EXHIBIT A-12

DR. SEAN A. KINGSLEY

PART 12

ANNEXES 19 TO 20

ANNEX 19

TO

EXHIBIT A

19.1. Iron stove on the wreck of HMS *Pandora*, Great Barrier Reef, 1791: http://www.qm.qld.gov.au/features/pandora/wreck/03_wreck.asp.

19.2. Iron stove on the Mardi Gras shipwreck, Gulf of Mexico, early 19th century: http://www.flpublicarchaeology.org/mardigras/artifacts/stove.

DR. SEAN A. KINGSLEY

HMS Pandora

The wreck

Rediscovery

The location

What remains of the hull

Will the Pandora ever be raised?

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What remains of the hull?

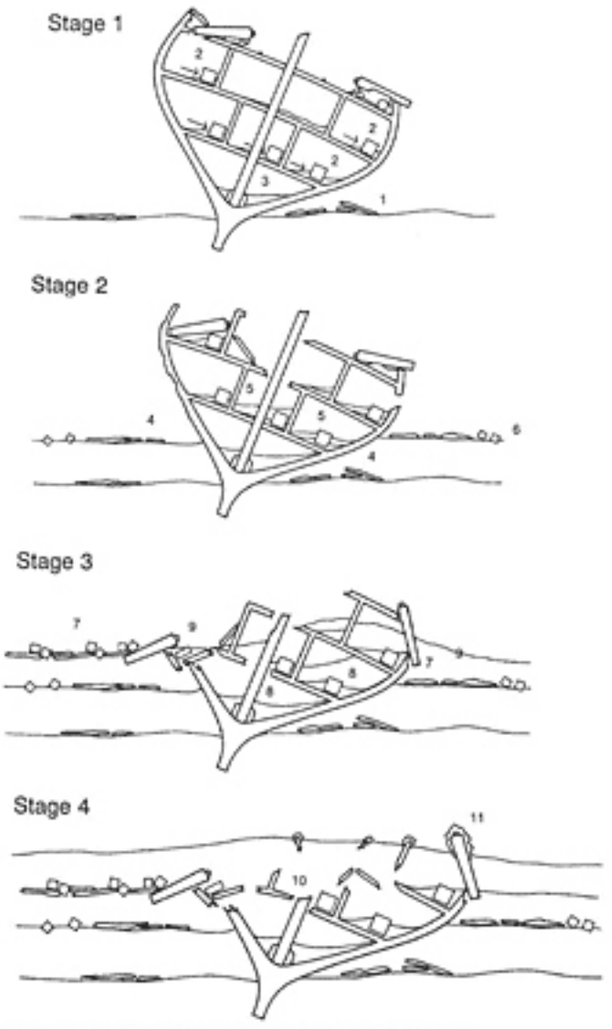
After sinking-damaged but substantially intact-the hull settled into the sea floor on its starboard side and appears to have been buried over time. As layers of sediment were accumulating within and around the hull, the exposed upper levels of the vessel collapsed and disintegrated as a result of attack by marine borers, the effect of currents and, to a lesser extent, wave motion (Stages 1 and 2).

The distribution of the visible features of the wreck attests to sediment build-up and the gradual collapse and disintegration of the exposed upper hull levels-i.e. burial from the bottom up and physical disintegration from the top down. These two processes probably took several decades, possibly up to 60 - 70 years (Stages 3).

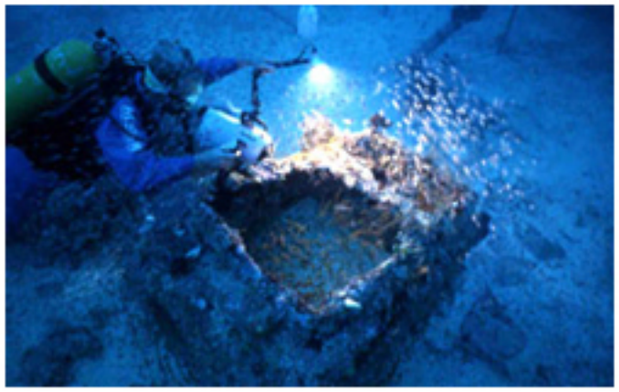
As the *Pandora* disintegrated, objects tumbled out of the wreck and were deposited on the seafloor around the wreck. Some were then buried; others may have been swept some distance from the wrecked hull or become trapped under the stern before its final collapse.

