

WEAPONRY **from the** ***MACHAULT***

An 18th-Century French Frigate



Douglas Bryce



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Cover: One of the solid cast-iron 12-*livre* French cannonballs recovered from the wreck of the *Machault*. (Photo by G. Lupien.)

WEAPONRY from the *MACHAULT*

An 18th-Century French Frigate

Douglas Bryce

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Abstract

The collection of small arms and accessories recovered during the archaeological investigation of the 1760 wreck of the French frigate *Machault* primarily represents French marine firearms and swords. A large collection of French ordnance, side arms and ammunition, representing ship's arsenal items and munition supplies for Canada, was also recovered, as were numerous examples of

British projectiles fired at the ship. This paper identifies, describes and interprets these large and varied assemblages.

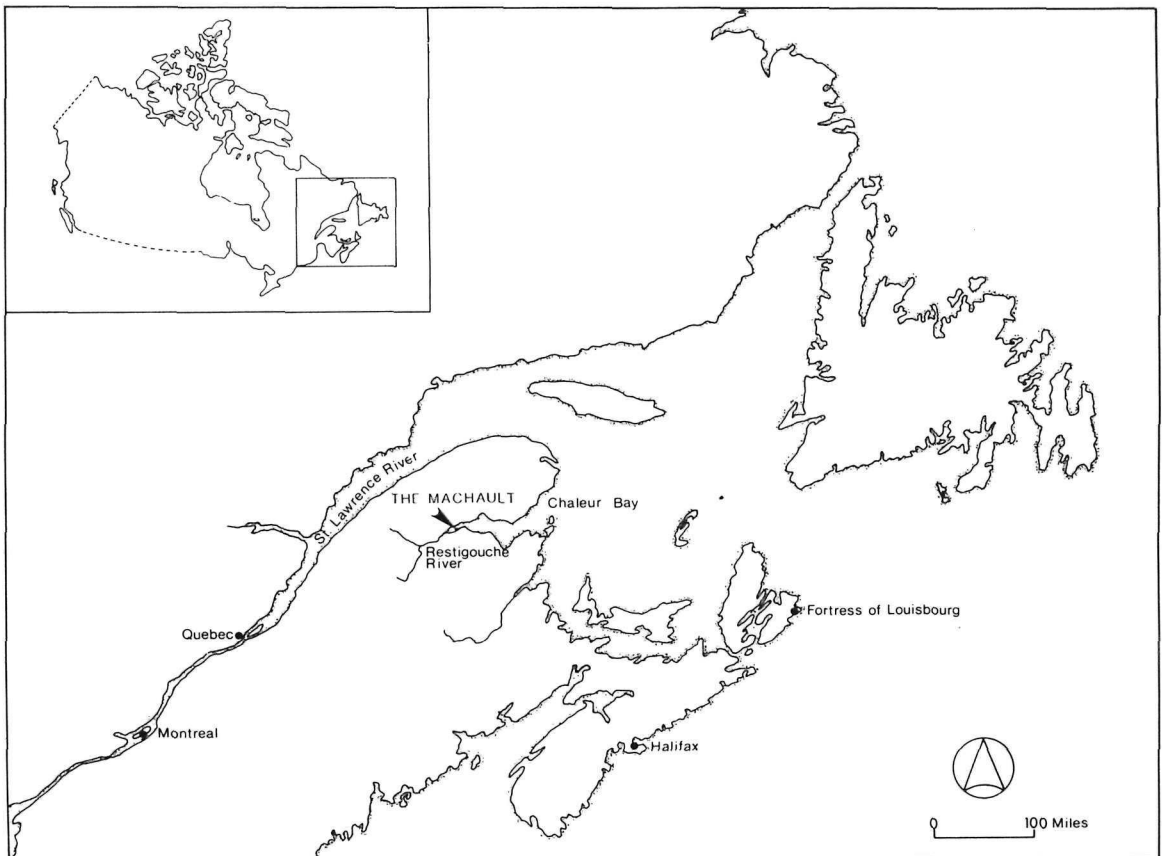
Submitted for publication 1983, by Douglas Bryce, Material Culture Research Section, Archaeological Research Division, Parks Canada, Ottawa.

Introduction

In the autumn of 1759 New France was on the verge of capitulation to the British. Montreal, its morale at a low ebb owing to the recent surrender of Quebec City and Louisbourg, was rapidly running out of military supplies and funds and in desperate need of French assistance. After prolonged haggling between civilian businessmen and the state, a six-ship fleet was hastily assembled at Bordeaux and outfitted to sail for Canada.

The flagship of the fleet was the *Machault*. It had been built in Bayonne, France, in 1757 as a 550-tonneaux merchant frigate and later converted to a 500-tonneaux frigate-at-war (Beattie 1968: 53). Initially pierced for 26 guns, it could have carried as many as 32 on its last voyage. The original 1758 outfitting

list (Compte de construction: 1758) includes, among other supplies, various weaponry items purchased for use by the ship and its company: 24 12-livre cannons for the deck, 2 six-livre cannons for the forecastle, 24 wooden gun carriages, 6 swivel guns, 800 12-livre cannonballs, and 120 hand grenades, as well as an unspecified number of muskets, pistols, sabres, boarding axes, and *mitraille* (the literal English translation of which is "shower"), which was small iron or lead balls for use in multiple-shot anti-personnel projectiles such as grape and cannister shot. It is not known what, if any, guns were added at the time of re-outfitting, nor the exact nature of the munition supplies for Canada.



1 Location of the Restigouche River.

On 11 April 1760, one day after leaving port, the fleet was scattered by two British ships, and only three ships -- the *Machault*, *Marquis de Malauze* and *Bienfaisant* -- were able to make contact and continue their journey. By mid-May the French had reached the Gulf of St. Lawrence, where they captured a British ship and learned that the British had preceded them downriver. The decision was made to head for the safety of the Bay of Chaleur, where they arrived with a number of British ships they had captured en route. The French set up camp on the bank of the Restigouche River and dispatched a messenger to Montreal for instructions.

The British response to news of their presence was decisive. A fleet commanded by Captain Byron, that included the *Fame*, 74 guns, the *Dorsetshire*, 70 guns, the *Achilles*, 60 guns, and the frigates *Repulse*, 32 guns, and *Scarborough*, 20 guns, quickly set sail with orders to find and destroy the French ships. On 22 June the British contacted the enemy fleet. The French, retreating upriver, attempted to prevent the British ships from following by sinking small boats across the channel, and at strategic points set up shore batteries with weapons removed from their ships. After approximately two weeks of manoeuvring and sporadic fighting, the final engagement occurred on 8 July 1760. When surrender became inevitable, Captain Giraudais of the *Machault* ordered all hands to remove as much cargo from the ships as possible. With a dwindling powder supply and with water in its hold, the *Machault* was defenceless and the order was given to abandon and scuttle it. The *Bienfaisant* suffered

the same fate and later in the day the British boarded and burned the abandoned *Marquis de Malauze*.

The Battle of Restigouche was a turning point in Canadian history. Montreal, denied its much-needed supplies and morale booster, now had neither the means nor the will to attempt to re-take Quebec City or properly defend itself. In short, the loss of the fleet contributed to the British conquest of New France (Beattie and Pothier 1977: 6).

During the summer of 1967 a brief survey of the *Machault* was carried out by the Archaeological Research Division of Parks Canada. In the winter of 1968-69 a comprehensive magnetometer survey preceded an extensive three-year underwater project lasting from the 1969 through the 1971 field seasons, which yielded the vast majority of recovered artifacts. The cutting and raising of some of the ship's timber occurred in 1972, along with minor artifact recovery (see Zacharchuk and Waddell 1984).

The reader should bear in mind that in 1760 the French and British measurement systems were slightly different (see below). Therefore, the French terms *pouce*, *pied* and *livre* cited from historical documents have been retained in the text rather than being literally translated into the British inch, foot and pound.

18th-Century

French	British	Metric
1 <i>pouce</i>	1-1/16 in.	2.70 cm
1 <i>pied</i>	12-3/4 in.	32.48 cm
1 <i>livre</i>	1.079 lb.	489.51 g

Part One
Small Arms

Introduction

Part One of this report describes and discusses the small arms and their accessories recovered from the *Machault*. Designed primarily to assist in the interpretation of this historic site, the study will also provide useful comparative data for other studies of mid-18th-century small arms.

Although no gun locks were found (due likely to iron's susceptibility to corrosion), it is assumed that all the firearms recovered and studied are flintlocks or closely related types that utilized flint striking steel to ignite the priming charge (Fig. 2).

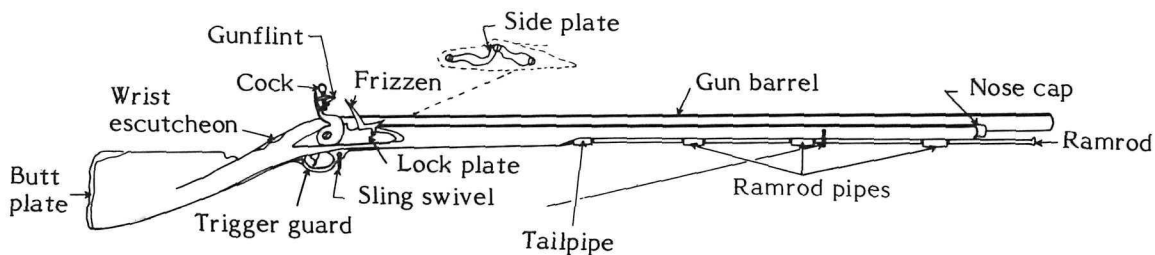
The bulk of the firearms is of French origin, with a minimum of 11 *fusils grenadiers* and ten Model 1733-34 cavalry or marine pistols comprising the majority. One *fusil grenadier's* butt stock is marked LE MACHAULT (Fig. 5), as are two of the Model 1733-34 cavalry or marine pistol stocks (Figs. 27-28), indicating that at least some and probably the majority of these firearms came from the ship's arsenal. Interestingly, the ramrod pipes of these two different firearm types are stylistically identical although the pistol pipes are proportionally smaller (Figs. 3, 10, 26-28). French military muskets are represented by two wooden stocks with Model 1728, or perhaps marine, type features (Figs. 16-17). At least two British Long Land Pattern muskets are present, one with a wrist escutcheon marked "50th. R[egiment]t." (Figs. 18-20).

A blunderbuss, musket butt plate, musket ramrod tip, trigger-guard finial, pistol butt

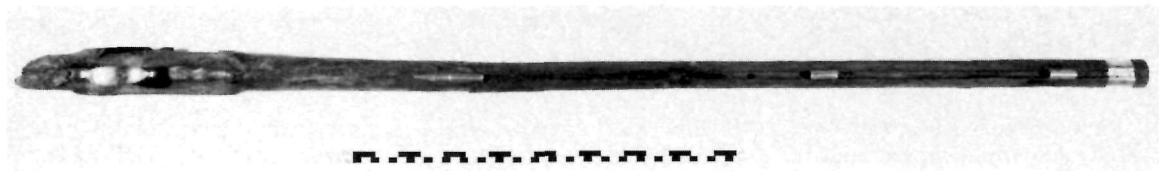
cap, pistol trigger-guard bow, pistol ramrod pipe, five gun barrels, and ten gunflints comprise the miscellaneous firearms and accessories (Figs. 33-42).

The edged weapons, almost exclusively swords, represent French arms of the late 17th to mid-18th century. The most numerous sword type, a boarding sabre belonging to the ship's arsenal, is represented by a minimum of ten examples and is characterized by a common 18th-century French military outboard shell counterguard known as a *pontet simple* (Fig. 44). However, unlike the plain soldier's sword, it has a relief wreathed-head decoration and either an octagonal bone or turned wooden grip (Figs. 45-47). Also present is a minimum of seven examples of another popular French military sword of the late 17th to mid-18th century known as *à la mousquetaire* (Figs. 48-49). Its features include a dished bilobate counterguard and a *pas-d'ane*, two rings, behind the counterguard, into which fencers placed their first two fingers. A possible boarding axe was also recovered (Fig. 50).

The edged-weapon accessories are represented by three sword scabbards, a possible bayonet scabbard, three scabbard tips and two wooden scabbard liners (Figs. 51-54). Although the assemblage includes a possible bayonet scabbard and tips, no bayonets were recovered, indicating perhaps that, if originally present, most were removed, along with the majority of the military small arms, prior to the scuttling of the ship.



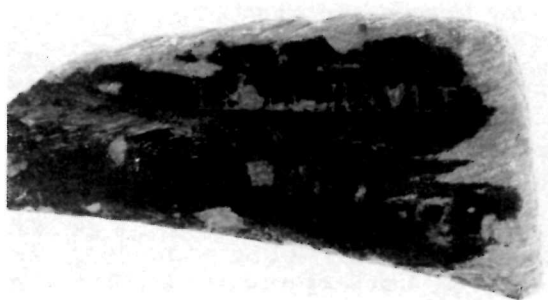
2 Flintlock musket nomenclature.



3 *Fusil grenadier* stock with furniture.



4 *Fusil grenadier* stock.



5 *Fusil grenadier* butt stock marked LE MACHAULT.



6 *Fusil grenadier* lock area showing the inset for the bridled tumbler lock.



Muskets

Fusils grenadiers

The most numerous musket type recovered from the *Machault* shares attributes with trade guns as well as French military arms such as the Model 1717 infantry musket and the Model 1733-34 cavalry musketoon and dragoon musket. However, its overall design and LE MACHAULT marking on the only surviving butt stock indicate that these muskets were likely French *fusils grenadiers* -- muskets with barrel bands designed for sling-swivel rings -- and that they belonged to the ship's own arsenal of weapons.

A minimum of 11 *fusils grenadiers* was recovered from the *Machault*, six with portions of their wooden stocks remaining. The most complete specimen, which is missing its butt stock, is a full-stocked musket, has three brass ramrod pipes, a single iron barrel-band outline, a sheet-brass nose cap, iron ramrod remains, and a brass trigger guard still intact (Fig. 3). Another excellent example (Figs. 4, 5) has only its muzzle end missing. Its butt stock is intact and is marked LE MACHAULT, indicating that at least some and probably all of these arms represent *fusils* referred to in the original 1758 outfitting list as being purchased at Saint-Etienne for use on board the *Machault*. Although no locks were recovered, numerous stock fragments from the lock areas of these muskets clearly indicate the locks' long length (approximately 16 cm), shape, and the inseting that was done to accommodate their bridled tumblers (Fig. 6).

From piecing together the two most complete examples of these muskets, it

appears that they were originally about 149 cm in overall length with 109-cm-long barrels. The most complete barrel (Fig. 3) has a bore diameter of approximately 17.5 mm, indicating that these muskets were .69 calibre (18 balls to the *livre*). This is the same calibre as that of French military muskets of the day.

Side plates. All three complete side plates are manufactured of cast brass and are hand engraved. Each has a flat surface with bevelled edges and three lock-screw holes; two of the holes took screws that secured the lock and the third, rear, hole took a screw that simply held the side plate to the stock. Two examples have countersunk rear holes (Fig. 7a, b); the third (Fig. 7c) has an additional, smaller hole probably added after manufacture. On all examples two parallel lines ring the perimeter of the central portion of the face, and a single U-shaped line dips under the centre screw hole. The rear finial consists of a shell-like motif with a tiny ball. On two specimens (Figs. 7b, c) the chased decoration adjacent to the rear finial spirals in one direction; on the other, likely by another engraver (Fig. 7a), it spirals in the opposite direction. The shape of these side plates is like that of the French Model 1733-34 cavalry pistol (Fig. 26) and the rarer Model 1733-34 musketoon.

Butt plates. All four butt plates are manufactured of cast hand-engraved brass. One complete example is slightly convex in cross-section, has two countersunk attachment holes in the butt, and has one attachment lug, with hole, on the underside of the tang. The tang



7 *Fusil grenadier* side plates: a, with three lock-screw holes, the rear one being countersunk; b, with three lock-screw holes; and c, with three lock-screw holes, the rear one being countersunk, and one extra hole for securing the side plate to the stock.



8 A *fusil grenadier* butt plate showing the tang decoration and trefoil finial.



9 *Fusil grenadier* trigger guards: a, large (heavy-gauge metal), and b, small (lighter-gauge metal).



10 *Fusil grenadier* tailpipe.

has a trefoil finial with linear decoration bordering its edges and a curving decoration on the central portion. One fragmentary example, represented by a tang with an attachment lug without a hole, has similar decoration (Fig. 8). A third is incomplete -- its tang finial and attachment lug are missing -- but has two attachment holes in the butt and appears to have similar decoration as the other two. The fourth specimen is represented by a corroded trefoil tang finial with fragmentary attachment lug and no visible decoration.

The butt tangs' shape is also similar to that of the Model 1733-34 musketoon as well as some 18th-century French trade guns.

Trigger guards. All ten trigger guards are manufactured of cast and filed brass and are hand engraved. Three complete examples each have a flat surface with wide bevelled edges, two countersunk holes in the rear finial, and one attachment lug, with hole, on the underside of the front finial at the base of the bow. The finials, both front and rear, consist of a teardrop, the smaller examples being more elongated than the larger (Fig. 9a, b). The central portion of the bow under the trigger has an incised linear and circular decoration. Although all the trigger guards have similar attributes and decoration, some are longer and wider, and are manufactured of a heavier-gauge metal than others (Fig. 9a, b).

