of corporate funding sources (McGhee 1998:4) or to a Eurocentric mentality, moral failing, or political cowardice among archaeologists.

McGhee’s paper was overtly politicized and deliberately provocative: he declared the discipline of being “as white as a freshly pressed set of bed sheets” and comfortable engaging in pseudoscientific “hodgepodgery” in homage of ships symbolizing genocide, and he accused Fred Hocker (at the time the past INA President and professor at Texas A&M) of neo-corporatism (McGhee 1998:4,5,8). Some of his charges were exaggerated or simply incorrect (for example, he suggested that the reason nautical archaeologists had not focused on slave ship investigations was due to a lack of interest, “moral amnesia,” or the controversial nature of the subject matter, when, in fact, there were many who were keenly interested in pursuing the subject, and it is simply very difficult to actually find a shipwreck associated with the slave trade¹). Notwithstanding, Flatman (2003:150) was correct when he noted that McGhee “forces maritime archaeology to take a hard look at its core values and perceptions, especially as regards some of the ‘dirty secrets’ of European global expansion, colonialism and domination.” McGhee (1998:5) was entirely justified when he pointed out that ships “are primarily cultural and political entities and ought to be thought of and investigated as such. As the mechanism by which European empire was initiated and consolidated, these machines should be looked at within a much larger context, not simply as ends in themselves.”

Since that time, there have been more examples of reflexive research and studies focusing on topics like colonialism, capitalism, ideology, gender, and social and economic relations (Staniforth 1999, 2000, 2003; Firth 2002; Flatman 2003; Horrell 2005; Ransley 2005, 2007; Dellino-Musgrave 2006; Farr 2006; Burke 2010; Harris 2010). Two of these stand out, and not only because both originate from the Southern Hemisphere. The first is Staniforth’s (2003) monograph *Material Culture and Consumer Society: Dependent Colonies in Colonial Australia*. Staniforth has reduced Orser’s (1996:22,57-88) “four haunts” to the three historical processes he considers most relevant: capitalism, colonialism, and consumerism, and he analyzes the cargo assemblages from four colonial Australian shipwrecks in that context. For Staniforth, the material goods bound for colonists carried symbolic attributes of status, wealth, and cultural coherence, especially in a nascent and isolated colonial setting, and cargos of such material culture lost by shipwreck therefore hold great potential for study. Informed by the Annales School (Braudel 1981; Bintliff 1991; Knapp 1992) and World Systems Theory (Wallerstein 1974, 1980, 1989; Champion 1989; Sanderson 1995) he proposes a scheme for analyzing shipwrecks as “the archaeology of the event,” so that the specificity of an event can be used to interpret larger scale cultural processes, in this case British colonialism, the modern capitalist system, and consumer behavior in a peripheral setting.

¹ In fact, the one exception McGhee (1998:8) noted of a project at that time underway investigating a wreck believed to represent a slave ship resulted in, to the disappointment of the principal investigators, the identification of the vessel as a French warship, not an English slaver (Johnson and Meide 1998). McGhee mistakenly wrote that the project in question was sponsored by the Institute of Nautical Archaeology when it was in fact a joint effort of the Institute of Maritime History and Florida State University’s Program in Underwater Archaeology.

The other study is titled *Maritime Archaeology and Social Relations: British Action in the Southern Hemisphere* by Virginia Dellino-Musgrave (2006). Dellino-Musgrave used assemblages from two Royal Navy shipwrecks in isolated locales, HMS *Swift* off Patagonia and HMS *Sirius* off Norfolk Island, Australia, to explore British social relations through the processes of colonialism, capitalism, and consumption. She draws on a wide range of material culture studies and social theories addressing time, space, place, landscape, and praxis (Braudel 1982; Giddens 1984; Shanks and Tilley 1988, 1992; Bourdieu 1990; Heidegger 1992; Gosden 1994; Tilley 1994; Hirsch 1995), while also acknowledging the influence of Staniforth (2000, 2003) and his ideas of the archaeology of the event. Her primary analysis is based on the ceramic assemblages from the two shipwrecks. With the understanding that ceramics reflect the praxis or practical action of those who created, bought, used, and discarded them, she identifies social differentiation both within the ship's hierarchy and between the ship's British complement and other peoples through production and consumption patterns. She argues that ceramics were used by the British to reproduce memory of the homeland while abroad, thereby increasing a sense of security and the continuity of British values. This security is further reinforced through habit (*habitus*), routine, authority, and discipline, all of which are expressed in the form, patterns, distributions, variability, and repetition of material culture. Dellino-Musgrave finally expands the focus to examine British activities on a global scale through landscape use such as trade routes and settlement patterns. Her study is successful at accommodating a diverse body of social theory in a meaningful way, at viewing shipwrecks on multiple levels of scale from local to global, and at evaluating 18th century British social relations as expressed through material culture, and as such her work represents some of the best of what theory can do for maritime archaeological research.