The most recognisable and visible features of the wreck include several large iron objects on the sea floor-e.g. an anchor and the vessel's galley (Brodie) stove.

Using remote sensing equipment, several attempts have been made to determine the extent and condition of the hull's remains, but these have given indications only. From what has been exposed to date, indications are that



4 stages of disintegration (Gesner 1991).



The *Pandora*'s Brodie stove (Photo: Brian Richard).

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Annex 19.1

approximately 30% of the original hull has been preserved (Stage 4). The timbers that have actually been seen so far appear to be in good condition. But there is evidence of collapse of deck beams and possibly of frames.

There are still numerous unanswered questions about the structural cohesion of the surviving timbers. A definitive assessment of the extent, cohesion and condition of the buried hull remains can only be made after excavation has uncovered them. This would require retrieval of the entire artefact assemblage lying buried in the sediment in and around the hull.

One of the *Pandora*'s anchors on the sea floor (Photo: Pat Baker).

In 1995 it was estimated that approximately 590 cubic metres of sediment would require systematic excavation to uncover all of the hull remains. To date (2005) approximately 240 cubic metres have been excavated.

One of the *Pandora*'s anchors on the sea floor. This was the anchor dropped "underfoot"-closest to the western reef-just after the crew had re-floated the vessel from the reef.

Mardi Gras Shipwreck

An early 19th century vessel off the coast of Louisiana.

The Ship's Stove

Introduction

Several unique artifacts characterize the Mardi Gras Shipwreck. One such artifact is the ship's cooking stove located along the western side of the site. At this time, little is known about this enigmatic artifact. Moreover, it is impossible while working from photos alone to determine if the stove is attached to the remains of an upper deck structure or some portion of a lower deck. The stove's size poses two questions: 1) does this stove represent the remains of a galley stove used to cook for the vessel's overall complement; and 2) could this stove represent the type of stove that would have been located in the commander's cabin; used exclusively to heat and cook for the commander and officers of the vessel? The location of this stove and its current association with many other artifacts only fuels speculation as to its purpose and function. These questions we hope to answer with data gathered during the archaeological investigations in May 2007.

Annex 19.2

Figures 1 and 2. Ship's Stove from the Mardi Gras Shipwreck; two views.

The stove found at the Mardi Gras Shipwreck site is believed to be similar to one patented by Alexander Brodie in England in 1780 (Brodie 1780). If this stove can be demonstrated to be of this type, it is an important find as it would represent one of only four ship's stoves of similar design and construction known to still exist. Two stoves positively identified as Brodie Patent Stoves have been located archaeologically. One still rests on the seafloor at the site of HMS Pandora. Pandora, a British Royal Navy warship, was dispatched to the South Pacific in pursuit of HMS Bounty and her mutinous crew. Pandora met her demise in 1791 off the coast of Queensland, Australia. In 1977, Pandora was re-discovered and continues to be the focus of archaeological investigations and preservation.

Another authentic Brodie Patent Stove was identified on HMS De Braak. De Braak foundered during a violent squall off the coast of Cape Henlopen, Delaware in May 1798 (Shomette 1993:38). Salvaged by treasure hunters on and off for over a century, De Braak was subjected to an intense and sustained removal of artifacts during the 1980s and early 1990s with the eventual removal of most of the hull structure. One artifact, the ship's galley stove, suffered an ignoble fate at the hands of the salvors. Shomette described this event:

> Owing to both the salvors' priorities and the selective nature of the retrieval process, many artifacts which were of historical or archaeological significance, but which had not been recovered whole, were lost. In some cases, artifacts thought to be of no monetary value were discarded altogether before they could even be brought ashore. When De Braak's galley stove was discovered amidships, for example, it was hoisted aboard the salvage vessel, but the salvors, considering it little more than an unwieldy piece of junk and of no obvious monetary value, threw it over the side on their way back to Lewes. Out of ignorance, the salvors had disposed of one of only two such items, known as Brodie Stoves, ever recovered from an eighteenth century shipwreck site…The other stove had come from the site of HMS Pandora… (Shomette 1993:221)

Still, archaeologists were able to learn about the stove by exploring the historic record and this unfortunate event.

The third stove that resembles the one on the Mardi Gras Shipwreck is located on a site named the Piña Colada Wreck (Sinclair 2002:3). This site was named because of the numerous coconuts that are the obvious remnants of a cargo and now litter the interior of the hull remains and the seafloor. Located by treasure hunters in 2000, the site lies in approximately 16,300 feet of water off the coast of Florida. Many navigational instruments, utilitarian wares, creamwares, and bottles were identified and resemble those found on the Mardi Gras Shipwreck site. Analysis of wood samples as well as material culture, including gold coins wrapped in fragments of newspaper found in a gold box, provides the site with a terminus post quem of 1810 (Sinclair 2002:5). An online report details some of the finds and a personal communication with the project archaeologist revealed that a cooking stove, similar to the one found on the Mardi Gras Shipwreck site, was found lying face down at the site approximately amidships (Figure 3.) (http://web.mit.edu/deeparch/www/events/2002conference/papers/Sinclair.pdf).

Figure 3. Ships stove located on Piña Colada Wreck approximately amidships, lying face forward (Photo courtesy of James Sinclair and Deep Ocean Exploration and Woods Hole Oceanographic).

Similar to the stoves found at the site of HMS Pandora and HMS De Braak, the stoves found on the Piña Colada Wreck and the Mardi Gras Shipwreck Site may represent smaller versions of the Brodie Stove. Little information is available about the stove located on the Piña Colada Wreck and it is unclear at present whether the stove on the Mardi Gras Shipwreck Site is a true Brodie Stove. Historic research has provided some insights into the construction of this most unique and invaluable archaeological feature. A brief synopsis of stoves from this period as well as Alexander Brodie and his life, may provide a bit of context for the Mardi Gras Shipwreck Site, as well as some insight as to what archaeologists may expect to find when this stove is recovered.

Iron Firehearths

The iron firehearth was not a new feature to the Royal Navy. First proposed in 1728, the iron firehearth was a replacement for the earlier firehearth constructed entirely of layers of brick. The iron firehearth replaced earlier firehearths "because... the 'great weight of brickwork' was overloading and straining some of the small sloops" (Lavery 1987:197). These early iron firehearths consisted of a rectangular kettle constructed of copper. Known as a double kettle, the kettle was divided into two unequal parts with the larger side covered with a round lid and the smaller side covered with an oval lid. The firehearth was essentially a frame constructed of iron designed to house the copper double kettle. The firehearth would have also contained a tray and fire box, and would have been fitted with racks and a spit for grilling and roasting. According to Brian Lavery, the frame would have been square and its size corresponded to the size of the ship (Lavery 1987:197-199). This design would continue in use until 1780 when Alexander Brodie received a contract from the British Royal Navy to produce stoves for Royal vessels. For more information, read the description of the stove and biography of Alexander Brodie.

Conclusion

Currently, it is unclear as to what type of stove is located on the Mardi Gras Shipwreck. This stove may be a smaller version of the stove that Brodie patented in 1780. Perhaps this stove was designed specifically for a small vessel or one that was used in the commander's cabin. Another possibility may be that this stove is not a Brodie stove, but one from another manufacture in either Britain or the United States. As archaeologists recover and examine the stove, it will likely provide answers to the two questions presented earlier, as well as provide further insight into the industrial technology of the day as well as the types of foods consumed and preparation methods used while at sea.

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