

**Private Provision of Public Goods:
Theoretical Issues and Some Examples from Maritime History**

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Introduction

The modern treatment of public goods theory dates back almost fifty years . Influential contributions to the mainstream approach to the topic include Samuelson (1954; 1955), Bator (1958), Tiebout (1956), and Musgrave (1959). To this day, detailed discussions of public goods and the implications of their existence remain a standard feature of virtually all economics textbooks¹. Such discussions usually identify public goods as those which possess two different characteristics: nonexcludability and nonrivalrous (or collective) consumption. Taken together, these characteristics mean that, once supplied, a public good provides benefits for everyone, but that those individuals who are so inclined may be able to avoid paying their fair share of the costs, and thus act as “free riders”. Therefore, the profit-seeking private sector will supply a suboptimal quantity of the good, if it supplies it at all. The supposed solution is to have government supply the good and tax the citizens accordingly.

First of all, to be precise it is preferable to subdivide public goods into those which are excludable and those which are nonexcludable. If one relies on Samuelson, whose work is probably the most commonly cited analysis of public goods, then nonrivalrous consumption is alone sufficient to establish the publicness of certain goods. “Samuelsonian publicness and nonexcludability are two completely distinct characteristics...there is a tendency to confuse Samuelsonian public goods with nonexcludable goods, partly because typical examples of public goods share both

¹ For example, see Arnold (2004, pp. 720-23), Ayers and Collinge (2004, pp. 555-59), and Willis (2002, pp. 161-63).

characteristics” (Holcombe 1997, pp. 6-7). One might then be tempted to think that, per Samuelson, excludable public goods could be efficiently supplied by private firms. But that is not the case. “For Samuelsonian public goods [that are excludable], inefficiency occurs if people are excluded, whereas the inability to exclude people creates the inefficiency with nonexcludable goods. In both cases, underproduction results when compared to a theoretical ideal” (Holcombe 1997, p. 7). It is therefore no surprise that most economists lump both characteristics together, despite the fact that they are logically independent of one another.

Among all those goods which have been offered as examples of public goods, national defense and lighthouses have been among the most frequently cited. In both cases, it is typically claimed that *only* a government can effectively provide the good. This paper will present historical evidence which demonstrates that such a claim is false. For instance, the 700-year history of privateering---the use of private armed ships during time of war---will show that national defense in the form of warfare on the seas was not, and need not, be monopolized by government. It will also be shown that lighthouses were frequently built and operated by private entrepreneurs, rather than by governments.

Indeed, maritime history, especially that concerning the age of sail, is rich with examples of privately supplied goods that today are often thought of as being “public”. Some additional ones which will be examined herein include: the positive information externalities provided by Lloyd’s of London and the American Shipmasters’ Association with regard to ship construction, movements, and quality; the voluntary carriage of mail by shipmasters; the “speaking” of vessels and the subsequent reporting

of a vessel's geographical position; the assistance given to vessels in need of supplies; the spontaneous lifesaving and salvage actions of pilot boats and their crews; the private publication of navigation manuals; the development of private systems of signal flags; and the dispersal of nautical information by private organizations and individuals.

Before delving into the historical aspects, however, certain theoretical arguments against the conventional approach to public goods deserve to be considered. Challenging the mainstream treatment of the public goods issue will become more likely if there are both theoretical and empirical reasons for doing so.

Theoretical Problems

Simply put, the core assertion of public goods theory is that some goods or services provide such significant positive externalities that every citizen should be taxed to pay for them. But the magnitude of such externalities may be impossible to prove. In fact, "no one has, as yet, offered any definite findings which purport to gauge external benefits received with any degree of exactitude" (Block 1983, pp. 17-18). And this is not merely a momentary difficulty that is easily solved. "What is being proposed by those who would attempt to measure the value of externalities is simply the measure of utility...a subjective phenomenon, rooted in individual preference. There are no units with which to measure utility" (Block 1983, p. 18).

Setting aside the insolubility of the measurement problem, what is to be done with those who are "free riders", who enjoy the "obvious" benefits without bearing part of the expense? Nothing, unless one wishes to superimpose his own ethics on what purports to be purely economic analysis. This conventional train of thought regarding

free riders would seem to have merit only in the case of the coercive free rider who wants to force others to provide him with something for nothing (Rothbard [1962] 1970, p.888). In fact, the entire free rider argument is, ultimately, a dead end, because it can be applied to virtually any human endeavor. For example, “the great modern accumulation of capital goods is an inheritance from all the net savings of our ancestors. Without them, we would...be living in a primitive jungle...We are all, therefore, free riders on the past” (Rothbard [1962] 1970, p. 888). “Free riding” provides the analyst with no useful, non-normative standard by which certain goods can be distinguished from others.

There is, moreover, a problem with the governmental provision of public goods which resides at the most fundamental level. Assume that one accepts all the standard propositions about public goods. This will lead one to assert that at least some public goods must be supplied via public expenditures. But what if the very act of governmental supply causes those same public goods to cease to be economic goods of any kind at all, whether rivalrous or nonrivalrous, whether collectively-consumed or individually-consumed? Public goods must be a subset of all economic goods. If not, then the entire thrust of public goods arguments is inappropriate and irrelevant.

Late in the nineteenth century Carl Menger, founder of the Austrian school of economics, took a careful look at the various characteristics and categories of goods. He pointed out that, in order for anything to be a good, it must meet *all* of the following conditions: 1) there must exist some unfulfilled human need, 2) the thing must possess properties that are causally related to the satisfaction of the need, 3) the economic actor must have knowledge of that causal relation, and 4) the actor must have sufficient

command over the thing that he can actually employ it in satisfying the need ([1871] 1976, p. 52).

Actual goods, in short, must be plausible means to human ends. They are acting man's levers for bringing about a projected new state of affairs that advances his life in some way. That requires both that they possess real attributes related to the preferred new conditions and that the individual actor exhibit efficacy with regard to their use. Causality in two dimensions is required. In contrast, "imaginary goods" are those which bear no causal relationship to the specified human need, even though some persons may persist in believing in such a causal relationship. Menger offers the examples of "charms, divining rods, love potions" ([1871] 1976, p. 53). Goods in general become *economic* goods when their "available quantities are smaller than the requirements of men", that is, when they cease to be superabundant or "free" goods (Menger [1871] 1976, p. 97).

Consider national defense. It is usually thought to be the supreme example of a public good that must be provided by governments. The present writer does not deny that the goods necessary for effective defense against external aggression are available in quantities smaller than the requirements of men. What this writer does question is the common assertion that collectively directed, taxpayer funded "national defense" is a good for all those who are forced to pay for it². And if it is not a good, then it cannot be an economic good, much less a public good.

² One problem is so obvious that it need only be mentioned. If some individuals consistently claim not to want the state to defend them, then the only justification for taxing them anyway would be if they were liars who "really" did want governmental defense forces, but also wanted to avoid paying. However, to assert that, one must implicitly claim that one is omniscient.

How can state-controlled national defense fail to be a good? It is not a good, in part because individual economic actors have no direct control over its use. It is simply not plausible to claim that individual citizens have, in general, significant influence on the methods, targets, or tools of national defense. Even in democratic societies, such decisions are usually made by a handful of military specialists and politicians, often in secret and sometimes in defiance of public opinion. Moreover, even when public opinion is dominated by support for the state's wartime actions, the minority who oppose war in general, or at least the particular war at hand, no longer possess (if they ever did) the kind of command over the thing which Menger identifies as a necessary aspect of the actor/good relationship. Equivalently, one could say that the politicization of defensive functions corrupts the principal-agent relationship and thereby divorces the economic actor from the object of his actions.

Moreover, regardless of whether one calls the goal "national defense" or "national security" or "public safety", what if the collective nature of state-run protective forces causes such forces to be inherently unable to provide true defense services? Pursuing that line of thought, Hans-Hermann Hoppe has recently made a frontal assault on the conventional thinking about national defense. He claims that "the idea of collective security is a myth that provides no justification for the modern state" and "all security is and must be private" (1998/99, p. 27). Hoppe defends that claim by means of two theoretical propositions. First of all, he proposes that effective defense against aggression can only spring from private insurers and their agents, because the boundaries of *private* property ownership constitute the proper boundaries of different security-risk

zones. Why? Because aggressors seek to have command over that which has value: persons and their property (Hoppe 1998/1999, pp. 40-41). Political boundaries are largely arbitrary in economic terms; whereas the boundaries of private property are a reflection of actions that create or enhance economic value.

Secondly, the motives of private defense agencies would be to offer ever more effective services at lower prices. In stark contrast, “[u]nder monopolistic auspices the price of justice and protection must rise and its quality must fall. A tax-funded protection agency is a contradiction in terms and will lead to ever more taxes and less protection” (Hoppe 1998/1999, pp. 33-34). In no small part, this is a result of the burdensome legal and regulatory structure to be found in all modern nations. That is, in the name of public safety or national security, states systematically expropriate property and thus deprive their citizens of “the very foundation of all protection: economic independence, financial strength, and personal wealth” (Hoppe 1998/1999, p. 31). To defend a nation’s spatial boundaries is *not* synonymous with defending the lives and property of all the citizens within that nation. If one ceases to make such an equation, “it becomes obvious that national defense protects the government’s sovereignty, and only peripherally protects the individual citizens of the government” (Holcombe 1997, p. 11).

If, as explained above, the case for national defense as a public good is problematic, then surely all such goods must be called into question. On the other hand, the commitment to public goods arguments undeniably persists and, just as undeniably, a multitude of government activities are supposedly justified on public goods grounds³.

³ Ironically, the largest governmental activity—redistribution—is clearly not a public good even by conventional standards (Holcombe 1997, pp. 9-10).

There must, therefore, be some reason for the robust survival of such flawed thinking. Can there be an economic theory that would explain the durability of the public goods approach?

Imagine that the officials of a democratically elected government seek their own self interest rather than serving the public interest. Their prime consideration would likely be to maintain their current levels of income and power, if not to increase both. To avoid the cost and danger of an insurrection, it is in their interest to persuade the populace of the government's legitimacy⁴. To succeed in that effort will reduce the costs of compliance with the government's laws and regulations, while maintaining the officials' stream of income. Moreover, success will bring praise to the government officials for all the benefits they bestow upon the society. But how is this to be accomplished? Overt control of the mass media will be quickly condemned as censorship and oppression. Is there a more subtle method that would still be effective? Yes, because to control educational services is, largely, to control the beliefs of the citizenry. Therefore, the key to the government's success is domination of educational services, particularly at the university level.