Maritime archaeology has come a long way in the last century, from the first deep sea divers groping at amphora to deep discussions of praxis to better grapple with modernity. Maritime archaeology's transition from antiquarianism to meaningful scientific endeavor happened much as it had in the parent discipline of archaeology itself, albeit in a much compressed time span. Practitioners went from divers who learned archaeology on the job, to archaeologists who learned diving for the job, to scholars who learned from the very start a specialized sub-discipline of archaeology with its own methodology and ideas. All the while there was a fight for legitimacy, in the eyes of colleagues who didn't take diving seriously, in the eyes of the public who couldn't easily differentiate between archaeology and treasure hunting, or in the eyes of purists who saw the field as more artifact- than theory-oriented. But as the methodologies and technologies required for safely and efficiently collecting data underwater were refined, so would the ideas behind the archaeology, whether borrowed directly from general paradigm shifts in archaeological and anthropological theory, or developed to fit the idiosyncrasies and unique opportunities of shipwreck sites or maritime landscapes. Today maritime archaeology is enjoying a period of unprecedented success. Many of the monumental projects of the past are coming to fruition with equally monumental final publications, including the Tudor warship *Mary Rose* (Marsden 2003; Marsden and McElvogue 2009; Hildred and Fontana 2011), the Swedish galleon *Vasa* (Cederlund and Hocker 2006), the Byzantine Serçe Limanı wreck (Bass et al. 2004; Bass et al. 2009; Van Doorninck in press), and the 1565 Basque whaling galleon wrecked at Red Bay, Labrador (Grenier et al. 2007). As cultural resource management legislation changes and academic interest waxes, there are more maritime archaeologists employed, conducting research, and teaching than ever before. Hundreds of archaeology and anthropology students graduate

each year with at least one maritime class under their belts, and dozens more with advanced degrees, from an increasing number of universities with maritime course offerings. It has now been ten years since Flatman (2003:144) called on maritime archaeologists for a greater emphasis towards the adoption of self-consciously theoretical perspectives. The call has been answered; there are more and more maritime scholars who have developed the skills to move seamlessly from the particular to the general in their analyses, and more theoretical discussions than ever before. In the face of this change, the perception that maritime archaeologists are more interested in ships than people should finally be put to rest, and the idea that maritime material culture, when considered with broad and intellectual perspectives, can offer one of the richest sources of evidence regarding the human experience can be more fully explored.

References Cited

Adams, Jonathan

2001 Ships and Boats as Archaeological Source Material. *World Archaeology* 32(3):292-310.

2003 *Ships, Innovation and Social Change: Aspects of Carvel Shipbuilding in Northern Europe 1450-1850*. Stockholm Studies in Archaeology No. 24. Stockholm Marine Archaeology Reports No. 3. University of Stockholm, Stockholm.

2006 From the Water Margins to the Centre Ground? *Journal of Maritime Archaeology* 1(1):1-8.

Babits, Lawrence Edward

1998 The Berth 52 Vessel (09CH691) The Interim Report (1982). In *Maritime Archaeology: A Reader of Substantive and Theoretical Contributions*, edited by Lawrence Edward Babits and Hans Van Tilburg, pp. xx, 590. The Plenum Series in Underwater Archaeology. Plenum Press, New York.

Babits, Lawrence Edward and Hans Van Tilburg (editors)

1998 *Maritime Archaeology: A Reader of Substantive and Theoretical Contributions*. Plenum Press, New York.

Baker, Frederick and Julian Thomas (editors)

1990 *Writing the Past in the Present*. St. David's University College, Lampeter, England.

Bannerman, Nigel and Cecil Jones

1999 Fish-trap Types: A Component of the Maritime Cultural Landscape. *International Journal of Nautical Archaeology* 28(1):70-84.

Bass, George Fletcher

1966 *Archaeology Under Water*. Thames & Hudson, London.

- 1967 *Cape Gelidonya: A Bronze Age Shipwreck*. Transactions of the American Philosophical Society No. 57(8). American Philosophical Society, Philadelphia.
- Bass, George Fletcher, Robert H. Brill, Berta Lledó and Sheila D. Matthews
 2009 *Serçe Limani, Volume 2. The Glass of an Eleventh-Century Shipwreck*. 1st ed. Texas A&M University Press, College Station, TX.
- Bass, George Fletcher, Sheila D. Matthews, J. Richard Steffy and Frederick H. Van Doorninck
 2004 *Serçe Limani: an Eleventh-Century Shipwreck, Volume 1. The Ship and its Anchorage, Crew, and Passengers*. 1st ed. The Nautical Archaeology Series. Texas A&M University Press, College Station, TX.
- 2004 *Serçe Limani: an Eleventh-Century Shipwreck, Volume 1. The Ship and its Anchorage, Crew, and Passengers*. 1st ed. Texas A&M University Press, College Station, TX.
- Bass, George Fletcher and Frederick H. Van Doorninck
 1971 A Fourth-Century Shipwreck at Yassi Ada. *American Journal of Archaeology* 75:27-37.
- 1982 *Yassı Ada*. 1st ed. The Nautical Archaeology Series. dInstitute of Nautical Archaeology and Texas A&M University Press, College Station.
- Bayard, Donn T.
 1969 Science, Theory, and Reality in the 'New Archaeology'. *American Antiquity* 34:376-384.
- Benoît, Fernand
 1961 *L'épave du Grand Congloué à Marseilles*. XIVE supplément à *Gallia*, Paris.
- Binford, Lewis R.
 1962 Archaeology as Anthropology. *American Antiquity* 28(2):217-225.
- 1964 A Consideration of the Archaeological Research Design. *American Antiquity* 29(4):425-441.
- 1965 Archaeological Systematics and the Study of Culture Process. *American Antiquity* 30(2):203-210.
- Blot, Jean-Yves
 1996 *Underwater Archaeology: Exploring the World Beneath the Sea*. Harry N. Abrams, Inc., New York.
- Blundell, Odo
 1909 The Crannog of Eilean Muireach. *Proceedings of the Society of Antiquaries of Scotland* 43:159-164.
- 1910 Further Examination of Artificial Islands. *Proceedings of the Society of Antiquaries of Scotland* 44:12-33.

