

Notes, Commentary, & Errata *The Sea Rover's Practice*

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Extensive notes on content, based on research and discovery subsequent to publication, are provided below. Critical typos are also noted. I also recommend reviewing notes and errata for *The Buccaneer's Realm* in a similar pdf document on my website, plus those for *Pirate Hunting*, *How History's Greatest Pirates...*, and *The Golden Age of Piracy* on their respective pages on my website at benersonlittle.com. Associated blog posts are noted in the text below. Copyright Benerson Little 2008-2020.

Errata

Page 4, last paragraph, typo, "Peter Drake" should be "Francis Drake." The reference is correct in the index.

Page 35, last paragraph, second line, delete the comma after *corsaire*. M. Merrien is a maritime historian, although he probably would not mind being referred to as a *corsaire*.

Page 55, Blackbeard's ship, the *Queen Anne's Revenge*. Recent research by maritime archaeologists indicates that the ship was probably not a flute.

Page 56, Blackbeard and the *Scarborough* man-of-war. There is no evidence that the engagement ever took place, and the man-of-war's logs do not mention the fight. The ultimate source appears to be Thomas Southey's *Chronological history of the West Indies* (London: Longman et al, 1827), vol. 2:212. I could not discover where Southey got his information.

Page 65, 2nd paragraph, powder loads. Revise to read, "500 to 650, or even more, depending on powder quality and musket caliber" as opposed to "1000 to 1300"; and "one and a half to two shots" as opposed to "three shots." For some reason I accidentally calculated from 40 pounds instead of 20. Moreover, if larger charges than conventional were used, these quantities would be reduced. See below, "Page 61," "Page 64," and "Page 65" in the "Notes, Comments, and Observations" for more details.

Page 68, 2nd paragraph, the second line should read: "The cutlass..., and may have been used similarly to..."

Page 139-140, great gun illustrations. Throughout the period, the bed carriage (illustrated on page 140) was the norm. The truck and axle carriage did not appear until roughly 1730 and probably was not common for at least two more decades. Note also that while the English (British) breeched naval guns at the gun's cascabel, European navies breeched them through the carriage.

Page 141, 1st paragraph, chambers for chamber-loaded swivel guns. Chambers were *not*, as I stated, loaded with powder and shot, but only with powder and a tompon or wooden cylinder if the powder load did not fill the chamber entirely *or* the shot was loaded conventionally from the muzzle. The shot, whether round shot or a form of case shot, was pushed into the barrel, then the chamber was loaded into the swivel gun. See below, “Page 141,” for more information.

Page 203, 2nd paragraph, last line should read “...and the younger men...”

Page 244, Captain Uring convalesced in Virginia, not North Carolina. Author’s error.

Notes, Comments, and Observations

Page 31, 3rd paragraph, ship’s officers. In 1686 Bartholomew Sharp, commanding the *Josiah* frigate, formally lists Paul Abney as the “lieutenant” of the *Josiah*. Sharp, a buccaneer, had recently committed piracy at Campeche and on the sea, and was assisting the governor of Bermuda in dealing with an insurrection, under authority of an almost certainly invalid commission. Sailing under, in theory at least, a “lawful” commission and wanting to avoid charges of piracy, Sharp had every reason to organize his vessel as a European naval vessel or privateer, not a buccaneer. However, the usual manner of American privateers, from the Caribbean to the New York and New England colonies, appears to have been in accordance with Caribbean custom, aka “the Jamaica rule.” See *CSP 1685-1688*, nos. 532, 841iv; the Bartholomew Sharp chapter in *How History’s Greatest Pirates*; and also the articles of Capt. William Kidd commissioned as a pirate hunter—his articles were organized more according to the Jamaica Rule, unlike Sharp’s “pirate and Indian hunting” privateer articles, unless, of course, Sharp designated his quartermaster as his lieutenant sole for the sake of appearance.

Page 31, 3rd paragraph, ship’s officers. Pirate officers listed by Captain Snelgrave in 1719 included quartermaster, boatswain, surgeon, trumpeter, master, and carpenter. Other sources list these officers and gunner as well. Commissions against pirates often list pirate officers other than captain as “lieutenant, master, quartermaster, carpenter, boatswain, gunner, and inferior officers.” See William Snelgrave, *A New Account of Some Parts of Guinea* (London: James, John, and Paul Knapton, 1734), 195-288, and Johnson, *History of the Pirates*, 13, 51, 54, 274.

Page 33, shares and outfitting (repeated from *Buccaneer’s Realm* notes). Buccaneers, filibusters, pirates, and many privateers were required to provide their own arms. According to Captain Thomas Larimore in Boston in 1695, “the person fitted out always allows to the person fitting out One full Quarter part of a whole share of whatsoever is gained on the voyage.” The records of the privateer *Revenge*, out of Rhode Island in 1741 provide “½ of a ¼ Share for a Gun and Cartouch” and “¼ of ¼ of do. [one share] for a pistoll.” This practice was almost certainly in place prior to 1695, and it is likely that many buccaneers and filibusters contracted in such a manner with local suppliers, investors, or bankers for the arms and powder required. Raveneau de Lussan was advanced funds by M. de Franquesnay in Petit Goave in 1684, although de Lussan does not provide the terms. See “Deposition of Thomas Larimore, October 28, 1695,” in Jameson, *Privateering and Piracy*, 152-153; “Abstract of the Shares of the Revenge” in Jameson, *Privateering and Piracy*, 417; and de Lussan, *Journal of a Voyage*, 36.

Page 36, second paragraph, disability compensation: conventional European privateers typically awarded the seriously wounded double shares. See Robert Park's *Defensive War by Sea* (London: 1704), page 128.

Page 45, larger sea roving ships. The *Mocha* Frigate, a Red Sea pirate in 1697, formerly an East Indiaman, carried at least a few—"some"—16 and 18 pounders (demi-culverins in older terminology) on her lower gundeck, 10 patereroes, and 2 Coehorn mortars in the head (the mortars fired a small grenade of iron or coated canvas, Woodes Rogers also carried these mortars on his privateering voyage around the world). Charles Johnson notes that the *Mocha* was a 40 gun ship, but an eyewitness aboard notes only 34. The smaller guns were probably of 9 or 8, 6, and 3 or 4 pound shot, unless the swivels were included in the number.

In 1683 Laurens de Graff sailed a captured Dutch-built Spanish slaver, the *San Francisco Javier y San Lucas Evangelista*, which he renamed the *Neptune* and increased the armament to roughly 50 guns, although at 263 or 273 tons *mercante*, equal to 310 or 322 tons *guerra* (roughly equal to English burthen), under de Graff she probably mounted no more than the 34 great guns that she was captured with, the rest being swivels, 14 or 16. For example, the Asiento slaver *Santa Cruz*, of roughly 500 tons, mounted 32 guns and 16 patereros at Cartagena in 1671. In theory, the *Santa Cruz* could mount roughly 50 guns of moderate size. Very typically, most Spanish ships (as well as ships of other nations often as well) did not mount as many guns as they had ports. The fact that the *San Francisco Javier's* had a full armament when captured was likely due to the fact that she was being dispatched to engage de Graff and his *flibustier* fleet. Additional guns would have been added to her existing armament.

There was a tendency then, and still so now, to exaggerate the number and size of great guns carried aboard larger pirate ships. Blackbeard's purported 40 gun ship was, given its 200 (or possibly 300) tons, probably no more than a 24 to 26 gun ship of 6 pound and smaller shot, with the rest being swivel guns. Even if she were of 300 tons, 40 guns would make her over-gunned for her size, with consequences in ship-handling. To date, guns recovered from the likely site of the wreck are small guns.

Note that the *Mocha* Frigate was unusual in the caliber of her guns: most ships up to the fourth rate of this period mounted smaller guns, even on the lower tier, and often mounted fewer guns than they were pierced for. A Spanish ship of the Armada de Barlovento, for example, of 500 to 700 tons and pierced for roughly 50 to 60 guns, might carry as few 40, ranging from 12 (or even 10) pounders to 4 pounders, with a half dozen 18 pounders mixed in with the 12s. Guns of 16 or 18 pound shot were usually the largest seen on Spanish ships of this size in this era. English ships of this size—fourth rates, of 450 to 940 tons—typically mounted 12 pounders on the lower deck, although occasionally culverins (18 pound shot) and, very rarely, demi-cannon (32 pound shot) are seen. The 50 gun, 711 ton pirate hunter HMS *Swallow*, whose captain and crew brought Bartholomew Roberts to bay, mounted 18 pounders on her lower deck, with 9 and 6 pounders above.

See Solomon Lloyd and William Reynolds, "A Large Account of the Action of the Ship Dorrill with a Pirate Ship Mocha, dated Achin, 28th August 1697" in *Pirates of the Eastern Seas, 1618–1723: A Lurid Page of History* by Charles Grey, edited by George MacMunn (London: Sampson

Low, Marston, & Co., [1933]), page 143; Adrian B. Caruana, *The History of English Sea Ordnance 1523-1875*, volume 1; Enrique García-Torralba Pérez, *Las Fragatas de Vela de la Armada Española 1600-1850*, 105-106; Beeston, *Voyage to Cartagena*, 172; and Little, *The Golden Age of Piracy*.

Pages 46-48, oars and sweeps, stowage of. Aboard the War of 1812 schooner USS *Hamilton*, lost and later discovered almost intact in Lake Ontario in almost 50 fathoms, sweeps were stowed lashed outboard at the stern quarter, probably resting in part on the mainmast channels, looms forward. See <http://www.hamilton-scourge.hamilton.ca/HamFinds.htm>. A late 17th century image of a very small Dutch frigate in the NNM shows sweeps stowed in the same place. French *corsaire* René Duguay-Trouin notes that sweeps used on the lower gundeck were lashed to the carlings above when not in use. Some French ships as large as 54 guns carried as many as 30 sweeps and stowed them this way. See *The Memoirs of M. du Gué-Trouin* (London: J. Bratley, 1732), 118, 87. Aboard English men-of-war and “galley-frigates” with oar ports on the upper deck, the sweeps were, or probably often were, stowed alongside the spar topmasts and spars resting on the gallows and edge of the forecastle. They may also have been stowed outboard astern, as in the case of the USS *Hamilton*: several late 17th images of Dutch warships, as well as a 1646 image of the Danish *Hannibal*, in the National Maritime Museum in Greenwich show various spars (and even a small topmast) being carried in this position, their aft ends on the mizzen channel, or sometimes centered on the mizzen channel. Small French frigates, typically lacking gallows, probably stowed their sweeps this way.

Pages 51-52, dugout canoes and pirogues. John Taylor, 1687, states that canoes were propelled via “short paddles” not “long oars.” It may well be that Europeans used long oars, for which we have solid evidence, but Native Americans and Africans used paddles even in local “European” service. Or, paddles were used by Europeans in canoes too small to be rowed. Taylor agrees with Exquemelin that dugout canoes were far more numerous than any other small craft. He notes that those made of cottonwood would soon rot if left out of the water. He also describes canoes—probably piraguas—of 40 feet long, 8 feet wide, flat bottomed, with carved keel and sternpost. There is much overlap in period definitions of canoes and *piraguas*. See John Taylor, *Jamaica in 1687: The Taylor Manuscript at the National Library of Jamaica*, edited by David Buisseret, (Kingston, Jamaica: University of West Indies Press, 2008), 185.

Pages 51-42, dugout canoes and their sails. An eyewitness illustration of a canoe depicted on a French 1680s chart (*Plan de la Ville et Citadelle de St Martin* by P. Cornuau, 1683) shows the canoe carrying a simple square sail. Edward Barlow’s illustration of Port Royal, Jamaica shows two apparent canoes using single sprit sails. Barlow’s canoes may have been used as skiffs, mentioned by Taylor (see above) in 1687, to ferry passengers back and forth from Port Royal to Kingston and other locations.

Pages 51-52, pirogues. From 1720 is the following description of a pirogue being built at Fort Royal, Martinique, roughly translated from French, and paraphrased at times: “It was made from the trunk of a single tree. It was 37 feet long, and 4.5 feet wide outside and 4 feet wide inside, giving a thickness of three inches at the gunwale. However, the thickness increased aft, and can be six inches at the keel, sides, and knees. The width decreases forward; the stern is wider by a foot. The mainmast at the center is as tall as that of a *canôt* [here meaning a ship’s boat], and has

a small mast forward with a lateen sail [probably a bowsprit with jib]. The mainsail is in the form of a trapezoid, larger at the head [top] than the foot [bottom], but parallel. The long dimensions from angles, one of 60 degrees, the other of 80. [Most likely a sprit sail as in the Labat drawing, or possibly a lug sail.] These boats row and sail well for their size, flying across the tips of waves and sailing very close to the wind: they can sail within three points of the wind, or better. Six Negroes are used to row, sail, and steer. A very low cabin is built in the stern for passengers to sleep. These vessels serve to sail from one island to another.” See Antoine Laval, *Voyage de la Louisiane* (Paris: Jean Mariette, 1725), 60.

Comparing with the description above, Labat’s illustration of a “*Canot à la voile*” is actually a pirogue. It’s mainmast is sprit-rigged, and it has a short bowsprit with staysail or jib. Barring the curious description of head and foot as parallel (sprit sails and lug sails generally have no parallel sides today), the pirogue described above was probably rigged as in Labat’s illustration. The sail plan in Labat’s illustration has been copied directly from du Pas, and it is very similar to that depicted in Jouve. In other words, although it may be accurate, the illustrator has copied it from another work in order to save time. It is not an eyewitness illustration.

Page 53, regarding the *barcalonga*. Early 19th century sources indicate that the Spanish *barcalonga* was rigged with a lug sail on each mast, and an earlier 18th century illustration in the Museo Naval de Madrid from the Marquis de la Victoria’s *Albúm* (the image is also reprinted in Apesteguí’s *Pirates of the Caribbean* and Konstam’s *The Pirate Ship*) indicates a “*virga al terció*” or lug spar for a lug sail. This sail plan would make the *barcalonga* an excellent vessel for chasing or escaping to windward. It may well be that *barcalongas* or *barque-longues* were rigged variously with lug or common square sails. A *barque-longue* attacked by Sir Henry Morgan in 1681 had a topsail, and thus probably had two masts.

The fact that it was uncommon to have a topsail strongly suggests that a *barque-longue* in the Caribbean was generally *not* the two or three mast fully-decked vessel *when referred to by the English*. It’s likely that the English used the term *barcalonga* to refer to the Spanish and Mediterranean style vessel, while the French used it to refer to a very small two-masted frigate, of which there are clear indications, for example a French document referring to a *flibustier barque-longue* with eight guns, clearly a larger decked vessel. Confusingly, the *barque-longue* of Dunkirk, known as a *snauw* in the Netherlands otherwise, was a small two-mast vessel whose foremast was about a third shorter. See J. J. Moore, *The Midshipman’s or British Mariner’s Vocabulary* (London: Vernor and Hood, 1805); the *Albúm* of the Marquis de la Victoria; and *The London Gazette*, April 14, 1681. See also page 53 below regarding the snow.