Tailpipes. All four tailpipes are manufactured of cast and filed brass. Each consists of a cylinder with a tapered tail. An attachment lug with a hole is located on the underside of each cylinder. One example has two deep lines cast across the back of its tail. Although larger, these tailpipes are otherwise identical to those on the French Model 1733-34 cavalry pistols from the ship.

Ramrod pipes. All three specimens are manufactured of rolled sheet brass and consist of cylinders with narrow raised bands near each rim (see Fig. 3). These too, although larger, are identical to those on the French Model 1733-34 cavalry pistols from the ship.

Stocks. The six stocks are fragmentary, one being complete from the lock area forward

(see Fig. 3). The only recovered butt stock is marked LE MACHAULT (Figs. 4, 5). A close-up of the inseting in the lock area indicates that the locks for these muskets had bridled tumblers (Fig. 6).

Ramrods. Both fragmentary specimens are iron (see Fig. 3).

French Military/Marine Muskets

The first French attempt at firearm standardization resulted in the adoption of the Model 1717 infantry musket. It featured iron furniture, an approximately 16.5-cm-long flat lock with gooseneck cock, sling swivels to the rear of the side plate and on one side of a single barrel band, and a bore of .69 calibre, or 18 balls to the *livre*. Other features included four ramrod pipes, a distinctive butt-plate tang of approximately 15.2 cm, a high comb on a curving butt stock, and an iron-tipped wooden ramrod. The barrel was octagonal at the breech, then became round; it was pinned and approximately 118.7 cm long.

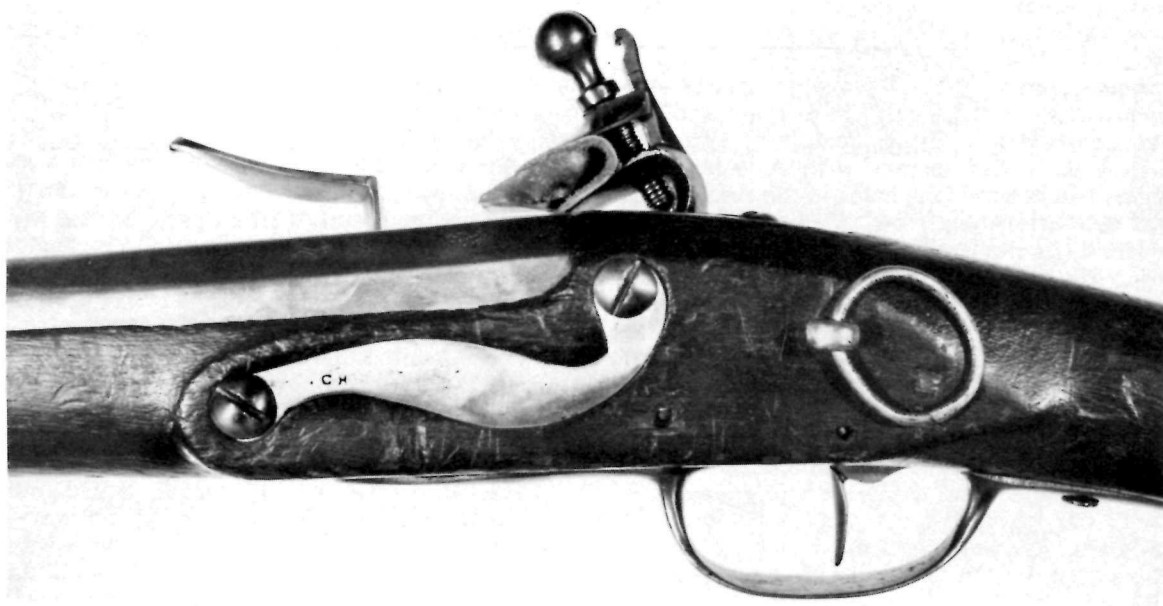
The Model 1728, which superseded the Model 1717, had almost identical attributes (Figs. 11-14); however, it did differ somewhat in that the barrel was no longer pinned but was secured by three bands (Fig. 11).

The *Ministère de la Marine* issued its troops its own model muskets, which were purchased primarily at Tulle, until the early 1740s (Bouchard 1980: 7). Later the ministry purchased these "marine" muskets at either Tulle or, preferably, Saint-Etienne. These muskets apparently adopted numerous features of the official French Model 1728 infantry musket, including the three barrel bands. Therefore, it is possible that, although sharing attributes with the Model 1728, the *Machault* examples represent a hybrid military/marine type of weapon.

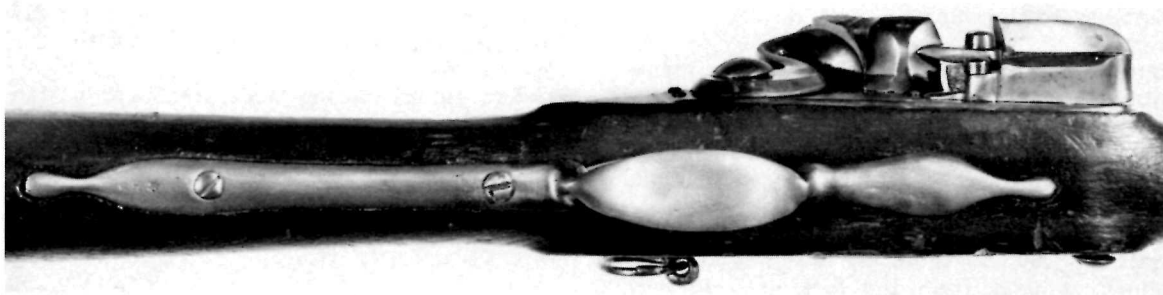
Two stocks sharing Model 1728 and marine musket features were found that could represent discarded weapons of the troops on board the ship, ship's arsenal arms, or military cargo for Canada.



11 A French Model 1728 musket.



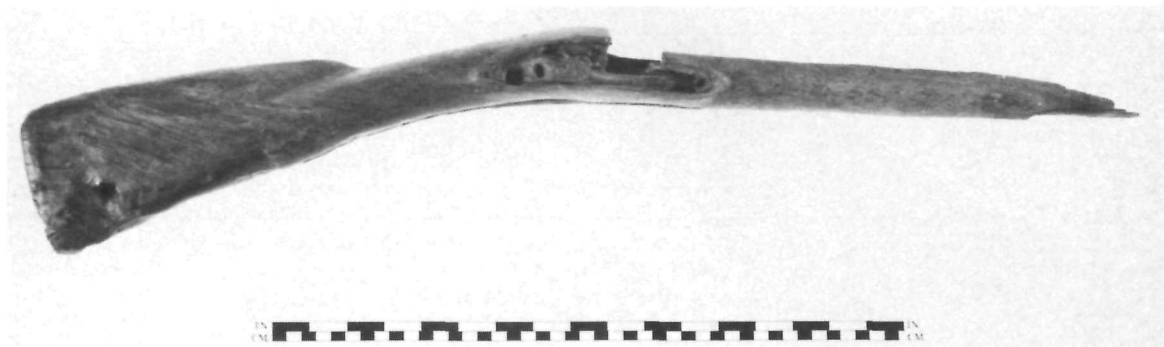
12 Side plate and sling-swivel attachment ring, French Model 1728 musket.



13 Trigger guard, French Model 1728 musket.



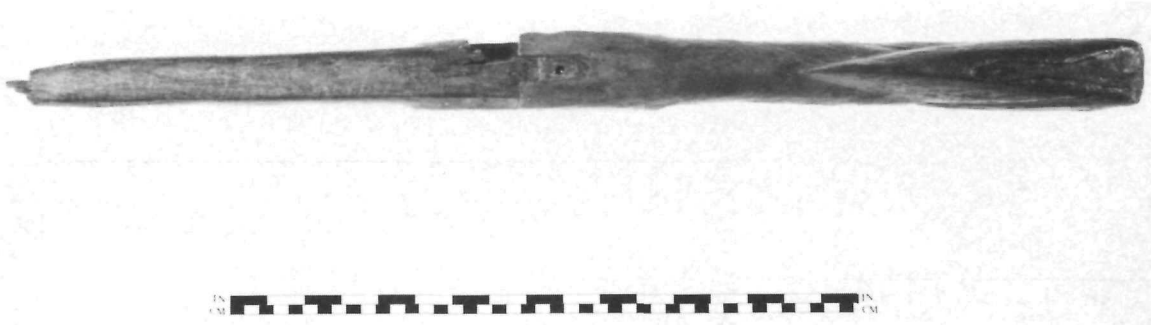
14 Butt-plate tang, French Model 1728 musket.



15 The lock side of a French military/marine musket.



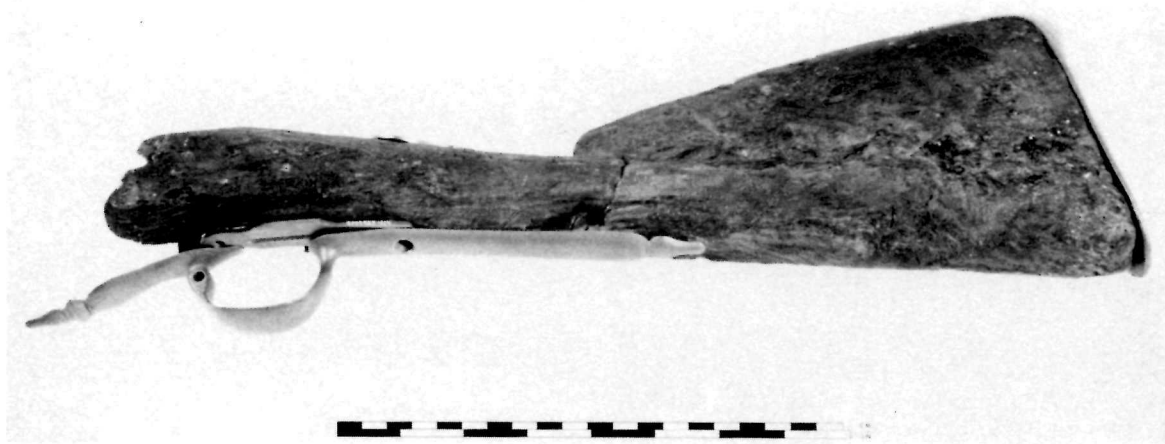
16 Bottom view of the trigger-guard outline and wooden ramrod, French military/marine musket.



17 Top view of the butt-plate tang outline, French military/marine musket.



18 Butt plate and wrist escutcheon, British Long Land Pattern musket.



19 Trigger guard and trigger floor plate, British Long Land Pattern musket.

Stocks. Two military/marine stocks were recovered. The most complete example (Fig. 15) has only its muzzle end missing; the distinctive French military trigger guard and butt-plate tang outlines and a high comb on a curving butt stock are present. There is a possible sling-swivel attachment hole below and to the rear of the rear side-plate screw (Figs. 16-17). As in the French Model 1728, the stock is not pinned, and a fragmentary wooden ramrod is still in place in its channel (Fig. 16). The other specimen consists of a small, undiagnostic wooden fragment from the lock area of a musket.

The lock area of the most complete military/marine stock indicates that, due to the absence of inseting, this musket's lock had an unbridled tumbler and was likely manufactured sometime in the late 17th or early 18th century. For example, in dismantling and examining a selection of non-*Machault* French muskets belonging to Parks Canada's Interpretation Division, it was discovered that all four of the Model 1728s and one Model 1754 had inseting in their stocks for bridled tumblers. On the other hand, three earlier 18th-century trade/hunting *fusils* and one Tulle 1696 contract *fusil* had neither bridled tumblers nor inseting. Another interesting observation on the *Machault* example is the absence of inseting in the stock for a side plate, a feature found on all early 18th-century French military muskets, as well as the three trade/hunting and one 1696 contract *fusils* examined at the Interpretation Division. In fact, it is likely that the *Machault* example had no side plate and that the lock was secured by only two screws.

British Long Land Pattern Muskets

The Long Land Pattern musket was accepted as the standard British infantry arm during the first quarter of the 18th century. Its production as an official model was terminated by royal warrant in March 1790 (Blackmore 1961: 61). The model is a readily identifiable arm featuring distinctive heavy cast-brass furniture, a .75-calibre bore, a round barrel, and dateable lock and furniture variations. A minimum of two Long Land Pattern muskets was recovered. The most complete comprised a stock fragment, side plate, butt plate, trigger guard, trigger floor plate, tail-pipe, and wrist escutcheon marked with a "b"

over a line over "41" and "50th. Rt." (Figs. 18, 23). The French likely captured these muskets from the 50th British Regiment at Oswego in 1756 and subsequently re-issued them for naval use.

After the introduction of the "Ordnance system of manufacture" in 1715, British service arms were made in patterned components by various tradesmen (i.e., lock-makers, stockers, etc.) at different locations, then shipped to the Tower of London for storage. When needed, complete weapons were assembled by gunmakers or "rough stockers and setters up" living close to the tower (Bailey 1971: 9, 10). Since an incised Roman numeral VI is found on the wooden stock (Fig. 20), side plate (Fig. 21) and trigger floor plate (Fig. 22) of the most complete specimen, it is probable that it was placed there after the components reached the tower but prior to final assembly. The ubiquitous stamped letters and numbers found on all of the brass furniture represent makers', assemblers' or inspectors' marks placed there anytime during the manufacturing process up to the final assembly of the musket. The broad arrows denote British government ownership.

Side plate. Manufactured of cast brass, the one side plate recovered has a flat back and a highly convex front with two countersunk lock-screw holes, and a tail with a tiny ball finial. The back is stamped with an S close to the rear finial and two vertical parallel lines over a broad arrow, all of which are over a crown with a line through it (Fig. 21). What appears to be a Roman numeral VI is scratched on the back near the rear finial.

Butt plate. Manufactured of cast and filed brass, the one butt plate has the characteristic Long Land four-step tang with tiny ball finial (see Fig. 18). There are two countersunk screw holes in the butt portion and one attachment lug, with a hole, on the back of the tang. The back of the butt portion is stamped with an S and a broad arrow, and bears a single engraved line. A "2" is stamped on the back of the tang adjacent to the attachment lug.

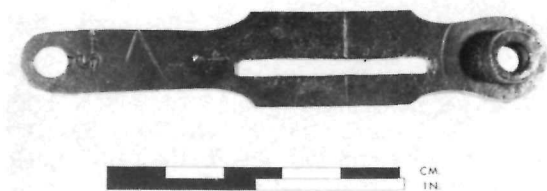
Trigger guard. Manufactured of cast and filed brass, the one trigger guard is convex in cross-section. The front finial and rear section of the rear finial each have an attachment lug with one hole (see Figs. 19-20). A hole passes



20 Trigger area and Roman numeral VI marking, British Long Land Pattern musket.



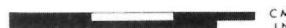
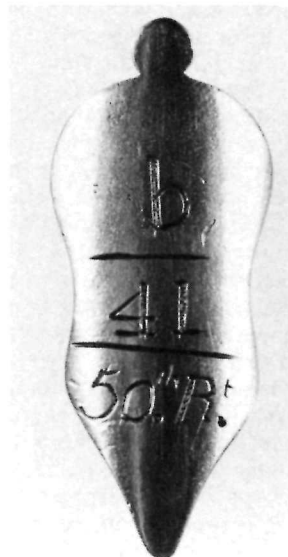
21 Back view, showing the markings, of a British Long Land Pattern musket side plate.



22 British Long Land Pattern musket trigger floor plate.

through the front of the bow to accommodate a sling swivel, and one countersunk attachment hole is located behind the bow to enable a wrist escutcheon to be secured to the top of the musket stock. There are pear-shaped front and rear finials, crowns stamped under the front finial and bow, and a W stamped under the rear finial behind the attachment lug. Also, the front attachment lug is stamped with an S.

The trigger guard has a solid rear section to the bow typical of Land Pattern muskets manufactured prior to about 1740 (Bailey 1971: 16). The pear-shaped front and rear finials are also indicative of a very early



23 Marked wrist escutcheon from a British Long Land Pattern musket.



24 Tailpipe of a British Long Land Pattern musket, showing the cylinder and curved, flared tail.

musket and are similar to those on the original iron-mounted models.

Trigger floor plate. Manufactured of cast and filed brass, the one specimen has a slightly off-set trigger slot. The back has a threaded socket to accommodate a screw from the breech-plug tang, is stamped with a "1" and an S, and is scratched with what appears to be a Roman numeral VI (Fig. 22).

Except for sea-service muskets, where they were used occasionally, trigger floor plates were standard on all British military arms of the 18th century (Darling 1970: 32).

Wrist escutcheon. Manufactured of cast brass, the one wrist escutcheon is slightly convex in cross-section and its face is engraved with a "b" over a line over "41" and "50th. Rt." (Fig. 23). The back has a threaded socket brazed to it for attachment to the wrist of the musket and is stamped TH over a broad arrow.

Colonel William Shirley's 50th Cape Breton Regiment was originally stationed at Louisbourg from 1746 until 1749, when it was disbanded. Re-raised by royal warrant on 4 November 1754 at Boston, the regiment found itself at Fort Oswego in 1755 where it was captured by Montcalm on 14 August 1756. The regiment was disbanded in December 1756 (Stewart 1962: 229).

The interpretation of markings such as the incised "b" over a line over "41" has been open to speculation for some time; however, there now appears to be a feeling that markings of this type represent musket storage-rack numbers.

Tailpipes. Manufactured of cast brass, both tailpipes consist of cylinders tapering slightly from front to rear, with curved, flared tails (Fig. 24). Both examples have single attachment lugs with one hole. The back of one tail bears a stamped broad arrow and TH separated by a crown and tail.