- Bourdieu, Pierre
1990 *The Logic of Practice*. Polity Press, Cambridge, UK.
- Braudel, Fernand
1982 *Civilization and Capitalism, 15th-18th century*. 3 vols. Harper & Row, New York.
- Breen, Colin
2001 The Maritime Cultural Landscape in Medieval Gaelic Ireland. In *Gaelic Ireland c. 1250-c.1650: Land, Lordship, and Settlement*, edited by Patrick J. Duffy, David Edwards and Elizabeth FitzPatrick, pp. 418-435. The Group for the Study of Irish Historic Settlement, Four Courts Press, Dublin.
- Bruseth, James E. and Toni S. Turner
2005 *From a Watery Grave: the Discovery and Excavation of La Salle's Shipwreck, La Belle*. 1st ed. Texas A&M University Press, College Station.
- Burgess, Robert Forrest and Carl J. Clausen
1976 *Gold, Galleons, and Archaeology: a History of the 1715 Spanish Plate Fleet and the True Story of the Great Florida Treasure Find*. Bobbs-Merrill, Indianapolis.
- Burke, P. Brendan
2010 From Manor to Mean: Documenting the Demise of a British Plantation and the Rise of a Minorcan Farmstead. In *ACUA Underwater Archaeology Proceedings 2010*, edited by Christopher Horrell and Melanie Damour, pp. 35-44, Amelia Island, Florida.
- Caldwell, Joseph R.
1959 The New American Archaeology. *Science* 129:303-307.
- Cederland, Carl
1983 *The Old Wrecks of the Baltic Sea*. BAR International Series No. 186. BAR, Oxford, UK.

1994 The Regal Ships and Divine Kingdom. *Current Swedish Archaeology* 2:47-85.

1995 Marine Archaeology in Society and Science. *International Journal of Nautical Archaeology* 24(1):9-13.
- Cederlund, Carl Olof and Frederick Hocker
2006 *Vasa I : The Archaeology of a Swedish Warship of 1628*. National Maritime Museums of Sweden, Stockholm.
- Champion, T. C.
1995 *Centre and Periphery : Comparative Studies in Archaeology*. One World Archaeology Series No. 11. Routledge, London.

- Cockrell, Wilburn A.
1980 The Trouble with Treasure--A Preservationist View of the Controversy. *American Antiquity* 45(2):333-339.
- Conran, Sheelagh
2001 Medieval Churches on a Coastal Landscape, The Iveragh Peninsula in South Kerry. Unpublished MSc thesis, University of Ulster Coleraine, Coleraine.
- Corcadden, Anne
2002 The Later Historical Maritime Cultural Landscape of Dundrum Inner Bay. Unpublished MSc thesis, University of Ulster Coleraine, Coleraine.
- Cousteau, Jacques-Yves
1954 Fish Men Discover a 2200-year old Greek Ship. *National Geographic* 105(1):1-36.
- Crumlin-Pedersen, Ole and Birgitte Munch Thye (editors)
1995 *The Ship as Symbol in Prehistoric and Medieval Scandinavia: Papers from an International Research Seminar at the Danish National Museum, Copenhagen, 5th-7th May 1994*. Nationalmuseet, Copenhagen.
- Delle, James A.
1998 *An Archaeology of Social Space: Analyzing Coffee Plantations in Jamaica's Blue Mountains*. Contributions to Global Historical Archaeology. Plenum Press, New York.

1999 Extending Europe's Grasp: An Archaeological Comparison of Colonial Spatial Processes in Ireland and Jamaica. In *Old and New Worlds: Historical/Post Medieval Archaeology Papers from the Societies' Joint Conferences at Williamsburg and London 1997 to Mark Thirty Years of Work and Achievement*, edited by Geoff Egan and R.L. Michael, pp. 106-116. Oxbow Books, Oxford.
- Dumas, Frédéric
1972 *30 Centuries Under the Sea*. Crown Publishers, New York.
- Ekman, Carl
1934 Sjöhistoriska undersökningar vid Björkenäs. *Sancte Christophers gilles chroenica* 8:21-35.
- Fairbanks, Charles
1964 Underwater Historic Sites on St. Marks River. *Florida Anthropologist* 17:44-49.
- Farr, Helen
2006 Seafaring as Social Action. *Journal of Maritime Archaeology* 1(1):85-99.
- Fenwick, Valerie
1987 Crisis in Nautical Archaeology. *International Journal of Nautical Archaeology* 16(1):1.