Page 53, regarding the schooner as a pirate vessel, the schooner known as such did not appear in force until the first quarter of the eighteenth century and was not a principal pirate vessel in this era: the single mast, sloop, brigantine and its variations, and ship were, although pirates did use schooners at times. Charles Johnson notes a few schooners as prizes, the earliest being two captured by Stede Bonnet in 1717. The most notable pirate schooner (and the only one Johnson mentions) was the eighty ton *Fancy* commanded by Charles Harris, a prize originally captured by Ned Low. *The Boston News Letter* of June 11, 1716 reports a “small Vessel with two Masts, two Boom sayles, and a flying Jib, Spanish Colours, about Ten hands on Board, very swarthy Fellows with red Caps,” which was clearly a Spanish pirate, perhaps the first reference to a pirate

schooner. Clearly schooners were a bit of a novelty at the time, although there were others identified by the term ‘schooner’ in the same year. Schooner is spelled “scooner” by Charles Johnson in 1724, and by the *American Weekly Mercury*, November 10, 1720. According to the Karl Heinz Marquardt, the schooner as a type was invented in 1695 not in America but in Britain, although the general type had been under development for some time. See Johnson’s pirate history, and also Marquardt, *The Global Schooner* (Annapolis: Naval Institute, 2003), 14-21.

Page 53, 4th and 5th paragraphs, regarding the snow. There is some speculation that the snow’s name may have referred originally to its hull form. In any case, in Dutch it was known as a *snauw* and in French as a *senau*, and appears to be either the same vessel described as a Dunkirk *barque longue*, or the latter was included in the general classification of *snauw*. In the late 17th century and early 18th century it was generally described as two-masted and square-rigged, *without a gaff set on a trysail mast*. It was sometimes described as being smack-rigged with larger sails. A description in Robert Park’s *Defensive War by Sea* (London: 1704), pages 109-111, confirms a square-rigged vessel. Notably, in the series of prints *Zeegevecht tussen Hollanders en Fransen op de Noordzee* (1694), a *snauw* is depicted as having three masts, suggesting, as some historians have concluded, that the Dutch *snauw* was a classification of small square-rigged dispatch vessel. At some point, probably late in the second quarter of the 18th century, a trysail mast and trysail were added. The snow was rarely seen in the Caribbean until the 1690s when it became fairly common there, although one did accompany the comte d’Estrees in 1678-1679 and was noted as being unique to the region, therefore it was more than a *corvette* or brigantine, often depicted as small vessels with courses and topsails on both masts. Some sources note that is identical with the Flemish *barque-longue* (not to be confused with the French three-mast *barque-longue* or mere *barque* such as *La Belle*, that is, a very small frigate, if indeed *La Belle* were three-masted [the mizzen step is missing], nor with the un-decked Spanish and English privateering *barque-longue* / *barcalonga*. From a distance its most unique characteristic was that its foremast was a third shorter than its main, as with the Flemish *barque-longue* apparently. See also *CSP 1677-1680*, no. 1118; Moore, Alan, “The Snow,” *Mariner’s Mirror* 2, no. 1 (1912), 38-43; Gueroult du Pas, *Batimens*, s.v. *barque longue* and *corvette*; and Patrick Villiers, *Les combats de Jean-Bart*, 134-35.

Page 56, sails on ships. Ships of this period never carried sails (later called royals) above the topgallants, and only exceedingly rarely carried topgallants on the sprit and mizzen. Captain Kidd’s *Adventure Galley* did so in 1697, and from 1673 is a report of a Spanish ship carrying topgallants on the mizzen and sprit. See Barlow, *Journal*, 2:484, and *Mariner’s Mirror* 4, no. 3 (1914), 288, query 59.

Pages 57-65. For more information on buccaneer guns, see my upcoming blog post (2020?).

Pages 57-74. For eyewitness images of arms and how they were carried, see the following, and also an upcoming blog post on pistol carriage (2020?):

<https://benersonlittle.com/2015/10/06/the-authentic-image-of-the-real-buccaneers-of-captain-blood-his-odyssey-by-rafael-sabatini/> and

<https://benersonlittle.com/2015/10/16/the-authentic-image-of-the-boucanier/>

Pages 60-61, last/first paragraphs, quick loading sequence: this sequence is not only described by eyewitness Jean-Baptiste Labat, for whom it was demonstrated, but also by eyewitness Fray Juan de Avila who saw it used in battle during the sack of Veracruz in 1683. See Fray Juan de Avila, manuscript describing the “*Pillage de la ville de Veracruz par les pirates le 18 Mai 1683*”, 3r. Pages 60-61, last/first paragraphs, quick loading sequence: the method is also discussed by Humphrey Bland in *A Treatise of Military Discipline*, 5th ed. (London: Daniel Midwinter, 1743), pages 73-74. He notes that unless the barrel is very clean, which is impossible after two or three shots, the cartridge will hang halfway down the barrel. In my experience, the cartridge nearly always hung immediately between the mouth of the barrel and halfway down, no matter how clean the barrel and how well-made the cartridge. Never did it slide all the way down and seat. Greasing the cartridge paper might possibly help. More windage between ball and bore might also permit a heavy cartridge to slide all the way down the barrel once or twice before hanging up in the barrel, but would significantly affect accuracy. When *boucaniers* used this quick-loading technique, they almost surely dumped the powder down the barrel, spat the ball from mouth into hand then into barrel (or directly from mouth to barrel), then banged the musket to seat charge and ball.

This leads to another issue, that of how cartridges were carried: ball up (top down) or ball down (top up). In most military manuals of the eighteenth century, cartridges are placed ball up, powder down, so that the soldier or marine can grasp the cartridge and bite off the opposite (powder) end. This also prevents powder corns from slipping between paper and ball if the cartridge paper is not tight around the ball or is not tied between ball and powder. However, there are suggestions that this was not always done, and I myself sometimes carry cartridges ball down, especially in a cartridge box without a drilled block.

Most late 17th and early 18th century cartridge boxes do not appear to have used drilled blocks, although there were several recovered from the wreck of the French privateer *La Dauphine* in St. Malo (the *corsaire* wrecked in 1704). I prefer a drilled block: in my experience it protects the cartridges much better than in an open box, even when stuffing a rag or such next to the remaining cartridges to keep them in place as cartridges are used up. And, based on the French eyewitness images of *flibustiers* in the 1680s, some of the cartridge boxes do seem large enough to accommodate 30 cartridge drilled block, with compartments beneath. That said, of the two non-belly box cartouche boxes recovered from the Phips and Whydah wrecks, neither are drilled, but rather are lined with a wood box.

Page 61, 4th paragraph, page 62, 2nd paragraph, also page 251, range of the *fusil boucanier* or “buccaneer gun.” An eighteenth century source states that “Boucaniers are assured of killing at 300 paces with this musket [a *fusil boucanier*], and of piercing [passing through?] a cow at 200.” A pace or *pas geometrique* is equal to five French feet, equal to 5.33 US/Imperial feet, thus 300 pas equals 1599 feet or 533 yards, and 200 pas equals 1066 feet or 355 yards. However, the text may be referring to the *pas commun* or *pas ordinaire* of 2.5 French feet, which would halve these numbers, and frankly make them more reasonable—killing at 266 yards, piercing a cow at 177 yards. One should view the aforementioned distances, if accurate, as effective ranges, and not as the actual ability to aim and hit a target at these longer distances. There are other reports of buccaneer and similar long-barreled muskets killing at long range: American Revolutionary War veteran Joseph Plumb Martin witnessed a fellow soldier “rest his old six feet barrel across a

fence” and hit a British soldier in a tree at half a mile (that is, 880 yards or 2640 feet). The shot was taken for fun, and no one expected it to hit its target, yet it did, and by all accounts killed the man. See M. Le Blond, *Traité de la défense des places*, 3rd ed. (Paris: Alex. Jombert jeune, 1783), sv “ARMES boucaniers,” and Joseph Plumb Martin, *A Narrative of a Revolutionary Soldier* (New York: Signet Classic, 2001), page 29. See also “Pages 136, 252” below.

A similar issue is associated with the statement that *flibusters* and *boucaniers* could hit a piece of eight (actually an *ecu*) at “100 *pas*.” See Anon., *Carthagene*, page 14, cited in *Buccaneer’s Realm*. This distance is roughly either 90 or 180 yards (almost certainly the former), depending on the *pas* used. Nonetheless, in either case, a buccaneer gun with an un-patched ball is not accurate enough to hit the piece of eight at this range, except occasionally and largely by accident—the error of dispersion is much broader at this range than the diameter of a piece of eight, which is roughly the size of a silver dollar. Modern MLAIC world record scores with smoothbore flintlock muskets with *patched* ball (which was not used by our sea rovers and *boucaniers*) fired at 50 meters indicate a majority of shots, perhaps 8 or 9 out of 13, within a roughly three inch bulls-eye (“10 ring”), which is twice the diameter of a piece of eight. And this is under optimum conditions, and at slightly more than half the range of the purported piece of eight shot, and, again, with a patched ball. It would be a very difficult, but by no means impossible, shot even with a very accurate Pennsylvania long rifle and expert rifleman at 90 yards, and even then the expert rifleman would not hit it every time. Again, see MLAIC typical and world record scores.

For that matter, a piece of eight is a small target at 90 yards with the naked eye. The perception of accuracy may in part be factual, however. A heavier long gun is easier to hold on target, assuming the shooter is strong, than a lighter one. Further, the longer barrel of the buccaneer gun, with its front sight farther out than on a conventional military firearm, would make it easier and more accurate aim. Only very rarely was a rear sight fitted, and perhaps not at all during the period under study, at least on common muskets, including buccaneer guns. If the buccaneer gun were loaded with a larger charge than usual for its caliber and if it actually did significantly increase muzzle velocity, this may have made it more accurate as well by diminishing the elevation required for long range shots (see below), may have given the gun its reputed killing power, as described in the previous paragraph, and may have given it its reputed range as well. Or, the longer barrel burned the charge more completely. Or both. But this is still somewhat speculative, at least for the moment. Readers should note that after a certain point, an increase in powder charge wastes powder, increases recoil, provides very little relative increase in velocity, and diminishes accuracy.

The question remains as to whether *fusils boucaniers* had a greater range than guns with shorter barrels. Certainly they were perceived to have had greater range. The general belief was that longer barrels permitted powder to burn completely, and thus propel a projectile farther. By the mid to late-18th century, however, the belief that longer barrels shot a ball farther had changed, based on studies that demonstrated that barrels of three and six feet, each loaded with the same size charge, threw a ball the same distance. However, it was acknowledged that duck guns, for example, which were very similar to *fusils boucaniers*, had greater range. This was believed due to the larger charge—two to three times that of a similar caliber sporting gun. Was the buccaneer gun loaded with a larger charge than average for its caliber? Labat, in reference to *fusils*

boucaniers, describes what could only be a field expedient powder measure used by *boucaniers*, that of pouring powder over a musket ball in the palm of the hand until it covered the ball (also described by Gaya). Based on my own tests, this is roughly the same amount of powder as was used in a conventional French military musket of the same caliber, although the amount of powder can vary significantly depending on how the palm is held, and cannot be considered accurate, or even a reflection of how much powder was typically used.

The question, unfortunately, remains unanswered. My own suspicion is that *fusils boucaniers* may have been loaded with charges somewhat larger than average, at least when longer range was required. Colonial *riflemen* varied the charge in their long rifles depending on range, for example. A conventional charge may have been used in buccaneer guns at ranges up to 100 yards, although a larger charge may have made the *fusil boucanier* more accurate—i.e. easier to aim—at this range by reducing the elevation required. If this is correct, that charge size varied, the number of charges that could be made from 20 pounds of powder would have to be revised. Appropriate testing should resolve the issue. This being said, longer barrels do provide for significantly improved aiming as previously noted. Also, see “Page 44” under the errata section above, and “Page 68” below. For references, see *An Essay on Shooting*, 2nd ed. (London: T. Cadell, 1791), 72-94, and Gaya, *Traité des Armes* (Paris: Sebastien Cramoisy, 1678).

Page 63, 2nd and 3rd paragraphs. Multiple shot is confirmed by John Cox's late seventeenth century buccaneer journal, and other sources as well. Cox describes "small shot" as a paper cartridge containing powder, one musket ball, and seven or nine "swan shot." I test fired a dozen such cartridges at ranges of ten and twenty yards to simulate their use as described by Cox: to clear barricades at close range after flanking them, and to unseat charging horsemen at close range. Patterns were on average nine and eighteen inches in diameter, respectively, and if projected would give patterns of twenty-seven and thirty-six inches at thirty and forty yards, respectively. However, the patterns varied widely. Some were tall and narrow, some broad and flat, and some were roughly circular with a shot or two thrown wide. Shot size also affected the pattern.

Besides its use at close quarters when flanking barricades, as Cox reported, it would also have been devastating during boarding actions, both during the boarding process when defenders remained on deck, as well as by defenders making a sally against boarders. Cox specifically describes the shot being used at close range to clear defenders behind barricades after a flanking action, and also for stopping a cavalry charge. See [Cox], *Adventures of Capt. Barth. Sharp*, 56. See also *The Buccaneer's Realm*, chapter 18, for additional details on buccaneer land warfare. My test firings are cited in note 36 to chapter 18.

Swan shot, and similar shot described in French as “*balles roulants*” (shot of three or four to the caliber of a musket ball) were large shot used for hunting swan and other large fowl. Many were apparently made by dropping melted lead through screens of varying size, and some suggest the name came from the slightly elongated shape and the occasional tail that resulted. Certainly the term “swan drops” derives from this manufacturing process. However, the several swan shot in my possession from one of the 1715 Spanish treasure wrecks were clearly cast in molds.

In Defoe's *Robinson Crusoe* is a description indicating that swan shot came in various sizes, and describes some as the size of small pistol balls. Some 19th century sources describe swan shot molds, like pistol and musket ball molds, and this was probably the case earlier. Likewise, some 19th century sources describe shot, from large to small, with swan the largest and dust the smallest. Others note that swan shot are the larger of small shot, and come in several sizes, the largest (LG) being 5.5 per ounce = .1818 ounces = 5.15 grams = a shot between 000 and 0000 buckshot. This is roughly the size of some swan shot in my possession recovered from one of the 1715 Spanish treasure wrecks: averaging .38 inch in diameter, with weights ranging from .171 to .188 ounce, with the average around .18 ounce. Medium (MD) were 9 to the ounce = .11 ounce = 3.14 grams = roughly 0 buckshot. Other sizes were SG at 11 to the ounce, SSG at 15 to the ounce, and SSSG at 17 to the ounce.

“Goose shot” and “duck shot” are also noted in the early 18th century. Some later sources define swan shot as 15 to the ounce, goose as 24 to the ounce, and duck as 34 to the ounce. See Delabere P. Blaine, *An Encyclopedia of Rural Sports* (London: Longmans, Green, Reader, and Dyer, 1870), 767. See also the *Revue militaire belge*, vol. 3 (Liège: Félix Oudart, 1843) for the definition of *balles roulants*.

Page 63, fourth paragraph, types of musket shot. According to the sieur de Gaya writing circa 1678, a projectile called a “*balle ramée*”—two musket balls attached by half an inch of small iron rod—was occasionally used by infantry. Sir Henry Mainwaring hints at another shot, probably similar to a cross-bar shot for a great gun (a round shot with an iron bar through its middle and projecting a few inches out each side). These were “armed” with rope yarn and such so that the exposed leading end of the bar would not catch on “flaws” in the barrel. He writes: “We also use to arm some small shot for muskets, like our cross-bars.” John Smith describes quarter shot: musket balls quartered or quartered then cut in half. In my own tests, quarter shot worked best when made up as balls and put into cartridges, otherwise it tended to jam in the barrel rather than seat safely on the powder charge. Further, to ease making it up, tallow or a soft beeswax mixture was useful in keeping the pieces together. Saint-Remy notes a similar practice in making grape shot, using pitch to attach the shot. See “page 137” below.

