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Pickled Fish and Salted Provisions
Historical Musings from Salem Maritime NHS

Fire and Lights

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The expression 'Fire and Lights' [1] refers to an old slang term in the British Navy for a ship's master-at-arms, whose responsibilities included securing all fires and extinguishing all lights during the night. Frequent inspections by the ship's corporals ensured compliance as a precaution against the most feared mishap aboard ship, particularly a wooden ship: fires.

In the age of sail, unless a ship caught fire at the dock or close to land, chances of survival were greatly limited. In the days before radio, if it became necessary to abandon ship and no other vessel saw the smoke, there were no means of communication beyond ringing the ship's bell or firing a gun to make a location known. Even if there was enough room in the ship's boats and plenty of food and water, being picked up still required visual contact. If a ship was in a heavily traveled shipping lane chances were reasonably good as long as the weather held. For those less fortunate, prospects were grim. Although it was possible to make extensive voyages in small boats, as did Captain Bligh after the unpleasantness aboard HMS *Bounty*, the typical scenario was disaster. And it could be weeks or months before someone noticed that a ship was missing.

Not surprisingly, the officers and men of ships that were potential floating torches took the danger of fire very seriously. Wood burns. Wood soaked with pine tar and pitch or painted with oil-based paint and varnish burns even better. The danger of fire aboard an early man-of-war was greatly increased during combat when the guns required the use of flammable cartridges (flannel bags filled with gunpowder), loose powder for priming, and a smoldering wick or sparking gunlock for ignition. Not to mention the fire damage expected from projectiles, hand grenades and possible attack by fire ships, specially prepared vessels that were sent in flames into an adversary's fleet, all of which could start a fire aboard ship. The absolute worst that could happen was the ship's powder magazine taking fire. Extensive precautions were taken to prevent this; however, more than a few ships were lost from explosions, such as the 126-gun Swedish flagship *Kronan* on June 1, 1676, and the French 124 gun *L'Orient* on August 1, 1798. Both of these vessels vanished in giant fireballs with massive loss of life. Modern navies face some of the traditional risks compounded by the presence of large quantities of petroleum fuels.

The potential for fire aboard commercial vessels was dictated by factors somewhat less dramatic than aboard naval vessels, although armed merchant ships were subject to the hazards inherent to the use of cannon. Nearly all ships used fire in food preparation, and various types of cambooses (stoves) or fireplaces were employed. Whaling ships used fire to render the oil from whale blubber, a combination for disaster waiting to happen.

Pre-electric illumination aboard ship was by candle or lantern (much preferred for safety reasons). Naturally the open flame required constant vigilance but accidents still happened in spite of precautions. In the hold a dropped candle or

lantern could start a chain of events that could quickly go out of control. Of particular concern in this regard were inflammable stores and spirits. Much care was taken in stowing casks of alcoholic liquors, which were prone to leak if not properly aligned, bedded and chocked to keep them from changing shape due to their own weight or the ship's motion. An open flame wouldn't get much response from a cargo of salt or bar iron, but alcohol fumes presented a whole different picture.

Different sets of circumstances surround materials subject to spontaneous combustion. Stevens' guide for stowage addresses these in detail.[2] He observes that the absorption of moisture and decomposition can facilitate spontaneous combustion. Some common products subject to moisture absorption hazard include raw cotton, cotton waste and cotton cloth, flour, hemp and rope, wood charcoal, roasted coffee, hay, guano, lime (leaking lime schooners were a recognized hazard) and even chocolate. Heat producing decomposition particularly affected all sorts of oily substances and materials, paint and printing ink, lucifers (matches), fireworks and even salvaged iron which had been a long time in salt water.

Although not sources of specifically spontaneous combustion, certain types of bituminous coal, and water-damaged guano produce explosive gasses. Similarly, fumes from spirits, such as brandy, rum, and whiskey, naphtha, turpentine and like products, will ignite at a distance from a leaking or opened container when exposed to an open flame.

Beyond human error and spontaneous combustion, lightning wreaked havoc when it traveled into the hold and ignited the ship's stores and cargo or set sails and rigging ablaze.

Stevens cites a bizarre example of a fire starting aboard ship. He quotes Lieutenant A. Rodney Blake, commander of the two-gun dispatch vessel *Psyche*. On December 16, 1865, Lieutenant Blake wrote: "yesterday afternoon, about three o'clock, the steward detected the smell of fire, and came into the saloon first, as there had been a fire in the stove; but, finding nothing wrong with that, he looked around and discovered one of the curtains that was drawn over a "bulls-eye" scuttle, smoldering, and all but in a blaze, from the rays of the sun striking through the glass. Two holes are burnt

quite through."[3]

What was to be done to extinguish fires aboard ship prior to the invention of the steam driven pump? On a well-run ship each man knew what to do in case of fire.