Original Long Land pipes were made to accommodate wooden ramrods until about the middle of the 18th century and had larger diameters than subsequent models designed for steel ramrods. Both pipe examples from the



25 Front pipe, British Long Land Pattern musket.

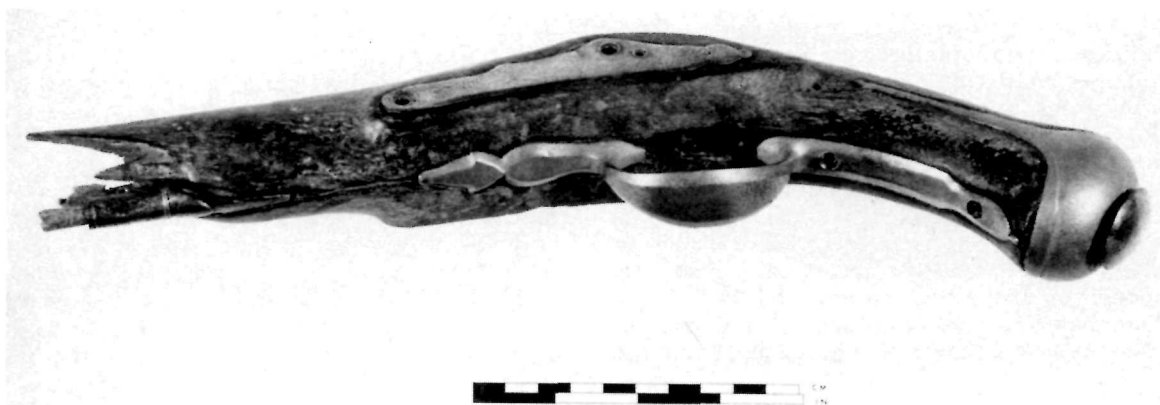
Machault are of a large diameter designed for wooden ramrods.

Ramrod pipes. Manufactured of cast brass, all four ramrod pipes are cylindrical with slight bulges in the middle, and have lips at both ends. There is one attachment lug with a hole and a series of short parallel lines stamped on its back (Fig. 25). The same comments on diameter size apply for these pipes as for the tailpipes.

Stock. One incomplete stock consisting of the butt, lock and wrist areas was recovered. Into it fit a butt plate, trigger guard, trigger floor plate and wrist escutcheon. The lock area above the trigger guard is incised with what appears to be a Roman numeral VI (Fig. 20).



26 A French Model 1733-34 cavalry or marine pistol.



27 The French Model 1733-34 cavalry or marine pistol marked LE MACHAULT.



28 The LE MACHAULT markings above the side-plate outline on a French Model 1733-34 cavalry or marine pistol.

French Model 1733-34 Cavalry or Marine Pistols

The Model 1733-34 cavalry pistol (Fig. 26) was apparently the first official-issue French military pistol and continued in use as such until 1763 when the next official cavalry model was introduced (Neumann 1967: 182). The model is characterized by an approximately 30.5-cm-long pinned barrel, octagonal for approximately 11.5 cm at the breech before becoming round, and a 16.7-mm, or .67-calibre, bore diameter. The furniture is brass and is highlighted by a solid triangular side plate (Figs. 26-28).

From the 1690s the French navy was also contracting for a pistol very similar in design to the Model 1733-34 cavalry pistol for issue to its ships. In fact, although the *Machault* examples appear to be identical to the Model 1733-34 cavalry pistol, they may be representatives of a rarer type of marine pistol, only one of which is known to exist (Figs. 29-31; Boudriot 1974).

There is a minimum of ten pistols with Model 1733-34 cavalry and marine attributes in the *Machault* assemblage, two with their wooden stocks marked LE MACHAULT. One of the most representative specimens is complete except for its lock and barrel (Fig. 26); another has its wooden ramrod still in place and LE MACHAULT incised on its stock above the side plate (Figs. 27-28).

Due to the widespread use of the Model 1733-34 cavalry pistol by French forces in the 18th century, it would be difficult to speculate whether the *Machault* specimens represented munition supplies for Canada or official-issue arms of the troops on board the ship. However, even if they are Model 1733-34 cavalry pistols, it is likely that they belonged to the ship's arsenal and were intended for marine use because the French cavalry did not serve in North America, because two of the examples were marked LE MACHAULT, and because very few other French military firearms were recovered from the site.

Side Plates

Manufactured of cast and filed brass, the seven side plates are characterized by an overall solid triangular shape with flat surfaces and narrow bevelled edges which is

similar to that of the *Machault fusil grenadier* examples. All have two lock-screw holes; four each have an additional smaller hole, probably added after manufacture, and one has four holes, two of which were probably added after manufacture (Fig. 27). The tail has a small ball over a larger ball finial, and three have linear file marks on their backs.

Trigger Guards

All seven trigger guards are manufactured of cast and filed brass and have linear file marks on their backs. One complete example has a flat surface with wide bevelled edges, two countersunk attachment holes in the rear finial, and one attachment lug, with hole, under the front portion of the bow. The front finial consists of a trefoil; the rear is a simple rounded design with a tiny ball.

Butt Caps

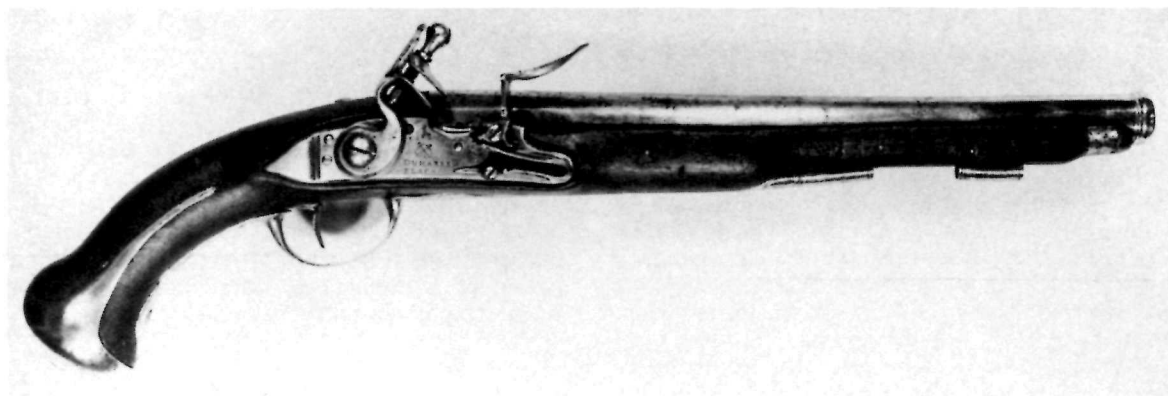
Manufactured of cast and filed brass, the eight complete butt caps each consist of a solid cap with an indented-line border on either side and two long tangs designed to be inset along the butt stock (Fig. 26). There are two openings in the cap end: one for a round screw to hold the cap in place, the other for a rectangular pin to cover the screw (Fig. 32).

Butt-Cap Pins

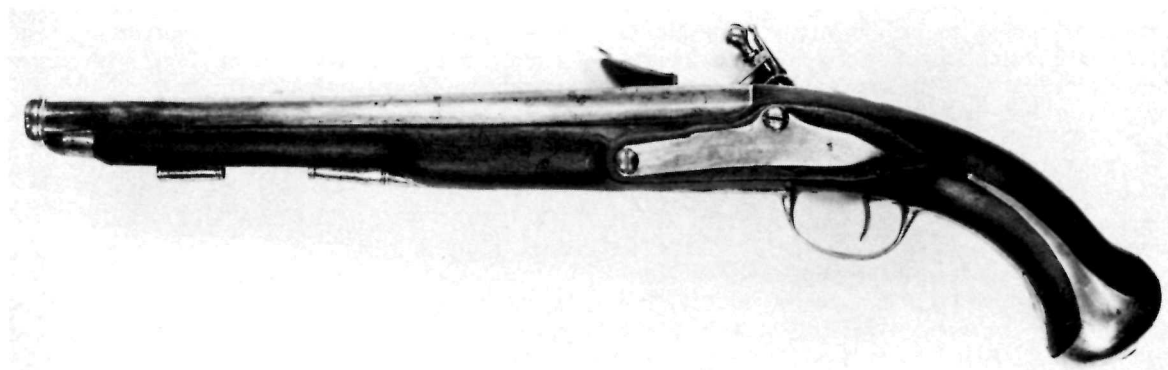
Manufactured of cast and filed brass, each of the six butt-cap pins consists of a convex head brazed to a rectangular shank. The pin is inserted into a rectangular opening in the rear of the butt cap to cover the attachment screw (Figs. 27, 32). Only one example has a hole in its shank.

Tailpipes

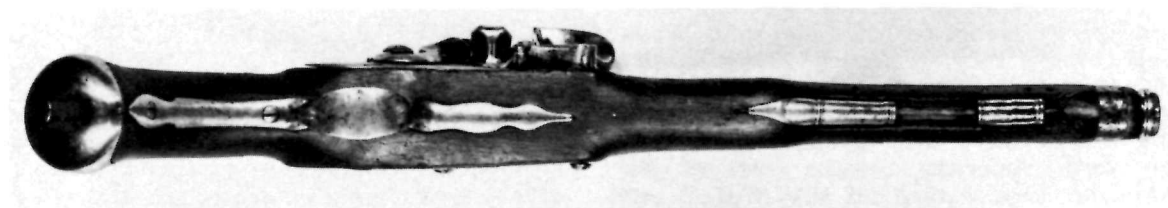
Manufactured of cast and filed brass, the four tailpipes each consist of a cylinder with a lip at either end and a curved, tapered tail. All examples have attachment lugs with one



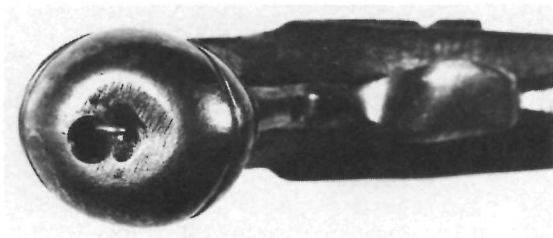
29 Lock side of a French marine pistol, ca. 1750. (Pierre Jarlier Collection.)



30 Side-plate view, French marine pistol, ca. 1750. (Pierre Jarlier Collection.)



31 French marine pistol, ca. 1750, from below. (Pierre Jarlier Collection.)



32 French Model 1733-34 cavalry or marine pistol butt cap showing the circular and rectangular openings.

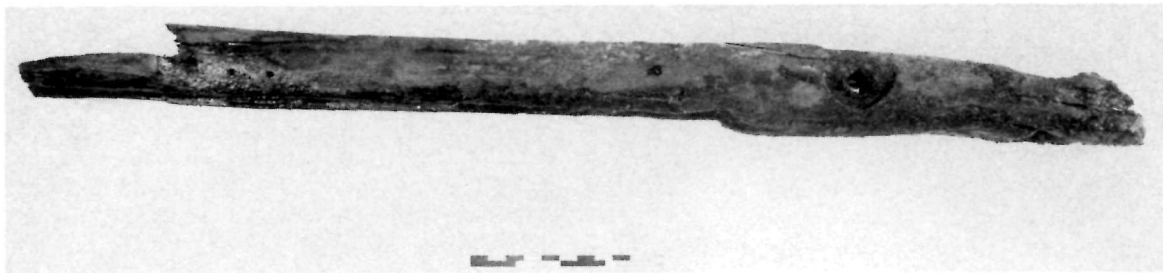
hole and, although smaller, are otherwise identical to those found on the *Machault fusils grenadiers*.

Ramrod Pipes

Manufactured of rolled sheet brass, the four front pipes are cylinders, each with a lip at either end. Three examples have attachment lugs with one hole and one has an attachment lug with two holes. Although smaller, they are otherwise identical to those found on the *Machault fusils grenadiers*.

Stocks

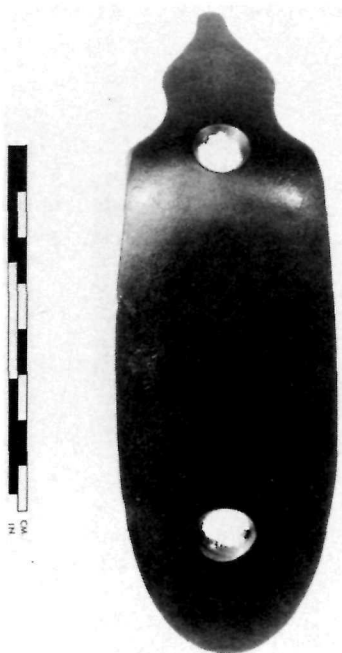
Ten stocks were recovered. One stock in excellent condition is a component of the most complete Model 1733-34 cavalry or marine pistol recovered from the ship (Fig. 26). Another stock is one of two examples marked LE MACHAULT (Figs. 25, 27, 28).



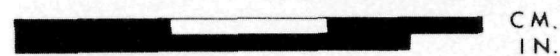
33 Side view of the blunderbuss showing the swivel attachment hole through the stock.



34 Bottom view of the blunderbuss showing the ramrod channel, ferrule outline and tail-pipe outline.



35 Musket butt plate showing the counter-sunk attachment holes and tang.



36 Musket ramrod tip.

Miscellaneous Firearms and Gunflints

Blunderbuss

One incomplete blunderbuss stock, represented by its muzzle end, was recovered. The stock features include barrel-band and tailpipe outlines, a ramrod channel and a swivel attachment hole (Figs. 33, 34). Canvas cloth remains found in association with this gun may represent a case or wrapping.

The blunderbuss saw limited use as a service arm in the 18th century. At sea it was employed by naval boarding parties for attacks on enemy ships, while large examples were sometimes mounted on swivels in the bows of small boarding boats (Pollard 1973: 95).

Musket Butt Plate

Manufactured of cast, hammered and filed brass, the butt plate is complete and has two countersunk holes in the butt and, under the tang, one attachment lug with a hole (Fig. 35). It is slightly convex in cross-section, has a shortened tang and, judging from its style, came from a military arm.

Musket Ramrod Tip

Manufactured of sheet brass, the one ramrod tip was cut and rolled to form a tapered sleeve (Fig. 36). A small hole near the large end permitted the securing of a wooden ramrod. The bottom plate that was brazed to the sleeve is missing. The tip is identical to those used on early 18th-century British Long Land Pattern wooden ramrods.

Trigger-Guard Finial

Manufactured of cast brass, the one fragmentary trigger guard consists only of a front finial and attachment lug (Fig. 37). It is like those on some 18th-century French trade guns.

Pistol Butt Cap

Manufactured of cast and filed brass, the single specimen, a large one, is complete and consists of a decorated cap with two tangs designed to be inset along the sides of the butt stock (Fig. 38). A rectangular opening in the end of the cap is designed for a butt-cap pin. Judging from its decoration, the cap probably came from a privately owned pistol.

Pistol Trigger-Guard Bow

Manufactured of cast brass, the one, fragmentary, trigger-guard specimen is plain and consists only of the bow (Fig. 39).

Pistol Ramrod Pipe

Manufactured of rolled sheet brass with multi-banded decoration, the one pistol ramrod pipe bears a single attachment lug with four holes (Fig. 40). It is like those on some 18th-century French trade guns.

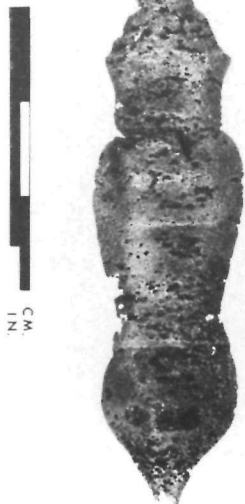
Gun Barrels

There are five wrought-iron gun barrels. One, a complete breech section with its breech plug intact and muzzle end missing, is octagonal for approximately 23 cm, then becomes round (Fig. 41). It is unusual in that there are three cast-lead balls (two measuring 16.7 mm in diameter, the other 16 mm) and organic wadding visible inside the bore. Another octagonal breech section, also with its breech plug intact and muzzle end missing, has a bore diameter of approximately 20 mm. A third octagonal breech section has an approximately 17.9-mm bore diameter and CH marked on one facet (Fig. 41b). Two incomplete mid-barrel sections are also present, one with a bore diameter of approximately

17 mm (Fig. 41c); the other, of approximately 17.5 mm (Fig. 41d). The breech sections that change from octagonal to round suggest that their barrels are of a French, rather than British, military origin.

Gunflints

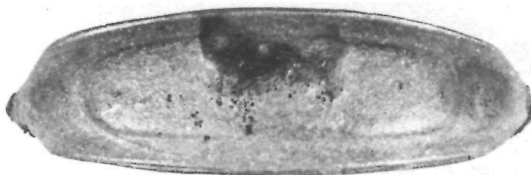
All ten gunflints have been manufactured by known French techniques, and range in colour from a translucent dark grey through blonde to black. Five specimens (Fig. 42a-e) are of a spall-type manufacture (a gunflint is struck individually from a core, has a prominent bulb of percussion on the heel of the face, and is wedge-shaped). The other five (Fig. 42f-j) have been manufactured by a blade technique (segments of long blades are struck from cores, broken into appropriately sized pieces, then shaped and finished by further chipping). The larger specimens (Fig. 42a, b, f, g, h) were probably designed for use with the French military/marine and/or *fusil grenadier* locks, while the smaller examples (Fig. 42c, d, e, i, j) were likely for use with lighter *fusils* and/or pistols.