Spanish wrecks often produce “split-shot”—large caliber (.80 on average, two ounces average weight, the apparent caliber of ten to the pound, aka for a *mosquete de dos onzas de bala*) musket ball halves connected by twisted wires cast in the sprues, around two ounces in weight. The shot would expand to several inches after firing and would be good against men and rigging. See Gaya, *Traité des Armes* (Paris: Sebastien Cramoisy, 1678); Henry Mainwaring, *The Seaman's Dictionary*, s.v. “arm;” and John Smith, *A Sea Grammar*, reprinted in *A Generall History of Virginia* (Glasgow: James MacLehose and Sons, 1907), vol. 2:294. For information on deformed or “chewed” musket balls used in order to increase injury, see *Buccaneer's Realm*, page 175, 2nd paragraph. On poisoned musket balls, see the same, and also *Buccaneer's Realm* notes and errata, “Page 175.”

Page 64, fourth paragraph, powder charges. Note: feel free to check my calculations, I've found errors in them before. Again according to Mallet in the late 17th century, a musket (matchlock) of 18 balls to the pound, and according to Gaya, a musket (matchlock) or fusil (flintlock) of a caliber of 16 balls to the pound, are all loaded with “*une demie once & un gros de poudre de*

magazin” (half an ounce plus one eighth of an ounce) or roughly .67 ounces avoirdupois = 10.72 drams = 293 grains of powder, a very large charge by any modern standard. (A 16 caliber [French system] musket ball, smaller than muzzle diameter, weighs roughly 1.079 ounces [US, avoirdupois], and is roughly .68 to .70 inch in diameter, or even smaller.) Modern blackpowder arms use a much smaller charge, in large part due to the much higher quality of modern corned blackpowder. Sir Richard Turner in his *Pallas Armata* (London: 1683, page 189) notes that powder in his time (writing 1671-1672) was far superior to that of the previous century. By 1740, it appears that the charge for a caliber of 18 balls to the pound, French, was .43 ounce avoirdupois = 6.88 drams = 188 grains. For shooting a similar ball (16 to the avoirdupois pound, roughly a .68 ball in a roughly .75 bore), *Marshall's Practical Marine Gunnery* of the early 19th century provides 6.0 drams = .375 ounces avoirdupois = 164 grains; for a ball of 20 to the pound (roughly a .63 ball for a .65 bore) is 5.5 drams = .34 ounces avoirdupois = 150 grains, and for a ball of 25 to the pound (roughly a .585 ball for a .62 barrel or modern 20 gauge) is 4.0 drams = .25 ounces avoirdupois = 109 grains.

A typical modern load for a French 16 caliber might be 100 grains, equal to 3.65 drams or .228 ounces; a maximum load would be 150 grains. By comparison to *Marshall's* above, the maximum charge I've fired from a .62 caliber bore is 120 grains, and it was much too heavy, with excessive kick, “red” fouling, and a broader pattern than with smaller charges. Typically I use 75 to 90 for a .62 caliber bore, depending on the projectile load, roughly 20 to 35 grains less than two centuries ago. Note: bores for French calibers had a fairly wide gage tolerances and bores could become larger over time through shooting. The rough diameters above are only averages.

Saint-Remy, in his *Mémoires d'artillerie* (1707, page 142), notes that the length of the powder in a musket cartridge was four calibers of the ball. In other words, the powder portion of the cartridge for an 18 caliber ball (18 balls to the pound, .65 ball in US measurement) would be roughly 2.6 inches (US measurement) long. This works out to be roughly .86 cubic inch = *very roughly depending on powder used* 216 grains *in volume*, a large charge although a small portion would probably be used for priming.

Gaya and Mallet also note the method of measuring powder over a musket ball in the palm, also described by Father Labat as used by the *boucaniers*. This works out to roughly Saint-Remy's suggested powder measure, indicating common powder, not pistol. I note this because Sir Richard Turner in his *Pallas Armata* (London: 1683, pages 188-189) describes the three sorts of powder: cannon, common or musket, and fine, that last being used not only in pistols and for priming (in the case in which priming was not done from a cartridge, at the time armies generally primed from a powder flask), but also in fowling and birding pieces, many of which were very similar in caliber and barrel length to buccaneer guns.

Gaya notes that a pistol firing a roughly .45 ball had a charge of “*un gros*” of powder, that is, one eighth of a French ounce = 2.14 drams = 60 grains.

Sir James Turner, in his *Pallas Armata* (London: 1683) written in 1671-1672, notes that the common military pistol, used primarily by the cavalry (and, I would note, similar and often identical to the common sea pistol) was of 24 balls to the pound, roughly a modern .62 caliber.

The powder load was one half the weight of the ball if the powder were of good quality, two thirds if poor. And if it were fine powder (assuming poor? Or standard pistol, which in fact fine was often used for?), one half. In general, he notes that three barrel diameters (bores) of musket powder is sufficient charge. For muskets, half the ball weight in fine powder, two thirds in common (musket) powder. See pages 173 and 175.

Page 64, cartridges (cartouches). According to Falconer's *New Universal Dictionary of the Marine* (1815), "The ball-cartridges, for wall-pieces, muskets, carabines, and pistols, are made of whited-brown paper, on formers of wood."

Page 64, cartridges. Sir James Turner in his *Pallas Armata* (London: 1683, page 173) recommends pistols be loaded from paper cartridges with the ball attached with packthread. Paper cartridges were used at sea at this time for pistols.

Page 65, powder quality. Some researchers have suggested that cartridges were made up only immediately prior to use in order to prevent tropical humidity from spoiling the powder, but period documents tend to dispute this, as do tests I ran (although the tests were with modern blackpowder, which is glazed with graphite, unlike 17th century gunpowders). Circa 1680 in England corned powder was also glazed—tumbled to polish it—which may have increased its ability to resist absorbing dampness, although blackpowder remains highly hygroscopic. In the mid-19th century graphite was added.

Sea rovers at sea or on the march had to have ready cartridges, and thirty was the common number, at least among buccaneers and *flibusters*. In my tests I exposed corned blackpowder to conditions of high heat and humidity for several weeks, and tested it daily. The powder burned quickly and cleanly each time, as long as a *sharp* flint was used. However, as noted, modern blackpowder is coated with "black lead" (graphite), which not only helps hold the corns together, but also provides some protection from humidity. A 1776 military text notes that after "being made some months," cartridges should be broken up and replaced, given that "Powder in Cartridges for a length of time, cakes or moulders into dust, and thereby considerably loses its original strength."

It is possible that cartridges may have been kept in leather bags within some cartouche boxes as means of extra preservation against moisture, as practiced by some eighteenth century military units such as the Prussian army. My tests are cited in *The Buccaneer's Realm*, note 30 to chapter 4. See also [Capt. Bennet Cuthbertson], *Cuthbertson's System for the Complete Interior Management and Economy of a Battalion of Infantry, new ed.* (Bristol: Rouths and Nelson for A. Gray, Taunton, 1776), page 117. Unfortunately, the subject of small arms cartridges is discussed little in period documents.

Regarding moisture and gunpowder, eighteenth century research suggested that damp powder burned twice as slow as dry, and that dry powder would shoot a ball twice as far as damp. If powder gets too damp, much less wet, its corns will fall apart, as they will if too battered or "bruised," as was well-noted during the period at hand. The latter was probably a greater concern than mere humidity. That being said, there was serious concern aboard ships about damaged cartridges and powder aboard ship. Ships needed ready cartridges, but struck a balance between

having too many on hand, given that powder was better preserved in barrels. See Anon., *Miscellanies, or a Miscellaneous Treatise, Containing Several Mathematical Subjects* (London: J. Nourse, 1776), pages 283-284.

Page 65, powder charges. Using Gaya's description above of a half-ounce plus an eighth ounce of powder for a musket of 16 balls to the pound, a *boucanier* would get roughly only 512 shots out of twenty pounds of powder. Using a powder charge of half the ball's weight would give 640 shots. Using his and Labat's rough measure in the palm, as few as 500 or as many as 800 or more charges might be made from 20 pounds of powder. Powder would go farther with smaller calibers as well, for example 720 or more for a gun of 18 balls to the pound. High quality powder would also require a smaller charge. Some 18th and early 19th century references provide for smaller charges, for example "6 drachms" (6 drams, or 6 16ths = 3/8 of an ounce) for an English .75 bore with a 1.06 ounce (avoirdupois) ball. This would give roughly 850 charges per 20 pounds.

Page 66, arms carriage of buccaneers and *flibustiers*. See Benerson Little, "Eyewitness Images of Buccaneers and Their Vessels," in *The Mariner's Mirror*, August 2012, for an analysis of eyewitness images of French buccaneers/*flibustiers* and *boucaniers*, and also the blog posts noted page 6 above. Notable are the long-barreled buccaneer gun, large cartouche box worn on a belt on the left side in front of the cutlass, the lack of bandolier from which to hang the cutlass, and a pistol worn on the right side or right front with butt turned in and the lock against the body, in a good position from which to draw left-handed. Clothing is as expected, including plumed hat, a lace cravat in one case, shoes, sash and belt, and so forth. Additionally, two accounts of the same French *flibustier* attack on an English merchantman in 1686 confirm the arms shown in the images and described in other written accounts.

Page 66, last paragraph, accuracy: The Spanish "pirate"—actually a seaman of the Armada de Barlovento—who attacked Father Labat shoved his pistol into the priest's ribs, ensuring he would not miss. Fortunately, the pistol misfired. In my own tests, I was able to keep pistol shots within a ten inch square from seven yards with only a brief hesitation for aiming. (Some texts suggest a 20 yard accuracy for pistols of this era, fired by an experience shooter, but in my opinion this would be a "paper shooting" range, not a combat shooting range.) However, my tests were on stable ground with a stationary target—and no one shooting back. Penetration was light at this range due to diminished velocity. The pistol was a replica late 17th century doglock, 24 period French caliber or 24 balls to the pound (.62 caliber barrel in modern terms), a common French caliber of the period, loaded with a paper cartridge with a .595 ball. No patch was used, per period practice. This being said, shoving a pistol into someone's ribs is an excellent way to ensure that the pistol will not miss, and the pistol ball will hit with maximum velocity. The flame from the pistol, as possibly also the remnants of the paper cartridge, may set clothing on fire, and will certainly burn and "tattoo" the surrounding flesh. My test firings at ranges of 12 inches produced burning of the surrounding area, set paper and fabric (wool, cotton, linen) targets afire or at least smoldering, and left "tattoos" of unburned powder embedded in the targets. Pushing pistol barrel onto the target was even more likely to cause burns and burning, obviously.

Pages 66-69, swordplay at sea: see also chapter 19 in *Buccaneer's Realm* and the chapter on the myth of dueling for command in *The Golden Age of Piracy* by Benerson Little, and also the link just below.

Page 68, 2nd paragraph, McBane's criticism of the cutlass might also have been due to the fact that it is most effective at close distance and often gives rise to grappling and "handy grips," providing little opportunity to display one's swordsmanship. Fencing at close distance, in this case due to a combination of blade length and tight quarters aboard ship, invariably leads sooner or later to grappling and other contact.

For more on cutlass type and cutlass play, see <https://benersonlittle.com/2016/12/31/buccaneer-cutlasses-what-we-know/>

Page 69, last paragraph. Although Spanish and Portuguese soldiers and sailors had an affinity for the rapier, Spanish seamen, including sea rovers, are also noted in primary sources as using cutlasses as well. See *The Buccaneer's Realm*, chapter 19, for additional details on period swordplay, and also the link above.

Page 71, boarding pikes and English bills. In general, most boarding pikes were "half pikes" of eight to ten feet. In the mid-17th century and for at least a few years after, some long pikes (sixteen feet) and three-quarter (twelve feet) were also carried by English men-of-war. Also noted among the small arms of some English men-of-war, and described in use in action in one account, from the mid-17th century to as late as 1702 are "brown bills," also listed as "English bills" or simply "bills." Whether a few English bills were carried aboard sea rovers of this era is unknown to me, but likely. French navy arms lists dating to the 1670s lists both "*piques*" and "*demy piques*" in large quantities (36 of each for a fifth rate), plus 10 "*pertuisanes*" and 2 "*hallebardes*."

Page 72, 4th paragraph, slow match. Match for lighting grenades could also be carried in one's hat, typically with the burning end encased in a metal match box or case. Sticking it under one's hat, as Blackbeard reportedly did according to Charles Johnson (although there is no eyewitness account of this), would have been a good way of setting his beard and hair on fire (as George MacDonald Fraser noted in his comic novel, *The Pyrates*, 1983). An illustration circa 1700 of corsair Jean Bart shows him with a match, lighted at each end, in his mouth. Perhaps this illustration even inspired Charles Johnson. See also Jacques Bourd  de Villehuet, *Le Manoeuvrier* (Paris: H. L. Guerin and L. F. Delatour, 1765), 236.

Slow match was typically made of hemp (occasionally cotton) three strand rope roughly one half inch in diameter, often described as the size of a man's little finger. It was not the smaller cord often sold and used today. The most common recipes soaked the hemp rope in a solution of water and saltpeter. Slow match burned with a hot slow coal.

Page 72, grenades. Duguay-Trouin in his memoirs notes grenades stored for ready use in action in small barrels. (*Memoirs*, 35.) Villehuet notes grenades in tubs for ready service. (*Manoeuvrier*, 189.)

Page 72, fuses (also “trains”) for grenades and firepots. Most commonly a grenade fuse, and occasionally one inserted into the wooden lid of a firepot, was made of wood, often beech or alder, roughly one half to three quarters of an inch in diameter, a bit thicker at the head for one eighth to one quarter of an inch, and typically almost as long as the hollow inside of the grenade (Sturmy suggests three quarters the diameter of the grenade). This wooden fuse was known as a spigot or bung. A one eighth inch hole was drilled through the center, and the head was typically concave.

Although a physical fuse could be inserted through the center hole, and sometimes was according to Gaya (1678), most commonly a mixture of various components (fine gunpowder and camphire, for example; or fine gunpowder and brandy or other aquavitae; or fine gunpowder, saltpeter, and sulfur; or fine gunpowder, saltpeter, and charcoal; or fine gunpowder, saltpeter, sulfur, and rosin) was inserted into the spigot. The fuse was tamped into the grenade or firepot lid, leaving only one eighth to one quarter inch showing, in order to find it in the dark as necessary. The fuse was typically covered with a small swatch of leather or greased or oiled cartridge paper tied on to protect the fuse. It could also be protected by a sticky composition of pitch, turpentine, wax, and rosin melted together.

Timing of the fuse depended upon the composition and length. A fuse burning too long could be shortened by reducing the length of the spigot, or by adjusting the amount of charcoal in the fuse mixture, if applicable. A four inch fuse, according to Francis Povey, would last for the count of 14 or 15 “in a moderate way” – roughly seconds, that is. William Mountaine’s experiments indicated that a roughly two and three quarter inch fuse would burn for approximately 10.5 seconds.

In general, see the period works of Sturmy, Smith, Binning, Park, Povey, Mountaine, Shelvocke/ Shelvocke/Siemienowicz, Gaya, Nye, and Seller.