The theory of public goods is a product of academicians working within the state-subsidized higher-education system. Public goods theory justifies government production on the grounds that the citizens of a government benefit from that production. Individuals who believe this theory are more inclined to view... government activity as legitimate. The theory of public goods furthers the government's own interests, and educators, as a part of the state-controlled education system, have an incentive to promote the theory in order to support the state that supports them...Public goods theory is a product of a state-dominated higher-education system. (Holcombe 1997, p. 20)

⁴ See Holcombe (1997) for an excellent exposition of this basic line of thought, which is a fairly straightforward application of "public choice" theory.

Historical Evidence

The foregoing has established that conventional public goods arguments, at least as justifications for the governmental provision of certain key goods such as national defense, are deeply flawed. The remainder of the paper will offer a number of examples from maritime history of a) public goods, b) goods that have often been characterized as public goods, or c) goods that are today commonly provided via public expenditures, all of which were at one time supplied privately.

Life at sea, especially in the days before steamships, radio, and radar, was remarkably similar in certain respects to life on the various land “frontiers”⁵. In both cases, many of the common activities were unfamiliar to the average citizen, and their very remoteness gave them an exotic flavor. In addition, governmental decrees often went unheeded, a high degree of self-reliance was taken for granted, eccentric behavior was not necessarily treated as a criminal offense, one’s daily work frequently involved hardship and danger, reciprocal relations regarding benefits and responsibilities were the norm, and voluntary cooperation was very common. Perhaps above all, traditions provided a framework for solving problems and resolving disputes. Customary law, not authoritarian (or state-created) law⁶, was normally the basis for conflict resolution. Seafaring men functioned, to a high degree, in a world apart. And this was a world in which, for centuries, governmentally provided goods played a rather small role.

⁵ See Anderson and Hill (1979) for some parallel characteristics of the frontier American west.

⁶ See Benson (1990, pp. 11-36) for a detailed explanation of the differences between customary law and authoritarian law.

Privateering

One of the most instructive of all the examples from maritime history is that of privateering, that is, the employment of profit-seeking, private armed ships during wartime⁷. This practice persisted for roughly 700 years and was a widely recognized part of international maritime law. In the context of the present paper, its significance is that it constitutes proof that national defense need not be monopolized by the state. Many scholars in all disciplines have merely ignored the history of privateers. But this is a part of history which is too rich and well documented just to be erased. Those who assume that only governments can provide for the “common defense” must then criticize privateering along one or more of several lines. If privateers were merely pirates by a different name, then they could hardly be relied upon to aggress only against a nation’s enemies. If privateers were ineffective fighters whose actions did nothing to further the war effort, then their employment was pointless from a public interest standpoint. If privateering was unprofitable, then it could not be relied upon to arise spontaneously when needed. If, on the other hand, privateers followed civilized rules of conduct, imposed significant losses on the enemy, and were sufficiently profitable to appear whenever needed, then the case against privateering must be dismissed.

Privateering as a kind of naval warfare evolved out of restitution for a loss on the seas imposed on the citizen of one nation by a citizen of another (Petrie 1999, pp. 2-3). The offended party sought a permit—called a “letter of marque and reprisal”—from his government to seek out ships flying the flag of the other nation. If he was able to capture

⁷ See Sechrest (2003) for a more detailed treatment of privateers.

such a vessel, he was empowered to sell the vessel and her cargo at auction, thereby recouping at least part of his earlier loss⁸. The first letter of marque and reprisal was issued in Tuscany in the twelfth century; while the first English example dates from 1243 (Garitee 1977, pp. 3-4). By the fourteenth century, letters of marque and reprisal were common throughout the Mediterranean. “Once such licenses were popularized, any reprisal without a permit became piracy in the eyes of the courts” (Garitee 1977, p. 3). Early on, there were occasional problems with holders of letters of marque and reprisal who violated their licenses by committing criminal acts. However, this steadily diminished as privateers became bonded and maritime courts more consistently enforced the relevant statutes. By the sixteenth and seventeenth centuries, privateering had changed into a well regulated instrument of war for maritime nations (Starkey 1990, pp. 22-31). By the nineteenth century, letters of marque “were issued only in time of war to supplement the public vessels of the respective navies” (Petrie 1999, p. 3).

Although the practice has been looked on with disfavor by many, it is undeniable that privateering was frequently undertaken on a large scale. The American colonies of Britain commissioned 113 privateering ships during King George’s War of 1744-48, and four or five hundred during the Seven Years’ War of 1756-63 (Garitee 1977, pp.7-8). During the American Revolutionary War, the British commissioned at least 700 such vessels—94 from Liverpool alone (Williams [1897] 1966, pp. 257, 667-69). The American secessionists who opposed them sent about 800 to sea (Stivers 1975, p. 29).

⁸ Originally, the amount that could be recovered was limited, and the individuals whose property could be taken were specified (Garitee 1977, p. 3). Once privateers had become a common part of warfare, such limitations disappeared.

“The great number of ships employed in this venture testifies to its widespread popularity and profit” (McFee 1950, p. 120). Some 526 American vessels were commissioned as privateers in the War of 1812, although only about half that many ever actually got to sea (Kert 1997, pp. 78, 89). Even the sparsely-populated Canadian maritime provinces of New Brunswick and Nova Scotia joined the war by sending 47 privateers to sea against their American neighbors (Kert 1997, p. 78). It seems fair to say that the Anglo-American peoples were particularly fond of and suited for privateering. Elizabethan England, for instance, was “almost totally dependent upon the private initiative and individual enterprise of its privateering establishment. Private armed vessels became the characteristic style of maritime warfare rather than a nuisance factor or a mere supplement to the navy” (Garitee 1977, p. 5).

On the continent of Europe privateering was also undertaken with enthusiasm by the French, Dutch, Spanish, and Portuguese, among others. For example, the French ports of Dunkirk, Calais, Boulogne, Havre, Cherbourg, St. Malo, Morlaix, Brest, Nantes, and La Rochelle were all sources of private armed ships, which were usually referred to as “corsairs”. During the War of the League of Augsburg (1689-97), the privateers from St. Malo alone made forty to fifty sorties during each year of the war (Lord Russell 1970, p. 22). During the War of the Spanish Succession (1702-12), French privateers roamed as far as Ireland, Portugal, and Rio de Janeiro in search of English and Dutch ships (Lord Russell 1970, p. 31). During that same conflict, the British sent an enormous number of privateers to sea, 1,343 to be exact (Starkey 1990, pp. 88-89).

Despite the obvious popularity of privateering, was it really just piracy masquerading

as national defense? It is true that the primary function of the privateer was to capture merchant vessels flying the flag of the enemy, because it was the sale of those vessels and their cargoes which made privateering lucrative. Therefore, privateers were usually very fast vessels of modest size which carried large crews but were lightly armed (Footner 1998, pp. 101-21). They were not really expected to engage the enemy's naval vessels in combat. Further, were the officers and crews of privateers really cutthroats who followed no code of conduct, who recognized no rules or customs, and who only fought when the risks were small and the monetary reward was expected to be great? Some certainly have thought so. William McFee is probably representative of that negative viewpoint. He asserts that "the difference between a pirate and a privateer was largely academic" and that privateering "was barren of good will, and it put a premium on lawlessness" (1950, pp. 105, 129).

Recent scholars seem to disagree strongly with such an assessment. Both profit and patriotism usually motivated those who invested in, or served as part of the crew of, a privateer (Garitee 1977, pp. 47-64). Some privateers fought heavily armed naval vessels even when they could have escaped, and others attacked enemy shipping even when there was little or no prospect of profit. For example, the American privateer *General Armstrong* fought a desperate, and ultimately, losing action against a squadron of British warships at Fayal in the Azores on the night of September 26-27, 1814 (Garitee 1977, pp. xiii- xv). That same privateer had, a year earlier, battled a British frigate, a ship several times her size and power. In the winter of 1812-13, while off the coast of Brazil, the American *Comet* captured three British merchant ships after a successful gunbattle with

the large Portuguese warship that was serving as their escort (Garitee 1977, pp. 150-51).

In addition to their frequent bravery under fire, the evidence suggests that, in general, those who commanded privateering ships acted as both sober business managers and gentlemen. The great majority of privateers were characterized by “a decent, civilized greed...Like sportsmen, privateers played by a code of rules” (Petrie 1999, p. 69). “[A] well-developed body of law underlay and circumscribed the privateering business in the eighteenth century; moreover, there were considerable economic incentives to encourage privateering venturers to operate within the regulatory framework” (Starkey 1990, p. 31)⁹.

First of all, since the usual goal was to capture a ship rather than destroy it, the actions of privateers probably led to fewer deaths and less property damage than did the typical naval approach. Under most circumstances privateers effected a transfer of property instead of the destruction of property. After using its cannon to inflict minor damage on the hull and rigging of an enemy ship, a privateer usually ranged alongside and captured the vessel by “boarding”, that is, by overpowering her crew through sheer force of numbers. The ship and its cargo were fair game, but the personal possessions of the crew or any passengers that might be aboard were not subject to seizure. Quite tellingly, the treatment accorded the prisoners taken by a privateer was normally of a high order. British shipmaster W.A. Bingham went to the trouble and expense of publishing in an American newspaper a declaration of his appreciation for the “very kind and humane

⁹ Among other possibilities, these incentives included loss of the amount of the surety bond (Garitee 1977, p. 17; Kert 1997, p. 92), loss of the letter of marque, an adverse judgment in the prize courts, damage to one’s commercial reputation, and even charges of piracy.

treatment” he and his crew enjoyed after being captured by the Baltimore privateer *Dolphin* in 1813 (Cranwell and Crane 1940, p. 103). Another Englishman extended a remarkable invitation to his American captors. He asked them to visit him at his London home after the war (Maclay 1899, pp. 460-61). In his memoirs, George Coggeshall recalled that while in command of the privateer schooner *Leo*, he had “voluntarily released more than thirty British prisoners notwithstanding the American government gave a bounty...of one hundred dollars per head for British prisoners brought into the United States” ([1858] 1970, p. 210).