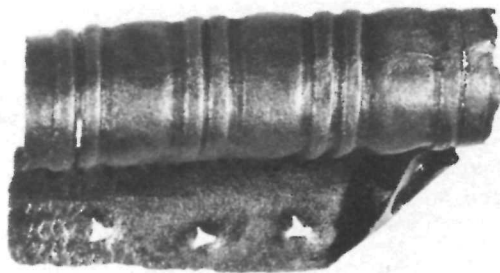
37 Fragmentary trigger-guard finial.



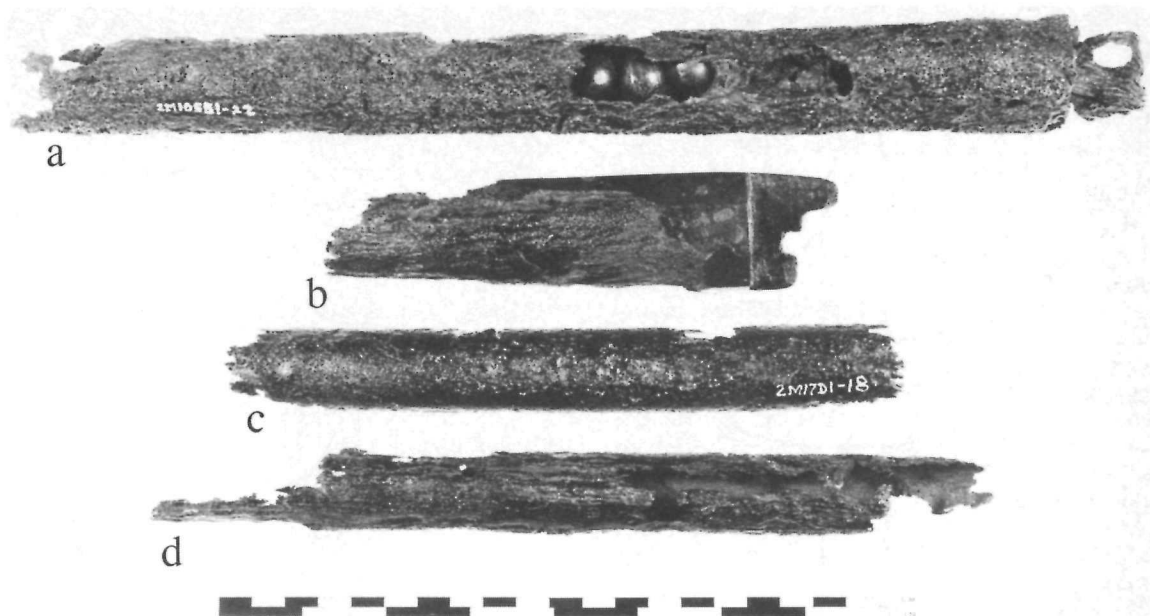
38 Pistol butt cap with cast decoration.



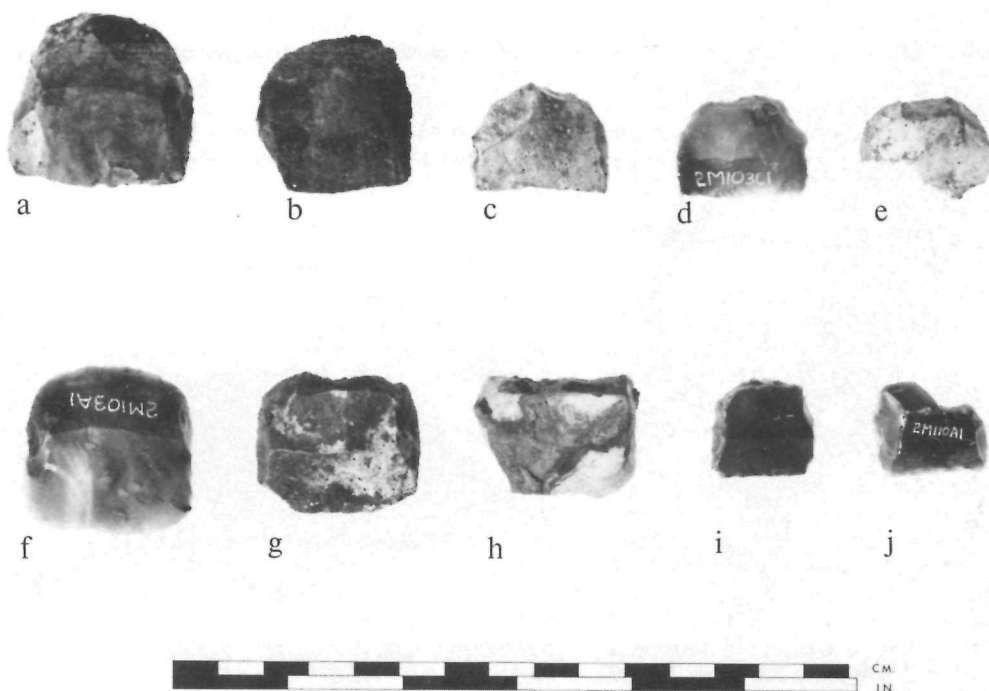
39 Pistol trigger-guard bow.



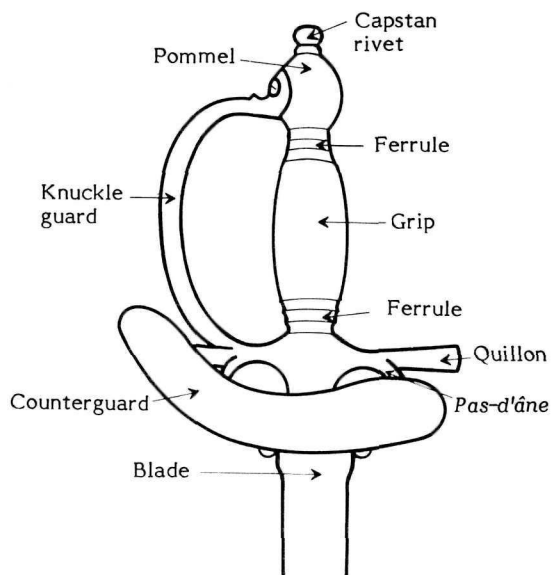
40 Front ramrod pipe with four holes in its attachment lug.



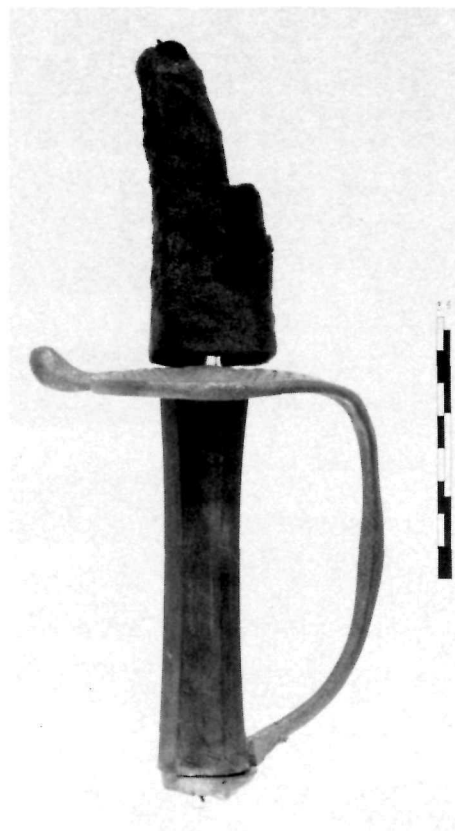
41 Unidentified gun barrels, possibly French.



42 Gunflints: a-e, made by a spall technique;
f-j, made by a blade technique.



43 Sword hilt nomenclature. (After Wilkinson Latham 1966: Fig. 1.)



45 A *pontet simple* sword hilt showing the crude cap pommel and fragmentary scabbard.



44 Hilt of a *pontet simple* soldier's sword showing the shape of the blade, the knuckle guard, the pommel with capstan rivet, and the brass-wire-wrapped wooden-core grip.



46 *Pontet simple* sword knuckle-guard decoration.

Edged Weapons

During the first half of the 18th century the sword was an important defensive weapon for all Europeans. It reflected social status for civilians as well as status and rank for military officers (Neumann 1973: 51). To the ordinary foot soldier or sailor, the sword was his final defence when faced with hand-to-hand combat. During the last half of the 18th century, swords became less popular. For example, by 1764 France had terminated the use of the infantry hanger except by its sergeants and grenadiers.

Two types of swords were found on the *Machault*, one for use on land, the other for use on the ship as a boarding sabre. A possible boarding axe was also recovered.

Pontet simple Swords

One type of sword is represented by a complete hilt with a common 18th-century French military knuckle guard known as a *pontet simple* (Fig. 44). It has an unusual relief wreathed-head decoration on its outboard shell counterguard, a single bulbous quillon, an octagonal worked-bone grip, and a crudely cast brass cap pommel (Figs. 45, 46). A wood-lined leather scabbard fragment found *in situ* with this complete hilt indicates that the blade had only one cutting edge and was therefore used as a sabre rather than as an *épée*.

Two turned wooden grips, which I believe were also for use with these knuckle guards, had pommel outlines and attachment hole locations identical to those found on the worked-bone grips (Fig. 47). The explanation for two types of grips being used with identical knuckle guards is likely that the guards were manufactured in large quantities, purchased as sword components along with blades and various grips, and assembled as complete weapons. In the case of the *Machault* swords, they were perhaps either purchased as complete weapons with two types of grips, or assembled from sword components on board the ship as needed. An identically decorated knuckle guard was also recovered at Fort Beauséjour, New Brunswick, a fort built by the French in 1751 and captured by the British in 1755.

A minimum of ten examples of this sword type was recovered. Judging by their grips and blade design, they were undoubtedly ship's arsenal arms to be used as boarding sabres.

Knuckle guards. Manufactured of cast brass, the complete guard has a single bulbous quillon and an outboard shell counterguard with a cast head-and-wreath decoration (Fig. 46). There is very little overall curvature to the guard and no finishing has been done after casting, indicating that these guards were cheaply made.

Grips. Three of the five grips are manufactured of worked octagonal bone, wider at the two ends than at the middle (Fig. 45). The two turned wooden examples are slightly tapered and appear to have the outline of a ferrule at the end that would have been closest to the blade (Fig. 47). Each has a single hole for a knuckle guard at the rear and one for a cap pommel in the centre of the butt end (Fig. 45).

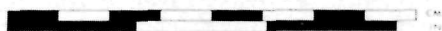
Pommels. Manufactured of cast and filed brass, the five pommels each consist of a crude hemispherical cap with a single attachment hole in its middle for securing it to the grip (Fig. 45).

A la mousquetaire Swords

The second type of sword is patterned after another popular French military style known as *à la mousquetaire*. It is identical to those found on *épées* used by the *Compagnies franches de la Marine* and other branches of the French military in the late 17th century to mid-18th century. The most complete specimen consists of an incomplete brass hilt with a simple knuckle guard and *pas d'âne*, a dished bilobate counterguard, and a ball pommel with a capstan rivet (Figs. 48, 49). (This hilt has been photographed with a reconstructed grip from another context to show a complete specimen.) At least seven examples of this sword type were recovered; they could represent either weapons of the troops on board the ship or, and less likely, munition supplies for Canada.



47 Turned wooden grip of a *pontet simple* sword showing evidence of a cap pommel, front ferrule and knuckle-guard attachment hole.

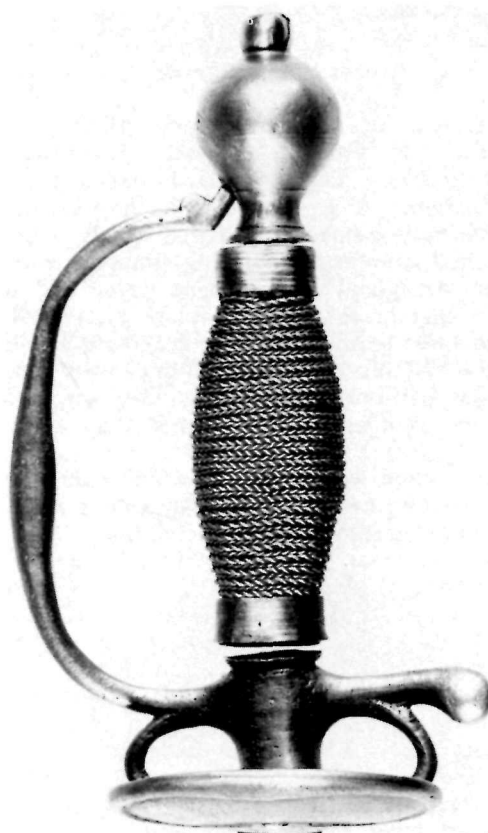


48 An *à la mousquetaire* sword hilt showing the dished bilobate counterguard.

Knuckle guards. Manufactured of cast brass, the one complete specimen of the seven knuckle guards has a single bulbous quillon, a *pas d'âne*, and a dished bilobate counterguard (Figs. 48, 49). There is very little overall curvature and it has been finely finished after casting.

Grips. Both grips consist of a wooden core wrapped with twisted brass wire and having sheet-brass ferrules at either end. One example has been reconstructed with new wire and photographed with the most complete hilt (Figs. 48, 49).

Pommel. Manufactured of cast brass, the one pommel is from the complete hilt and consists of a simple ball pommel with a knuckle-guard



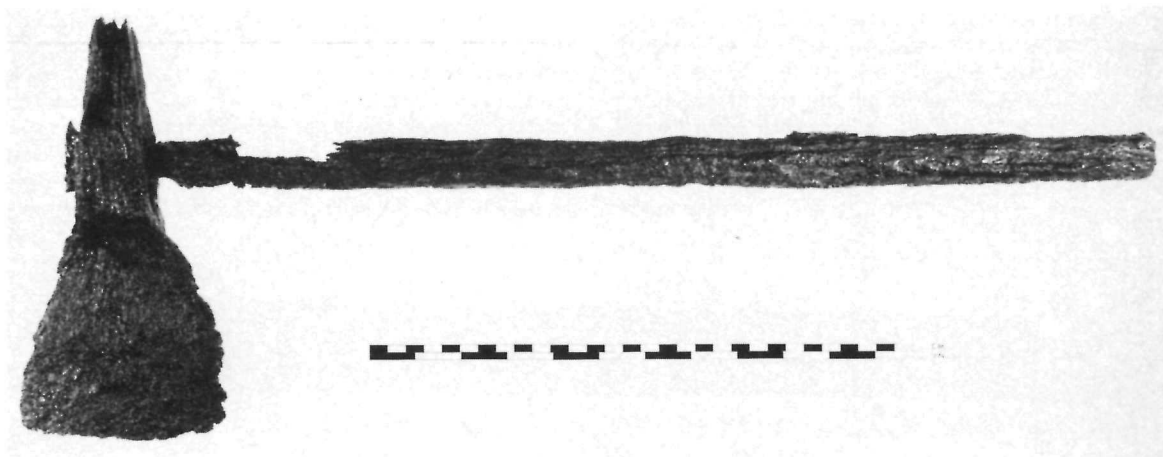
49 Side view of an *à la mousquetaire* sword hilt showing the (reproduction) twisted brass wrapped grip with two ferrules, the *pas-d'âne*, and the ball pommel with capstan rivet.

attachment hole and a capstan rivet (Figs. 48, 49).

Boarding Axe

One complete wrought-iron axe consisting of a head and haft was recovered (Fig. 50).

This type of axe was possibly used as a boarding weapon and therefore would have belonged to the ship's arsenal.



50 Boarding axe.

Edged-weapon Accessories

Three sword scabbards, one possible bayonet scabbard, two wooden scabbard liners and three scabbard tips were recovered.

One scabbard (Fig. 45) is manufactured of wood-lined leather with a seam at the back. It belongs with the complete *pontet simple* hilt, and indicates that the blade had one flat and one sharpened edge, and was therefore a sabre rather than an *épée*. Another incomplete sword scabbard (its tip and shoulder sections are missing) is manufactured of leather seamed at the back (Fig. 51). What may be another sword scabbard is represented by a

small section of woven rope (Fig. 52). The possible bayonet scabbard, missing its central and tip portions, is triangular in cross-section, manufactured of leather seamed at the back, and lined with wood (Fig. 53). The two wooden scabbard liners consist of small, undiagnostic fragments. The scabbard tips are manufactured of rolled sheet brass and consist of cones with simple ball finials (Fig. 54). All have three holes in a triangular pattern near the open end for attaching the tip to a leather scabbard, and could be from bayonet or sword scabbards.



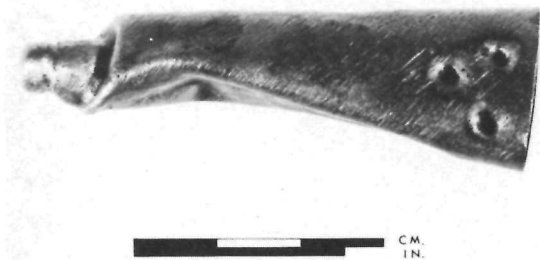
51 Back view of a leather sword scabbard with seam.



52 Possible rope sword scabbard fragment.



53 Possible triangular bayonet scabbard.



54 Scabbard tip with three attachment holes.

Conclusions

The small-arms assemblage from the *Machault* for the most part represents ship-owned arms for use by the ship's company and military weapons that had been brought on board the ship by French troops and then discarded. For example, because the *Machault* had been utilized as a raiding ship on its two previous voyages and had two marked French Model 1733-34 cavalry or marine pistols and one marked *fusil grenadier* on board, one can speculate that at least some and probably the majority of these firearms came from the existing ship's arsenal. Granted, these "ownership" marks could have been made on arms brought onto the ship (the French military used large numbers of these pistols during the 18th century); however, the transience of one voyage to North America would probably have discouraged the soldiers from such a practice. It is also unlikely that munitions cargo for Canada would have included such *fusils grenadiers* or would have been marked in this manner.