Pages 72-73, fireworks. Subsequent research into grenades and firepots, as well as practical work with the Middlealdercentret (Medieval Center) in Nykøbing, Denmark, provides additional detail. In the Age of Sail, clay pots were used as fragmentation grenades, as smoke pots, and as true firepots designed to set vessels aflame. Some firepots had both an iron grenade and blackpowder inside. Fusing was typically slow match (most common), or a wooden tube filled with a fuse, or fuse mixture, or often both slow match and fuse. In some cases, quick match was used. For example, see Johnson, *History of the Pirates*, 54.

In a test, a firepot with a typical two pound charge of blackpowder, broken as it would be if tossed on deck, appeared to explode, in spite of not being entirely contained, and produced significant flame as well as some probably non-deadly fragmentation. Anyone within ten feet would certainly have been severely burned, and any cannon cartridges or musket cartouche boxes would likely have ignited. Father Labat describes the use of one such firepot: it “grilled seven or eight Englishmen in such a horrible fashion that they immediately asked for quarter.” See Labat, *Voyages aux isles*, vol. 1:99 (edition noted in *SRP*). Park, however, in his *Defensive War by Sea* (London: 1704), notes grenades and stinkpots smothered by wet port sails (double thick or heavy canvas tarpaulins), and notes that two port sails could stop the fragmentation of an iron grenade.

Several firepots armed with a hot-burning mixture were also tested, and would easily have set fire to anything combustible—and did. Indeed, the fire’s brightness reminded me of thermite. We also considered the question as to whether some firepots may have been lit with a central fuse and thrown with line attached to the “ears.” The answer, as I later discovered, is both. The cords were indeed both match and a sling of sorts: “This pot being thrown by a handle of match...” notes *A Military Dictionary* published in 1778 in London for G. Robinson, sv. “firepot.” A similar description can be found in Mallet as described below.

Further research located a seventeenth century description: “Two lengths of match are crossed over the top and lit, then the pot is thrown with a handle made of match.” Although the crossed match, tied to the “ears” of the pot as shown in the illustration, could probably serve as a handle (and also keep the wooden lid secure, although a piece of canvas and marline would also keep it in place), a period illustration shows an additional length of match tied to the firepot in the manner of a simple basket handle, most likely from an ear to its opposite. No mention is made as to whether this match was also lit, but there would be no reason for it not to be. See Mallet, *Les travaux de Mars* (Paris, 1691), vol 3:164-167, including a detailed illustration. It is also certain that some of these grenades were “double primed” (to use a modern term) with attached matches as well as a fuse set in the cover. The latter would ensure that the grenade still detonated in case it did not break.

Empty firepots recovered from La Salle’s late 17th century *La Belle* have both ears for match as well as a central fuse, making it likely that these were double-primed with both match attached to the ears to light the powder when the device broke on impact, and with a central fuse in case the it failed to break. If an iron grenade were inside, the central fuse would detonate the powder in the firepot, which would detonate the grenade sympathetically. (Researches of the firepots found in the wreck of *La Belle* indicate a flexible fuse running from the firepot spigot into the grenade spigot, but this would be entirely unnecessary.) My thanks to Jens Christiansen and Peter Vemming Hansen of the Middlealdercentret for the opportunity to have hands-on experience with these devices.

Regarding the nine firepots recovered from *La Belle*, each had an iron grenade inside. According to the website, the pots would have been filled with oil and the grenade with powder, although it is unclear if the firepots were recovered loaded like this. Typically, they would have been made up prior to use. Oil spills easy. If a combustible mixture were used, it would likely have been thick and viscous, rather than liquid. More likely is the load described in the *Military Dictionary* (London: G. Robinson, 1778): “Fire Pots. Small earthen pots, into which is put a granade filled with powder, and then the pot is filled with fine powder till the granade is covered: the pot is afterwards covered with a piece of parchment, and two matches lighted across. This pot being thrown by a handle of match where it is designed, it breaks and fires the powder, and burns all that is near it, and likewise fires the powder in the granade, which ought to have no fusee, to the end its operation may be quicker.” A grenade fuse or quick match could be placed in the lid to ensure detonation, double-primed in modern terminology. The Mallet reference in the paragraph above has an illustration showing iron grenades being loaded into firepots.

Notably, there were a variety of grenades in use at the time, although the cast iron was most common. The Reverend Cotton Mather, for example, was attacked unsuccessfully for his vigorous promotion of smallpox inoculation (which he learned from an African slave), by an iron grenade, which was divided into two chambers inside, one of which was loaded with gunpowder, the other with turpentine, gunpowder, &c.

Pages 72-72, fireworks. Alonso Ramírez, captured in 1687 by buccaneers aboard the *Cygnnet*, one of whom was William Dampier, noted that the pirates were “well supplied with...several cauldrons full of pestiferous ingredients” (*había sobradísimo número de escopetas, alfanges, hachas, arpeos, granadas y ollas llenas de varios ingredientes de olor pestífero.*) See Alonso Ramírez, *The Misfortunes of Alonso Ramírez*, translated and edited by Fabio López Lázaro (Austin: University of Texas Press, 2011), 116, and Carlos de Sigüenza y Góngora, *Infortunios de Alonso Ramírez*, 1690 (reprint Madrid: [Impr. de la viuda de G. Pedraza], 1902), 52. By The “pestiferous ingredients” would have been mixtures for use in smoke or stink pots, or for firepots, or both. Due to the extreme hazard of fire, firepots would only have been used against attacking ships from which the pirates hoped to escape, and not against likely prizes.

Pages 72-73, fireworks. *Saucissons* or “sausages,” mentioned by Esquemelin as being thrown by Spaniards defending against L’Ollonois’s attack on the Hulk (the “Honduras ship”), were “pipes made of tarred cloth, filled with powder, and rolled up in the form of a gut, about 2 inches in diameter.” They were normally used as large fuses to fire mines under fortifications in siege warfare, but could also be used as an incendiary against an enemy. “Torches,” also mentioned, were probably exactly that, torches lit and thrown upon the attackers decks in hopes of setting fire to their vessel, or of igniting great gun and small arms cartridges. See Anon. *Miscellanies*, 280, cited above, and Exquemelin, *Flibustiers*, 139.

Page 73-74, last/first paragraph, pistols: pistols at sea often had belt hooks. Whether they had belt hooks or not, they appear to have been worn with the lock in and butt toward the left, at least in the case of a right hander. See Benerson Little, "Eyewitness Images of Buccaneers and Their Vessels," in *The Mariner's Mirror*, August 2012, for an analysis of an eyewitness illustration of a French buccaneer fully outfitted for a land campaign. Also, an illustration of Jean Bart circa 1701-1702 shows a pistol under his sash, belt hook out. This protected the lock, preventing the hammer from being accidentally pulled to full cock, and also the battery from opening and spilling powder from the pan. However, the illustration mistakenly shows the cock and battery on the left side—the same side as the belt hook, an obvious, gross error. The cock and battery are somewhat poorly depicted as well. In both illustrations the pistol is placed with its butt toward the body, making it easy to draw with the left hand. Of course, once the pistol is drawn for use, the belt will become loose. In practice, I suspect the pistol was carried belt hook out until nearly time for use, in which case it was removed and the belt tightened.

See also the buccaneer blog post cited above.

Pages 88-89, dress and arms of buccaneers and flibustiers. See Benerson Little, "Eyewitness Images of Buccaneers and Their Vessels," in *The Mariner's Mirror*, August 2012, for an analysis of eyewitness images of French buccaneers/flibustiers and boucaniers. Notable are the long-barreled buccaneer gun, large cartouche box worn on a belt on the left side in front of the cutlass,

the lack of bandolier from which to hang the cutlass, and a pistol worn on the right side with butt turned in and the lock against the body, in a good position from which to draw left-handed. Clothing is as expected, including plumed hat, a lace cravat in one case, shoes, sash and belt, and so forth. The discussed illustrations are probably the only eyewitness illustrations of Golden Age sea rovers. Again, see also the blog posts above.

Page 88, 1st paragraph, clothing. There are some distinct period references to “white shirts” worn by the early 18th century Anglo-American pirates, for example: “who obliged all the prisoners to come upon deck in white shirts, to make a show of force [as if they were pirates],” and “most of them with white shirts.” This may have been the preferred shirt of the pirates, as opposed to the checked shirts of seamen. Gentlemen wore white shirts, in other words. See Johnson, *History of the Pirates*, 145, 209.

Page 91, second paragraph, superstition. Educated buccaneer-surgeon Lionel Wafer writes that the Native American mummified remains he took aboard the buccaneer ship *Batchelors Delight*, commanded by Edward Davis, in 1686 at Huarmey, Peru, caused an uproar among some of the crew, who forced him to leave it behind. They did not want a dead body—and one they likely thought might be a devil of some sort—aboard, believing the compass would not read right. See Lionel Wafer, *A New Voyage & Description of the Isthmus of America*, 1699, (reprint, London: Oxford, for the Hakluyt Society, 1934), page 123.

Page 92, gambling. Gambling among buccaneers was apparently restricted to shore and, probably, when at anchor. It appears to have been prohibited at sea while under sail. In general, see the journals of Ringrose, Cox, and Povey.

Page 105, second paragraph, language upon sighting a vessel at sea. Another authentic cry from aloft is the example of “A sail upon our weather quarter! She lays her head to us!” See Francis Povey, *The Sea-Gunners Companion* (London: Richard Mount, 1702), page 44.

Page 114, buccaneer and filibuster flags. Filibusters in the South Sea under “Francisco Franco,” an Hispanicization of the name of the Dutchman François Rolle (Frantz Rools), at least once flew the skull and bones in 1688. This is the only reference, other than among the Barbary corsairs, of pirates flying this flag in the seventeenth century. The *flibusters* flew a skull with crossed bones underneath, in white, on a red flag ashore on an attack on Acaponeta, Mexico, and intended it as the flag of no quarter. See “Journal de Bord d’un Flibustier (1686-1693),” edited by Edward Ducéré in the *Bulletin of the Société des Sciences et Arts de Bayonne*, years/editions 1894 and 1895, and also in manuscript form, digitized, in the French National Library. See also Benerson Little, “The Origin of the Dread Pirate Banner, the Jolly Roger” in *Pirates Magazine* 12 (April 2010), 9-14; Benerson Little, *Pirate Hunting*, 191; and Benerson Little, first chapter in *The Golden Age of Piracy*.

Page 114, pirate flags, skull and bones. We can discount theories that the “Jolly Roger” originated from “*joli rouge*,” for there are no period references. However, “Roger” was not only a nickname for the devil as well as for a thief-taker (see *A New Dictionary of the Canting Crew*, 1700) but also for a man’s penis as well as for sex. The symbolism is readily apparent, at least to

anyone who has sailed or otherwise adventured, in particular to those who have served in the combat arms. See Benerson Little sources noted in the paragraph above.

Page 114, fabric of colors. A reader inquired as to the source of the statement that most ensigns were made of wool: see Wilson, *Flags at Sea*, 85. Typically, ensigns, jacks, and pendants during the period under study were made of a loose, coarse wool fabric called “bewpers” or “bunting.” Linen was used in some navies, such as Spain’s, whose ensigns were elaborately painted, and occasionally silk is noted for exceptional flags.

Page 121, 2nd paragraph. The *Mocha* Frigate, a pirate, in 1697 had taken down her galleries, probably to disguise the ship at long range (a ship without galleries would appear to be a smaller one at long distance, small vessels did not have galleries), and also to aid in the use of great guns aft. See Solomon Lloyd and William Reynolds’s account of the *Mocha* Frigate in *Pirates of the Eastern Seas, 1618–1723: A Lurid Page of History* by Charles Grey, edited by George MacMunn (London: Sampson Low, Marston, & Co., [1933]), pages 139, 146.

Page 124, speed in chase. Duguay-Trouin would have his crew lie down during a chase in order to increase speed. At close ranges this would also provide some protection against enemy fire. (*Memoirs*, 116.)

Page 126, 4th paragraph, rowing in a chase. At close ranges—“half a ship’s length of us,” for example—the chase might be able to shoot “all her [the pursuer’s] oars to pieces” and escape. See Johnson, *History of the Pirates*, 89.

Pages 130-131, amain. According to Henry Mainwaring, amain was used as a general term to lower anything, especially with speed. To “strike amain” was to lower topsails. To wave amain was to wave a bright sword as an order to strike amain. The sword was generally waved either from the foretop or from the poop. (*Seaman’s Dictionary*, 81, s.v. “amain.”)

Pages 136, 252, the ranges of “musket shot” and “pistol shot.” In general, “musket shot” as I determined it was a rough or general range of 600 to 800 feet. However, based on subsequent research, 700 to 800 hundred feet might be a more accurate assessment of “musket shot” range among the English, and 700 to 1000 feet among the French, with the higher end probably “portée de fusil boucanier.” Originally I had thought pistol and half-musket to be equivalent, given that I found several instances that seemed to equate them. In fact, the instances appear to have been used together as a rough range. Gaya in his *Traité des Armes* (see below) gives “40 *pas* [paces]” as pistol portée. A *pas* geometrique is equal to five French feet, thus pistol shot is roughly 213 feet or 71 yards. However, if a *pas commun* is used, “pistol shot” is half that, or roughly 35 yards. (See James, sv. “*pas*,” below. A *pas commun* is only 2.5 French feet.) One reading of Duguay-Trouin suggests pistol shot might be as close as the range “yardarm to yardarm.” (*Memoirs*, 91.) Assuming a beams of 22 to 28 feet and mainyards of 50 to 60 feet, pistol shot in this case gives a rough measure of 30 feet or less, a fairly accurate estimation of the effective range of a pistol. “Carbine shot” or “caliver shot” would logically lay between pistol and musket shot distances. Research into the question is detailed in the next paragraph.

Research details on firearm ranges used as an indication of distance. Locating specific period documentation of ranges was difficult, and early on I had to rely to some degree on inferences. For example, in 1669 Philip Staynred in *A Compendium of Fortification* noted that 720 feet was within musket shot. William Hutchinson writing of mid-eighteenth century privateer tactics in *A Treatise of Naval Architecture* describes half-musket shot or “half a cables length,” that is, sixty fathoms (360 feet) in his day according to *Falconer’s Dictionary of the Marine*, 1780, making musket shot range 720 feet if it is equivalent to a half cable. However, there are period references to cables as being of 100 fathoms in the seventeenth century, which would make musket shot roughly 600 feet if it were described as a half cable’s length. See for example “E. S.,” *Britain’s Buss* (London: Nicholas Bourne, 1615), page 279. A footnote in *An Essay of Naval Tactics* (3rd ed., John Clerk, 1827) defines pistol shot or half-musket shot as 400 yards, an apparent typo for 400 feet, making musket shot a distance of 800 feet.

Later I found other specific references. Blondel, quoted in Charles James’s *A New and Enlarged Military Dictionary* (2nd ed., 1805), gives 140 *toises* as the longest range of musket shot (a *toise* is equal to 6 old French feet or 1.949 meters, roughly 6.4 feet), equal to 895 feet. James also defines *portée de fusil* (range of a musket) as a various distance ranging from 120 to 150 *toises* (767 to 960 feet). The most specific references I eventually located, unfortunately after publication, were Gaya, *Traité des Armes* (Paris: Sebastien Cramoisy, 1678), which gives 120 *toises* for a regular musket or fusil, and 140 to 150 for those “*renforcé*”; St. Remy, *Memoires d’Artillerie* (1697), 120 to 150 *toises*; and *A Military Dictionary* published in 1778 in London for G. Robinson, in which musket shot is defined as “about 120 fathom (720 feet, 240 yards) and almost all the military architecture is regulated by this rule.” Major Frances J. Day, describing ranges of past centuries, concluded in 1887 that musket shot was approximately 250 yards, pistol shot 120 to 150 yards, half-musket 150 to 200 yards, and half-pistol 60 to 80 yards. However, I am not sure how well these estimates apply to the late 17th and early 18th centuries. See Frances J. Day, *Professional Papers of the Corps of Royal Engineers*, vol. 13 (Chatham: W. & J. Mackay & Co., 1888). This being noted, I prefer the period sources.