Clearly, these are not the actions of seagoing criminals. As a matter of fact, privateering was perceived as such a respectable activity that, in France for example, the Catholic bishops of the cities of St. Malo and Nantes invested in privateering ventures (Lord Russell 1970, p. 23). In the United States during the 1775-1815 period, the “owners and investors associated with the Portsmouth [New Hampshire] privateering fleet...included some of the wealthiest, most respected, and best known of the Piscataqua mercantile elite” (Winslow 1988, p. 134). During the eighteenth century in Britain, “[m]embers of the nobility and gentry held shares in private ships-of-war”...even “Sir Owen Buckingham, Lord Mayor of London, speculated in the activity”, as did the famous Admiral Lord Anson (Starkey 1990, p. 67).

A second key concern involves the effectiveness of privateers. Did they, in fact, inflict significant damage on the enemy? Here the evidence in their favor seems overwhelming. Indeed, in Europe between 1600 and 1815, privateers “probably contributed much more than warships to the actual harm done the enemy” (Anderson and

Gifford 1991, p. 101). On the other side of the Atlantic, “without the presence of the American privateers in the Revolutionary War and the War of 1812, the United States would never have been able to hold off the British Navy” (Kert 1997, p. 81). In fact, during the later stages of the War of 1812, the American privateers constituted “the nation’s only effective offensive maritime force” (Garitee 1977, p. 61).

American privateers swept the Atlantic and even penetrated within a few leagues of the mouth of the Mersey. The merchants and shipowners of Liverpool, instead of fitting out private armed vessels with the energy that had characterized them in former days, put their trust in the Lords Commissioners of the Admiralty, and found, too late, that the king’s cruisers, like the modern policeman, were too often absent from the spot where their services were most required. The depredations of the American privateers on the coasts of Ireland and Scotland at length produced so strong a sensation at Lloyd’s that it was difficult to get policies underwritten, except at enormous rates of premiums. (Williams [1897] 1966, p. 433)

The foregoing comments are powerfully positive judgments of privateers’ effectiveness. Furthermore, such judgments are well supported by the available data. French privateers “captured not less than 1,300 Spanish and Dutch ships” in the war against Holland and Spain (1672-79) (Lord Russell 1970, p. 20). Between 1689 and 1697 the French “corsairs” operating out of only one city—St. Malo—alone took “no less than 3,384 English and Dutch merchant ships and 162 escorting men-of-war” (Macintyre 1975, p. 83). During the War of the Spanish Succession (1702-1712), private armed French ships captured or destroyed more than 1,000 ships belonging to either the English or the Dutch (Lord Russell 1970, pp. 31-32). Over the first fourteen months of the Seven Years’ War (1756-63), French privateers captured 637 British vessels (Williams [1897] 1966, p. 115). Part of the explanation for this French success was a lack of effort by the British Navy. Many of the “commanders of the King’s ships appear to have been

shamefully relax in the unpleasant duty of convoying merchant vessels, and in pursuing the privateers of the enemy” (Williams [1897] 1966, p. 116). On the other hand, British naval officers did seek out French merchant vessels, of which at least 794 were taken as prizes (Starkey 1990, pp. 178-79). The reason for their enthusiasm for the latter activity is that naval personnel, like privateers, were awarded prize money for capturing merchant ships carrying valuable cargoes. In the first few years of the Napoleonic Wars, specifically 1793 to 1797, the British lost “no less than 2,266 vessels, a large proportion of which were captured by the [French] corsairs” (Lord Russell 1970, p. 39).

In the case of the United States, it is interesting to compare the record of the public warships with that of the privateers. During the Revolutionary War, the ships of the Continental Navy took 196 British prizes, while the privateers took at least 600 (Maclay 1899, p. viii). Moreover, as the war progressed, the number of privateers increased from 136 in 1776 to 449 in 1781 before declining to 323 in 1782. During those same years, the number of active public warships decreased from thirty-one to nine to seven, respectively (Maclay 1899, p. viii). In short, the British Navy succeeded against the Continental Navy, even though it failed to curtail the activities of American privateers. In the War of 1812, the U.S. Navy captured or destroyed 165 British merchant ships and fifteen naval vessels. American privateers, on the other hand, took only three British naval vessels (a task for which they were really not designed), but a minimum of 1,300 merchant ships (Garitee 1977, p. 243). A Baltimore newspaper of the time put the figure at 1,750. One recent writer has said that the British lost 2,500 ships, with the majority taken by privateers (Petrie 1999, p. 1). “Even a maritime establishment as large as Britain’s in

1815 could not ignore such figures nor enjoy the prospect of greater losses at sea if the war were extended another year or more” (Garitee 1977, p. 244).

On the other side of the same conflict, the Canadian privateers also contributed to the cessation of hostilities. The privateers from the maritime provinces were few in number but both active and successful. They probably captured or destroyed close to 600 American ships (Kert 1997, p. 80). One in particular created consternation along the eastern seaboard, the Nova Scotian schooner *Liverpool Packet*. She was such a threat to shipping, that the Congress even considered cutting a canal across Cape Cod in order to reduce shipowners’ losses (Kert 1997, p. 84). From the American perspective therefore, “the privateers of New Brunswick and Nova Scotia provided a major incentive for peace” (Kert 1997, p. 78).

To propose that privateers often had a significant, perhaps even deciding, impact on the course of wars between maritime nations seems beyond dispute. Only one question remains. Was privateering sufficiently profitable to assure that its practitioners would want to offer their services during wartime? There is an immediate, intuitive answer to that question. Those who undertook to build, equip, arm, and man a ship in preparation for a raiding cruise were, naturally, men with expertise in nautical matters. In other words, they were usually shipowners, merchants, and shipmasters. In time of war, their ordinary commercial activities were being curtailed by the enemy’s actions: blockades, coastal attacks, diminished markets in which to sell their cargoes, privateering itself, and so forth. They had every reason to engage in privateering, both in patriotic outrage against the enemy and as a means to recover at least some of their lost income. For

example, shortly after the War of 1812 was declared, large numbers of privateering vessels appeared, ready for sea, in both Canadian and American ports (Kert 1997, pp. 78, 88).

Quantitatively, the data on profits are rather limited, few account books and ledgers having survived, and they reveal somewhat mixed results, as one should expect. After all, privateering was a very risky business. It will help to illuminate the usual risk environment if one keeps in mind that 28% of all American and 21% of all Canadian privateers were either wrecked, destroyed, or captured during the War of 1812 (Kert 1997, p. 90). Most fundamentally, one must inquire as to the cost to build and outfit a typical privateering vessel, as well as the magnitude of its revenues. At the apex of privateering activity, from the late eighteenth to the early nineteenth century, the outfitting cost was roughly \$40,000 at contemporaneous prices, although this could vary considerably with the size of the ship (Garitee 1977, p. 125; Williams [1897] 1966, pp. 661-64; Starkey 1990, p. 305). Furthermore, since the average value of a ship taken as a prize during the War of 1812 was around \$13,500, any privateer of the time that took at least four prizes was likely to prove profitable (Garitee 1977, pp. 197-98). And the extant records indicate that, during that war the average number of prizes taken by both Canadian and American privateers was at least six (Kert 1997, p. 90).

In his meticulous study of privateering as a business, Jerome Garitee found that 58% of the Baltimore privateers were profitable. The mean average proceeds to the owners from the cruises of those successful vessels were \$116, 712 per privateer (1977, pp. 271-74). That indicates an average return on assets of about 192%. High profits also seem to

have been achieved frequently by American privateers in the mid-eighteenth century. Two different researchers have found evidence of annual rates of return on the order of 130%-140% (Swanson 1991, p. 218; Lydon 1970, p. 253). On the other hand, some privateering ventures brought minimal profits or even losses to the investors. Nevertheless, the fact that some privateers achieved very high returns apparently served as a powerful incentive which brought forth large numbers of private armed ships over several centuries of warfare. Many examples could be cited of individual privateering ships that were extraordinarily successful. A few of the most famous will be noted below.

The Canadian *Liverpool Packet* was mentioned earlier as striking fear in the hearts of New England merchants during the War of 1812. Their fears were well founded. This small vessel was purchased in 1811 for a mere 420 pounds-sterling. In four cruises she captured 50 American ships and brought her owners at least 10,000 pounds-sterling (Kert 1997, pp. 83, 166-91). In 1756, the British privateer *Anson* took sixteen French prizes, which produced a 5,000% return (Williams [1897] 1966, pp. 88-90). During the Napoleonic Wars, the French corsair *Emilie* netted the equivalent of \$700,000 from her actions against the British (Lord Russell 1970, pp. 150-51). One of the most renowned privateers of the Revolutionary War was the *Pilgrim*, whose home port was Beverly, Massachusetts. Her achievements ranked with those of the *Liverpool Packet*, for she was credited with taking 50 British prizes (Howe 1922, pp. 349, 352). The most successful privateer from Salem, Massachusetts was the large, ship-rigged *America*, which carried twenty-four guns and a crew of 150. She captured twenty-six British vessels, which sold at auction for more than \$1 million (Morison 1921, p. 202). The *True-Blooded Yankee*

captured or destroyed thirty-four British ships in a span of only thirty-seven days during the War of 1812, one of the prizes being valued at \$400,000 (Maclay 1899, pp. 275-77). But perhaps no privateer ever had such remarkable success in such a short time as did the American *Kemp* in 1814. In a cruise lasting only eight days, she captured vessels which generated gross prize court proceeds of \$500,000 (Cranwell and Crane 1940, pp. 210, 220, 225).