By their very nature as early hybrid muskets, the two examples with French Model 1728 and marine features could have belonged to the troops on board the ship, or could have been ship-owned arms or military cargo for Canada.

The Long Land Pattern muskets represent some of the weaponry that the French under Montcalm would have captured from the British 50th Regiment at Oswego in 1756. It is possible that once the muskets were taken to France, they were re-issued as marine arms to be used on board ships such as the *Machault*.

Both sword types represent common 18th-century French military styles and could have been arms of the troops on board the ship, ship-owned arms or, and less likely, munition

supplies for Canada. The unusually decorated *pontet simple* knuckle guards, which were perhaps originally designed for a more sophisticated grip assembly than octagonal bone or turned wood with a simple cap pommel, were likely purchased in quantity and assembled with the other components for use as boarding sabres. However, it is also possible, although unlikely, that the French military used these knuckle guards on some swords brought onto the ship because an identical specimen, without grip, was recovered at Fort Beauséjour, New Brunswick. The *à la mousquetaire* hilts were found on épées used by the *Compagnies franches de la Marine* and other branches of the French military from the late 17th century well into the 18th century and could therefore represent weapons of the troops on board the ship or, which is less likely, munition supplies for Canada.

During the mid-18th century the blunderbuss and axe were often used as boarding arms and thus the *Machault* examples were ship-owned weapons. The remaining small number of miscellaneous firearms and edged weapons, although generally undiagnostic, in most instances represent privately owned weapons, officers' weapons or cargo.

These conclusions in some instances disagree with the artifact distribution, which indicates that the vast majority of small arms came from the area on a ship normally associated with cargo. However, the overwhelming clustering around this bow area for many classes of artifacts may be somewhat misleading, and may be more a result of the way in which the vessel went down and was subsequently affected by tidal action than the artifacts' original placement.

Part Two
Ordnance, Ordnance Accessories
and Ammunition

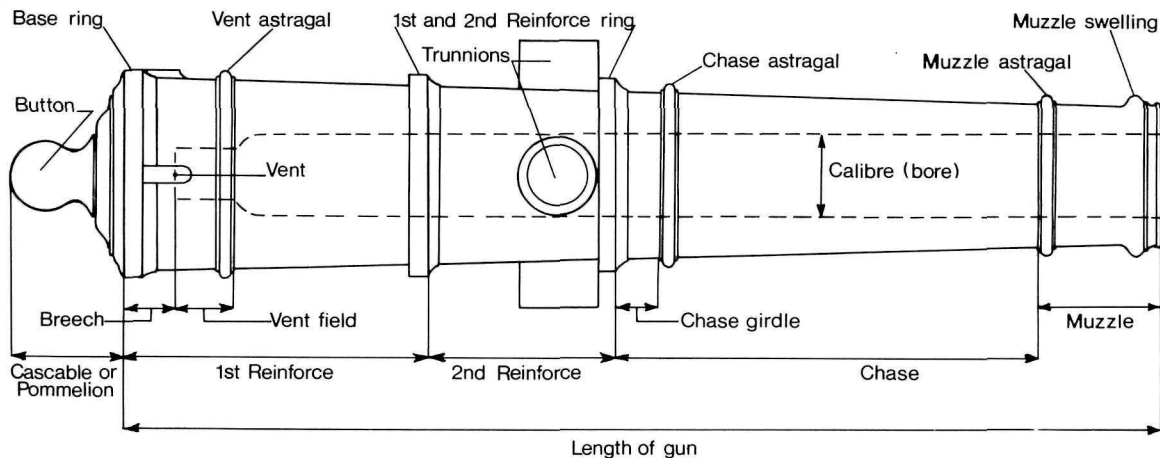
Introduction

"Ordnance is the most accurate and acceptable generic term which embraces all those weapons of war which use an explosive charge to propel a missile in the direction of an enemy, and which are larger than those which can be used as personal arms" (Hughes 1969: 1). Part Two of this report examines the pieces of ordnance, side arms and ammunition recovered from the *Machault*. The assemblage includes items intended for use by the ship's company, munition supplies for Canada, and numerous British projectiles.

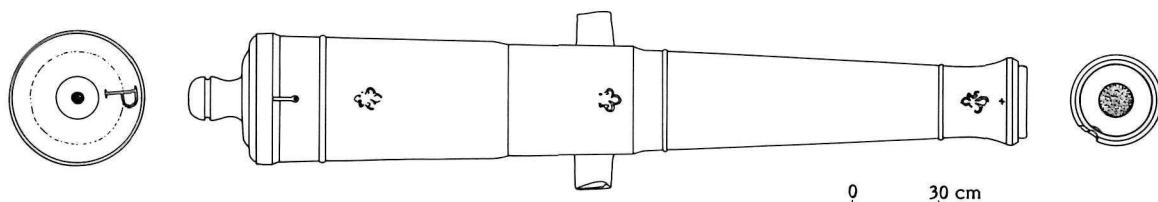
In order to facilitate an understanding of this extensive assemblage, each type of ordnance, side arm or ammunition will be introduced by a section outlining its historic evolu-

tion, common varieties, and mid-18th-century shipboard usage. Detailed descriptions of specific *Machault* examples follow, along with any relevant interpretive comments. A concluding section examines the entire assemblage and considers its roles as defences of a ship, munition supplies for Canada, and British bombardment.

As the entire site was not excavated, nor the ordnance sample random, any proportional statements regarding the numbers, type preferences and sizes of the projectiles would be misleading. However, obvious concentrations do occur in certain areas of the ship, and these are discussed in the text and presented graphically in the appendices.

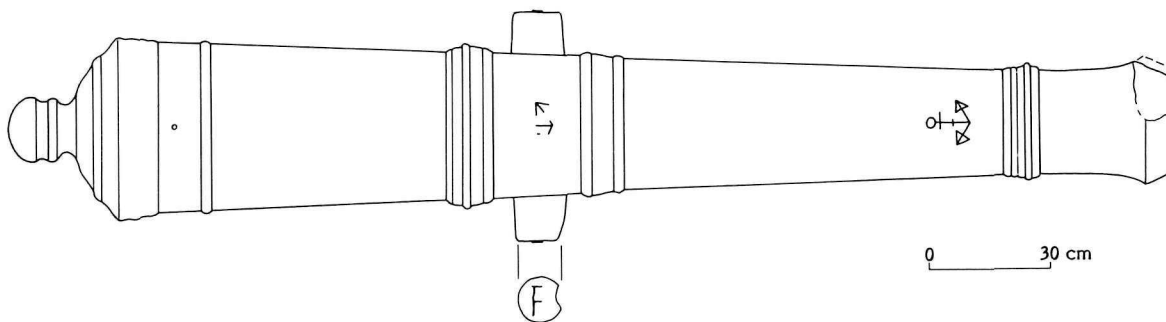


55 Cannon nomenclature.



56 A French 12-livre cannon showing the incised fleur-de-lis on the first reinforce, second reinforce and muzzle parts of the tube,

the incised P on the cascable, and the chiselled train behind the vent.



57 Another 12-livre cannon showing the incised anchors on the second reinforce and

chase parts of the tube, and the cast F on both trunnion ends.

Guns and Carriages

The mid-16th century witnessed the emergence of the cast-iron smooth-bore muzzle-loading ordnance that was to remain dominant and virtually unchanged in European warfare for approximately 300 years. During the early years, gun founders assigned the names of exotic animals and serpents to identify their cast pieces; however, by the middle of the 18th century (the date of the outfitting of the *Machault*), both French and British guns had become more standardized and were generally classified by the weight of the solid iron ball they fired. Thus, a 12-pounder cannon fired a 12-pound ball; a six-pounder, a six-pound ball, etc. The smooth-bore era witnessed few changes in either the manufacturing process, design, or usage of its guns, and having once evolved, its nomenclature remained remarkably consistent. Basically, a cast-iron smooth-bore cannon was a piece of ordnance consisting of a long tube tapering in thickness from the cascable to the muzzle, with a limited bore and a high muzzle velocity. Cast in a mould set vertically in the ground, it consisted of five principal parts (the cascable, first reinforce, second reinforce, chase and muzzle) and numerous minor parts (Fig. 55). Sometimes the minor parts were altered to reflect the various theories of the day; however, these changes were invariably stylistic and in no way altered the basic functional design or performance of the guns (Gooding 1965: 17).

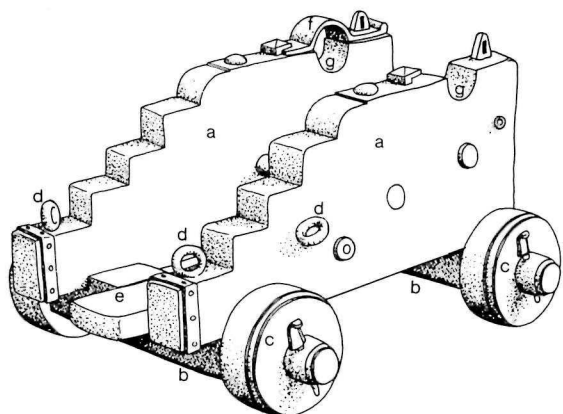
At sea, cannons were mounted on wooden carriages on the decks and, depending on the type of projectiles employed, were used for bombarding enemy ships' hulls, destroying spars, sails and rigging, and devastating personnel.

Smaller guns firing solid iron and/or lead balls were oftentimes utilized as anti-personnel swivel guns capable of firing at enemy ships, parties attempting to board ship, or those who had already gained access to the decks. Usually mounted on the forecastle gunwales, swivel guns were sometimes found on wooden stands in the fighting tops (small platforms high up on masts) of larger vessels and in the bows of small boats carrying boarding parties to enemy ships.

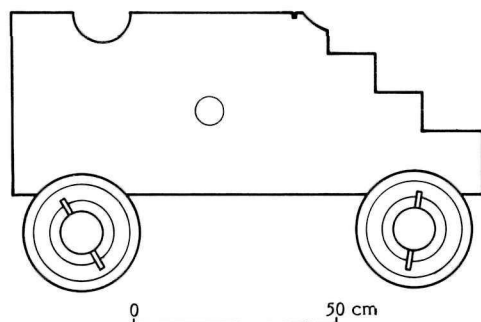
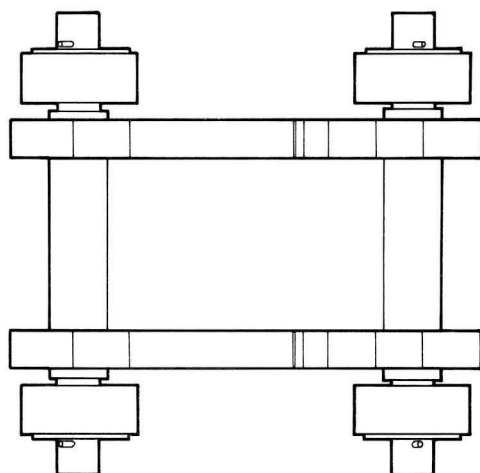
The only other type of smooth-bore ordnance used on ships of the mid-18th century prior to the invention of the carronade in 1774 was the mortar: a large-bore short piece designed to fire fused hollow bombs on high, 45-degree trajectories over fortifications and at shore installations. Small mortars were sometimes found on conventional three-masted ships, but the large mortars capable of firing the 31.75-cm bombs in the *Machault* assemblage were only found on specially designed two-masted bomb vessels. Unlike cannons, mortars were not classified by the weight of the projectile fired but rather by their bore diameter at the muzzle. Thus, a mortar with, for example, a ten-inch bore diameter was referred to as a 10-inch mortar regardless of the weight of the projectile.

The large 18th-century cannons used in permanent land fortifications were mounted on simple yet sturdy wooden garrison carriages. Usually manufactured of elm, they consisted of two cheeks on which the gun rested its trunnions, a large central bed, two axletrees with four small trucks or wheels, and numerous iron fastenings (Fig. 58). Not designed for mobility, their primary functions were to steady their enormously long and cumbersome pieces and to compensate for recoil in firing. Both French and British sea carriages of this era were of the garrison type and were very similar to those in use on land. But, unlike those on land, sea carriages were always equipped with solid wooden trucks rather than iron wheels in order to protect the wooden decking of the ship and facilitate repairs at sea. For sea carriages, additional ring bolts and hemp tackle consisting of recoiling and heaving cables were attached in order to minimize an unchecked recoil that would create problems in such a confined area as a ship's gun position (Fig. 60).

Swivel guns were not mounted on carriages but rather on yoke-like swivels similar in design and function to the modern oarlock (Fig. 67). The swivel was fastened to the gun's trunnions, then set into an opening in either the gunwale of the ship or a wooden stand which could be used in the fighting top (Fig. 64).

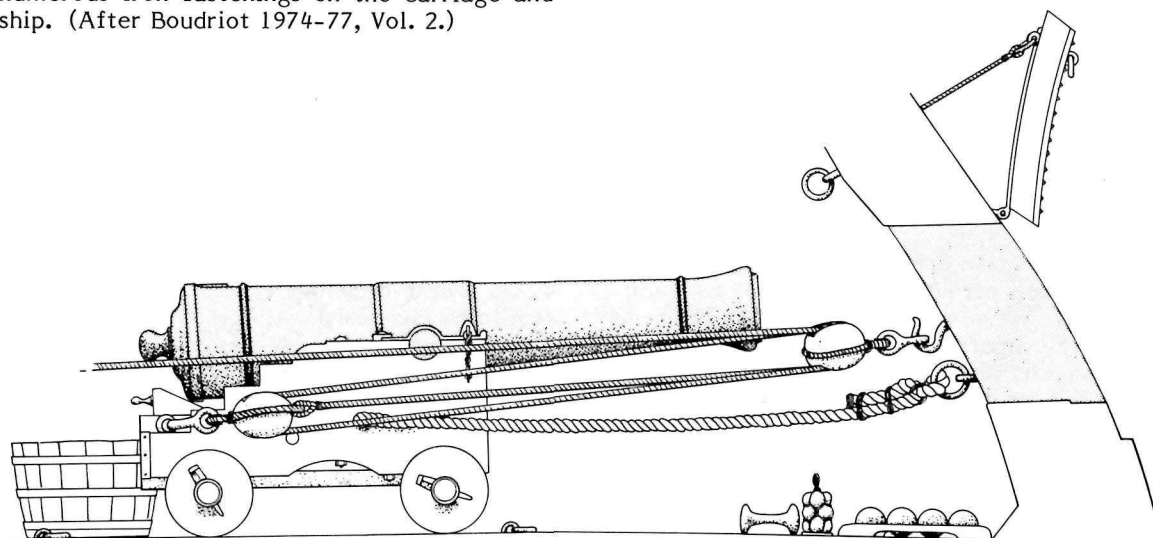


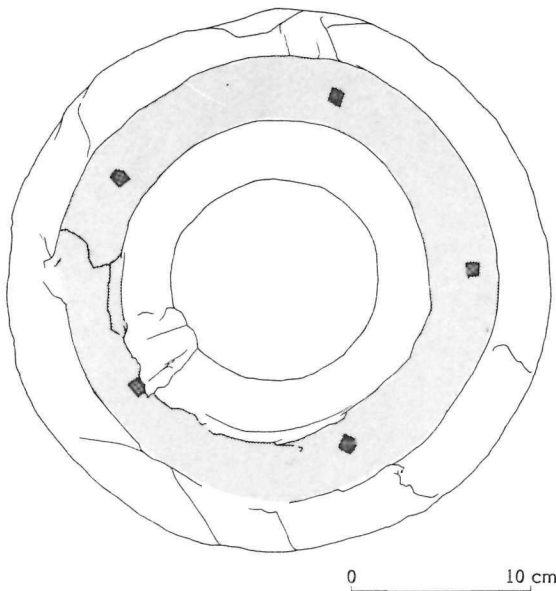
58 Sea-carriage nomenclature: a, cheeks; b, axles; c, trucks; d, eye bolts; e, bed; f, cap-square; and g, trunnion channel. (After Boudriot 1974-77, Vol. 2.)



59 Idealized drawings (opposite) of the Machault 12-livre cannon carriage.

60 A ship's cannon at gun position showing the heaving and recoiling cables, and the numerous iron fastenings on the carriage and ship. (After Boudriot 1974-77, Vol. 2.)

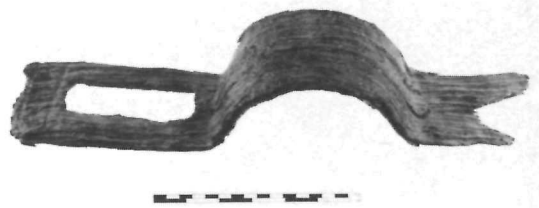




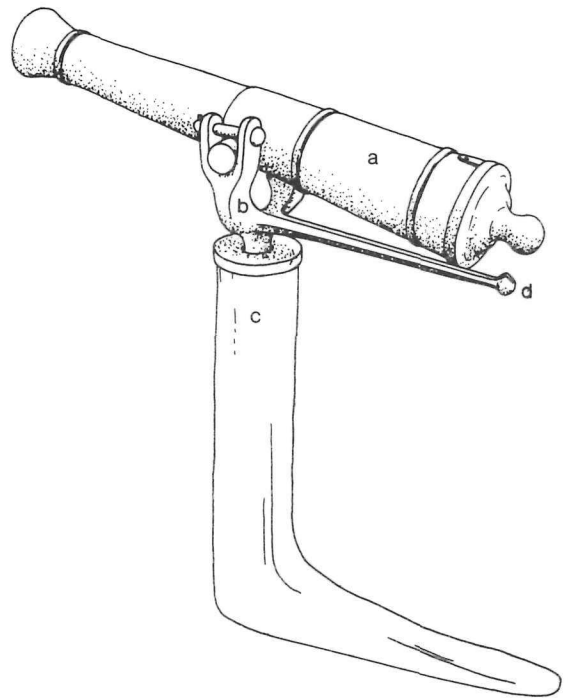
61 A 12-livre-cannon carriage truck showing the inset iron reinforcing band secured by five nails.