Firth, Antony

1995 Three Facets of Maritime Archaeology: Society, Landscape, and Critique. Department of Archaeology, University of Southampton. <http://www.wessexarch.co.uk/files/splash-import/wp-content/uploads/2010/04/Firth-1995-Three-Facets-of-Maritime-Archaeology-140410.pdf>.

2002 *Managing Archaeology Underwater: A Theoretical, Historical, and Comparative Perspective on Society and its Submerged Past*. BAR International Series No. 1055. British Archaeological Reports, Archaeopress, Oxford.

Fischer, George

1993 The Conference on Underwater Archaeology and The Advisory Council on Underwater Archaeology: A Brief History. In *Underwater Archaeology Proceedings from the Society for Historical Archaeology Conference*, edited by Shelli O. Smith, pp. 2-6. Society for Historical Archaeology, Kansas City, Missouri.

1999 The History of Underwater Archaeology at Florida State University: a Retrospective of the Past and a Look to the Future. In *Underwater Archaeology Proceedings from the Society for Historical Archaeology Conference*, edited by Adriane Askins Neidinger and Matthew A. Russell, pp. 80-84. Society for Historical Archaeology, Salt Lake City, Utah.

Flanagan, Laurence

1988 *Ireland's Armada Legacy*. Gill and Macmillan, Dublin.

Flatman, Joe

2003 Cultural Biographies, Cognitive Landscapes and Dirty Old Bits of Boat: "Theory" in Maritime Archaeology. *International Journal of Nautical Archaeology*, 32(2):143-157.

Ford, Ben (editor)

2011 *The Archaeology of Maritime Landscapes*. Springer, New York.

Franzén, Anders

1961 *The Warship Vasa: Deep Diving and Marine Archaeology in Stockholm*. 2d ed. Norstedt and Bonnier, Stockholm.

Frost, Honor

1963 *Under the Mediterranean*. Routledge and Kegan Paul, London.

1972 Ancient Harbours and Anchorages in the Eastern Mediterranean. In *Underwater Archaeology: A Nascent Discipline*, edited by UNESCO, pp. 95-114. UNESCO, Paris.

Gawronski, Jerzy

1991 The Archaeological and Historical Research of the Dutch East Indiaman *Amsterdam* (1749). In *Carvel Construction Technique: Fifth International Symposium on Boat and*

Ship Archaeology, Amsterdam 1988, edited by Reinder Reinders, Sean McGrail and Kees Paul, pp. 81-84. Oxbow Monograph No. 12. Oxbow Books, Oxford.

Gibbins, David

1990 Analytical Approaches in Maritime Archaeology: A Mediterranean Perspective. *Antiquity* 64:376-389.

1995 What Shipwrecks Can Tell Us. *Antiquity* 70:234-236.

Gibbins, David and Jonathan Adams

2001 Shipwrecks and Maritime Archaeology. *World Archaeology* 32(3):279-291.

Giddens, Anthony

1984 *The Constitution of Society: Outline of the Theory of Structuration*. Polity Press, Cambridge.

1984 *The Constitution of Society: Outline of the Theory of Structuration*. Polity Press, Cambridge.

Giesecke, Anne G.

1985 Management of Historic Shipwrecks in the 1980s. *Journal of Field Archaeology* 12:108-116.

Goggin, John M.

1960 Underwater Archaeology: Its Nature and Limitations. *American Antiquity* 25(3):348-353.

Gosden, Chris

1994 *Social Being and Time*. Social Archaeology. Blackwell, Oxford.

1999 *Anthropology and Archaeology: A Changing Relationship*. Routledge, London.

Gould, Richard A. (editor)

1983 *Shipwreck Anthropology*. University of New Mexico Press, Albuquerque.

2000 *Archaeology and the Social History of Ships*. Cambridge University Press, Cambridge.

Green, Jeremy

1977 *The Loss of the Verenigde Oostindische Vergulde Draeck, Western Australia 1656*. BAR Supplementary Series 36. 2 vols. British Archaeological Reports, Oxford.

1989 *The Loss of the VOC Retourschip Batavia, Western Australia 1629. An Excavation Report and Catalogue of Artefacts*. BAR International Series 489, Oxford.

Grenier, Robert, Marc Andre Bernier and Willis Stevens (editors)

2007 *The Underwater Archaeology of Red Bay : Basque Shipbuilding and Whaling in the 16th Century*. 5 vols. Parks Canada, Ottawa.

Hafors, Birgitta

1985 The Preservation of the *Wasa*. In *Postmedieval Boat and Ship Archaeology: Papers Based on those Presented to an International Symposium on Boat and Ship Archaeology in Stockholm in 1982*, edited by Carl Olaf Cederlund, pp. 15-18. vol. 256. British Archaeological Reports Series, London.