It is clear that privateers were not pirates, and investments in privateering were often very lucrative. Moreover, privateering “had a marked impact on Atlantic commerce in the 1740s, just as it did in earlier wars and would continue to do in the subsequent conflicts of the eighteenth and early nineteenth centuries” (Swanson 1991, p. 2). Why, then, did privateering disappear? Many have assumed that the technological developments during the latter half of the nineteenth century---steam power, armored warships, and rifled cannon---made private ships of war obsolete, but that is false (Anderson and Gifford 1991, p. 118). Privateering disappeared precisely because it worked so well. It was effectively legislated out of existence in 1856 by means of the Declaration of Paris. The signatory nations ¹⁰ wished to eliminate privateering, because it offered a low-cost but effective alternative to those nations who did not want to undertake the massive expenditures required by public navies (Anderson and Gifford 1991, pp. 118-19). “Privateering was not a market that can be shown to have ‘failed’”(Anderson and Gifford 1991, p. 120). Clearly, national defense, at least insofar as naval warfare is involved, need

¹⁰ Those nations were Great Britain, France, Prussia, Austria, Russia, Sardinia, Turkey, Belgium, Denmark, the German Confederation, the Netherlands, Norway, Portugal, and Sweden. The United States did not sign the declaration, but renounced the practice in the Hague Peace Conference of 1899.

not be the exclusive province of the government.

Lighthouses

For a long time, the lighthouse was also commonly mentioned as a supposedly classic example of a public good that must be publicly provided. Then Ronald Coase looked into the facts about the provision of lighthouses in Great Britain. His choice of Britain was excellent in part because maritime matters, such as lighthouses as aids to coastal navigation, have obviously played a huge role in the history of that nation. What he found is most revealing.

The standard argument regarding lighthouses has been that, once the structure is built and as long as it is maintained, its service cannot be restricted only to those who pay for it. In short, there would be large numbers of “free riders”. Therefore, private construction of lighthouses could never be profitable and must be a function of government. But what Coase found was that the building and operating of lighthouses by private firms and individuals was actually quite common in the British Isles. By 1820, for example, thirty-four of the forty-six lighthouses then in operation had been built privately, and twenty-two were still operated by private individuals (Coase [1974] 1988, p. 266). The owners of these structures gained their revenue from fees paid by shipowners, who benefited enormously from the service, so much so that they regularly petitioned the government to permit new lighthouses to be built. “The lighthouses were built, operated, financed, and owned by private individuals, who could sell the lighthouse or dispose of it by bequest. The role of the government was limited to the establishment and enforcement of property rights in the lighthouses” (Coase [1974] 1988, p. 276). This is confirmed by specialists

who have concentrated on lighthouse history. For instance, Bella Bathurst, though clearly an advocate of public provision, grants that along England's coastline "[f]or a period of three hundred years or so, most of its lights were built and maintained by individuals who had been granted charters" (1999, p. xxi).

Not only did the British government often fail to initiate the building of needed lighthouses, it even resisted their construction on more than one occasion. "Captains, shipowners, sheriffs, and landowners had all written to the commissioners [of the Scottish Lights] at various times in tones of mixed desperation and severity for a light on the Bell Rock", a deadly reef twenty-seven miles east of Dundee and eleven miles south of Arbroath (Bathurst 1999, p. 64). Engineer Robert Stevenson proposed to build a tower of his own design, but was denied permission until December 3, 1806 when the lighthouse commissioners reversed their earlier decision that the project was too dangerous and the methods untried (Bathurst 1999, pp. 69-70, 75). Stevenson began construction the following year, and the Bell Rock lighthouse was completed in 1811. Fourteen miles southwest of Plymouth, England lies the Eddystone reef, one of the more notorious hazards in the heavily-traveled English Channel. In 1664 two local men asked the commissioners for permission to build a light on this treacherous reef. Their petition was rejected on the grounds that "since there was no precedent for an offshore light, it must therefore be impossible to build one" (Bathurst 1999, p. 54). Finally, thirty-two years later, the commissioners relented and allowed a Plymouth man to attempt it "at his own cost and entire financial risk" (Bathurst 1999, pp. 54-55). That man passed the project on to a Henry Winstanley, who completed the first Eddystone light in 1699.

Despite the centuries of private initiative, by 1842 Parliament had eliminated all private ownership of lighthouses. Was this because the privately operated lighthouses were inefficiently run? Coase does not think so. His conclusion is that the shipowners, who paid the “light dues”, lobbied for the change in the mistaken belief that it would result in smaller fees ([1974] 1988, p. 269). Coase wisely cautions that “economists should not use the lighthouse as an example of a service which could only be provided by the government” ([1974] 1988, p. 277).

One should note that the basics of the British system, that is, an official regulatory body which dispensed charters to private entrepreneurs, who then charged fees for the service, were also to be found during the early period of lighthouses in Canada (Holland 1995, p. 75). This was in conscious imitation of the British. And Hawaii, prior to the American takeover in 1898, possessed a number of private aids to navigation (Holland 1995, p. 94). It might also be pointed out that the American colonists, largely left to their own devices by the mother country, frequently erected beacons and other aids for navigating the coasts. Most beacons were simple wooden structures, which often had metal baskets filled with lighted coal or oakum to cast a light seaward (Gleason 1991, pp. 4-5). As early as 1663, the Boston area could boast of having such beacons at Allerton Point, Beacon Hill, and Beacon Island. On Beavertail Point, opposite Newport, Rhode Island, bonfires were lit “for the guidance of vessels at night”, perhaps as early as 1639 (Gleason 1991, p. 4). Whenever they expected a vessel to arrive at night, the residents of Nantucket Island “would display a light from the window of a private dwelling” (Gleason 1991, p. 6). One tavern owner on Naushon Island, Zaccheus Lumbert, seemed

to be aware of the basic issue. He argued that he should be exempt from the liquor tax on the grounds that the private lighthouse he operated was a public service that had saved lives and property (Gleason 1991, p. 6).

After their secession from Britain, however, the United States took a rather different approach. In 1789, Congress created the Lighthouse Establishment, which was given direct control over all coastal aids to navigation (Bauer 1988, p. 61). 1791 saw the beginning of a program of new construction. But the new agency was burdened with bureaucratic problems, so little was accomplished until well into the nineteenth century. Of the twenty-four existing lighthouses in 1800 it has been said that they “failed in their primary purpose of guiding ships safely at night” (Gleason 1991, p. 32). Then Winslow Lewis appeared on the scene. This political entrepreneur and inventor had installed Argand lamps in both the Boston and Baker’s Island lighthouses along the Massachusetts coast in 1810. The Argand lamp was invented around 1782 by a Swiss chemist and was a definite improvement over the “spider lamps” previously used (Gleason 1991, pp. 3, 33). Amazingly, Lewis claimed to have invented the lamp himself and through his political connections successfully sought a patent on the device. “Congress not only paid Lewis the princely sum of \$24,000 for his patent right but [also] gave him a monopoly on lighting the country’s lighthouses” (Gleason 1991, p. 43).

As economic theory would suggest, this monopoly privilege brought stagnation. In 1823 an even better device was invented by a young Frenchman--the Fresnel lens, which produced a light four times brighter than that possible with any previous method (Gleason 1991, p. 57). The results of its use were remarkable. In France, the average

annual number of shipwrecks fell from 163 to 59 (Stevenson 1959, p. xxiii). It was not until 1852 that the United States government mandated the installation of Fresnel lenses in all its lighthouses (Gleason 1991, p. 59). By that date, the Fresnel lens was already being used in Britain, France, Holland, Ireland, Belgium, Denmark, Norway, Sweden, Russia, Italy, Spain, Portugal, Egypt, Turkey, and Brazil.

To make matters even worse, Winslow Lewis was in the unfortunate habit of changing the customary characteristics of existing lights without informing the maritime community ahead of time. For instance, he changed the fixed Boston light to a revolving one, even though it had been a fixed light for almost a century, and made the revolving Cape Cod light into a fixed one (Gleason 1991, p. 52). The internationally recognized practice of course was to inform shipmasters and shipowners of such changes months in advance. During Lewis's tenure, that very reasonable "procedure was not followed in the United States, sometimes with dire consequences" (Gleason 1991, p. 52). In short, Lewis's quirky behavior caused more than one shipwreck. This public-sector endangerment of mariners was bitterly criticized by, and to the extent possible, rectified by individuals in the private sector. As early as 1817 Edmund M. Blunt, who published *The American Coast Pilot*, a widely used guide to coastal navigation, tried valiantly via his publication to inform shipmasters as quickly as possible of the changes Lewis made (Gleason 1991, p. 53). So too did the sons who succeeded Blunt in his publishing enterprise. It was not, however, until 1852 that timely notification was consistently practiced by government officials.

Oceanic and Coastal Navigation

The foregoing reference to Edmund M. Blunt brings to mind Nathaniel Bowditch's world-renowned book *American Practical Navigator*, which was published originally by Blunt, and thus raises the topic of private sources of maritime information. Today, most shipmasters and yachtsmen are likely to think first of their government as the primary supplier of information regarding both oceanic and coastal navigation. But that was not always the case. For centuries, for critical marine information such persons relied on books made available by profit-seeking authors and their publishers. The first of these appeared in the early sixteenth century, were addressed largely to mathematicians and astronomers, and were often written in Latin (Bowditch [1802] 1966, p. 32). The first really practical navigation manual was John Davis's *The Seaman's Secrets* of 1594 (Bowditch [1802] 1966, p. 34). Bowditch's *American Practical Navigator* was first published in 1802. The following year an almost equally popular manual, J. W. Norie's *Epitome of Navigation*, was published in England (Bowditch [1802] 1966, p. 34). There were twenty-two editions of Norie's book; while the book by Bowditch had been through thirty-five editions by 1867, the later ones being revised by Bowditch's son. In 1868, the copyright on *American Practical Navigator* was purchased by the Hydrographic Office of the U. S. Navy, and the federal government has published it ever since.

The extensive use of these navigation manuals suggests that they became an indispensable part of a shipmaster's vocation. Therefore, one might well wonder what sort of information such navigation manuals contain. A brief sampling of the contents---

these tomes often exceed 1,000 pages in length---reveals that they include data on the coastal tides, ocean currents, the identification of celestial bodies, the proper use of navigational instruments such as the compass, the sextant, and the chronometer, global wind patterns, weather forecasting, methods of calculating the latitude and longitude of one's position on the sea, the use of charts, the coordinates of hundreds of port cities and natural formations around the world, and numerous tables to assist in making the necessary mathematical calculations.