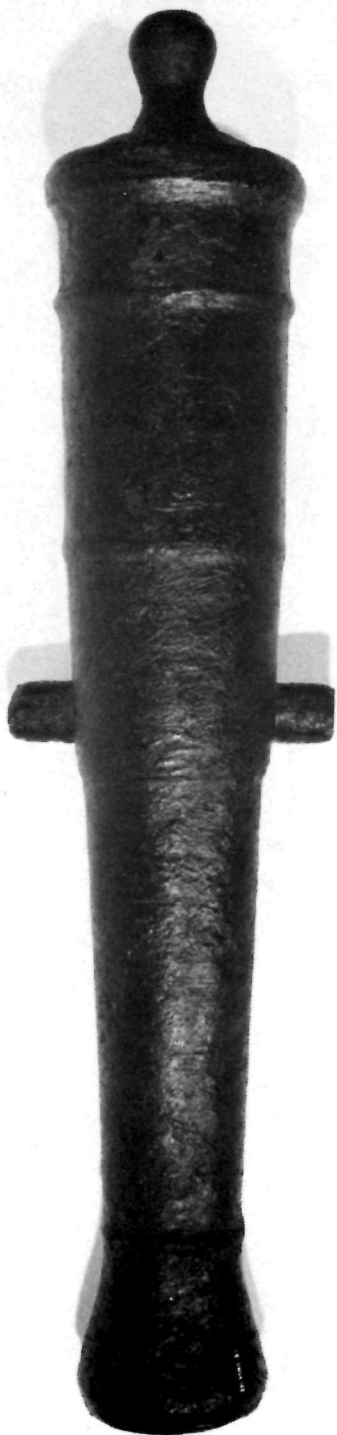
62 A 6-livre-cannon carriage iron truck-reinforcing band with two remaining nail holes.



63 An iron capsquare for a 12-livre-cannon carriage.



64 A swivel gun mounted on a fighting top stand: a, swivel gun; b, yoke swivel; c, stand; and d, aiming tiller. (After Boudriot 1974-77, Vol. 2.)



65 Swivel gun: overall view.



66 Swivel gun: oblique view of the muzzle and bore.

Descriptions

There were two identical 12-*livre* French cannons, a different 12-*livre* cannon, one 12-*livre* cannon carriage, one additional 12-*livre*-cannon carriage truck, one 12-*livre*-cannon carriage capsquare, two six-*livre*-cannon carriage trucks, six six-*livre*-cannon carriage truck-reinforcing bands, two swivel guns, and one swivel-gun yoke swivel representing the numerous guns and carriages that would have been on board the *Machault* prior to its scuttling.

The two cast-iron French 12-*livre* cannons measure 2 m 77 cm from muzzle to first reinforce and 3 m in overall length (Fig. 56). Their bore diameters are approximately 12 cm and their trunnions approximately 11.5 cm long and 12 cm in diameter. Both examples have incised fleur-de-lis markings on the first reinforce, second reinforce and muzzle parts of the tube, and an incised P, perhaps a proof mark, on the end of the cascable.

The other 12-*livre* cannon is likely French. It is manufactured of cast iron and measures 2 m 59 cm from muzzle to first reinforce and 2 m 85 cm in overall length (Fig. 57). Its badly corroded bore measures approximately 12.7 cm. Its trunnions are approximately 11.4 cm long and approximately 12 cm in diameter. Both trunnions are cast with what seems to be the letter F, and incised anchors appear on the second reinforce and chase parts of the tube.

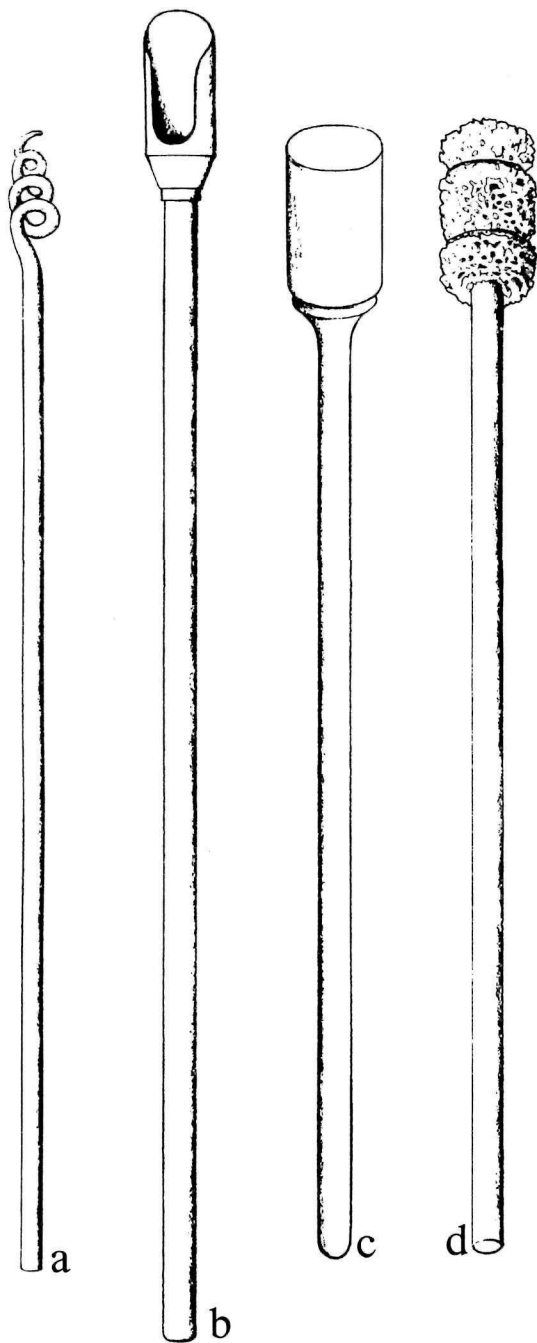
One wooden gun carriage for these cannons is represented by two cheeks, two axletrees, and four wooden trucks (Fig. 59). The trucks are approximately 37.5 cm in diameter and have iron reinforcing bands secured by five hand-forged nails inset into either side (Fig. 61). One other 12-*livre*-cannon carriage truck was recovered along with one of two capsquares from a 12-*livre*-cannon carriage that were used to secure the trunnions to the carriage (Fig. 63). Two smaller trucks, approximately 30 cm in diameter, are of identical design to the 12-*livre* examples. Six reinforcing bands for the smaller size of truck were also recovered (Fig. 62). These trucks and bands probably represent carriages for the six-*livre* cannons that were reported to have been on board the ship.

The two cast-iron swivel guns recovered are identical in appearance and are both 92 cm long (Figs. 65, 66). One example's bore diameter is approximately 3.54 cm; the other's,

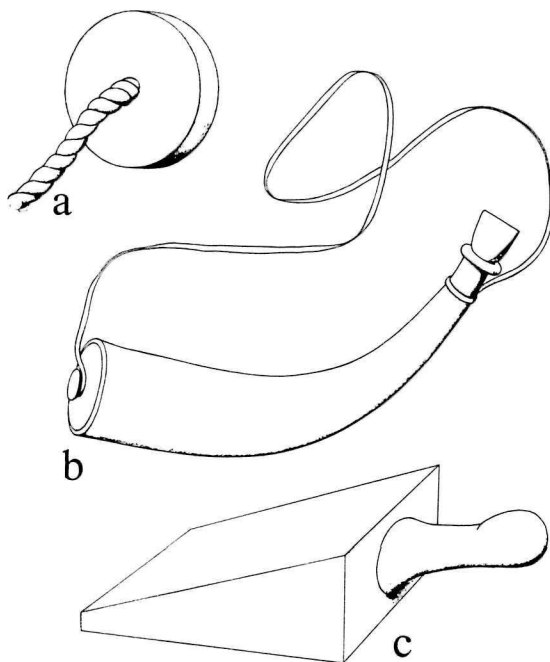
approximately 3.89 cm. One of the guns was found *in situ* along the starboard side of the ship towards the bow; its yoke swivel was still intact on its trunnions. This yoke swivel is manufactured of forged iron and consists of a cylindrical rod which was set into an opening in the gunwale of the ship and a two-tined fork with an eye on either tine (Fig. 67). From its design, it appears as if this type of swivel (unlike the fighting top example illustrated in Figure 64) would have been hammered over the trunnions, and if one desired to move the gun, the yoke swivel would have been moved along with it. If any aiming tiller was present at the time of manufacture, it has since been broken off.



67 A yoke swivel found *in situ* with one of the *Machault* swivel guns.



68 Cannon side arms were approximately 30 to 36 cm longer than the bores of the guns they were intended to service: a, iron gun-worm; b, brass-headed, wood-handled powder ladle; c, wooden rammer; and d, sponge-headed, wood-handled cannon sponge.

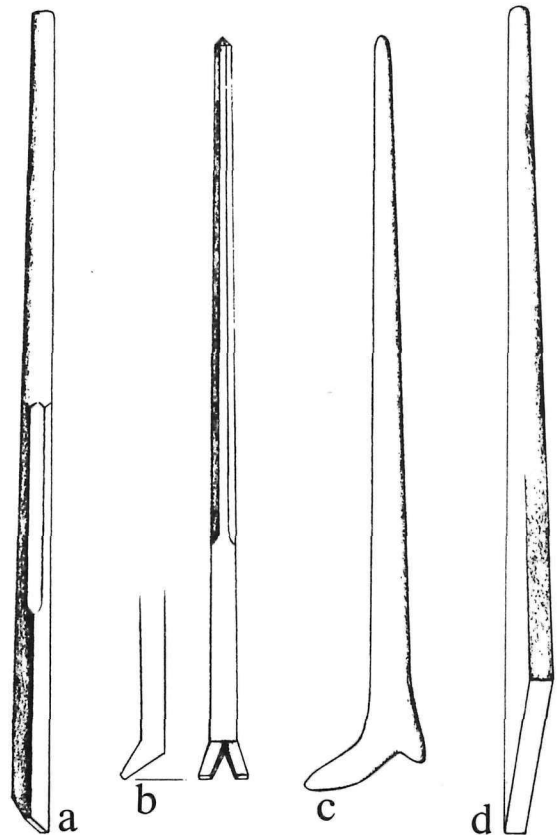


69 Other items found at the gun positions: a, wooden tampion with rope pull; b, powder horn with spatulate-headed wooden plug; and c, wooden quoin.

The firing of a ship's cannon demanded the co-ordination of a gun crew (the size of which was directly proportional to the size of the gun), strict attention to detail, and the successful performance of well-rehearsed steps. Associated with these procedures were a number of simple yet functional accessories known as side arms, which, like the guns they serviced, remained remarkably unaltered in style and usage throughout the smooth-bore era. Assuming that a round had just been fired, the following steps were required to reload. A corkscrew-like iron gunworm on a long wooden handle (Fig. 68a) was inserted down the muzzle into the breech of a cannon to remove any large cartridge or powder-bag fragments remaining from the previous round. A wetted sheepskin sponge on a long wooden handle (Fig. 68d) was rammed down to the breech in order to further clean the bore and extinguish any lingering sparks. Loose powder was placed into the tube with an appropriately sized powder ladle on a long wooden handle (Fig. 68b), and rammed into place in the breech with a long-handled wooden rammer (Fig. 68c). If the powder was pre-packaged in a canvas bag (Figs. 93, 94), the powder ladle was not required. A wad of hay, cloth or rope was rammed on top of the charge to prevent an excess amount of gasses escaping around the projectile, reducing the force of the explosion and decreasing the projectile's range. The desired projectile was rammed onto the powder charge. When round shot was used, another wad was rammed on top of it in order to prevent the ball from rolling out of the tube. If the powder charge was contained in a canvas bag, an iron wire known as a pricker was inserted into the vent in order to puncture the bag and insure ignition of the main charge in the bore of the cannon. If loose powder was used, this step was unnecessary. Loose powder was poured from a powder horn (Fig. 69b) into the vent to prime it, and the gun was ready for firing. On some guns, including the two identical 12-livre French cannons from the *Machault*, is an additional feature known as a train, a chiselled channel behind the vent, which was also filled with powder (Fig. 56). On the command to fire, the priming powder was lit by a portfire, a side arm which transferred the flame from the linstock, another

side arm, which held a continuously burning slow match at the gun position during battle.

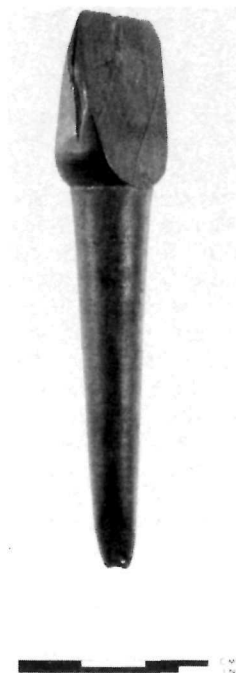
Other items not directly associated with the loading or cleaning procedures were commonly found at gun positions. These included large iron crowbars and wooden handspikes for manoeuvring the guns and carriages (Fig. 70), wooden quoins for elevating and aiming the tubes (Fig. 69c), and wooden tampions with rope pulls for plugging the muzzles of cannons not in use (Fig. 69a).



70 Crowbars and handspike ranging in size from approximately 1.5 m to 2.5 m long were also present at gun positions: a-c, iron crowbars; d, wooden handspike.

Descriptions

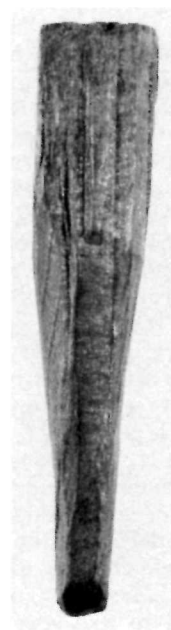
Only one incomplete powder ladle and four wooden powder-horn plugs were recovered from the numerous side arms and accessories that would have been present at each gun position on the *Machault* (Figs. 71-73). The copper and wooden powder ladle was recovered without its long wooden handle (Fig. 71). Powder ladles, as well as gunworms, rammers and sponges, were manufactured in specific sizes in order to fit the bores of particular guns. The *Machault* powder ladle measures 8.13 cm across its base and was likely designed for loading the six-*livre* cannons reported on board the ship. Two turned and carved wooden powder-horn plugs with spatulate heads and tapered cylindrical bodies were also recovered (Fig. 72). Although plugs of this type were found on powder horns, they were also used as bung plugs on numerous types of 18th-century staved containers (L. Ross, pers. com.). The other two wooden plugs are smaller and very crudely carved (Fig. 73).



72 A turned and carved powder-horn plug with spatulate head and tapered cylindrical body.



71 A wood and copper powder ladle without its long wooden handle.



73 A crudely carved powder-horn plug.

Ammunition

Powder

In order to fire a projectile from a gun, gunpowder (approximately one-third to one-half the weight of the projectile) was required to provide the explosive force capable of hurling the object from the muzzle. Gunpowder is composed of sulphur, saltpetre and charcoal, but, with additives such as borax, can be produced in various grades. For all 18th-century ordnance, gunpowder was used for priming and ignition. The priming powder was poured, free running, from a powder horn kept at the gun position into the vent and train of a gun, and was lit by a portfire in order to transfer the flame to the main charge in the bore of the cannon. The coarser ignition powder was used for the main charge and was either scooped into the guns with appropriately sized powder ladles or placed there in pre-measured and sewn canvas bags. These canvas bags, like grenades and bombs, were filled in the ship's powder room with powder stored in barrels there.

Projectiles

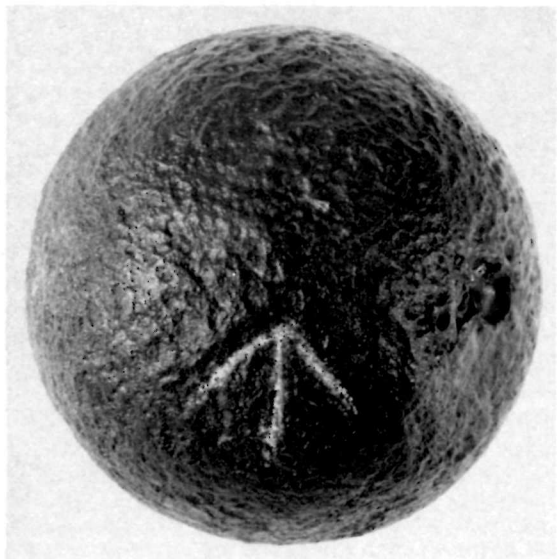
Three specialized types of projectiles were fired from ship's guns of the mid-18th century: anti-hull, anti-personnel, and anti-rigging. There were 553 single-shot solid ferrous balls, 56 multiple-shot solid iron and lead balls, thousands of lead pellets, 6 hand grenades, 58 mortar bombs, 6 fuses, 53 examples of bar shot, 15 examples of star shot, 3 examples of linked shot, and 8 canvas bags recovered from the *Machault*, representing ammunition for the ship's guns, munition supplies for Canada, and projectiles from the British bombardment.