Hall, Martin

2000 *Archaeology and the Modern World: Colonial Transcripts in South Africa and the Chesapeake*. Routledge, London ; New York.

Harpster, Matthew

2009 Keith Muckelroy: Methods, Ideas and Maritime Archaeology *Journal of Maritime Archaeology* 4(1):67-82.

Harris, Lynn

2010 South Carolina Shipyards: Labour, Logistics, Lumber, and Ladies. *Journal of Maritime Archaeology* 5(1):17-35.

Heidegger, Martin

1992 *The Concept of Time*. B. Blackwell, Oxford, UK.

Hicks, Dan

2007 *The Garden of the World: An Historical Archaeology of Sugar Landscapes in the Eastern Caribbean*. BAR International Series. Archaeopress, Oxford.

Hildred, Alexzandra and Dominic Fontana

2011 *Weapons of Warre: the Armaments of the Mary Rose*. Archaeology of the Mary Rose. 2 vols. Mary Rose Trust, Portsmouth.

Hirsch, Eric

1995 Landscape: Between Place and Space. In *The Anthropology of Landscape: Perspectives on Place and Space*, edited by Eric Hirsch and Michael O'Hanlon, pp. 1-30. Oxford Studies in Social and Cultural Anthropology. Oxford University Press, Oxford.

Hodder, Ian

1982a *Symbols in Action: Ethnoarchaeological Studies of Material Culture*. New Studies in Archaeology. Cambridge University Press, Cambridge Cambridgeshire ; New York.

1982b *Symbolic and Structural Archaeology*. Cambridge University Press, Cambridge Cambridgeshire ; New York, N.Y.

- 1991a *Reading the Past: Current Approaches to Interpretation in Archaeology*. 2nd ed. Cambridge University Press, Cambridge England ; New York.
- 1991b The Need for an Interpretive Archaeology. *Scottish Archaeological Review* 8:8-13.
- 1997 Towards a Reflexive Excavation Methodology. *Antiquity* 71:691-700.
- Horrell, Christopher
 2005 *Plying the Waters of Time: Maritime Archaeology and History on the Florida Gulf Coast*. Unpublished PhD Dissertation, Department of Anthropology, Florida State University.
- Hunter, J.R.
 1994 'Maritime Culture': Notes from the Land. *International Journal of Nautical Archaeology* 23(4):261-264.
- Jasinski, Marek
 1993 The Maritime Cultural Landscape: An Archaeological Perspective. *Archaeologia Polski* 38:7-21.
- 1999 Maritime Archaeology and Underwater Cultural Heritage into the 21st Century. In *Proceedings of the Fourth World Archaeology Congress*. University of Cape Town, South Africa.
- Johnsen, Harald and Bjørnar Olsen
 1992 Hermeneutics and Archaeology. *American Antiquity* 57(3):419-436.
- Johnson, David A. and Chuck Meide
 1998 In Soufrerie's Shadow: An Introduction to an Historic Shipwreck in Kingstown Harbour, St. Vincent and the Grenadines. In *Underwater Archaeology*, edited by Lawrence E. Babits, Catherine Fach and Ryan Harris, pp. 79-87. Proceedings from the 1998 Conference on Historical and Underwater Archaeology, Society for Historical Archaeology, Atlanta, Georgia.
- Johnson, Matthew
 1996 *An Archaeology of Capitalism*. Blackwell Publishers, Oxford.
- Johnson, Richard E. and Russell K. Skowronek
 1986 A Quantitative Analysis of Patterning Potential in Shipwreck Artifact Assemblages. In *Underwater Archaeology: Proceedings of the Fourteenth Conference on Underwater Archaeology*, edited by Calvin R. Cummings, pp. 85-91. Fathom Eight Special Publication No. 7. Fathom Eight, San Marino, California.
- Katzev, Michael
 1974 Last Harbor for the Oldest Ship. *National Geographic* 146:618-625.
- Kelleher, Connie E.

- 1998 The Maritime Archaeological Landscape of Baltimore, Co. Cork. Unpublished MA thesis, University College Cork, Cork.
- Knapp, Arthur Bernard (editor)
1992 *Archaeology, Annales, and Ethnohistory*. Cambridge University Press, Cambridge.
- Kuhn, Thomas S.
1970 *The Structure of Scientific Revolutions*. Chicago University Press, Chicago.
- Lamboglia, Nino
1965 Albenga. In *Marine Archaeology: Developments During Sixty Years in the Mediterranean*, edited by Joan du Plat Taylor, pp. 53-65. World Confederation of Underwater Activities. Hutchinson, London.
- Lenihan, Daniel
1983 Rethinking Shipwreck Archaeology: A History of Ideas and Considerations for New Directions. In *Shipwreck Anthropology*, edited by Richard A. Gould, pp. 37-64. University of New Mexico Press, Albuquerque.
- Leone, Mark P.
1983 Land and Water, Urban Life, and Boats: Underwater Reconnaissance in Chesapeake Bay. In *Shipwreck Anthropology*, edited by Richard A. Gould, pp. 173-188. University of New Mexico Press, Albuquerque.