For those sailing along coastlines there were similar texts which focused on tides, safe places to anchor, the locations of buoys and other seamarks, and the positions of lighthouses along with the characteristics of their lights (white, red, revolving, fixed, and so forth). "Coast pilots, or sailing directions, for the Atlantic coast of the United States were privately published in the first half of the 19th century", but then the U. S. Coast and Geodetic Survey began to accumulate data on coastal conditions and eventually displaced the private publishers (Bowditch [1802] 1966, p. 31). The transition process was exemplified by the efforts of George Davidson, who compiled the first comprehensive manual for the Pacific coast. The first edition of Davidson's *Pacific Coast Pilot* was published in the mid-1850s. Although he was employed by the U. S. Coast and Geodetic Survey, this compilation "was undertaken by Mr. Davidson wholly outside of official powers and official duties; part of it was first published in one of the daily journals of San Francisco" (Connett 1948, p. 484). And even though Davidson was familiar with "the general features of nearly every mile of the seaboard", the Superintendent of Surveys was later reluctant to publish the work "because he had known

nothing of it officially” (Connett 1948, p. 485).

For those making deep sea voyages, perhaps nothing was as crucial as establishing exactly where one’s ship was. The crudest method is known as “dead reckoning”. This requires only that the navigator possess a compass and a “log”, the latter being a device for measuring the vessel’s speed. From some known starting position, one tracks the combinations of direction and distance and thereby, hopefully, determines one’s current location. However, compasses are affected by magnetism, the log was only modestly accurate, and estimates of the distance covered are distorted by currents. Thus dead reckoning was notoriously unreliable. What was needed was a dependable means of finding one’s position anywhere on the curved surface of the Earth. A variety of instruments were invented to give the mariner his position in terms of latitude, that is, in the north/south dimension. The earliest of these appeared in the eighth century (Bowditch [1802] 1966, pp. 40-41). Thus, even in the early Middle Ages seafarers could ascertain the latitude of their position. However, they had no effective way to know their longitude, that is, in the east/west dimension. As a result, the common practice was to sail to a certain latitude and then travel east or west until some known land mass was encountered. This was, obviously, very hazardous as well as causing ocean voyages to be far more time consuming than they might otherwise have been. For centuries, various maritime nations had offered large prizes to anyone who could invent a device or method which would accurately determine one’s longitude at sea. In 1714 the British Parliament established the Board of Longitude whose mission was to elicit solutions to what had come to be thought of as the most pressing technological challenge of the age (Sobel

1995, p. 68). The reward for success was to be a prize of 20,000 pounds-sterling, an enormous sum for the time.

Such a magnificent reward produced many attempts, but the first practical and accurate device was the chronometer (as it came to be known) finished by English clockmaker John Harrison in 1735 after five years of effort (Sobel 1995, p. 77). Harrison was a man of little education but remarkable skills. For instance, in 1722 he constructed a clock that was placed in the tower above a local estate's stable. That clock has been running continuously ever since, except for some refurbishing done in 1884 (Sobel 1995, p. 68). Harrison saw that the heart of the longitude problem was time, and that it would be solved if an extremely accurate clock could be built, at least if such a clock would retain its accuracy throughout a long ocean voyage despite both the rolling and pitching of the ship and the unavoidable changes in temperature, pressure, and humidity. Time is the paramount concern, because every hour of time represents fifteen degrees of longitude. And that translates into a certain distance in nautical miles (a mile of 6076 feet in contrast to the land mile of 5280 feet). Of course, one has to know in what latitude one is, since the number of nautical miles in a degree of longitude varies with latitude¹¹. While at sea, each day at noon the shipmaster checks the chronometer to see what time it is back at his home port. Each hour of difference represents fifteen degrees of longitude away from that point of departure.

Harrison's chronometer made ocean navigation immensely safer and more efficient.

¹¹ To illustrate, in ten degrees of latitude, either north or south of the Equator, one degree of longitude equals 59.201 nautical miles. In forty degrees of latitude, one degree of longitude equals 46.110 nautical miles (Bowditch [1802] 1966, p. 1246).

He clearly deserved the promised prize of 20,000 pounds-sterling. His timepiece was hailed as a great success after being tested at sea on a roundtrip between England and the West Indies in 1736 (Sobel 1995, pp. 79-82). Famed explorer James Cook praised the chronometer that he used on his second voyage (Sobel 1995, p. 149). Nevertheless, Harrison never received full compensation. The Board of Longitude repeatedly stalled, changed the testing parameters, and made impossible demands on the clockmaker. Parliament amended and even repealed the original Longitude Act. Finally, by appealing directly to King George III, a very elderly John Harrison received most of the money in June of 1773, thirty-eight years after completing the first chronometer (Sobel 1995, pp. 146-49).

Despite the injustice to Harrison, a number of inventors and entrepreneurs soon saw that there were profits to be made. Men such as John Arnold, Larcum Kendall, Thomas Mudge, and Thomas Earnshaw produced chronometers that steadily became more compact and less expensive (Sobel 1995, pp. 152-64). The production of chronometers “became a boom industry in a maritime nation...it was by dint of the chronometer that Britannia ruled the waves” (Sobel 1995, pp. 152-53). Soon the chronometer was an essential part of every shipmaster’s daily routine. Men in the private sector had eliminated a problem that no government official had been able to solve. The solution involved a device that obviously was both rivalrous and excludable, and thus itself not a public good. However, knowledge of the proper use of the chronometer was available to all, and that rapidly became an integral part of oceanic navigation.

A further, but often overlooked, example of a private source of public benefits

has been the marine society or association. In the United States, such organizations have frequently played an important role in maritime affairs. Many have focused on the dissemination of information, some on nautical reforms, others on historical preservation, still others on mutual assistance among their members. Reflecting the large part that the sea once played in American society, they began to appear rather early in this country's history.

Colonial seamen began to form associations for mutual aid...The first was established in Boston in 1742, followed by the Newport Marine Society a decade later. The Salem Marine Society was incorporated in 1772....years later shipmasters in the China trade formed the Salem East India Marine Society. (The Peabody Museum of Salem was founded by the latter in 1799 as a repository for exotic artifacts gathered abroad.) Portland, Portsmouth, Newburyport, Marblehead, and Providence all formed marine societies, as did ports to the south. (Gleason 1991, pp. 9-10)

Indicative of the Salem East India Society's intense interest in the dissemination of information is the fact that one member was fined for failing to provide a written record of the navigational, meteorological, and geographical observations he had made during a recent voyage (Gleason 1991, p. 10). Members were expected to share such information with one another, which cooperation made it possible for them to compose sailing directions for their home port, a distinctive and "useful service performed by marine societies" (Gleason 1991, p. 12). On the other hand, the "[p]reparation of charts was beyond the capacity of marine societies", but private publishers such as Edmund M. Blunt filled that gap (Gleason 1991, p. 12). Such societies generally pursued any action that was seen to benefit the maritime community. They offered their expertise regarding the quality of nautical charts and instruments, and they often agitated for the introduction of new lighthouses or other navigational aids. Sometimes they even performed the

construction themselves. “In 1791, the Salem Marine Society undertook an ambitious project, the building of a beacon on Baker’s Island by private subscription” (Gleason 1991, p. 12). This was done despite the federal assumption of control over all navigational aids, because the members were frustrated by the U. S. government’s reluctance to act. In addition, such societies often provided mutual insurance for its members. Widows, orphans, the sick, and the elderly would be eligible for relief payments derived from the fees and fines paid by the other members.

Finally, no discussion of maritime information would be complete without at least mentioning the work of Matthew F. Maury. Without his initiative---and the assistance of hundreds of merchant shipmasters---the study of oceanography would not be nearly so advanced as it is. In 1842, Maury, then a lieutenant in the U. S. Navy, was put in charge of the Navy’s Depot of Charts and Instruments (Bowditch [1802] 1966, p. 31). This office was charged with maintaining a stock of those items and issuing them to naval officers as they left on cruises. Soon, however, Maury took it upon himself to greatly expand his range of activities. He offered shipmasters blank logbooks for “free”. He only asked that they send him the completed books, or copies thereof, when their voyages were ended. He would then compile the data and make it available to all interested parties.

Logbooks were an ancient part of seafaring, but prior to Maury’s efforts, they were often jealously guarded as proprietary information to be shared only with one’s friends and colleagues. The kind of information contained in logbooks was crucial, particularly during the age of sail. Shipmasters recorded, day by day, such data as wind direction and

strength, weather patterns, ocean currents, the ship's course and distance traveled, other ships encountered, air temperature, water temperature, and the location of uncharted landmasses, in addition to notable incidents on board the vessel, such as deaths or illnesses. The collected and disseminated data on winds and currents, in particular, made possible much faster passages by commercial sailing ships. Maury "dispelled the myths of navigation and showed shipmasters the way to save time and money" (McKay [1928] 1969, p. 116).

It must not be forgotten, however, that Maury's success would never have been possible without the voluntary cooperation of a great number of private shipmasters. Also, it is often assumed that Maury was alone in his endeavors. He certainly deserves credit for bringing attention to the possibilities and for showing the way, but "daily newspapers also contributed in the general 'Marine Awakening', for they, too, furnished shipmasters with blank logs to fill in, and published them when returned" (McKay [1928] 1969, p. 116). Nor was this data collection process unique to Americans. British shipmaster C. C. Dixon, reflecting on his seagoing experiences late in the nineteenth century, notes proudly that for "eighteen years I kept a four-hourly meteorological log for the British Meteorological Office" (McCulloch 1933, pp. 8-9).

Ship Registers and Shipping Intelligence

One category of maritime information whose importance ranked right along with navigational instructions was that regarding ships' characteristics, quality, and movements. In other words, the data found in ship registers and shipping reports. Here the world's innovator was Lloyd's of London, the renowned firm of insurance

underwriters. Lloyd's, which began in a coffee house in 1688, has been called "the most important and practical Corporation in the world" (Worsley and Griffith 1932, p. 13). Even if that declaration is a bit hyperbolic, Lloyd's surely was and is the best known underwriter of marine insurance. But why should such a firm collect and publish huge quantities of marine information? It is well known that all maritime nations have long had custom house officials in their port cities who recorded the tonnage and ownership of vessels for taxing purposes. The custom house records for Philadelphia go back to 1725, for example. However, Lloyd's had a powerful incentive to gather, use, and distribute additional, more detailed data. In order to make a reasonable assessment of the risk faced by insuring a ship and its cargo, the underwriter needed to know something of the size and quality of the ship, the nature of its cargo, its owners, its master, and its intended destination.