Page 136, great guns. Note that mariners referred to cannon as “great guns” or simply “guns.”

Page 136, great guns. The *flibusters* who entered the South Sea and raided from 1686 to 1693 under “Franciso Franco,” who was actually Dutchman François Rolle (Frantz Rools), carried spare great guns in the hold specifically for the purpose of outfitting prizes. See “Journal de Bord d’un Flibustier (1686-1693),” edited by Edward Ducéré in the *Bulletin of the Société des Sciences et Arts de Bayonne*, years 1894 and 1895. The original manuscript has been digitized and is available online via the French National Library.

Page 136, great guns aboard ship. In general, guns of the same caliber and similar weight and dimensions appear not only have been placed opposite one another larboard and starboard, but grouped similarly in the same area of the vessel. For example, *CSP 1679* no. 948 describes four 6.5’ sakers of 10 cwt placed in the forecastle, four 6’ sakers of 8 cwt placed in the steerage, four 7.5’ sakers of 16 cwt placed in the gunroom, and 2 falcons of 2.5 cwt placed on the quarterdeck.

Page 137, chain shot. The French and Spanish appear to have made far greater use of chain shot than the navies and privateers of other nations, but England appears to have abandoned its use by

the late 17th century. A French fifth rate of 30 guns in the 1670s carried 100 chain shot, as compared to a total of 1500 round shot. They also carried 200 double-head. The English, according to Francis Povey circa 1700, considered chain shot less effective than double-head and iron bars (“much better service”) and so abandoned its use. Boteler’s *Dialogues* (first half 17th century) doesn’t mention chain shot, nor does Seller’s *Sea Gunner* in 1691, the latter listing only round, double-head, and cut iron bars (langrage/canister could be easily made up). According to William Shelvocke of privateer, shipwreck, and albatross fame, and also translator of *The Great Art of Artillery* by Kazimierz Siemienowicz (1729), chain shot was loaded into a cylindrical wooden box, of the appropriate gun’s caliber, for firing.

Page 137, grapeshot. As a term, grapeshot does not seem to have appeared in common use in English until the early eighteenth century. Povey in his *Sea-Gunners Companion* (London: Richard Mount, 1702) does not describe it by name, and Park in his *Defensive War By Sea* (London: Richard Mount and Thomas Page, 1704) does not mention it at all. Charles Johnson in his pirate history mentions it in 1724 (page 272), and a letter written by Capt. Solgard of the *Greyhound* and printed in *The New-England Courant*, June 10, 1723, mentions it in relation to the capture of the pirate Charles Harris. Povey on pages 15 and 41-42 does describe “small Iron-shot of a pound weight” fired in quantities of 20 or 30, which is doubtless grapeshot. Twenty or more may be fired out of a demi-cannon (a 32 pounder), and fewer by proportion in smaller guns. He does not describe how it was loaded. In the early 18th century, grapeshot apparently consisted of either lead shot (probably very large musket balls) or iron shot placed in a canvas bag and wrapped with a pattern of marline to make it cylindrical and better fit the barrel, as opposed to shot simply stuffed in a canvas bag, then stuffed into the barrel. It does not appear to have been supported by a spindle or wooden base, as was later the case. Burrell may have been similarly wrapped, and thus have been the term for what amounted to late 17th century grapeshot. However, Povey (page 15) describes “Bur-Shot” as made of the iron sprues cut from roundshot when they were taken from the mold. He describes what is clearly grapeshot as “small Iron-shot of a pound weight.”

That said, the shot itself is described by Jean Thevenot, in his description of a voyage to the Levant in 1658. He notes that an English ship used “*grappes de raisin*” in their “*scopa coperta*,” the latter of which was a term used in the Levant for small cannon thrust through ports in the poop, quarterdeck, steerage, or forecastle bulkheads and used to sweep the decks of boarders. Such guns were used in this manner by all nationalities. *Scopa coperta* translates as “covered brooms,” almost certainly because they were intended to “sweep” the decks. In practice, a small bell was rung just before firing in order that defenders on the opposite end of the ship could take cover, although it appears that the enemy quickly learned to also take cover when the bell rang. Thevenot describes *grappes de raisin* as clusters or packets of small lead bullets split in the middle which nonetheless stick together. See Thevenot, *The Travels Of Monsieur De Thevenot Into The Levant*, vol. 1 (London: H. Clark et al, 1687), page 268, and Thevenot, *Relation d'un Voyage Fait au Levant* (Paris: Thomas Jolly, 1665), page 532.

Saint-Remy in his *Mémoires d'artillerie* (1707, page 143) describes “*cartouches à grappes de raisin*” as those “*qui sont des balles de plomb jointes avec de la poix, enfermées d'une toile claire, et disposées sur une petite planche en forme piramidale, autour d'un piquet de bois qui s'éleve du milieu de la planche, sont d'une grande utilité dans un combat ou dans une bataille*,”

which translates as “grape raisin cartridges” “which are lead balls attached with pitch, enclosed in a light canvas, and arranged on a small plank pyramidal in form around a wooden stake that rises from the middle of the board are very useful in a fight or a battle.”

George Shelvocke, the privateer captain shipwrecked on Juan Fernandez Island in 1720, whose crew more or less mutinied, whose shareholders later accused him of piracy, and whose captain of marines shot an albatross during the voyage, leading to the albatross in *The Rime of the Ancient Mariner*, defines grape shot in his translation of Kazimierz Siemienowicz’s *The Great Art of Artillery* (London: J. Tonson, 1729), page 306, as “in the Form of a Bunch of Grapes: The ordering of this is very easy. In Letter F you have a Wooden Tompion with a perpendicular Rod stuck into the Center of it. The Bottom of the Bag must be sewed up pretty strongly, and then filled with Leaden Bullets of 2, 3, or 4 Ounces. You must then fasten your Bag at Top, and pass Marline over all the Interstices of the Balls; in such Form that the Circumvolutions of it crossing one another, it may look like a Net, This done; dip the whole into Pitch.”

Page 137, canister and other small shot. Shelvocke makes it clear that these various forms of small shot—“Case Shot, Cartouch Shot, Partridge Shot and Grape Shot”—are known collectively as *hail shot* or *pyrotechnic hail*: “[O]ur Artificial Hail being mostly of coarse Gravel, River Pebbles, or any Stones of the bigness of a Pigeon's Egg, and sometimes of Leaden Balls or Slugs, or little Bits of Iron, and all such like Things.” And, “This Shot or Hail (as we have called it)...”

He notes their several forms. Some is contained in wooden cases or cartouches, or brass or iron boxes, with pitch poured in among the “interstices” to keep the shot together. Some gunners simply ram a wooden tompion on top of the powder charge, pour shot to the length of a round shot, then put a wad on top. Another form is that of a canvas bag filled with shot. Grape shot is considered a form of this bagged shot. Another form consists of bore-sized balls made of shot held together with a mixture of pitch, wax, turpentine, and other ingredients. See Shelvocke, page 306, above.

Povey describes “Tin-Case” shot, which he defines as a tin case (a can) plugged with wood at each end and filled with musket and pistol shot, and fired from guns ranging in size from eighteen pounders to sakers (5.25 pound shot). See Povey, 15-16, 42. This form of shot was used to clear decks. As many as two could be fired simultaneously from a gun, at a range of no more than sixty yards single or double shot.

Page 137, range of canister and other small shot such as burrel. Povey, page 42 (see above), recommends not firing case shot beyond sixty yards, given the dispersion pattern. This confirms tests I helped conduct in Denmark, in which a paterero’s dispersion pattern at 60 yards was six feet. The *Essai sur l'usage de l'artillerie, dans la guerre de Campagne* (Amsterdam: Arkstée & Merkus, 1771), page 37, gives the average range of “*grappes de raisin*” as 200 toises (roughly 213 yards) and of “*balles roulants*” (swan shot, or shot of three or four to the caliber of a musket ball) as 60 toises (roughly 139 yards). See the *Revue militaire belge*, vol. 3 (Liège: Félix Oudart, 1843) for the definition of *balles roulants*.

Page 137, other small shot used in great guns. The *Mocha* Frigate fired shot of tin and pewter (probably from captured cargoes), as well as shards from broken bottles and teapots, plus chain, stones, and so forth, doubtless because they lacked proper small shot. See the firsthand account in *Pirates of the Eastern Seas, 1618–1723: A Lurid Page of History* by Charles Grey, edited by George MacMunn (London: Sampson Low, Marston, & Co., [1933]), page 142.

Page 137, round shot and partridge combined. Duguay-Trouin recommended double round with partridge at pistol shot range (or yardarm to yardarm, which may or may not have been pistol shot). (*Memoirs*, 100.)

Page 137, round shot combined with double-head. Povey strongly recommended against this combination because the combined shot was too “weighty” for the gun, and might break it, not to mention do little execution. (Povey, *Sea-Gunners*, 40.) However, this was apparently common practice: the *Bauden* Frigate, a merchantman, used it in a fight in 1686 against pirates. (Salvey’s account of the fight, published in *The Indian Antiquary*, 1919.) Similarly, the HMS *Phoenix* loaded this way when fighting a Sangarian pirate in 1685. (Log of the HMS *Phoenix* in *The Indian Antiquary*, 1919.)

Page 137, other shot. Povey strongly recommended the use of “double head hammer’d shot” (wrought iron double head) for use against masts, beams, knees, &c. In other words, fire at the hull or mast with it. He notes that it could break iron bolts. He did not recommend the use of cast double head (the most common sort of double head) against the hull, noting that it would simply break. It was to be used against sails and rigging. (Povey, *Sea-Gunners*, 14-15.) The Whydah exhibit has an example of double head hammer’d shot, but describe it as “pestle” shot, a term the exhibit management may have made up: I’ve not seen the term anywhere else.

Page 137, round shot combined with bar shot. Again, this was a common combination: “his lower tier with round shot and bar shot...,” for example. (Richard Gibson describing the fight between the *Sapphire* and a French privateer (1660s?)).

Page 141, quarter bill: in *A Faithful Narrative of the Capture of the Ship Derby* by Philoleutherus” (London: S. Osborne, 1738), page 21, the vessel’s captain posts quarter bills over the guns (lists of names and duties for each gun), and “Rewards and Close-quarters &c. at the Mizzen-mast.”

Page 141, phrases and orders to clear for engaging: Mainwaring in his *Seaman’s Dictionary* s.v. “arm” (page 91) notes “make ready the ship” as an expression or order to prepare the ship for action. “A clear ship, all officers to their posts,” is the command as described by Povey (*Sea-Gunners*, 44). Lloyd and Reynolds note ordering “our people to their respective stations for action.” (Letter from Solomon Lloyd and William Reynolds regarding the fight between the *Dorrill* and the *Mocha*, 1697, in *The Indian Antiquary*, 1920.)

Page 141, signals and orders to make a clear ship. Carli in *Voyage to Congo* (582) notes the use of drums by an English man-of-war as the signal to prepare for action.

Pages 141 to 145, making a ship clear for engaging. Villehuet, writing in the mid-18th century, provides other details. Woven plattings or mats should be nailed between the gunports to help prevent splinters from striking the gun crews. This should be done at the beginning of a cruise and appears to be primarily a French practice. Spare sails should be on hand below, made up and ready to be sent aloft as necessary. Spare stoppers, blocks, tarred marline, and other cordage and rigging should be on hand on deck. Booms should be laid out for defending against fireships or boarding. Sails not intended for use during the action could be secured with rope yarns instead of gaskets, so that they could be set quickly. See also below, 182-83. Water for fighting fires must be available, as well as to wet the sails if the breeze is light, and two pumps should be available as well. The master should have all he needs at hand to navigate and keep track of the vessel's course while engaged. Hatchets or boarding axes should be distributed throughout, and also hung from each mast. Water should be available to quench the crew's thirst, and should be carried to each gun and other quarters so that the men do not have to leave their stations. See Villehuet, *Le Manoeuvrier*, pages 221-27.

Similarly, in *A Faithful Narrative of the Capture of the Ship Derby* by "Philoleutherus" (London: S. Osborne, 1738), pages 20-23, the ship is made ready with powder chests on the quarterdeck, poop, and forecabin; puncheon, hogshead, and barrel in the maintop, foretop, and mizzen-top, respectively, for fighting fires; chests of grenades in the tops; small arms in readiness; shot-lockers and shot in their proper stations; plugs for shot holes; the two lower yards slung with chain; and eventually the transom in the great cabin and balcony in the roundhouse cut away for traversing the stern chase.

Page 141, 1st paragraph, chambers for chamber-loaded swivel guns. Chambers *were not*, as I stated, loaded with powder and shot, but only with powder and a tompon or wooden cylinder if the powder load did not fill the chamber entirely. The shot, whether round shot or a form of case shot, was pushed into the barrel, then the chamber was loaded into the swivel gun. Breech-loading swivels were considered more dangerous than their muzzle-loading counterparts, given that gases tended to blow back from the breech into the gunner's face; Sir Henry Mainwaring, the early 17th century pirate, notes in his dictionary that he has seen many men hurt with them, and that they are dangerous to the eyes, which probably made them less accurate if the gunner turned away to shield his eyes.

In test shots, at sixty yards a wrought iron breech-loading swivel gun with a three inch bore shot a pattern six feet in diameter, of scrap metal bits roughly one half to three quarters of an inch square. This validates Povey's admonition against firing guns loaded with case shot beyond 60 yards. See Povey, *The Sea-Gunners Companion* (London: Richard Mount, 1702), page 42. By projection, the pattern would be an estimated diameter of ten feet at 100 yards. My thanks to Jens Christiansen of the Middlealdercentret (Medieval Center) in Nykøbing, Denmark, for demonstrating the loading and firing with shot of a hand-forged iron swivel gun. This and other information on swivel guns is noted in *The Buccaneer's Realm*, pages 266-267. See also Mallet, *Les travaux de Mars* (Paris, 1691), vol 3:133, 154-155 in which the loading of a breech-loading swivel gun is illustrated, and "Page 251" below.

Page 141, swivel guns: Thevenot refers to patereroes (Fr. *pierriers*, Sp. *pedreros*) as *petreras*. See Thevenot, *The Travels Of Monsieur De Thevenot Into The Levant*, vol. 1 (London: H. Clark et al, 1687), pages 223, 283-85.

Page 141, swivel guns: the organ. In the early 18th century, the organ—a series of musket barrels laid flat together, in other words a sheaf of musket barrels made to fire together, and more accurately than a common swivel. usually in a wooden rack, was occasionally seen shipboard. See Council Minutes, July 22, 1718, in *Minutes of the Provincial Council of Pennsylvania*, Vol. 3, (Harrisburg, PA: Theophilus Fenn for the State of Pennsylvania, 1840) for a description of a pirate sloop with organ barrels, if not an organ itself.