Anti-hull shot. Anti-hull shot consists exclusively of solid cast-iron balls. These spheres, more commonly referred to as cannonballs, were the most popular, accurate and far-ranging projectile used throughout the entire smooth-bore era. Fired as single shots on low trajectories, they were sometimes heated to red-hot temperatures and fired as "hot shot" in order to set fire to land fortifications or ship decks, and blow up powder magazines. At sea they had a devastating effect on ship hulls and

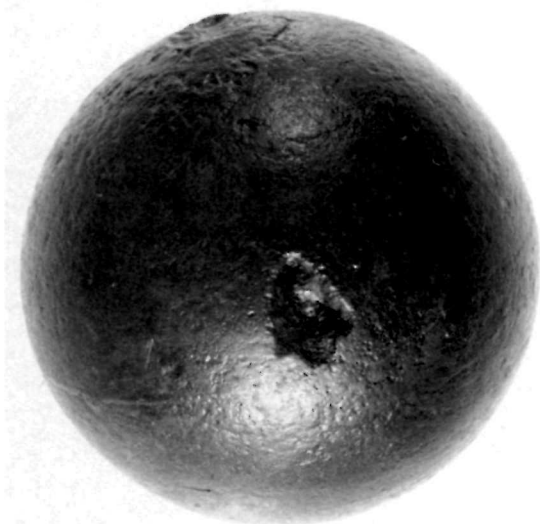
tightly massed personnel; however, they were relatively ineffective against loosely assembled groups and ship rigging. Most cannonballs, including all the *Machault* examples, were manufactured of cast iron in two-piece moulds. There is in the *Machault* assemblage a total of 553 cast single-shot solid iron cannonballs, of which 538 are likely French and 15 possibly British. Three hundred and four of the French examples are 12-*livre* cannonballs, and likely represent ammunition for the 12-*livre* cannons originally placed on the ship. Their diameters range from 11.3 cm to 11.7 cm and they weigh approximately 5.5 kg. Twenty-seven of these specimens are cast with stylized fleur-de-lis (Fig. 74). Only 48 of the French examples are of the size that could be fired from the two six-*livre* cannons originally mounted in the forecastle area of the ship. They have no markings, range in diameter from 8.8 cm to 9.2 cm, and weigh approximately 3 kg. The third French size represented is the four-*livre* ball. Its 186 examples range in diameter from 7.8 cm to 8 cm and weigh approximately 1.9 kg. Of these balls, 94 were cast with stylized fleur-de-lis. There is no mention of four-*livre*



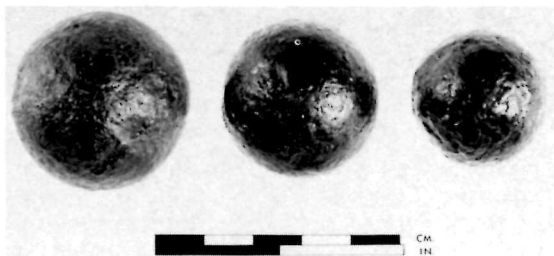
74 A French 12-*livre* cannonball cast with a fleur-de-lis.



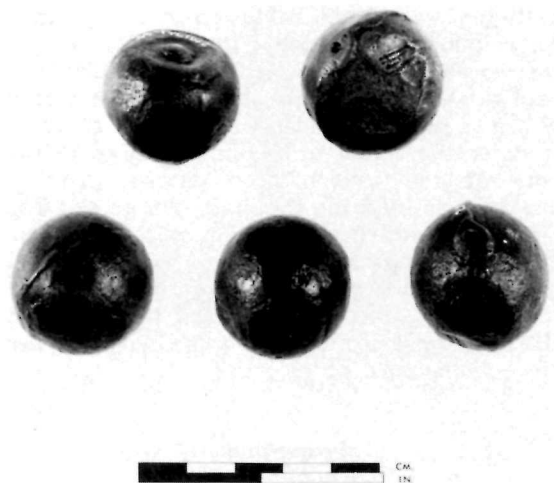
75 A 12-pound British cannonball cast with a broad arrow.



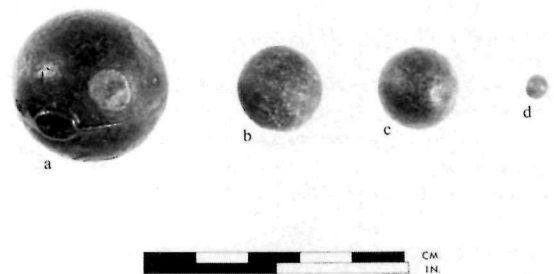
76 A nine-pound British cannonball cast with a different type of broad arrow.



77 Multiple-shot solid cast-iron balls.



78 Multiple-shot solid cast-lead balls.



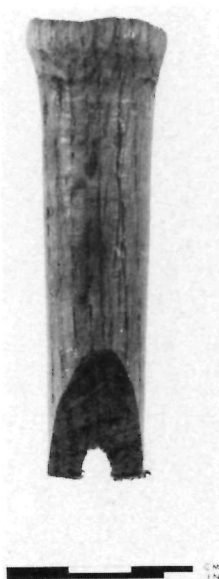
79 Solid cast-lead ball size ranges: a, multiple-shot balls; b and c, small-arms lead shot for French .69-calibre weapons; d, lead pellet.



82 A mortar bomb with a flared extension collar around the fuse opening.



80 Hand grenade with fuse in place.



81 Hand-grenade fuse.



83 A mortar bomb with eared handles and a plain extension collar around the fuse opening.

cannons being on board the *Machault* so that unless they were added at the time of re-outfitting, they likely represent munition supplies for Canada. It is apparent from the distribution of all three French sizes that the balls were stored in the central mast step area of the ship along the keelson in what may well have been a shot locker (Appendix A).

Along with the French cannonballs are 15 examples of possible British origin. The 14 12-pound balls range in diameter from 11 cm to 11.2 cm, and one is cast with a broad arrow denoting British government ownership (Fig. 75). Also recovered was one nine-pound ball of exactly four inches (10.16 cm) in diameter, the size precisely conforming to British ordnance specifications, which was cast with a different style of broad arrow (Fig. 76). These balls represent some of the hull-destroying shot with which the British would have bombarded the *Machault* prior to its scuttling and burning.

Anti-personnel shot. Anti-personnel shot was designed to make up for the inadequacies of single-shot solid cast-iron balls against loosely assembled land troops and ships' crews. In the mid-18th century basically two types of multiple-shot anti-personnel projectiles were available: grape shot, which consisted of a number of solid cast-iron or cast-lead balls arranged around a central wooden spindle attached to a tampion and wrapped in a canvas bag to form a cylinder, and cannister shot, which consisted of a spherical tin cannister filled with numerous deadly articles including small iron and/or lead balls. Both types were designed to shower their contents on the enemy and were assembled in different sizes in order to fit the bores of particular guns. Recovered from the *Machault* were 56 solid cast-iron and 14 solid cast-lead balls, of either French or British origin, which ranged from 2.4 cm to 3.2 cm in diameter and which could have been for use in multiple-shot anti-personnel projectiles (Figs. 77-79a-c). The two swivel guns are also anti-personnel weapons and could conceivably have fired the larger balls in the 3-cm range. Thus, balls of this size could either represent single shots for these ship-owned guns or components of multiple-shot projectiles.

The second type of anti-personnel shot represented is the hollow cast-iron ball. A type of projectile that was filled with powder and fused, it was designed to burst in flight

and shower the target with small iron fragments from the shell. Although not as accurate or far-ranging as single-shot solid balls, they were used throughout the smooth-bore era. The six small hollow cast-iron balls recovered are hand-thrown grenades (Fig. 80). Five of them are approximately 8 cm in diameter, while the other is a somewhat smaller 7.3 cm. Three wooden fuses for the grenades are present, one of which was found *in situ* in the fuse opening of a shell (Figs. 80, 81). At sea, hand grenades were particularly effective when thrown from rigging and fighting tops, and the *Machault* examples likely came from the ship's own arsenal. The large hollow iron balls are mortar bombs. Of the 58 examples, 56 are each 31.75 cm in diameter, cast in a two-piece mould with a visible seam around the middle, and have a flared extension collar around the fuse opening (Fig. 82). The two remaining bombs are each 30.48 cm in diameter, cast in a two-piece mould with the seam perpendicular to the fuse hole, and have two eared handles and a plain fuse extension collar (Fig. 83). Three wooden cylinders in the assemblage perhaps are fuses for these bombs (Fig. 84). Although slightly larger in diameter



84 Possible mortar-bomb fuse.

than the fuse holes, fuses were intended to be rasped to size and driven into the openings with a wooden mallet. These bombs were not part of the ship's arsenal but munition supplies for Canada. All the mortar bombs were found with the cannonballs in the central mast step area of the ship along the keelson in what is possibly the shot locker (Appendix B).

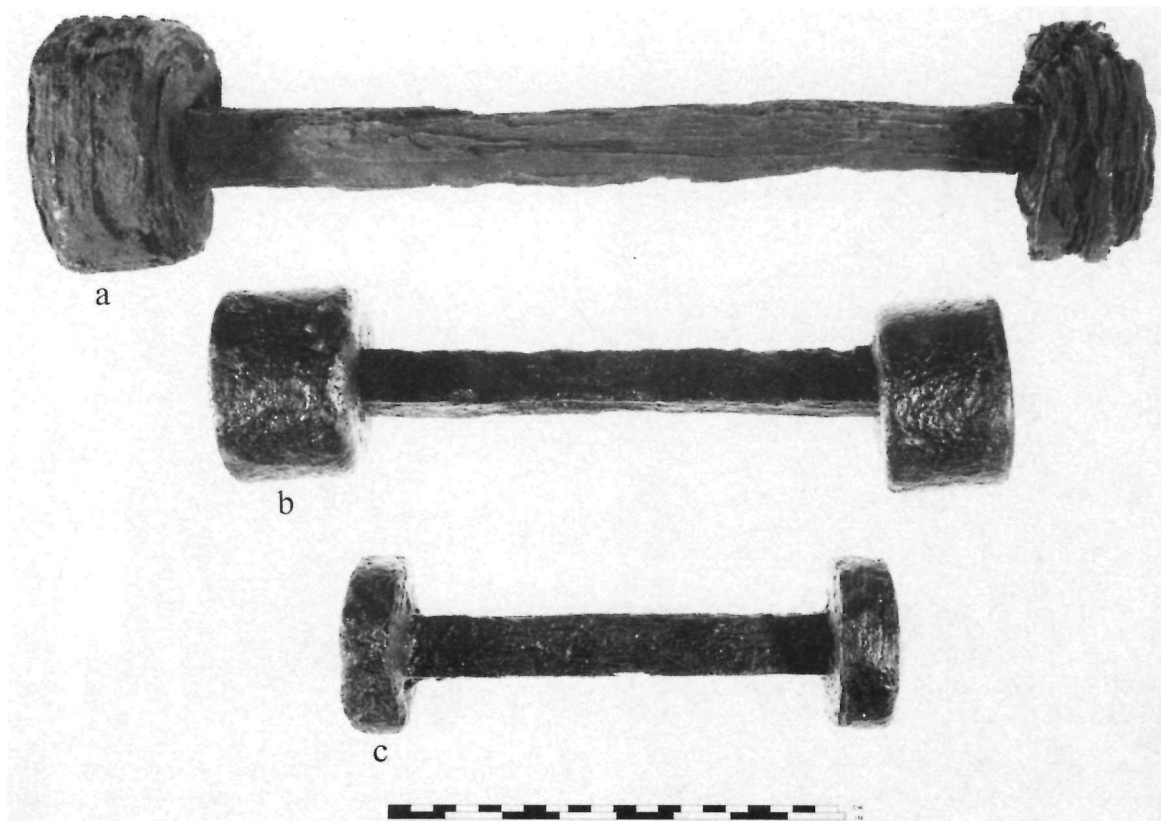
Along with the multiple-shot balls and hollow iron balls are thousands of tiny lead pellets in the 2.5 mm to 5 mm size range (Fig. 79d). These were made by a process first publicized by Prince Rupert in 1665.

The Rupert shot was made by pouring the melted lead through a brass colander-like affair mounted a foot or so above a pan of water. The lead, fluxed with arsenic, was poured through live coals in the colander and dripped through to the water below. Since not enough

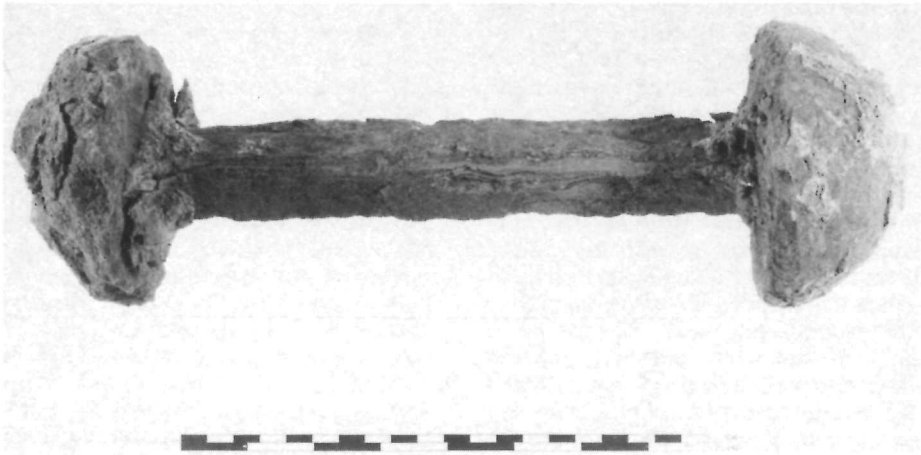
time elapsed in the drop to permit surface tension to form a perfect sphere, the resulting shot is slightly ovoid in cross-section and has a slight dimple on the more flattened side (Hamilton 1976: 35).

These pellets were perhaps intended for use in ship-owned cannister shot or more likely as small-arms ammunition for Canada. They are not associated with the cannonball and mortar-bomb concentration in the central mast step area, but were found stored in barrels in a concentration closer to the bow hold area of the ship.

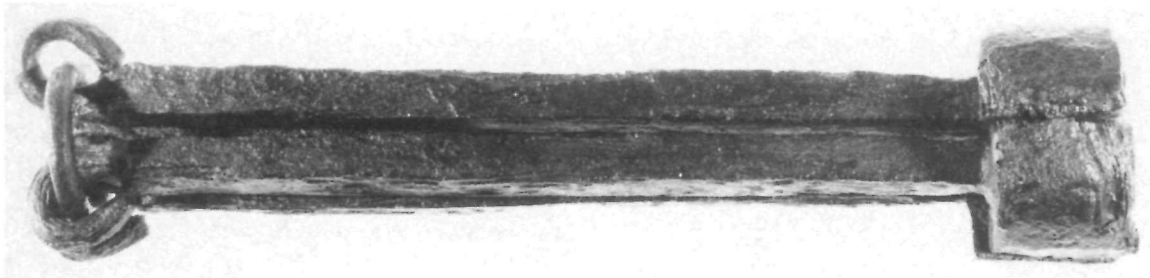
Anti-rigging shot. Although the single-shot solid balls were effective against ships' hulls and anti-personnel projectiles were effective against people, they did relatively little damage to spars, sails and rigging. What was



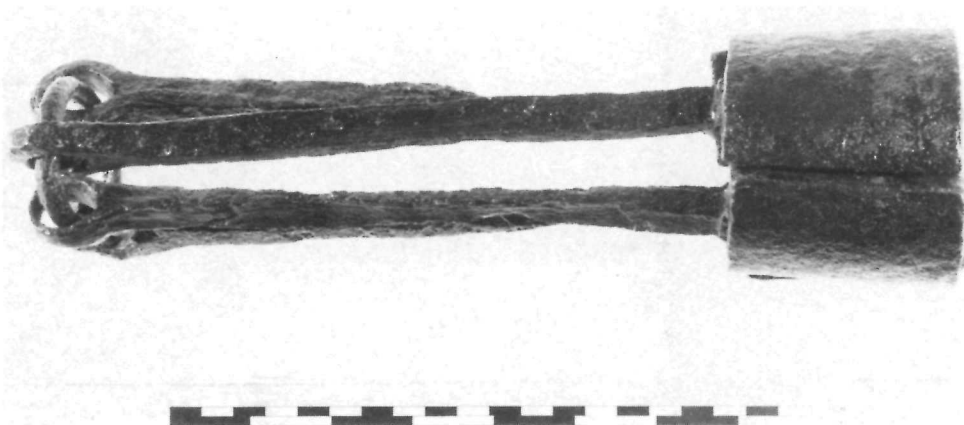
85 Examples of bar-shot types and sizes: a, all-forged manufacture; b, forged bar with cast cylinder ends; c, all-forged manufacture.



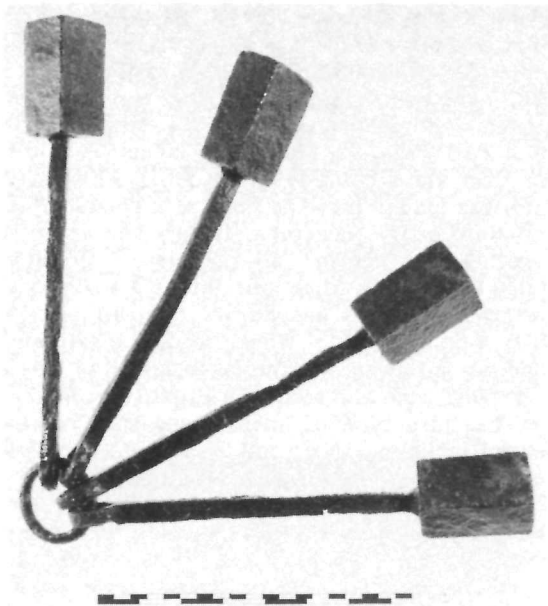
86 Close-up of forged bar shot with cast hemispherical ends, possibly British.