1984 Interpreting Ideology in Historical Archaeology: Using the Rules of Perspective in the William Paca Garden in Annapolis, Maryland. In *Ideology, Representation, and Power in Prehistory*, edited by Christopher Tilley and Daniel Miller, pp. 25-35. Cambridge University Press, Cambridge, U.K.
- Leone, Mark P. and Parker B. Potter (editors)
1999 *Historical Archaeologies of Capitalism*. Kluwer Academic : Plenum Press, New York.
- Leone, Mark P., Parker B. Potter and Paul A. Shackel
1987 Toward a Critical Archaeology. *Current Anthropology* 28(3):283-302.
- Maarleveld, Thijs
1995 Type or Technique: Some Thoughts on Boat and Ship Finds as Indicative of Cultural Traditions. *The International Journal of Nautical Archaeology* 24(1):3-7.
- Marsden, Peter
2003 *Sealed by Time: The Loss and Recovery of the Mary Rose*. The Archaeology of the *Mary Rose* Volume 1. The Mary Rose Trust, Portsmouth, England.
- Marsden, Peter and Douglas McElvogue
2009 *Mary Rose: Your Noblest Shippe: Anatomy of a Tudor Warship*. Mary Rose Trust, Portsmouth, England.

Martin, Colin J. M.

1972 *El Gran Grifon: an Armada Wreck on Fair Isle. International Journal of Nautical Archaeology* 1:59-71.

1973 The Spanish Armada Expedition, 1968-70. In *Marine Archaeology: Proceedings of the Twenty-third Symposium of the Colston Research Society Held in the University of Bristol, April 4th to 8th, 1971*, edited by David J. Blackman, pp. 439-461. Colston Papers, Volume 23. Colston Research Society and Butterworths, London.

1975 *Full Fathom Five: Wrecks of the Spanish Armada*. Viking Press, Inc., New York.

1979 *La Trinidad Valencera: an Armada Invasion Transport Lost off Donegal*. Interim Site Report, 1971-1976. *International Journal of Nautical Archaeology* 8(1):13-38.

2001 De-Particularising the Particular: Approaches to the Investigation of Well-Documented Post-Medieval Shipwrecks. *World Archaeology* 32(3):383-399.

McCarthy, Michael

2001 Australian Maritime Archaeology: Changes, their Antecedents and the Path Ahead. In *Maritime Archaeology in Australia: A Reader*, edited by Mark Staniforth and Michael Hyde, pp. 14-21. Southern Archaeology, Blackwood, South Australia.

McErlean, Thomas, Rosemary McConkey and Wes Forsythe

2002 *Strangford Lough: An Archaeological Survey of the Maritime Cultural Landscape*. Northern Ireland Archaeological Monographs No. 6. Northern Ireland Environment and Heritage Service and Blackstaff Press, Belfast.

McGhee, Fred L.

1998 Towards a Postcolonial Nautical Archaeology. *Assemblage* 3
<http://www.shef.ac.uk/~assem/3/3mcghee.htm>.

McGrail, Seán

1977 Aspects of Experimental Boat Archaeology. In *Sources and Techniques in Boat Archaeology: Papers Based on Those Presented to a Symposium at Greenwich in September 1976*, edited by Seán McGrail, pp. 23-45. BAR Supplementary Series No. 29. British Archaeological Reports, Oxford.

1980 Obituary: Keith Muckelroy. *International Journal of Nautical Archaeology* 9(4):276.

1998 *Ancient Boats in North-West Europe: The Archaeology of Water Transport to AD 1500*. Longman Archaeology Series, London.

McGuire, Randall H.

1992 *A Marxist Archaeology*. Academic Press, San Diego.

McNeary, Rory William Adamson

2000 Aspects of the Maritime Cultural Landscape of South West Donegal. Unpublished MSc thesis, University of Ulster Coleraine, Coleraine.

Meide, Chuck

1991 *The Development of Legislation Concerning Historic Shipwreck Preservation*. Department of Anthropology, Florida State University.

2001 The Archaeology of Economic Transition: the Excavation of the San Marcos Shipwreck, a Mid-Nineteenth Century Merchant Sailing Ship Lost at St. Marks, Florida. Unpublished Master's thesis, Department of Anthropology, Florida State University, Tallahassee.

Muckelroy, Keith

1975 A Systematic Approach to the Investigation of Scattered Wreck Sites. *International Journal of Nautical Archaeology* 4(2):173-190.

1976 The Integration of Historical and Archaeological Data Concerning an Historic Wreck Site: the *Kennemerland*. *World Archaeology* 7(3):280-290.

1977 Historic Wreck Sites in Britain and Their Environs. *International Journal of Nautical Archaeology* 6(1):47-57.

1978 *Maritime Archaeology*. New Studies in Archaeology Series. Cambridge University Press, Cambridge.

1980 *Archeology Under Water: An Atlas of the World's Submerged Sites*. McGraw-Hill, New York.

Murphy, Larry

1983 Shipwrecks as Data Base for Human Behavioral Studies. In *Shipwreck Anthropology*, edited by Richard A. Gould, pp. 65-89. University of New Mexico Press, Albuquerque.