To gather such data, Lloyd's established an extensive, world-wide network of "surveyors". In 1874, Lloyd's ship surveyors could be found in cities as widely dispersed as Shanghai; Venice; Hamburg; Calcutta; Nieuwe Diep, Holland; Bergen, Norway; and Hobart Town, Tasmania, as well as ninety-eight ports in the British Isles (*Lloyd's Register* 1874). The collected data on many thousands of vessels was then published annually as *Lloyd's Register*, a bound volume(s) that was considered a vital tool of the trade for merchants, shippers, shipowners, shipmasters, and above all, the underwriters at Lloyd's itself¹². A marine underwriter needed to be a "man with a great knowledge of

¹² *Lloyd's Register* was published first in 1746, sporadically until 1775, then has been published every year since 1775. The publication of this document was such a large undertaking that in 1834 it was set up as an independent branch of the overall operation of Lloyd's (Worsley and Griffith 1932, pp. 93-95).

ships who could read and understand *Lloyd's Register* as easily as he could read the *Daily Mail* and could tell exactly the kind of damage to which any particular cargo was subject” (Gibb 1972, pp. 178-79). To see what information such an underwriter had to draw on, one may take the example of the famous *Cutty Sark*, preserved today at Greenwich, England. The *Register* gives her official number (63557), her identifying signal code letters (JKWS), her rig (three-masted ship), her length, breadth, and depth, her tonnage (921 tons), her master (W.E. Tiptaft), her owner (John Willis of London), the fact that she is composite-built (iron frames with wood planking) and has two decks, the date and place of her most recent survey (London in November 1873), the date and place she was launched (Dumbarton, Scotland in November 1869), her builder (Scott), and her classification (16 years A1) (*Lloyd's Register* 1874). This last entry signifies that she has received the highest insurance rating given to wooden ships (A1) and that she is expected to retain that rating for sixteen years. Beginning in the 1860s, *Lloyd's Register* also produced an annual of *American and Foreign Shipping* for the benefit of American shipping interests. Registers emulating that of Lloyd's were published in the United States by the New York Marine Underwriters beginning in 1857 and by the American Shipmasters' Association beginning in 1867. French and other European ships, not already surveyed by Lloyd's, were recorded by the Bureau Veritas beginning in 1828.

In addition to the documentation found in *Lloyd's Register*, Lloyd's underwriters could track the movements and experiences of ships by means of a proprietary global communications system. This involved agents, some 1500 of them by the early 1930s, found in all the important ports of the world. Their job was to “examine and report on any

ships or cargoes that may have suffered damage for the purpose of enabling the Underwriters to ascertain the amount of the loss” (Worsley and Griffith 1932, p. 16). Of almost equal importance were Lloyd’s signal stations around the world, which “speak and report all passing ships” (Worsley and Griffith 1932, p. 16). These depended on flags, semaphore, and signal lamps in the days of sail, which might seem primitive and ineffective today, but their utility was demonstrated on many occasions. Perhaps the most famous example of the effectiveness of Lloyd’s communication system occurred in 1740 during the War of Jenkins’ Ear. In that year Lloyd’s reported to the Prime Minister that Admiral Vernon had been victorious at Portobello even before the British Navy could inform the government (Worsley and Griffith 1932, p. 160; Gibb 1972, p. 35). In short, Lloyd’s has long kept in touch with maritime events around the world. Moreover, since 1738 the firm has shared that shipping intelligence with the public by publishing the daily newspaper known as *Lloyd’s List*, “the most complete record in the world of ships’ movements” (Gibb 1972, p. 116).

The abovementioned publications have also produced an unintended benefit that Lloyd’s probably never even considered. For several generations, maritime historians have depended on *Lloyd’s Register* as a foundation for their research. And *Lloyd’s List* led to the cataloging of Lloyd’s Voyage Record Cards, housed in the Guildhall Library in London, which are a unique means of tracking marine events.

Pilots and Piloting

The profession of piloting is very old, dating back to the origins of oceanic travel (American Pilots’ Association 1979, pp. 1-5). Most fundamentally, a pilot must be one

with extensive knowledge of a particular harbor and its environs, because his task is to guide commercial vessels safely into and out of the port. He must know the depth of the channel at every point, the strength of currents, the prevailing winds, and the locations of all aids to navigation. It is thus not surprising that the first pilots were usually local fishermen who knew the waters well and wanted to supplement their normal income (Rees 1939, p. 13). The earliest recorded piloting activities in the United States date from 1633 for Boston and 1634 for Chesapeake Bay (American Pilots' Association 1979, pp. 6-7). Until quite recent times, piloting was an arduous and dangerous occupation. In order to generate an income, pilots had to patrol the waters outside a harbor, ready to assist any vessel. This meant that they must stay at sea for long periods in all sorts of weather. Moreover, to guide a vessel the pilot had to be on board her. The transfer of the pilot from the small pilot boat to a large merchant ship---whether sail or steam---was often very hazardous. During bad weather, for example, the pilots of Liverpool, England tied a rope around themselves, under the armpits, leaped into the sea from the deck of their pilot boat, and were pulled aboard the waiting ship by means of the rope (Rees 1939, p. 126).

Pilots were private suppliers who faced intense competition. "Competition was keen and each pilot schooner tried to get as much business as possible" (Knopp 1996, p. 67). "These boats raced as far as several hundred miles out from the coast to meet incoming ships, it being agreed among the pilots at that time that the first pilot to board an incoming ship served as her pilot for both the incoming and outbound trip" (Knopp 1996, p. 6). A similar situation existed among British pilots, with "the most enterprising and venturesome securing the greater part of the work....each [pilot] boat acting

independently of the others for its own gain” (Rees 1939, p. 17)¹³. Market pressure not only drove pilots to outperform their rivals, it also constituted one of the reasons why shipmasters were usually eager to employ a pilot. The underwriters of marine insurance were often reluctant to insure vessels that did without a pilot altogether, or used a pilot whom the underwriters did not consider competent (Russell 1929, pp. 61-62).

One might think that pilots would be content with just doing their allotted job, considering that it was a challenging task and a service vital to maritime safety and efficiency. But most of them were not content to do only that. Many willingly took it upon themselves to provide services that, in the United States today, people would expect of the U. S. Coast Guard. For example:

The Sandy Hook pilots became popularly known as the “coast police” through their efficient work in rescuing the crews of small craft and scows that had drifted out to sea. Just how many lives were saved in this way by the sturdy harbor mariners must be guessed at, for no complete record has ever been kept of the rescues. The items gathered and at hand are so numerous, however, that it would require many pages to chronicle them all. (Allen 1922, p. 72)

And this public service was restricted neither to just the New York pilots, nor just to small boats and their occupants. During the 1890s, the Philadelphia pilot boat *J. H. Edmunds* encountered a Norwegian brig in distress off Cape Henlopen. The Norwegian crew had been decimated by yellow fever and were short of provisions. The men of the *J. H. Edmunds* “at the risk of their lives, boarded the plague-stricken vessel, supplied her with plenty of provisions, and set her off on a correct course for her destination” (Knopp

¹³ Competition generally declined, and both collusion and government regulation increased, in the period 1890-1910 (see Russell 1929, pp. 378-82). Today, most pilot organizations operate more or less as regulated guilds. In some nations, pilots are even government employees.

1996, p. 48). Boston pilot George Lawler rescued the crew of the schooner *William D. Cargill* in 1884 and that of the schooner *Hattie L. Curtis* in 1888 (Eastman 1956, p. 49).

In 1857, the Liverpool, England pilot boat *Pioneer* discovered a schooner that was leaking badly. She first tried to tow the schooner to safety, but the connecting hawser parted under the pressure. At that point the *Pioneer* was brought alongside, and the men of the pilot boat were able to rescue the schooner's crew just before the schooner capsized (Rees 1939, p. 156). Another Liverpool boat, the *Pride of Liverpool*, was renowned for saving a dozen vessels at the same time in 1866. There was a howling gale blowing such that the pilot boat herself was in danger, and it was impossible for the pilot to board any of the ships. Strictly speaking, the pilot had met his obligation, and could have simply returned to port, leaving the incoming ships to their fate. But the men of the pilot boat were determined to do more. They signaled to the assembled group to follow their boat closely, and the *Pride of Liverpool* safely led those twelve ships over the Mersey bar and into Liverpool, thereby saving half a million pounds-sterling worth of property and scores of lives (Rees 1939, pp. 154-55). The American pilot boat *Walter Adams* came to the rescue twice in 1897 (Allen 1922, p. 31). In January of the year she saved the passengers and crew of the British steamship *Alvena* after that large vessel ran aground off Sandy Hook. Then, on Thanksgiving Day she saved from drowning the 150 passengers on board the steamboat *John E. Moore*, which had wrecked in a dense fog and was sinking. The most amazing of all the rescues by pilot boats occurred in 1886, when the *Phantom* saved all of the 700 passengers and crew of the sinking Cunard liner *Oregon*. "Every inch of deck room on the little pilot boat was jammed full with

disheartened passengers and crew of the ill-fated *Oregon*” (Allen 1922, p. 35).

Pilots seem to have made a habit of providing these sorts of public services without hesitation---and without any expectation of compensation. In fact, most did not even want their exploits to be publicized. Once the New York *Herald* told its readers of some rescue effected by pilot Joseph Nelson, who had earlier participated in saving those aboard the *Oregon* mentioned above. But Nelson objected in the strongest terms, begging the newspaper never to do it again. “Spotlight performance is against revered tradition and fringed about with too much ridicule” appears to be an accurate portrayal of the typical pilot’s attitude (Russell 1929, p. 154).

Customary Practices at Sea

In addition to the facets of maritime life explored above, there were a number of customary practices which every shipmaster took for granted during the days of sail. Some of them are especially noteworthy and those will be reviewed in what follows. The lesson to be culled from all these examples, as from those already discussed, is that governmentally-provided goods and services are not a necessary condition for either peaceful social interaction or effective commerce. As was true on other frontiers, seafarers solved their own problems.