87 Star shot: forged bars, ring and quarter-cylinder ends in a closed position.



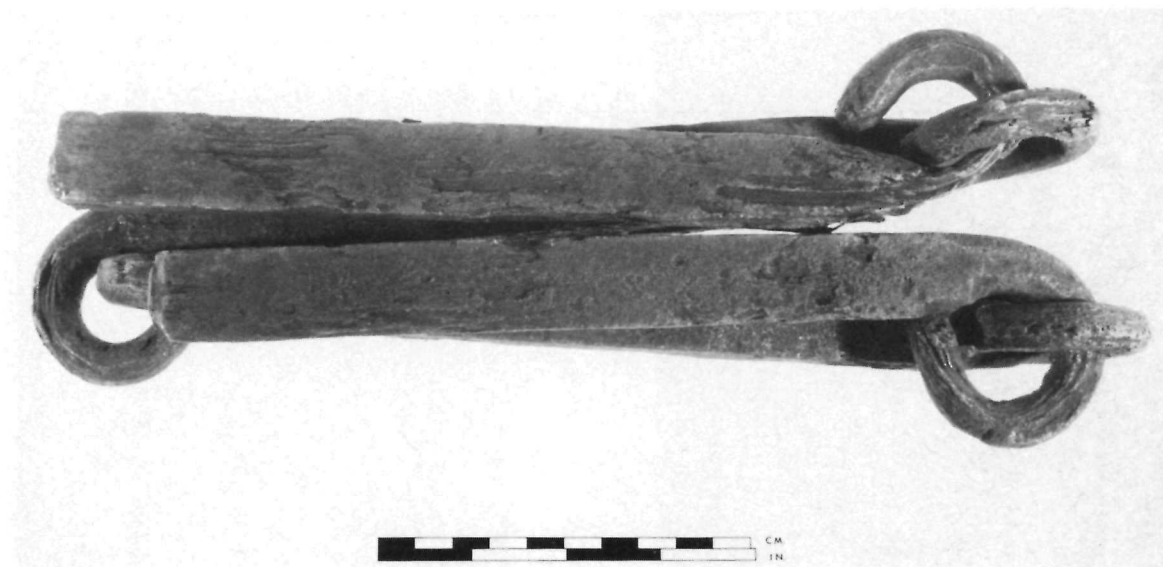
88 Star shot: forged bars, ring and cast quarter-cylinder ends in a closed position.



89 Star shot: forged bars, ring and cast quarter-cylinder ends in an open position.



90 Star shot end comprised of cast one-third cylinders, in the closed position.



91 Linked shot comprised of four forged bars joined by interlocking eyes, closed position.

required was a projectile capable of tearing and ripping at a ship's rigging in order to immobilize it. In response to this need, double-headed and expanding projectiles such as bar, star, chain and linked shot were invented that would rotate in flight and wreak tremendous havoc on impact. Although inaccurate and of short range, their effectiveness against ships' rigging was considerable, and the French in particular preferred their use to solid hull-destroying balls. In the same manner as single-shot balls and anti-personnel projectiles, anti-rigging shot was manufactured in different sizes in order to fit the bores of specific guns. In the 71 examples of iron anti-rigging projectiles in the *Machault* assemblage are bar shot, star shot and linked shot (Figs. 85-92).

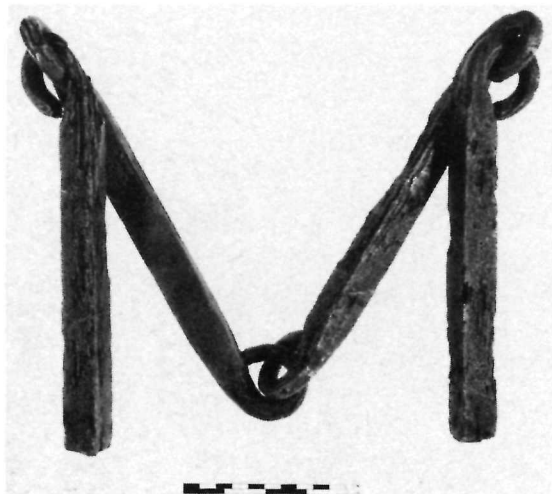
The 53 examples of bar shot are manufactured in three ways. One variety, represented by 25 specimens, consists of a forged bar with forged cylindrical ends (Fig. 85a, c). The second variety consists of 26 specimens with forged bars and cast cylindrical ends (Fig. 85b), while a third variety is represented by two examples with forged bars and cast hemispherical ends (Fig. 86).

The second type of anti-rigging projectile represented is star shot, and its 15 examples are manufactured in two ways. One variety, represented by eight specimens, consists of four forged bars with the eye at one end of each bar joined by a ring, with a forged

quarter-cylinder welded onto the other end of each bar (Fig. 87). The other variety, represented by six examples, consists of four forged bars with eyes joined by a ring, with a cast quarter-cylinder welded onto the other end of each bar (Figs. 88, 89). One larger example has cast third-cylinders (Fig. 90). When star shot was loaded into the bore of a cannon, the one-third or one-quarter cylinders were placed together to form a complete cylinder (Figs. 87, 88, 90), then put into a canvas bag and the bag tied around its central portion with rope (Fig. 94). When fired, the bag and rope burned away and the projectile was freed to expand, spin and rotate in flight (Fig. 89).

The third type of anti-rigging shot represented is linked shot, and its three examples consist of four forged and linked bars (Figs. 91-92). It too was folded together and packaged in a canvas bag tied with rope (Figs. 91, 94). Upon firing, it was freed to expand to a full length of approximately 1 m and its impact had similar results to that of bar and star shot (Fig. 92).

Except for two bar-shot examples with exactly 4-inch-diameter cast hemispherical ends (Fig. 86) which are probably British because they are the exact size of British nine-pound cannonballs, the anti-rigging projectiles are likely French ammunition from the ship's arsenal. They do not cluster in any one area of the ship (Appendix C).



92 Linked shot of four forged bars and eyes, open position.

Canvas Bags

Canvas bags were used to house powder or powder with a projectile, or were used in conjunction with rope to hold together multiple-shot anti-personnel or anti-rigging projectiles. When filled with powder or small balls, they were tied at the top with rope (Fig. 93); with anti-rigging projectiles such as star and linked shot, they were tied with rope around their central portions (Fig. 94). Powder bags and cartridges could be made up in advance in the powder room of a ship so that in time of battle the loading procedures

for the cannons could be speeded up. However, this did involve more preparation time prior to an engagement. From the *Machault* assemblage it appears as if both pre-packaged powder charges in canvas bags and direct loading of loose powder with ladles were used when loading the ship's cannons.

Eight canvas bags were recovered. Four examples have jute rope tied around their tops and were likely used for housing powder or multiple-shot projectiles (Fig. 93); the other four have jute rope tied around their central portions, likely from housing linked or star shot (Fig. 94).



93 Canvas bags were tied with a rope at the top for use with powder or multiple-shot projectiles.



94 Bags were tied with rope in the central portion of the bag for use with anti-rigging projectiles such as star and linked shot.

Conclusions

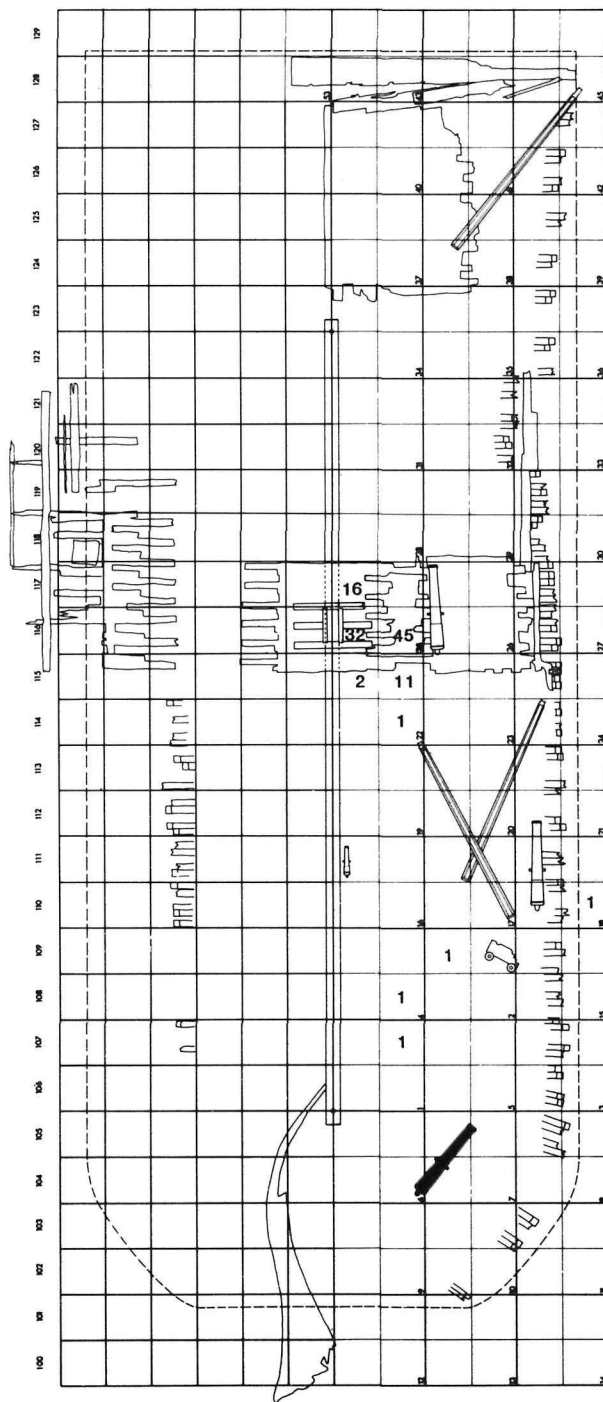
The ordnance assemblage from the *Machault* primarily represents ship-owned items along with French munition supplies for Canada and some souvenirs of the British bombardment. The ship-owned items consist of three French 12-*livre* cannons, all the cannon carriage components, two swivel guns, the powder ladle and powder-horn plugs, the majority of the anti-rigging projectiles and cannonballs, four hand grenades, and eight canvas bags. The 186 four-*livre* cannonballs were either part of the ship's arsenal or munitions for Canada since no records have been found indicating whether or not four-*livre* guns were ever present on the ship. As stated, most of the anti-rigging projectiles consisting of bar, star and linked shot are likely ship-owned French ammunition; however, the two examples of bar shot with cast 4-inch-diameter hemispherical ends are likely part of the British bombardment. The 12-pound and

nine-pound cannonballs marked with broad arrows were also British and another 13 12-pound balls may have been of British origin. The mortar bombs represent munition supplies for Canada since the *Machault* was a three-masted vessel incapable of firing large mortars from its decks. The numerous multiple-shot balls and pellets are undiagnostic and were fired at the ship by the British, were ship-owned ammunition, or were supplies for Canada.

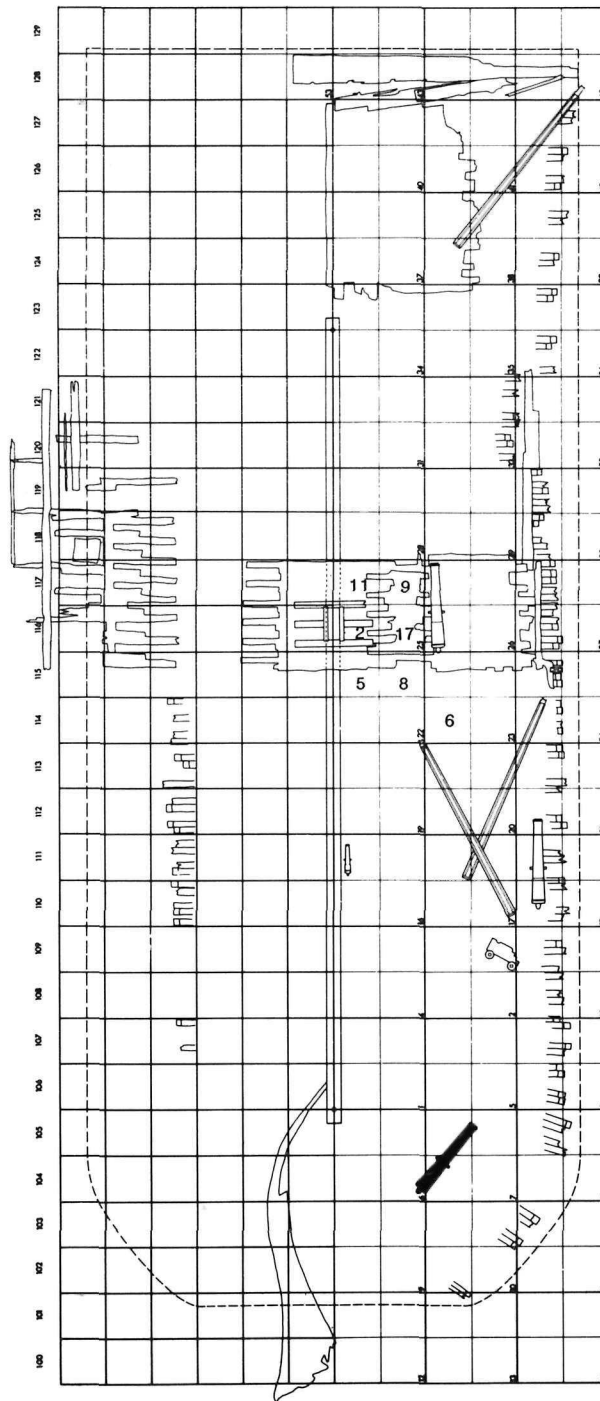
The ordnance from the *Machault* along with the small arms retrieved from it constitute a remarkably extensive and varied collection of mid-18th-century French shipboard weaponry. Not only does the recovered assemblage represent almost all the weaponry items mentioned in the 1758 outfitting list, it also includes other ship-owned weaponry accessories, French munition supplies for Canada, and some British weapons.

Appendix A

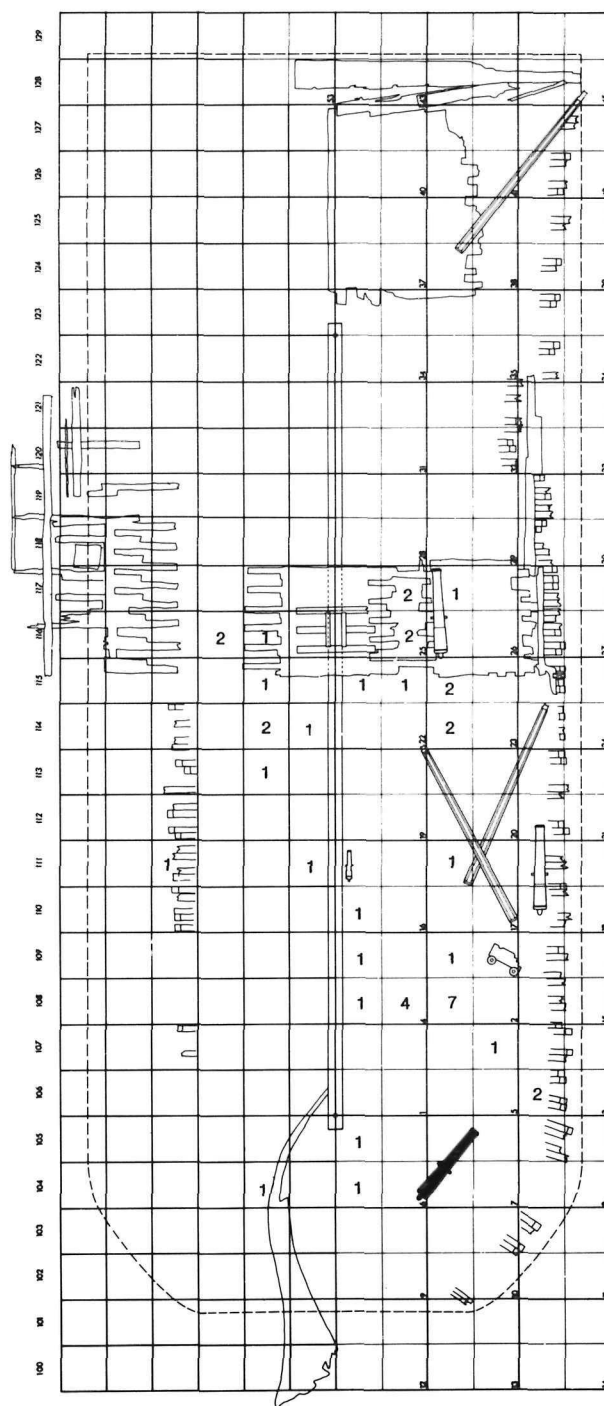
Distribution of French Cannonballs



Appendix B Distribution of Mortar Bombs



Appendix C Distribution of Anti-rigging Projectiles



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A history of the war between Britain and France for control of North America, a large and varied collection of small arms and ordnance was recovered from the 1760 wreck of the French frigate *Machault* in the Restigouche River, between New Brunswick and Quebec.