For centuries the firefighter's tools of the trade were buckets, hooks, axes, and ladders. In the seventeenth century the predecessors of today's fire engines appeared. These hand-powered pumps were not very powerful by today's standards, but did allow directing the water at a specific area at some distance. Throughout the eighteenth century and early years of the nineteenth century, the "engines" required their reservoir tubs to be filled by hand. These tools were equally familiar to firefighters on land or aboard ship. Some larger vessels, such as the United States frigate *Essex* (1799), had an "engine" aboard. Hers is described in the carpenter's indent (list of property) as "1 engine with copper tub, pipe suction, & leading."[4] Other options were available to those less well provided. "Wet mattresses, hammocks, blankets and so on might be enough to put out a small fire; otherwise, buckets of water were passed from hand to hand, and the wash deck hoses were used."[5] If the sails or rigging caught on fire, attempts were made to lessen the effect of the wind on the spread of the fire. Adjacent sails were taken in or drawn as far away from the fire as possible, or cut away if necessary, and yards with burning canvas were struck (brought down) to within reach of the firefighters if possible. If the fire could not be controlled aloft it sometimes required cutting down the mast.

When a ship was moored in the harbor or at a wharf, the possibility of fire was subject to additional considerations. If the fire started on land nearby, sailing ships were at risk since they could not be easily maneuvered out of harm's way. Fire aboard one vessel at her mooring could quickly set a nearby vessel on fire. If moored in an anchorage, sometimes the only solution was to cut away the anchor cables and try to get out of the way as quickly as possible. Wind and tide dictated the effectiveness of evasive action, as did the speed of your attempts to get boats into the water to tow the ship out of danger.

When moored at, or close to, a wharf, land-based fire engines could be deployed directly, or put into boats to access a ship, as happened when the ship *Martha* was struck by lightning on June 29, 1798.[6] But sometimes a ship was just far enough out of reach to fatally slow the response. Salem's Dr. William Bentley commented on a fire aboard the ship *Aurora*, February 4, 1798: "We could do little, but the Ship has not been entirely lost."[7] The next day he again commented concerning the incident: "The Ship we find belonged to Mr. W. [William] Gray, outward bound, commanded by Capt. Felt. Her cargo was principally rum & sugar. One Duncan was left on board as Ship keeper. He lost an arm in the war. He had been before dismissed from service for intemperance. He perished in the flames & but a small part of his body was left unconsumed. It was doubt-

less his folly which occasioned the damage to the Ship & the loss of his own life."[8] On February 21, Bentley notes: "Mr. Wm. Gray presented to the Engine men, who first reached the Ship at the late fire, 140 dollars. The [fire engine] Company agreed that the seven who went off with the Engine should receive it."[9]

The concept of drowning or smothering a fire was thoroughly understood as another entry in Stevens points out: "Capt. Sedgwick recommends that when fire occurs in the hold, a recorded number of auger holes should be bored in the gun-room or forecastle until the water is level with the beams; one hatch only to be kept open, two will admit a draught and create flame; throw in water daily. When the danger is over, plug all the holes. If bad weather prevails, close every aperture, as a fire may be thus kept smoldering for weeks. Another plan is to bore holes in the deck, over the suspected place, nearly through; plug the scuppers, &c., and fill the deck six or eight inches with water. Then finish the holes, and, and keep them supplied with water; plug them immediately [if] the supply fails or the danger is over. In all cases prepare boats with provisions."[10] Harland cites an interesting [if somewhat more risky] variant on the use of augers in fire fighting: "…the crew of the American ship *John Kay* extinguished a fire in the hold, by boring holes along the waterline, then going about, thus submerging them, on the other tack."[11]

In spite of developments in fire fighting technology, shipboard fires remained the source of some of the deadliest accidental disasters. On December 6, 1917, the French ship SS *Mont Blanc*, loaded with ammunition and high-octane fuel caught fire and blew up in Halifax, Nova Scotia, leveling the city.

On April 16, 1947, the explosion of the ships SS *Grandcamp* and SS *High Flyer*, both loaded with ammonium nitrate, obliterated a major portion of Texas City, Texas. In a situation harking back to Stevens' observations nearly one hundred years earlier, moisture (in this case from the steam fire suppression systems) saturated the fertilizer. As predicted, it rapidly decomposed, giving off a flammable gas, which finally ignited and blew the ships and the surrounding waterfront to bits.

Even the most carefully regulated practices did not eliminate fires aboard the aircraft carriers USS *Leyte* on October 16, 1953, and USS *Enterprise* on January 14, 1969; both events took their toll in lives and injuries.

The transportation of large quantities of potentially dangerous cargo remains hazardous even though fire suppression technology has become a long way since the days of the fire bucket and hand pump fire engine.

No doubt the threat of fire aboard ship and its consequences will remain with us for a long time to come.

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Notes

[1] Peter Kemp, ed., *The Oxford Companion To Ships & The Sea* (London, 1976), p. 305.

[2] Robert White Stevens, *On The Stowage of Ships and Their Cargoes: With Information Regarding Freights, Charter-Parties, etc., etc. Sixth Edition* (London, 1873), p.135-137, paragraphs 187-193.

[3] Stevens, p.187, paragraph 298.

[4] Philip Chadwick Foster Smith, *The Frigate Essex Papers: Building the Salem Frigate 1798-1799* (Salem, 1974), p. 270.

[5] John Harland, *Seamanship In The Age of Sail, An account of the Shiphandling of the Sailing Man-of-War 1600-1860, Based on Contemporary Sources* (Annapolis, 1984), p. 311.

[6] William Bentley, D.D., *The Diary of William Bentley, D.D.,* vol. 2, p. 273.

[7] Bentley, vol. 2, p. 257.

[8] Ibid., 257.

[9] Ibid., 258.

[10] Stevens, p. 186, paragraph 296.

[11] Harland, p. 311.

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