Myhre, Bjørn

1985 Boathouses as Indicators of Political Organisation. *Norwegian Archaeological Review* 18(1):36-59.

O'Hara, Deirdre

1997 Tonn Rudhraighe: A Maritime Landscape Study of Dundrum Bay, Co. Down, Northern Ireland. Unpublished MSc thesis, University of Southampton, Southampton.

Olsen, Olaf and Ole Crumlin-Pedersen

1967 The Skuldelev Ships. *Acta Archaeologica* 38:73-174.

Olsen, Stanley J.

1958 The Wakulla Cave. *Natural History* 67(7):396-403.

- 1959 The Wakulla Cave. In *Captain Cousteau's Underwater Treasury*, edited by Jacques-Yves Cousteau and James Dugan, pp. 369-373. Harper & Row, New York.
- 1961 SCUBA as an Aid to Archaeologists and Paleontologists. *Curator* 4(4):371-378.
- O'Raw, John B.
 2003 The Salhanha Disaster in the Maritime Cultural Landscape of Lough Swilly. Unpublished MSc thesis, University of Ulster Coleraine, Coleraine.
- Orser, Charles E.
 1996 *A Historical Archaeology of the Modern World*. Contributions to Global Historical Archaeology. Plenum Press, New York.
- O'Sullivan, Aidan
 2001 *Foragers, Farmers, and Fishers in a Coastal Landscape: An Intertidal Archaeological Survey of the Shannon Estuary*. Discovery Programme Monographs No. 5. Royal Irish Academy, Dublin.
- O'Sullivan, Aidan and Colin Breen
 2007 *Maritime Ireland: An Archaeology of Coastal Communities*. Tempus, Stroud, Gloucestershire.
- Patterson, Thomas C.
 1990 Some Theoretical Tensions Within and Between the Processual and Post-processual Archaeologies. *Journal of Anthropological Archaeology* 9(189-200).
- Peterson, Mendel
 1955 *The Last Cruise of H.M.S. "Loo"*. Smithsonian Institution, Washington.
- Poidebard, Antoine
 1939 *Un grand port disparu, Tyr*. Vol. 29. Bibliothèque archéologique et historique, Paris.
- Pollard, Edward John David
 2000 Archaeological Survey and Computer Modelling of the Skerries Maritime Landscape, Co. Antrim. Unpublished MSc thesis, University of Ulster Coleraine, Coleraine.
- Pulak, Cemal
 1998 The Uluburun Shipwreck: An Overview. *International Journal of Nautical Archaeology* 27(3):188-224.
- Ransley, Jesse
 2005 Boats are for Boys: Queering Maritime Archaeology. *World Archaeology* 37(4):621-629.

2007 Rigorous Reasoning, Reflexive Research, and the Space for 'Alternative Archaeologies.' Questions for Maritime Archaeological Heritage Management. *International Journal of Nautical Archaeology* 36(2):221-237.

Rule, Margaret

1982 *The Mary Rose: the Excavation and Raising of Henry VIII's Flagship*. Conway Maritime Press, London.

Ruoff, Ulrich

1972 Palafittes and Underwater Archaeology. In *Underwater Archaeology: A Nascent Discipline*, edited by UNESCO. UNESCO, Paris.

Sanderson, Stephen K. (editor)

1995 *Civilizations and World Systems: Studying World-Historical Change*. Altamira Press, Walnut Creek, California.

Sauer, Albrecht

2011 Maritime Experimental Archaeology: Trying the Impossible. In *ACUA Underwater Archaeology Proceedings*, edited by Felipe Vieira de Castro and Lindsey Thomas, pp. 49-53. Advisory Council on Underwater Archaeology, Austin, Texas.

Shanks, Michael and Christopher Y. Tilley

1988 *Social Theory and Archaeology*. University of New Mexico Press, Albuquerque.

1992 *Re-Constructing Archaeology: Theory and Practice*. 2nd ed. New studies in archaeology. Routledge, London ; New York.

Skowronek, Russell K.

1984a *Trade Patterns of Eighteenth Century Frontier New Spain: the 1733 Flota and St. Augustine*. Master's Thesis, Department of Anthropology, Florida State University, Tallahassee. Volumes in Historical Archaeology No. 1. South Carolina Institute of Archaeology and Anthropology, Columbia.

1984b *Archeological Testing and Evaluation of the Legare Anchorage Shipwreck Site, Biscayne National Park, Summer 1983*. Southeast Archeological Center, National Park Service, Tallahassee, Florida.

Smith, Roger C.

2002 Florida Frontiers: From Ice Age to New Age. In *International Handbook of Underwater Archaeology*, edited by Carol Ruppé and Jan Barstad, pp. 143-167. Plenum Series in Underwater Archaeology. Kluwer Academic/Plenum Publishers, New York.

South, Stanley A.

1977 *Method and Theory in Historical Archeology*. Academic Press, New York.

Souza, Donna J.

1998 *The Persistence of Sail in the Age of Steam: Underwater Archaeological Evidence from the Dry Tortugas*. The Plenum series in underwater archaeology. Plenum Press, New York.