Pages 141 to 145, making a ship clear for engaging. Covell's diary (1679) notes that seamen's "chests and lumber [anything cluttering the decks]" were stowed in the ship's boat or by the main chains "or elsewhere" out of the way in time of action. See Covell's diary in *Early Voyages and Travels in the Levant*, edited by J. Theodore Bent (London: Hackluyt Society, 1893), 129. Aboard the English ship upon which Thevenot sailed in 1658, seaman's chests &c. were stowed on the poop deck. This actually assisted the defense of the ship: boarders distracted themselves with looting, and were shot from closed quarters. The chests also made it difficult for the boarders to hack their way through the deck. See Thevenot, *The Travels Of Monsieur De Thevenot Into The Levant*, vol. 1 (London: H. Clark et al, 1687), page 282.

Pages 141 to 145, making a ship clear for engaging. In general, see Park, *Defensive War by Sea*, 129-133.

Page 142, making a clear ship for engaging: wads. Wads were often placed in nets called "wad-nets," hung up on the bulkhead between the guns or in general hung "fore and aft." Wads were also placed in garlands and probably in shot lockers, if used on deck. Regarding wad-nets, see Park, *Defensive War by Sea*, 63, and "A True Account of a Fight Between Captain John Leech...And a French Privateer" (London: Sam Crouch, 1690). Regarding the placement of wads (Fr. *étoupes*) in garlands (Fr. *parquets*) among the shot (Fr. *boulets*), see *L'Ecole de Mars*, vol. 2 (Paris: Simart, 1725), 527.

Page 142, 2nd paragraph, making a ship clear for engaging. "Seaman's bedding" (hammocks and blankets) was noted in 1686 as being used by a merchant crew to fortify the quarterdeck in action. This was common in the 18th century, but references to this practice in the 17th century are few. See Edmond Wright, "A True & Exact account of an Engagement maintained by the Ship Caesar, Capt. Edmd. Wright Comandr. Against Five Shippes (being Pyrates) in sight of ye Isleand St. Iago on Sunday, The Last Day of Octobr 1686," reprinted in *Medals and Decorations of the British Army and Navy* by John Mayo Horsley (Westminster: Archibald Constable and Co., 1897), page 63. The account of the action in *The London Gazette* (no. 2251, 16 June 1687) on account of its relative brevity does not discuss clearing for engagement.

Various Van de Velde drawings of Dutch warships show what appears to be lengths of old cable laid over the gun's at various parts, the quarterdeck in particular, almost certainly to provide additional protection. In general, see the many seventeenth century drawings of Dutch men-of-war in the National Maritime Museum, Greenwich.

Page 142, 3rd paragraph, cartridges and budge barrels. Great gun cartridges were often carried individually in “latten” (brass) cases or more commonly,. (Mainwaring, *The Seaman’s Dictionary*, s.v. “cartridge,” “budge barrel,” and Mountaine, *Boteler’s Dialogues*, 202.) Ideally, only as many cartridges as were needed at the moment were carried on deck in order to prevent accidental discharge, explosion, and likely consequent fire which might race across the deck. According to Povey in his *Sea-Gunners Companion* (London: Richard Mount, 1702), page 30, cartridge containers were “cases of wood.” Cartridges were carried in these cases to the deck, then removed and placed in budge barrels according to Povey. This is not likely the case all of the time: cartridge cases were probably often set next to the gun, although this would prevent the cartridge cases from being refilled until the cartridge inside was loaded. Mainwaring appears to suggest that cartridge cases were kept next to the guns until the cartridges were used. Covil notes that “rounds of powder and ball” were provided next to “each” gun. See Covil’s diary in *Early Voyages and Travels in the Levant*, edited by J. Theodore Bent (London: Hackluyt Society, 1893), 129.

Page 142, 3rd paragraph, garland (Fr. *parquet*, Dutch *kogel-bak*). See Nicolas Aubin’s *Dictionnaire de marine contenant les termes de la navigation...* (Amsterdam: Pierre Brunel, 1702), s.v. “*parquets*” for a description of rope or cable garlands used to hold shot during battle. See *Skeps Byggerij* by Åke Rålamb (Stockholm: 1695), and the *Albúm* of the Marquis de la Victoria for period illustrations of rope garlands. See below re: shot lockers and their association with garlands. Both shot lockers and rope garlands were used aboard some vessels, while others kept shot below until there was a fight, and then brought it up and placed it in rope garlands. Shot was carried from below in baskets. Period texts are often of little use in this matter, for often, no matter how detailed they otherwise are, they fail to mention shot stowage during battle. Whether to garlands during battle or lockers prior, baskets were used, according to Sturmy and others, to carry shot to the guns. See Sturmy, *The Mariner’s Magazine* (London: E. Cotes et al, 1669), 45.

Page 142, 3rd paragraph, shot lockers. Shot lockers were located not only in the hold, typically near the ship’s center for stability, but also, at least through much of the 16th and 17th centuries, and probably well into the 18th, at various places on the gun decks as well, typically between the guns. Spanish orders from 1597, signed by Don Martin de Padilla, Admiral of Spain, require lockers between each gun; Sir William Monson in the same volume notes them as necessary between each gun on English ships of the early 17th century; and Henry Mainwaring in 1644 likewise notes them between each gun. Mainwaring goes further and describes their use as being for what today we would call “ready service”—but the shot were not to be kept there during battle, but only until ready for battle. During the clearing of a ship for engagement, the shot were transferred to rope garlands; the lockers were not used during a fight except perhaps for wads. This was to lesson the possibility of injury should an enemy shot strike a locker.

Probably these smaller lockers were also referred to as “garlands” per Wm. Dampier’s quote used in the text. A highly detailed period model of a Dutch two decker built circa 1660 to 1670, unfortunately destroyed during WWII, shows small lockers without lids built into the ship’s sides between each pair of guns on a side, and sometimes between all guns, as does a circa 1700 cross-section illustration of a Dutch man-of-war. Although some researchers suggest these may have

been used primarily for wads and lighter items, the model shows various round and double head shot in them, and the existence of the lockers would correlate well with Monson, Padilla, Mainwaring, and Dampier who note shot lockers around the ship. This said, they would be a good place to hold wads, tompions, &c. during battle after shot has been removed. Various late seventeenth and early eighteenth century Dutch drawings of man-of-war cross-sections also show these lockers between the guns. See Monson, *Naval Tracts* (London: A. & F. Churchill, 1703), 353, 356; Mainwaring, *Life and Works of*, ([London]: Navy Records Society, 1920), vol. 2:181; and Heinrich Winter, *Der Holländische Zweidecker Von 1660-1670* (reprint, Bielefeld, Germany: Verlag Delius, 1985). Dampier citation info is in *SRP*.

At some point, the use of half-round hollows in timbers began to replace rope garlands and shot lockers in both merchantmen and men-of-war, probably in the very early eighteenth century. Eventually these shot timbers were laid fore and aft, but at least some were laid perpendicular to the ship's sides in the early years of their use, as shown in the model of the 36 gun Dutch merchantman *Stathuys van Dort*, dated 1723 (auctioned by Sotheby's in 2017). Each timber holds five round shot. Whether shot were routinely kept in these timber garlands, or were placed there only prior to action, is unknown.

Page 143, fighting sail. The foresail, when not set, was often left in brails, ready to be quickly set. Although this may in part have to provide extra speed when necessary, it was probably just as much to ensure that the ship could still steer if the foretopsail or foretopmast were shot away. There are numerous instances in eyewitness accounts of sea actions of ships losing steerage when the foremast or foresails, or even a fore sheet, were shot away.

Page 144, quarter bill. Robert Park provides a quarter bill for a small crew, including an officer in each quarter "to encourage the Men," the master (captain) in the roundhouse with a few hands (3 if a crew of 14, 2 if only 12, and notes that if smaller the master may have to help serve the guns), the gunner in the steerage, the mate at the forecastle to among other duties manage the fore braces, a boy in each quarter to carry powder, the carpenter to look after the gunports and look for shot holes, and two men to a gun on each side (that is, four men to a gun on a single side). See Robert Park's *Defensive War by Sea* (London: 1704), page 130.

Page 144, gun crews and quarter bills. Guns up to sakers (commonly guns of slightly more than five pound shot, although some six pounders are categorized as such) and six pounders were often managed with four men per gun, although a crew of six was probably preferred if the vessel's crew were large enough. In the late 17th century the English Navy provided for two men per each 3 pounder, three men per each minion (sometimes only two), saker, and demi-culverin (9 pound shot), and four per each 12 pounder and culverin (18 pound shot). In other words, a 3 pounder would have a crew of four, a saker a crew of six, and a 12 pounder or culverin a crew of eight when fighting only one side. The late 17th century sixth rate *Lark* of 18 guns (16 sakers, 2 minions), roughly the size of a typical three-masted pirate or privateer of the period, had a crew of eighty-five. In battle, fifty-two would serve the guns (forty-eight for the sakers, four for the minions), four boys would carry powder, two men would fill and pass powder, the surgeon and two assistants would be in the hold, the carpenter (no mates) would be prepared to stop holes and make repairs as necessary, eleven men would be tasked for "small shot" (muskets and swivels), and a dozen would sail the ship, including the captain, master, and other officers. See J. R.

Tanner, ed., *A Descriptive Catalogue of The Naval Manuscripts in the Pepysian Library at Magdalene College, Cambridge* (London: Navy Records Society, 1903), vol. 1:239, and Hutchinson, *Treatise on Naval Architecture*, 224-26.

Page 145, flame from the vent extinguishing a match. What the flame and gases from the vent do is blow the match apart, into separate three separate strands in other words, in which case the match must be cut and re-lighted. Sturmy notes that the flame from the vent can knock both the coal (lighted end of the math) and the linstock itself out of the gunner's hand. Thus were guns fired from the base ring during this period, not from the vent. See Samuel Sturmy, *The Mariner's Magazine* (London: E. Cotes et al, 1669), 68. The determination of what the vent flame does to a match came during a discussion a few years ago with St. Augustine re-enactor and gunner Chad Light.

Page 145-147, linstocks. Linstocks were used to fire great guns (touched to crushed powder next to the vent, that is, at the base ring, not to the vent itself) and probably to fire swivels although a simple match would suffice in this case. In general we might assume one linstock per gun, with a few spares, but this was not the case in practice. Povey in his *Sea-Gunners Companion* (1702) lists only four for a 28 gun sixth rate, for example, although he does list plenty of rope rammers (30), powder horns, and vent picks (40 each). Spanish inventories of several small merchant ships in 1699 note a linstock for each gun. However, the seventy-six gun HMS *London*, which sank after an explosion in 1665, was issued only 30 linstocks. The French *Règlements pour l'armement et les équipages des vaisseaux de Louis XIV* published in the early 1670s lists 20 linstocks for a 30 gun fifth rate, 30 for a 40 gun fourth rate, 40 for a 50 gun third rate, and so on: plenty to have a linstock for each gun and its opposite, for swivel guns, and spares. It could be that Povey meant 14 rather than 4, which would provide one for each gun and its opposite, although adding a 1 to the numbers for 5th through first rates would not correct them. Linstocks may also have been used to light grenade fuses in some cases although a simple match would suffice and was the general practice. The small number of swivels assigned to the French ships—only two each for fifth and fourth rates, four for a third rate—does not account for the additional linstocks.

Page 147-152, engagement. Smoke could be a critical factor. The vessel with the lee gage was subject to smoke drifting down upon it, clogging the mouths and eyes of the enemy. On the other hand, as Duguay Trouin pointed out, it might obscure the target and also damage to it. (*Memoirs*, 104.)

Page 147, 2nd paragraph, weather versus lee gage. There were drawbacks to the weather gage other than exposed decks, although this was the principal disadvantage. Cannon might roll forward after recoil, and would need to be hauled inboard again for loading, thus slowing the time to load and fire. If the weather vessel were taking a beating, escape to windward was more difficult than escape to leeward—and for the vessel with the weather gage, a lee escape was blocked by the enemy. Breaking off to windward was also dangerous, as it exposed the stern to raking fire longer than would breaking off to leeward. Another disadvantage of the lee gage was the possibility of becoming becalming by the windward ship's sails.

Some French cruisers, Duguay-Trouin and the comte de Forbin, for example, preferred boarding from the lee gage against ships lying by. That said, Duguay-Trouin once found his plans to board from the lee thwarted when he lost the wind and was becalmed by his adversary's sails.

Some recommended fighting close hauled on the weather gage to (1) prevent the enemy from gaining the weather gage, and (2) because "ships being less in the trough of the sea, and steadied more the canvas, roll less, therefore fire with greater accuracy." See Ward, *Naval Tactics*, page 8. This being said, the minimal sail carried in battle (topsails, perhaps the foresail, mizzen, and a head sail) limited ships to sailing no more than seven points toward the wind. On the other hand, some believed that sailing "right afore ye wind" was "abolutely ye best manr soe to ingage." See Wright, *True & Exact Account*, page 64. This was probably because, as noted in *Sea Rover's Practice*, vessels steered more easily large, no matter how damaged their sails and rigging were. An advantage of the weather gage I did not note in the book was that the wind might carry burning wads into the rigging and sails of the adversary. The lee gage, however, could be advantageous in single ship actions, particularly if the wind blew strong and the sea ran high. Withdrawing to leeward was also easier. See P. Paul Hoste, *A Treatise on Naval Tactics*, 1691, reprint, translated by J. D. Boswall (Edinburgh: Bell and Bradfute, 1834), pages 21-22, 25-28; Villehuet, *Le Manoeuvrier*, 274-278; and James H. Ward, *A Manual of Naval Tactics* (New York, D. Appleton & Company, 1859), page 8.

Page 148, second paragraph, running fight. Commodore Walker notes that in a stern chase the chased vessel often lost way by having to alter its heading slightly in order to bring its chase guns to bear. See [Walker], *Commodore Walker*, 24. Note also that the chasing vessel could lose some way by firing its chase guns. See for example Hutchinson.

Page 148, running fight. Duguay-Trouin confirms a chased ship shoving as many guns to her stern as possible in a stern chase, six guns in this case, making for an unpleasant approach for the attacker. (*Memoirs*, 181.)

Pages 153-161, note that defenders in closed quarters sometimes made sallies against boarders when they felt they had depleted their numbers sufficiently. See Robert Park, *Defensive War By Sea in Five Parts* (London: Rich. Mount and Tho. Page, 1704), pages 157-59, for example.

Page 153, 4th paragraph, disabling powder chests. Although Father Labat states that powder chests were disabled by piercing them with pistol shots so that they would have little effect if fired, further evaluation indicates that he *may* have been mistaken. Firing a pistol into a powder chest would do little more than perforate it, leaving it still dangerous, or detonate it (especially via the pistol's hot gases at close range), and the detonation of a powder chest might injure or kill anyone close enough to shoot the chest with a pistol. Particularly dangerous would be the burning powder; fragmentation was less dangerous. However, at a distance of roughly seven yards one might hit a powder chest with a pistol shot and possibly detonate it.

Even so, pistols of this era did not have great penetrating power, and would also need to ignite the blackpowder inside, which is not always as easily done in reality as in Hollywood. Or, perhaps rather than "*coups de pistolet*," "*coups de sabre*"—cutlass blows—might have been meant. Fuses, if exposed (often they led directly from beneath the powder chest to the deck below), could be cut, or the chest could be broken apart. Even so, two or three pounds of loose

powder can be deadly if ignited, even if uncontained, and the spark from a cutlass striking iron shrapnel within the chest could ignite it. On the other hand, fire chests were not considered particularly dangerous except to those very close by: it might be feasible to stand off and detonate them with a pistol shot or two, but this requires testing for proof. Cited in *The Buccaneer's Realm*, note 22 to chapter 6.