One of the memorable events at sea was to encounter another vessel. However, on occasion a ship might travel 10,000 miles or more and never see any sign of human activity. Without radio or radar, sailing ships could easily travel the same route between the same two ports and still never sight one another. Therefore, when they did pass within visual range it was a significant event. Of course, if the weather was bad, it might be too

dangerous to “heave to”¹⁴ and talk, so they might communicate only via signal flags, if at all. Anytime two ships met and at least exchanged the names of the ships and those of the shipmasters, this was known as “speaking” a vessel. Often the shipmasters would check with each other to confirm their navigational position. This was critical in cases where, say, one ship’s chronometer was malfunctioning due perhaps to damage. Such a vessel would not know its longitude with any precision unless it received the information from the other. From that point she could rely on dead reckoning until, with luck, she encountered another ship. To speak another ship at sea also meant that, when each reached its destination, the shipmaster would report the meeting, giving the date, the name of the other ship and the latitude and longitude of the meeting. Such information was published by both the local newspapers (many newspapers had extensive sections of marine news in those days) and by Lloyd’s of London in *Lloyd’s List*. If a ship was long overdue, and she had not been reported by any other ship, Lloyd’s was likely to consider her “missing”. The spontaneously-developed process of ships speaking one another provided, in short, a global tracking system that was a boon to the entire maritime community--underwriters, owners, builders, and merchants, as well as the families and friends of shipmasters and seamen.

Maritime histories and the memoirs of retired shipmasters are replete with references to speaking ships at sea. For instance, British shipmaster William A. Nelson, while commanding the bark *Rising Star* in 1890-91, spoke the *Coriolanus*, *Maraval*, *Alice*

¹⁴ This was a procedure where some of a ship’s sails were set to drive her forward and others were set so as to drive her backward. The net effect was to keep her in one position. This was also the usual method of picking up a pilot.

Platt, Drumeltan, Drumlarig, Rottingham, Garsdale, Agnes Oswald, and Lismore on one round trip to Chile (Falkus 1982, p. 81). The same man was in command of the four-masted bark *Auchencairn* in 1897 on a passage from San Francisco to Queenstown. During that passage the *Auchencairn* spoke the *Rockhurst, Euterpe, Marie, Socotra, Perseverance, Glenfinart, Criffel, Doisan Hill, Norman McCleod, and Drumpark* (Falkus 1982, p. 100). During the winter of 1855-56 on a passage from Melbourne to Liverpool, the American-built, but British-owned, clipper ship *Lightning* spoke the *Blackwall, Centurion, Emma, Henry Fulton, Fashion, and Breeze* (Lubbock [1924] 1975. pp. 337-38). The list of similar examples is virtually unlimited.

An exchange of information was by no means the only result of these encounters at sea. On occasion a vessel would have been so long on her passage that her crew would run low on certain vital supplies. Food was the most common problem. One must keep in mind that these ships very rarely had any kind of refrigeration¹⁵, and the canned and pickled meats which they relied on sometimes spoiled. Sometimes the specific problem was the onset of scurvy. In that case, the crew would be desperate for fresh fruit. It usually surprises landsmen, but a lack of fresh water was not too uncommon. There were no means by which fresh water could be condensed from salt water, and if the ship's water tanks sprang a leak, dying from thirst became a real possibility unless the ship was fortunate enough to pass through several rain showers. Of an importance almost equal to that of food and water was tobacco. For centuries sailors cherished tobacco, whether

¹⁵ The exceptions would be those few ships in the ice trade from Boston to India or the frozen meat trade between New Zealand and Britain.

smoked or chewed, and considered its absence to be a severe hardship. Therefore, sometimes there was a plea to be supplied with tobacco.

The point is that deep-water encounters between ships often brought about a transfer of such badly needed supplies. For example, in 1846 Captain Jotham Blaisdell of Maine, in command of the bark *Abbot Lord*, gave food to the ship *Monmouth* while near the Bahamas (Daggett 1988, p. 40). The *Monmouth* had already taken 84 days to reach that point from Liverpool, a distance that many vessels would have covered in a month or less. In 1878 the crew of the American brig *R. M. Heslin* gratefully received both food and tobacco from two vessels they “spoke”, one Dutch and the other Nova Scotian (Kittredge [1935] 1971, p. 289). Walter Runciman recalled being a member of the crew of an unnamed British vessel in the mid-1860s which ran dreadfully low of food. After many days of privation, and being almost too weak to move about, they signaled the bark *Ariel*, which came to the rescue. Her master gave them “beef, pork, flour, biscuits, tea, coffee, sugar, and a few tins of preserves and tobacco...The extent of the joy that man put into our souls can never be fully expressed” (Runciman 1924, p. 154).

At times a ship would be in need of other forms of assistance. In 1872 the passenger sailing ship *Collingwood* was dismasted during a storm in the South Atlantic. Soon thereafter, two other British sailing ships, *Palmyra* and *Scawfell*, saw her in distress and hove-to to offer their help (Course 1961, pp. 50-51). In 1870 the three-masted American schooner *Lucy Gibson* foundered in the North Atlantic, “but before she sank all hands but one were taken off by the Dutch brig *Engelina*, and carried to Falmouth, England” (Kittredge [1935] 1971, p. 35). The American clipper ship *Flying Mist* was off the coast

of Chile in 1857 when her master sighted a yacht sinking. The yacht could not be saved, but all its passengers were rescued (Kittredge [1935] 1971, p. 201). Nor were men in small boats excluded from this benevolent tradition of the sea. Two fishermen from the schooner *Solomon Poole* were lost and adrift in their dory off Newfoundland in July of 1882. After eight days of suffering, they were picked up by a brig on its way to Brazil. They were cared for and then returned to their homeport of Gloucester, Massachusetts in September (Garland 1983, p. 79).

Some shipmasters were renowned for their voluntary lifesaving and salvage actions. Captain John Collins of Truro, Massachusetts, for instance, was “always ready to heave to and assist vessels in distress” (Kittredge [1935] 1971, p. 129). Indeed, during his career Captain Collins received numerous medals and commendations for his rescue efforts, which included the vessels *Scotia*, *Erin go Bragh*, and *Garnet* (Kittredge [1935] 1971, pp. 129-30).

One additional service that shipmasters periodically performed for one another was the transportation of letter mail. After meeting at sea, one of the vessels might be destined for the homeport---or at least a port nearby the homeport---of the master of the other. Since shipmasters were often absent from home for up to a year at a time, this afforded them the opportunity to communicate relatively quickly with their families. In 1885 the three-masted schooner *City of Baltimore* spoke the ship *E. B. Sutton* off the coast of South America. The master of the former agreed to mail a letter for the master of the latter, later noting that “the captain wrote a letter to his family, sent it on board of me, and I mailed it from Rio Grande de Sol. I suppose he was well around the [Cape] Horn before

the letter reached his family” (Burgess 1967, p. 159). In 1899 the same man did a similar favor for both the master and the mate of the schooner *Bianca* by mailing their letters when he arrived in New York (Burgess 1967, p. 368).

Before electronic communication, signal flags were the primary method by which either ship-to-ship or ship-to-shore messages were sent. The earliest developments were made by public navies, but those were not very applicable to the usual activities of merchant shipping. In Britain, certain distinctive flags were adopted by various chartered companies which had quasi-official status, such as the Royal Africa Company and the East India Company (Wilson [1986] 1999, pp. 36-37). However, at the beginning of the nineteenth century “there was no generally understood flag ‘language’ by which ordinary merchant ships could signal to one another, except for certain conventions such as the hoisting of the ensign upside-down as a signal of distress” (Wilson [1986] 1999, pp. 82-83).

This problem was solved in 1817 when Frederick Marryat published the first edition of his book *Code of Signals for the Merchant Service*. Marryat’s was a numeric system that made it possible both to communicate whole sentences and to identify each individual merchant ship in the world via its unique assigned number. The *Code of Signals* was an enormous success, “going through no less than nineteen editions between 1817 and 1879 (not including foreign language editions)...The preface to [the] twelfth edition claimed, accurately enough, that ‘an European vessel is rarely met unprovided with these signals’” (Wilson [1986] 1999, p. 84). Even though replaced officially in 1857 by the *Commercial Code of Signals* via an act of the British Board of Trade, some

shipmasters were still using the Marryat system as late as 1890.

Finally, one might wonder if those in maritime occupations provided for the future of their industry. That is, did they themselves offer training and education for the young? Or did they rely on government to fill the gap? As with so many other aspects of the maritime world, they did it themselves, at least until swept aside by the growth of the modern welfare state. The associations of harbor pilots all had extensive training programs for apprentice pilots (American Pilots' Association 1979, pp. 15-19). And a number of shipmasters routinely took boys on board ship as apprentices who were, during the course of the voyage, trained in mathematics, navigation, seamanship, coastal piloting, and occasionally even languages such as Latin or French. Typical of these was Captain Edward Meacom, master of the American ship *Brutus* in 1856. He took several boys on each voyage and had very definite ideas about the importance of such training. "The time given to these boys...will be repaid in the knowledge that they will be fitted for their profession. These boys in time will become officers and rise to the command of our ships, and in case of trouble with foreign nations, our ships will become the nurseries of seamen for our navy" (Whidden 1910, p. 139).

Captain Heslop of the British brig *Northumberland* also enjoyed conveying knowledge to the boys on board his vessel. One of those boys, later recalling his experiences, said that Captain Heslop "frequently came to the fore-castle deck when he saw me at work, and it seemed to please him when he could make clear that which was puzzling me, but easy to him" (Runciman 1924, p. 143). Famed Boston shipmaster and shipowner Robert B. Forbes was very active in promoting nautical training, declaring that

“I have expended much time and ink in trying to establish nautical schools” (Forbes [1882] 1970, p. 256).

Probably the most famous of all private nautical training programs was that begun by the British shipowning firm of Devitt & Moore in 1890 (Course 1961, pp. 126-31). The firm owned several sailing ships that were specially fitted for accommodating large numbers of “cadets”. For a fee that ranged from 30 to 70 pounds-sterling per voyage (depending on the boy’s level of experience), parents could be assured that their son would be well cared for and well trained in all nautical matters during his time on board. A boy who went through the Devitt & Moore program would be highly prized as a junior officer in the merchant marine. Unfortunately, the last of Devitt & Moore’s sail training ships, the *Medway*, was taken by the British government in 1918 (Course 1961, p. 191). However, the firm transferred their training operations to their land-based Nautical College at Pangbourne near the River Thames (Course 1961, pp. 193-214). The Nautical College was still in operation in the 1960s.