Spencer-Wood, Suzanne

1990 Stretching the Envelope in Theory and Method. In *Underwater Archaeology*, edited by Toni L. Carrell. Society for Historical Archaeology, Tucson.

Staniforth, Mark

1999 Immigrants and Convicts to Australia: The Voyage Experience. *Proceedings of the World Archaeological Congress 4*. University of Cape Town, South Africa.

2000 The Archaeology of the Event - The Annales School and Maritime Archaeology. In *Maritime Archaeology in Australia: A Reader*, pp. 42-45. Southern Archaeology, Blackwood, South Australia.

2003 *Material Culture and Consumer Society: Dependent Colonies in Colonial Australia*. The Plenum Series in Underwater Archaeology. Kluwer Academic/Plenum Publishers, New York.

Sténuit, Robert

1973 *Treasures of the Armada*. E.P. Dutton & Co., Inc., New York.

Stickel, E. Gary

1983 The Mystery of the Prehistoric "Chinese Anchors": Toward Research Designs for Underwater Archaeology. In *Shipwreck Anthropology*, edited by Richard A. Gould, pp. 219-244. University of New Mexico Press, Albuquerque.

Taillez, Philippe

1965 Titan. In *Marine Archaeology: Developments During Sixty Years in the Mediterranean*, edited by Joan du Plat Taylor, pp. 76-92. World Confederation of Underwater Activities. Hutchinson, London.

Taylor, Joan du Plat

1965 *Marine Archaeology: Developments During Sixty Years in the Mediterranean*. World Confederation of Underwater Activities. Hutchinson, London.

Tilley, Christopher Y.

1994 *A Phenomenology of Landscape: Places, Paths, and Monuments*. Explorations in Anthropology. Berg, Oxford, UK.

Tuddenham, David Berg

2010 Maritime Cultural Landscapes, Maritimity and Quasi Objects. *Journal of Maritime Archaeology* 5(1):5-16.

UNESCO

- 1972 *Underwater Archaeology: A Nascent Discipline*. UNESCO, Paris.
- Van Doorninck, Frederick H.
 in press *Serçe Limani, Volume 3. The Ceramics, Mercantile Equipment, and Historical Context of an Eleventh-Century Shipwreck*. 1st ed. Texas A&M University Press, College Station, Texas.
- Wagner, Kip
 1965 Drowned Galleons Yield Spanish Gold. *National Geographic* 127(1):1-37.
- Wallerstein, Immanuel Maurice
 1974 *The Modern World-System I: Capitalist Agriculture and the Origins of the European World-Economy in the Sixteenth Century*. Studies in Social Discontinuity. Academic Press, New York.
 1980 *The Modern World-System II: Mercantilism and the Consolidation of the European World-Economy, 1600-1750*. Studies in Social Discontinuity. Academic Press, New York.
 1989 *The Modern World System III: The Second Era of Great Expansion of the Capitalist World-Economy, 1730-1840s*. Studies in Social Discontinuity. Academic Press, San Diego.
- Watson, Patty Jo
 1983 Method and Theory in Shipwreck Archaeology. In *Shipwreck Anthropology*, edited by Richard A. Gould, pp. 23-36. University of New Mexico Press, Albuquerque.
- Watson, Richard A.
 1972 The 'New Archaeology' of the 1960s. *Antiquity* 46:210-215.
- Wedde, Michael
 1996 From Classification to Narrative. *Mediterranean Historical Review* 11:117-164.
 2000 *Towards a Hermeneutics of Aegean Bronze Age ship Imagery*. Peleus : Studien zur Archäologie und Geschichte Griechenlands und Zyperns. Bibliopolis, Mannheim.
- Weinberg, G. D., V. R. Grace, G. R. Edwards, H. S. Robinson, P. Throckmorton and E. K. Ralph
 1965 The Antikythera Shipwreck Reconsidered. *Transactions of the American Philosophical Society* 55(3).
- Westerdahl, Christer
 1986 Die maritime Kulturlandschaft. Schiffe, Schifffahrtswege, Häfen. Überlegungen zu einem Forschungsansatz. *Deutsches Schifffahrtsarchiv* 9:7-58.
 1992 The Maritime Cultural Landscape. *International Journal of Nautical Archaeology* 21(1):5-14.

- 1994 Maritime Cultures and Ship Types: Brief Comments on the Significance of Maritime Archaeology. *International Journal of Nautical Archaeology* 23(4):265-270.
- 1995 Traditional Zones of Transport Geography in Relation to Ship-Types. In *Shipshape: Essays for Ole Crumlin-Pedersen on the Occasion of His 60th Anniversary February 24th 1995*, edited by Olaf Olsen, Jan Skamby Madsen and Flemming Rieck, pp. 213-230. Viking Ship Museum, Roskilde, Denmark.
- 2008 Fish and Ships: Towards A Theory of Maritime Culture. *Deutsches Schifffahrtsarchiv* 9 (2007):191-236.

Wyllie, Alison

- 1985 Critical Theory in Archaeology. *Journal of Anthropological Archaeology* 4:133-147.