Page 154, wounds. In many engagements, small shot from small arms and great guns caused many of the wounds. In the case of round shot and other heavy shot, splinters often caused more wounds, a misguided and erroneous *Mythbusters* episode notwithstanding. There are many examples of this throughout the Age of Sail. Large men-of-war often reduced the charges in their larger guns so that the large slow shot would crush and splinter timbers, and thus would or kill more of the enemy, rather than punch right through the timbers. See for example Park, *Defensive War by Sea*, 6, and the display at the Erie Maritime Museum showing the results of actual tests of guns fired at a ship section and the splinters produced.

Page 154, boarding preparation. Typically, an attacking vessel would bring its spritsail yard alongside its bowsprit, doubtless lashing it well, prior to boarding. This practice served to strengthen the bowsprit so that it was less likely to be “sprung” or broken if it struck the prey’s sides, and also gave the bowsprit more force as it struck shrouds, for example. It also protected the yard itself, which was likely to be damaged upon impact if it were not brought alongside. Several paintings and illustrations in the Rijksmuseum show this in practice: the spritsail yard is brought along in parallel to the bowsprit, and the sprit topsail yard is brought near-vertical along the sprit topmast. See Georges Guillet, *Les Arts de L’Homme d’Epée, ou Le Dictionnaire du Gentilhomme* (The Hague: Adrian Moetjens, 1680), s.v. “VERGUE. Prolonger, allonger, ou elonger la vergue,” pages 506-507. (See pages 338-39 in the 1678 Paris edition, third section.)

Page 154, boarding axe. In French, *hache d’armes*, later *hache de bord*. The axe’s name—boarding, *bord*—derives from its use in chopping holes in decks and bulkheads during boarding actions when the adversary had retreated to closed quarters. Also note that iron crows, used to elevate gun (cannon) breeches, were also so used, in particular for prying up planks. For example, see Park, *Defensive War by Sea*, pages 4-5.

Although many boarding axes had fairly long handles—shorter than that of a chopping ax but longer than a hatchet—some were short and worn in the belt or sash: “But our men bravely quitted themselves of the Fire-ship by cutting the Sprit-sail-Tackle off with their short Hatchets (which they wore during Fight sticking in their Sashes.)” See Richard Wiseman, writing of a Dunkirk privateer in *Several Chirurgical Treatises*, 2nd ed., 1686. In Saint-Remy’s treatise of artillery is an illustration of a naval boarding ax: it lacks langets, which many had, but has a belt hook for wearing at the waist.

Page 154, boarding & grappling hooks. Duguay-Trouin suggests having the crew lie low behind the bulwarks, and no shot be fired until the grappling hooks are thrown, in order to avoid the first broadside of guns and small arms from the enemy prior to boarding. After the enemy fires, the officers should rise up and take command of their charges when the captain gives them the order. It is likely this order to hold fire applied only to the boarders themselves; musketeers or “small arms men” would doubtless have kept up a steady fire aimed at suppressing enemy fire. Duguay-

Trouin (see below) suggests that only one third of the small arms men be assigned to the boarding party, leaving two thirds to sustain fire. Most of the remaining boarders would be drawn from the gun crews. See Duguay-Trouin, *Memoirs* (London: J. Batley, 1732), 119, 134.

Page 154, boarding & grappling hooks. Similarly, Duguay-Trouin notes the use of drums beating to give the order to board. See Duguay-Trouin, *Memoirs* (London: J. Batley, 1732), 47.

Page 154, 3rd paragraph, hooks. Grappling hooks, also known as grappling irons, and *grapins*, *grappins*, *grapins d'abordage*, and *grapins á main* in French, were not thrown by hand from the ends of yardarms, but were suspended from them via several feet of chain attached to a line, with the line belayed on deck where seamen could ease it or haul on it, as required, or were lashed to the end of the yard as with large fire ship grapplings (see below). It is possible that light grappling hooks could have been thrown from the yard ends, but probably they were not. Grappling hooks were normally thrown from deck into the adversary's shrouds, and also onto his decks in order to catch on the rails when heaved taut, although some sources state that hooks thrown by hand were intended primarily for the shrouds, which would be an easier target, and probably more secure. Grappling hooks were also used to tear down boarding nettings, and to peacefully hold vessels together when transferring cargo, etc. A mid-18th century French privateer, *Le duc de Mazarin* of 150(?) tons and 14 guns, was provisioned with three grappling hooks, for example. French fifth and fourth rates of the early 1670s were provisioned with three grappling hooks: one *grapin d'abordage* (a large grappling hook to be dropped from the main or foreyard) and two *grapins á main* ("hand hooks" or grappling hooks thrown by hand). Villehuet suggests grappling hooks at the extremity of the lower yards, and also on the quarterdeck, forecastle, and gangways, which clearly indicates at least five hooks. The HMS *Phoenix* had a pair of large grappling hooks with chain attached, which were referred to as "fire graplines," it used in a fight against a Sanganian (Indian) pirate in 1685. It makes sense that fire hooks, lashed parallel to the yardarms of fireships in order to snag in the enemy's rigging, could also be used as grappling hooks dropped from yardarms into enemy shrouds for boarding.

See the *Règlements pour l'armement et les équipages des vaisseaux de Louis XIV*, 1673-1674, in the BnF; Villehuet, 188 (English translation, 1738); J. Lafay. *Aide-mémoire d'artillerie navale* (Paris: Librairie Militaire, Maritime et Polytechnique, 1850), page 291; R. P. Daniel [Gabriel Daniel], *Histoire de la Milice Française et des Changements qui s'y sont faits depuis l'établissement de la Monarchie dans les Gaules jusqu'à la fin du Règne de Louis le Grand*, 2 vols. (Paris: Jean-Baptiste Coignard, 1721), page 743; Villehuet, *Le Manoeuvrier*, pages 132, 223-224; Mainwaring, *The Seaman's Dictionary*, sv. "nettings"; Henri Malo, *Les Corsaires: Mémoires et Documents Inédits* (Paris: Mercure de France, 1908), page 382; P.M.J. Bonnefoux, *Dictionnaire abrégé de la marine* (Paris: 1834), s.v. "*grapin*"; Louis-Marie-Joseph O'Hier de Grandpré, *Répertoire polyglotte de la marine* (Paris: 1829), s.v. "*grapin*"; Alonso de Chavez, "*Espejo de Navegantes*" in Duro, *Armada Española*, vol. 1:383; and the log of the HMS *Phoenix*, Captain John Tyrrell, by John Beavan, Sloane MS No 854..

Page 154, 3rd paragraph, grappling hooks: note that vessels were not held together just by grappling hooks, but by lashings as well. A particularly strong place to lash was to the fore and main chain-plates, presumably from one's own chain-plates. The bowsprit could also be lashed to chain-plates, if for example it had pierced the shrouds. See for example *The Boston News-Letter* of January 14, 1705/6; John Smith's *Seaman's Dictionary*; "The Reminiscences of

Richard Gibson,” 1702, in *Letters and Papers Relating to the First Dutch War*, vol. 1, page 5; and the eyewitness description of the fight between the *Bauden* Frigate and a French *flibuster* in 1683, in *Episodes of Piracy in the Eastern Seas*.

Page 155, 2nd paragraph, laying alongside and boarding. Flutes were noted as being difficult to board, given their bulging hull and the tumblehome above, making the distance between the attacker’s deck and his prey’s greater than usual. See Daniel, *Histoire de la Milice Française*, pages 720-721, and Georges Guillet, *Les Arts de L’Homme d’Epée, ou Le Dictionnaire du Gentilhomme* (Paris: Gervais Clouzier, 1678), 158-159.

Page 155, 2nd paragraph, laying alongside. The order to board might not be given until the captain could see “blood run out of their scuppers,” especially if the enemy had a larger crew and good protection. See “The Reminiscences of Richard Gibson,” 1702, in *Letters and Papers Relating to the First Dutch War*, vol. 1, page 3.

Page 155, 2nd paragraph, laying alongside and boarding. If in a river or tideway, the boarding ship could overset its cable coils on deck in preparation for boarding, then come alongside and lash, then let go an anchor to bring both ships up. One ship, the *Tiger*, did this in 1649 successfully. The anchor cable was bent to the mainmast. “The Reminiscences of Richard Gibson,” 1702, in *Letters and Papers Relating to the First Dutch War*, vol. 1, pages 4-5.

Page 157, 1st paragraph, tactics to prevent boarding. A ship intending to board, or a fireship, might be fended off with booms or, if small, boathooks. See Guillet, *Les Arts de L’Homme*, 743, and Villehuet, *Le Manoeuvrier*, 224.

Page 157, 1st paragraph, tactics to prevent boarding. Circa 1658, Captain Parker of the *Briar*, defending against an Ostend (Spanish) privateer, had the first six lines of ratlines cut away, and all shrouds below, and all ropes below, tallowed to make boarding more difficult, along with making it more difficult to climb the shrouds to cut the yards away. He brought baskets of shot to the quarterdeck, and, the enemy being single-decked, he had the lower deck fire a broadside of round shot and bar, the upper deck with round and bags or iron, plus musketry, when given the order by the sounding of the “great bell” at the “*fore-part of the quarterdeck*” (the bell had not yet been moved to the forecastle in all English ships), then had the ports barred. From the quarterdeck his crew fought with small arms, and also flung round shot onto the massed enemy boarders, some 150 of them. He was able to prevent the initial attempt at boarding athwart the hawse by putting his helm over, which took the wind from the enemy’s sails, forcing them to board alongside. Captain Parker and his crew were victorious. See “The Reminiscences of Richard Gibson,” 1702, in *Letters and Papers Relating to the First Dutch War*, vol. 1, 26-28. Note that the great bell was placed at the break of the quarterdeck, not the forecastle as was becoming common, and “great bell” also suggests that there was a smaller bell as well.

Page 157, second paragraph, number of boarders. Villehuet suggests that no more than three quarters of the crew be assigned to boarding, and that the principal company of boarders be composed of the “most vigorous and most intrepid.” Officers leading a boarding action should have “*de l’ardeur & de l’intrépidité.*” Duguay-Trouin suggests a boarding party be composed of

half the officers, a third of small arms men, and two men from each gun. See Villehuet, *Le Manoeuvrier*, 235, and Duguay-Trouin, *Memoirs* (London: J. Batley, 1732), 134.

Page 157, where to board. Typically, boarders massed on the forecastle and leaped into the enemy's shrouds. Duguay-Trouin notes boarding a ship from the cathead, at least in his own personal instance in order to be able to board first. See Duguay-Trouin, *Memoirs* (London: J. Batley, 1732), 15.

Page 157, boarding athwart the hawse. Boarding in heavy seas was always dangerous and probably never actually successful. Even in rough seas boarding was dangerous. For captains who liked to board athwart the hawse so that they could bring their guns to bear but the enemy could not, boarding this was risky but not impossible. The same in action in higher seas was even riskier: the great guns must be hauled in, lashed to the sills, and the ports barred in order to prevent the lower decks from flooding if open ports were rolled under. In general, guns were probably hauled in and ports closed as a ship came alongside another to board—this would ensure that gunports would not be stripped off, nor guns dismantled. See “The Reminiscences of Richard Gibson,” 1702, in *Letters and Papers Relating to the First Dutch War*, vol. 1, pages 6-7.

Page 157, fighting on deck. Fighting on the open deck, as opposed to fighting against closed quarters (an entirely different beast), was almost certainly not the random melee we see in Hollywood films, but a line or grouping of boarders facing off against a similar line or grouping, often under cover, of defenders. This is not to suggest that boardings did not at times descend into random melees, but fighting in line was far more effective.

Page 157, fighting on deck. Luke Lafontaine, a fight choreographer/stunt man who worked on *Master and Commander*, noted to me that broken toes were common during the filming of the boarding action.

Page 158, 3rd paragraph, boarding arms (and arms carried by pirates in general). Often debated is just exactly what arms boarders carried, and whether they carried cartouche boxes. One period text notes a dead *flibustier* boarder as armed with “a fuzee [a flintlock musket], an axe, a cartouche-box, a stinkpot, a pistol, and a cutlass.” See *Buccaneer's Realm*, pages 19-20. Another eyewitness reported that the same pirate had a very long musket (a buccaneer gun), two pistols, a cutlass, a stinkpot, a poleaxe, a cartouche box with 23 cartridges (doubtless some had been fired already), and lengths of line for tying prisoners. The same account notes muskets, pistols, cartouche boxes, &c left on deck by the boarding *flibustiers*. Less specific, a newspaper report of a privateer attack lists “3 Fuzees, 3 Swords, and some Axes and Pistols” as left behind by boarders. The comte de Forbin as a commanding officer at least once carried a musket with plug bayonet when boarding under fire. See the eyewitness description of the fight between the Bauden Frigate and a French *flibustier* in 1683, in *Episodes of Piracy in the Eastern Seas; The Boston News-Letter* of January 14, 1705/6; and Forbin, *Memoirs*, vol. 1:87. See also Benerson Little, “Eyewitness Images of Buccaneers and Their Vessels,” in *The Mariner's Mirror*, August 2012, for an analysis of eyewitness images of French buccaneers/*flibustiers* and boucaniers, including their arms, which include buccaneer gun, cutlass, cartouche box worn on the left, and pistol with lock toward the body on the right (for a left-hand draw, and probably to protect the

lock as well). Given that boarding actions were often drawn-out close fights, cartridge boxes were surely mandatory.

See also my blog posts on buccaneer and *boucanier* dress and arms, cited previously.

Alonso Ramírez, captured in 1687 by buccaneers aboard the *Cygnets*, one of whom was William Dampier, noted that the pirates were “well supplied with muskets, cutlasses, axes, grappling irons, grenades, and several cauldrons full of pestiferous ingredients.” See Alonso Ramírez, *The Misfortunes of Alonso Ramírez*, edited by Fabio López Lázaro (Austin: University of Texas Press, 2011), 116. The “pestiferous ingredients” would have been mixtures for use in smoke or stink pots, or for firepots, or both. Due to the extreme hazard of fire, firepots—intended to set a ship afire—would only have been used against attacking ships from which the pirates hoped to escape, and not against likely prizes.

Fray Juan de Avila describes the arms of the *flibustiers* who sacked Veracruz in 1683 as being “a cutlass, a large [or long] flintlock musket [clearly a buccaneer gun], two pistols, and hanging from a waist belt two cartridge boxes [*baulillos*] with paper cartridges [*alcartazes*] inside.” The two cartridge boxes, as opposed to the usual one, may have been added to carry the much larger number of cartridges necessary to a major attack ashore, including defense against counter-attack. The second box was probably worn at the small of the back, given that, based on eyewitness images of *flibustiers* at the time and how they carried their arms and equipment, there was no other place for it.

Page 160, closed quarters. Guns (cannon) thrust through ports in inboard bulkheads at the forecabin, steerage, quarterdeck, and poop were known in the Levant as *scopa coperta*, that is, “covered brooms,” given that they could sweep the decks clear. See Thevenot, *The Travels Of Monsieur De Thevenot Into The Levant*, vol. 1 (London: H. Clark et al, 1687), page 268, and Thevenot, *Relation d'un Voyage Fait au Levant* (Paris: Thomas Jolly, 1665), page 532.