Conclusion

The maritime world during the days of sail was not unlike other frontiers. As long as individuals bore the full costs of their actions, they tended freely to take responsibility for their lives. And thus those in the private sector provided the goods and services that were needed. Governmentally-provided goods and services were usually superfluous or redundant, if not burdensome. Of course, over the past century, roughly speaking, there have been both amazing technological advances and huge increases in government involvement in daily life, both on land and on the sea. One should not be deceived into

thinking that the former have necessitated the latter. It is not the fact that the sea was a frontier which, per se, led to the superfluity of government involvement. It is the fact that on such a frontier individuals were generally unable to socialize the costs of their actions. Both benefits and costs accrued to those who acted. The government provision of goods and services largely constitutes a convenient method by which some individuals can retain the benefits while shifting many of the costs to others.

References

Allen, Edward L. 1922. *Pilot Lore: From Sail to Steam*. New York: United New York and New Jersey Sandy Hook Pilots Benevolent Associations.

American Pilots' Association. 1979. *State Pilotage in America: Historical Outline with European Background*. Washington, D.C.: American Pilots' Association.

Anderson, Gary M. and Adam Gifford, Jr. 1991. Privateering and the private production of naval power. *Cato Journal* 11:1, Spring/Summer, 99-122.

Anderson, Terry L. and P. J. Hill. 1979. An American experiment in anarcho-capitalism: The *not so wild, wild west*. *Journal of Libertarian Studies* 3:1, 9-29.

Arnold, Roger A. 2004. *Economics*. Mason, OH: South-Western.

Ayers, Ronald M. and Robert A. Collinge. *Economics: Explore and Apply*. Upper Saddle River, NJ: Prentice Hall.

Bathurst, Bella. 1999. *The Lighthouse Stevensons*. New York: HarperCollins.

Bator, Francis M. 1958. The anatomy of market failure. *Quarterly Journal of Economics* 72, August, 351-79.

Bauer, K. Jack. 1988. *A Maritime History of the United States: The Role of America's Seas and Waterways*. Columbia, SC: University of South Carolina Press.

Benson, Bruce L. 1990. *The Enterprise of Law: Justice Without the State*. San Francisco: Pacific Research Institute for Public Policy.

Bowditch, Nathaniel. [1802] 1966. *American Practical Navigator*. Washington, D.C.: U.S. Government Printing Office.

Burgess, Robert H. (editor). 1967. *Coasting Captain*. Newport News, VA: Mariners Museum.

Coase, Ronald H. [1974] 1988. The lighthouse in economics. In *The Theory of Market Failure*, pp. 255-77. Ed. Tyler Cowen. Fairfax, VA: George Mason University Press. Reprinted from *Journal of Law and Economics* 17 (October 1974), 357-76.

Coggeshall, George. [1858] 1970. *Thirty-Six Voyages to Various Parts of the World*. New York: Library Editions.

- Connett, Eugene V. (editor). 1948. *Yachting in North America*. New York: D. Van Nostrand.
- Course, Alfred G. 1961. *Painted Ports: The Story of the Ships of Devitt & Moore*. London: Hollis and Carter.
- Cranwell, John P. and William B. Crane. 1940. *Men of Marque: A History of Private Armed Vessels out of Baltimore During the War of 1812*. New York: W. W. Norton.
- Daggett, Kendrick P. 1988. *Fifty Years of Fortitude: The Maritime Career of Captain Jotham Blaisdell of Kennebunk, Maine, 1810-1860*. Mystic, CT: Mystic Seaport Museum.
- Eastman, Ralph M. 1956. *Pilots and Pilot Boats of Boston Harbor*. Boston: State Street Trust Company.
- Falkus, Hugh. 1982. *Master of Cape Horn: The Story of a Square-rigger Captain and His World*. London: Victor Gollancz.
- Footner, Geoffrey M. 1998. *Tidewater Triumph: The Development and Worldwide Success of the Chesapeake Bay Pilot Schooner*. Centreville, MD: Tidewater Publishers.
- Forbes, Robert B. [1882] 1970. *Personal Reminiscences*. New York: Library Editions.
- Garitee, Jerome R. 1977. *The Republic's Private Navy: The American Privateering Business as Practiced by Baltimore During the War of 1812*. Middletown, CT: Wesleyan University Press.
- Garland, Joseph E. 1983. *Down to the Sea: The Fishing Schooners of Gloucester*. Boston: David R. Godine.
- Gibb, D. E. W. 1972. *Lloyd's of London: A Study in Individualism*. London: Lloyd's.
- Gleason, Sarah C. 1991. *Kindly Lights: A History of the Lighthouses of Southern New England*. Boston: Beacon Press.
- Holcombe, Randall G. 1997. A theory of the theory of public goods. *Review of Austrian Economics* 10:1, 1-22.
- Holland, F. Ross. 1995. *Lighthouses*. New York: MetroBooks.
- Hoppe, Hans-Hermann. 1998/1999. The private production of defense. *Journal of Libertarian Studies* 14, Winter, 27-52.

- Howe, Octavius T. 1922. *Beverly Privateers in the American Revolution*. Cambridge, MA: John Wilson and Son.
- Kert, Faye M. 1997. *Prize and Prejudice: Privateering and Naval Prize in Atlantic Canada in the War of 1812*. St. John's, Newfoundland: International Maritime Economic History Association.
- Kittredge, Henry C. [1935] 1971. *Shipmasters of Cape Cod*. Hamden, CT: Archon Books.
- Knopp, Andrew. 1996. *One Hundred Year History of the Pilots' Association Bay and River Delaware, 1896-1996*. Wilmington, DE: Delaware Heritage Press.
- Lloyd's Register of British and Foreign Shipping*. 1874. London. Arranged alphabetically, no pagination.
- Lord Russell of Liverpool. 1970. *The French Corsairs*. London: Robert Hale.
- Lubbock, Basil. [1924] 1975. *The Colonial Clippers*. Glasgow: Brown, Son and Ferguson.
- Lydon, James G. 1970. *Pirates, Privateers, and Profits*. Upper Saddle River, NJ: Gregg Press.
- Macintyre, Donald. 1975. *The Privateers*. London: Paul Elek.
- Maclay, Edgar S. 1899. *A History of American Privateers*. New York: D. Appleton.
- McFee, William. 1950. *The Law of the Sea*. Philadelphia: J. B. Lippincott.
- McCulloch, John H. 1933. *A Million Miles in Sail*. New York: Dodd, Mead and Company.
- McKay, Richard C. [1928] 1969. *Some Famous Sailing Ships and Their Builder Donald McKay*. Riverside, CT: 7 C's Press.
- Menger, Carl. [1871] 1976. *Principles of Economics*. James Dingwall and Bert F. Hoselitz, trans. New York: New York University Press.
- Morison, Samuel E. 1921. *The Maritime History of Massachusetts, 1783-1860*. Boston: Houghton Mifflin.
- Musgrave, Richard A. 1959. *The Theory of Public Finance*. New York: McGraw-Hill.

- Petrie, Donald A. 1999. *The Prize Game: Lawful Looting on the High Seas in the Days Of Fighting Sail*. Annapolis, MD: Naval Institute Press.
- Rees, John S. 1939. *History of the Liverpool Pilotage Service*. Southport, England: Southport Guardian.
- Rothbard, Murray N. [1962] 1970. *Man, Economy, and State*. Los Angeles: Nash Publishing.
- Runciman, Walter. 1924. *Before the Mast---and After: The Autobiography of a Sailor and Shipowner*. London: Ernest Benn.
- Russell, Charles E. 1929. *From Sandy Hook to 62°: Being Some Account of the Adventures, Exploits, and Services of the Old New York Pilot-Boat*. New York: Century Company.
- Samuelson, Paul A. 1954. The pure theory of public expenditure. *Review of Economics and Statistics* 36, November, 387-89.
- _____. 1955. A diagrammatic exposition of a theory of public expenditure. *Review of Economics and Statistics* 37, November, 350-56.
- Sechrest, Larry J. 2003. Privateering and national defense: Naval warfare for private profit. In *The Myth of National Defense*, pp. 239-74. Ed. Hans-Hermann Hoppe. Auburn, AL: Ludwig von Mises Institute.
- Sobel, Dava. 1995. *Longitude: The True Story of a Lone Genius Who Solved the Greatest Scientific Problem of His Time*. New York: Walker and Company.
- Stivers, Reuben E. 1975. *Privateers and Volunteers: The Men and Women of Our Reserve Naval Forces, 1766 to 1866*. Annapolis, MD: Naval Institute Press.
- Starkey, David J. 1990. *British Privateering Enterprise in the Eighteenth Century*. Exeter, England: University of Exeter Press.
- Stevenson, D. Alan. 1959. *The World's Lighthouses Before 1820*. London: Oxford University Press.
- Swanson, Carl E. 1991. *Predators and Prizes: American Privateering and Imperial Warfare, 1739-1748*. Columbia, SC: University of South Carolina Press.
- Tiebout, Charles M. 1956. A pure theory of local expenditures. *Journal of Political Economy* 64, October, 416-24.

Whidden, John D. 1910. *Ocean Life in the Old Sailing Ship Days*. Boston: Little, Brown, and Company.

Williams, Gomer. [1897] 1966. *History of the Liverpool Privateers and Letters of Marque*. New York: Augustus M. Kelley.

Willis, James. 2002. *Explorations in Microeconomics*. Redding, CA: North West Publishing.

Wilson, Timothy. [1986] 1999. *Flags at Sea*. Annapolis, MD: Naval Institute Press.

Winslow, Richard E., III. 1988. "*Wealth and Honour*" : *Portsmouth During the Golden Age of Privateering, 1775-1815*. Portsmouth, NH: Portsmouth Marine Society.

Worsley, Frank and Glyn Griffith. 1932. *The Romance of Lloyd's: From Coffee-House to Palace*. New York: Hillman-Curl.