Page 160, closed quarters. Another tactic to defeat boarders, effective but seldom used because it was extremely dangerous to the boarded ship, was to literally “blow up” a deck, typically the quarterdeck or forecabin, or both. The tactic is mentioned in Smith’s *Sea-man’s Grammar and Dictionary* (page 57), and Luttrell notes that it was used in 1695 by an English East India ship to defeat a 36 gun French privateer who boarded her three times: “and after several hours dispute, and a 3d boarding, blew up her deck, with 70 French men, and so gott off.” See Luttrell, *A Brief Historical Relation of State Affairs* (Oxford: University Press, 1857), vol. 3:505. Thevenot notes that if necessary, the captain of the English ship upon which he sailed, and which was attacked by three Spaniards, would have ordered the poop deck blown up with Spanish boarders upon it. See Thevenot’s English translation immediately above, page 282, or the French, page 560. In 1641(?) a Spanish ship of three decks (probably not all gun decks, the text is not clear) blew up its decks one by one to defeat Japanese boarding parties of soldiers in Nagasaki. In the end the overwhelming number of Japanese soldiers overpowered the Spanish defenders and killed them to a man. The description is not eyewitness, and is dated 1690, half a century later; see *The Indian Antiquary*, 1919. In 1638 the English merchantman *Comfort* blew up its upper deck in a fight against Malabar “pirates.” Although the explosion killed a large number of the attackers (and wounded but not killed some of the English), the rovers, members of a nine-ship flotilla,

continued to attack. In the end, the English captain blew up his ship, killing a great many of the attacking rovers. Fifty-four of the English crew and passengers survived to be captured. Captain Walter Clark's letter describing the attack is reprinted in *The Indian Antiquary*, 1919.

Page 160, closed quarters. Park, in his *Defensive War by Sea*, page 7, notes that a petard can be used to breach closed quarters, but I have found no firsthand account of this actually being done. A few petards were discovered in the wreck of the French naval supply vessel *La Belle* (1684), but they were probably intended for the short-lived French colony on the Gulf Coast. *La Belle* and her crew were too small to have considered attacking a ship of any size by boarding.

Page 160, closed quarters. Broken bottles were sometimes scattered on the deck to help repel boarders, in combination with powder chests and closed quarters. Given that many seamen, pirates included, went barefoot, this would have been fairly effective. Similarly, the crew of the *Bauden* in 1686 poured melted butter topped with dried peas on the poop deck, and elsewhere (not specifically identified) two deal boards with ten-penny nails, points upward. Review also the note to page 157 on tallowing to prevent boarding. See "J. D., a Antigua, to J. A., in London, March 5th, 1710-11" in *Penn and Logan Correspondence*, vol. 2:433, and the eyewitness description of the fight between the *Bauden* Frigate and a French *flibuster* in 1683, in *Episodes of Piracy in the Eastern Seas*.

Page 160, powder chests were made of a board to which two boards were nailed like the roof of a house. A powder cartridge (made up for a naval gun) was placed inside, the ends closed up, and a top, sloping like a seaman's chest (which often was narrower at the top than the bottom) was nailed on. Between the "roof" and the top was shrapnel. The chest could be fired by a fuse, or better, via a hole leading below into which a powder-filled tube was inserted, and fired via a pistol loaded only with powder, but no wad. Powder chests could be nailed directly to the deck or nailed down—"plated"—via "winding plate," which is soft metal stripping. Often the bases were nailed to the deck the first time a ship made ready for engaging, and then were left on deck, to be armed when necessary. See Park, *Defensive War By Sea*; Little, *The Wonderful Preservation of the Ship Terra Nova*, page 347, cited in *Buccaneer's Realm*.

Page 160, placement of powder chests. *The Terra Nova* (see above) mounted seven chests, some on the quarterdeck (four? five?) and the remainder on the forecastle. The *Derby* (see above) mounted powder chests on the forecastle, quarterdeck, and poop deck. The *Bauden* (see above) mounted two on the forecastle and one on the poop. The *Mary Galley* (1708, see *The Papers of Thomas Bowrey*) mounted six "powder Chists" on her quarterdeck and two on her forecastle when chased by a French privateer. Labat describes an unnamed number, more than one, mounted on the forecastles and quarterdecks of a pair of English merchantman.

Pages 190-195, land warfare: see chapter 18 in *Buccaneer's Realm* for far more detail.

Page 194, alternating fire. This method of keeping a constant fire was not original with the buccaneers, filibusters, and *boucaniers*. Bernal Díaz del Castillo in his *The Discovery and Conquest of Mexico* describes its use against Aztecs, and there are contemporary accounts of conventional forces in Europe using it when necessary, although not as a standard battlefield tactic, but to prevent being overrun, for example, by cavalry &c.

Page 208, 1st paragraph, earrings. Based on detailed period illustrations, at least some Dutch seamen did wear earrings, often pearl earrings, and very likely many Native American, African, mulatto, and zambo rovers wore earrings as well, given the prevalence of earrings among Native Americans, Africans, and mixed race ethnicities in the New World. For more detail see: <https://benersonlittle.com/2017/07/05/pirates-earrings/>

Page 208, 1st paragraph, tattoos, for more detail see: <https://benersonlittle.com/2017/08/16/gunpowder-spots-pirates-tattoos/>

Pages 210-211, dueling: see also chapter 19 in *Buccaneer's Realm* and chapter by Benerson Little.

Page 222, *forban*. The term derives from Medieval Fr. *forbannir*, to banish or exile, dating (*forsban*) to at least 1273 AD. The term is derived either from the Dutch *verbannen*, or as likely from the Latin *forisbannire*, to outlaw. A *forbannerie* is an act of piracy. See *Le Trésor de la Langue Française Informatisé*, s.v. “forban.”

Page 223: Insert the following: *boss-loper*: a Dutch *coureur de bois* or ranger.

Page 223. Insert the following: *écumeur de mer*: (Fr.), a pirate or *corsaire*.

Page 224. To linguister add: See also *truchman*.

Page 225. Add to swashbuckler: the term “swashbuckler” appears to have been first applied to these piratical gentlemen of fortune in 1684 in the Malthus edition of Exquemelin’s *The History of the Bucaniers*.

Page 225. Insert the following: *truchman*: an interpreter or linguister. See also *linguister*.

Page 226. Add to grommet: Also referred to as a powder monkey, at least from the mid 17th century.

Page 226, musician. Pirate captains John Banister and Howell Davis also had a trumpeters aboard in 1687 and 1719, respectively; the practice was common for centuries. Everard mentions a drummer aboard ship, as does the trial record of Charles Harris and his crew, whose drummer beat his drum on the roundhouse of the pirate sloop during action. Aboard the pirate ship *Mocha Frigate* in 1697 were “hautboys” (oboes), drums, and trumpets. See Taylor, *Jamaica in 1687*, 49; William Snelgrave, *A New Account of some parts of Guinea and the Slave Trade* (1727); Everard, “Relation of Three Years Suffering,” 289; “Trials of Thirty-Six Persons for Piracy &c” in *Memoirs of the Rhode Island Bar*, edited by Wilkins Updike (Boston: Thomas H. Webb, 1842), page 289; and the firsthand accounts in *Pirates of the Eastern Seas, 1618–1723: A Lurid Page of History* by Charles Grey, edited by George MacMunn (London: Sampson Low, Marston, & Co., [1933]), pages 140, 145.

Page 229. Add the following to *barca longa*: Spanish *barcalongas* were rigged with lug sails, or at least some of them were.

Page 230. Add the following to *barque longue*: In the French navy of the late seventeenth and early eighteenth centuries, a *barque longue* was also a category of “small frigate” used for coastal transport and lightering duties. They appear to have been two-masted with square courses, topsails, and spritsail, with no lateen or gaff mizzen. La Salle’s *La Belle*, lost off the Texas coast and recently excavated, has been described as a *barque longue* of three-mast type, although its designation as three-masted is based on the distance between fore and main-masts: the mizzen step is missing and it’s possible it was in fact two-masted. A *barque en fagot* was a *barque* or *barque-longue* shipped in pieces and assembled at its destination. *Barque-longue* was also the term for a Dunkirk two-masted privateer whose foremast was about a third shorter than the main. The Dutch called this vessel a *snauw* (a term that may have been applied to any small naval scouting and dispatch vessel); among French privateers it was called a *senau* (snow). These vessels were very similar in hull, rig, and purpose to French *corvettes*, and one source suggests that a *barque-longue* was nothing more than a corvette (although du Pas shows them both), and that the name corvette was taken from name of a French naval *barque-longue*. See *snow* and *corvette*.

Page 231. Insert *chat* (Fr.), *cat* (Eng.): basically a flute with little tumblehome. The design was originally used for ferrying lumber. See *hagboat*.

Page 231. Insert *chasse-marée* (Fr.): a lugger-rigged fishing vessel often used for smuggling and privateering. Strictly speaking, a *chasse-marée* was a fishing vessel that carried fresh catch for sail.

Page 231. Add the following to *dogger*: (Fr. *dogre*, Dut. *dogger*). Also *doggerboot*, *dogre-bot*. At the end of the entry, add: Typically used for fishing, as in *fishing-dogger*, and also for privateering.

Page 232. Add the following to *fluyt*: the fluyt began to be slowly replaced starting in the last quarter of the 17th century by the *hackboat* or *hagboat* (Fr. *chat*) when the narrow upper decks of the flute were no longer required. However, the term fluyt remained in use for some time afterward to indicate a moderate to large cargo vessel with round bow and stern. See *hackboat*, *hagboat*.

Page 232. Add to *flyboat* (Fr. *flibot*, Sp. *filibote*): In French and Spanish, a small flute of roughly 80 to 100 tons. In English, generally a pink (by definition of similar tonnage) or sometimes a full-size fluyt. See also *urqueta*.

Page 233. Add the following to *hackboat*, *hagboat*. The hagboat is descended from the *fluyt*, and is essentially a flute without the narrow upper deck and sharp tumblehome. See *chat*, *cat*.

Page 234. Insert the following: *hoecker* (Dutch): a Dutch vessel with a flat bottom, pinked bow and stern, with two masts, the mainmast large and square-rigged, usually with a single sail, and

the mizzen small, with a square fore-and-aft sail hooped to the mast. Somewhat similar to a *chasse-marée*.

Page 234. Insert the following: *hourcre* (Fr.): an *urca* or *hagboat*. Also a *hoeker*.

Page 234. Insert the following: *Hulk*: Also *Hulke*. An English term for the rich Spanish *urca* of 700 to 800 tons which called on Honduras, often as a *navio de registro*. The French referred to it as the *hourque*, *houcre*, or *ourque*, also terms used in the 18th century for *hackboat* or *hagboat* (from the Dutch *hoek-boat*). A hulk is also an old ship used as a platform or machine in a shipyard, for example to set up masts or aid in careening.

Page 234. Add the following to *ketch*: *load-ketch*: a ketch used for cargo as opposed to fishing.

Page 236. Insert new entry: *roader*: a vessel riding at anchor in a road, that is, a protected anchorage with good anchoring ground and reasonable access to shore. A roader is also a vessel anchored in a bay or river.

Page 237. Add the following to *snow*: Dutch *snauw*. In the seventeenth century, a two-mast square-rigged vessel used for privateering. Its foremast was a third shorter than the main. Probably identical to the Dunkirk *barque longue*.

Page 237. Insert the following: *urqueta*: a small *urca* or flute; a pink or *flibot*. Also *filibote*. These vessels were typically around 100 tons or smaller.

Page 237. Insert the following: *well boat*: In general, any fishing boat with partitions in the hull for holding catch. The term was often used in the late 17th century in reference to fishing boats, usually French, converted to privateers.

Page 238. Add the following to *yacht*: In the New World, yachts were seen most often at New York and in the Dutch colonies, and occasionally at Jamaica and St. Thomas.

Page 248, black strap beer. The sieur de Diéreville, a traveler to Acadia in the late 17th century, describes this beer as a “decoction” of the tips of fir trees, yeast, and molasses fermented for two or three days. The heavier ingredients settle, and the "light coloured Liquor" at the top is drunk. See de Diéreville, *Relation of the Voyage*, 91, 256. The text is in both French and English.

Page 251, add to *swivel*: maximum range 150 *toises* when charged with 2.5 pounds (French) powder; maximum effective range 150 *pas* (probably *commun*), equivalent to 960 feet/320 yards and 400 feet/133 yards respectively, probably when armed with a round shot. See Le Blond, *l'Artillerie Raisonnée* (Paris: 1761), 215-218.

Page 251, add to *swivel*: Francis Povey in his *Sea-Gunner's Companion*, page 42, recommended that guns loaded with case shot not be fired beyond 60 yards because the dispersion pattern was too great. This agrees with tests I helped conduct in Denmark with a paterero loaded with burrel or scrap iron, in which the pattern at 60 yards was six feet.

Page 251, modified ranges. Musket shot: 700 to 800 feet (among the English), 700 to 1000 feet (among the French). Buccaneer gun (*fusil boucanier*): 800 to 1000 feet. Pistol shot: poorly defined, may range from half-musket to 210 Feet (70 yards), and possibly only to 105 feet (35 yards) or even roughly 30 feet (10 yards) if equated, as Duguay-Trouin did, with “yardarm to yardarm” range (his memoirs in English, page 91). Ten yards is in my experience the effective range of the typical flintlock pistol of the era.

Occasionally readers will argue to me that there is in fact no point blank range. This is an argument without much merit other than theoretical, not to mention a misunderstanding of the practical use of a naval gun in a fight. As a shot exits the barrel at maximum velocity, it will briefly fly *relatively* straight, that is, the shot will not drop much over a short distance. This is point blank range: the shot of a properly aimed gun will strike roughly where the gun was pointed. I’ve quit arguing with certain “engineers” and “physics students” of little practical inclination who continue to tell me that “It doesn’t really move in a straight line.” Yes, we know this.

Page 251. Add gunshot range: generally equivalent to point blank range. See for example Falconer’s *Dictionary* and *The British Mariner’s Vocabulary* by J. J. Moore (London: 1801). However, it was also a general term that could be confusing, requiring clarification between “point blank” and “random shot.” See for example *Minutes taken at a court-martial, assembled on board His Majesty’s ship Torbay* (London: W. Webb, 1745).

Page 252, measures and distances. The length of a French cable was 100 toises (six French feet) or 120 brasses (French fathom of five French feet = 1.62 meters = 5.329 feet), roughly 639.5 English feet.

Page 252, anker: According to *The Merchant’s Magazine: or Trades Man’s Treasury* by Edward Hatton (1712), an “anchor” in Holland was 10 English wine gallons.

The following are from Hatton:

Page 252, add: butt: “Of Sack 2 Hogsheads. Currants—15 to 22 C.” (hundredweight).

Page 252, add: cask: an uncertain quantity or capacity.

Page 252, add: chest: of sugar, for example, 10 to 15 hundredweight, of indigo, 1.5 to 2 hundredweight.

Page 252, add: jar: 18 to 26 gallons liquid measure.

Page 252, add: keg: 4 or 5 gallons.

Page 252, rundlett, add :Also a various measure from 3 to 20 gallons. (From Hatton.)

Page 252-53, add: quintal: of fish, 100 pounds.

Page 253, serroon, add: A serroon or *serón* typically weighed 1 to 4 hundred pounds depending on the product.