

Abstract

Waterways of Innovation: The Marine Technological Advancements of America's Prohibition Era

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Prohibition opened the door to the United States for individuals or groups to smuggle alcohol by waterways. These people came from all walks of life and were known as rumrunners. The United States Coast Guard was charged with upholding the law and preventing any alcohol from reaching the American shore. This brought the two groups into constant conflict with each other. Each side continually modified their technology in accordance to their needs and associated economic factors in efforts to gain the upper hand. These maritime innovations caused an escalation in innovations between the two opposing forces, resulting in a rapid advancement of maritime technology that would not likely have been attained during normal times of trade. Designers and builders implemented the most successful of these innovations into later vessels.

WATERWAYS OF INNOVATION: THE MARINE TECHNOLOGICAL ADVANCEMENTS
OF AMERICA'S PROHIBITION ERA

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by

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CHAPTER ONE: INTRODUCTION

Prohibition of alcohol during the 1920s and the early part of the 1930s in the United States essentially placed the country at war with itself. Major governmental efforts were made from the coast of California all the way to the Great Lakes to stop the sale and manufacture of liquor in America (Ensign 1997:1). The majority of these efforts ended peacefully while some ended in direct conflict and bloodshed. However, with a constant demand for liquor and the opportunity for profit, many individuals grew wealthy from delivering alcohol to clandestine markets within the United States through various methods (Garling 1992:103). With a developing mainland police that was concentrating its efforts on reducing the manufacture and transportation of liquor within America, many took to importing spirits from other countries via the water. These individuals, or rumrunners, were in constant opposition with the organization tasked with stopping them: the United States Coast Guard (Willoughby 1964:19). This conflict, known as the Rum War, spanned over a decade and resulted in a multitude of innovations in marine technology on both sides, with the rumrunners augmenting their watercraft to be more effective at eluding the Coast Guard while the latter organization struggled to increase the capabilities of their vessels in order to prevent liquor from reaching the mainland. The designers and engineers of watercraft types and associated technologies of all kinds, from vessels of war to everyday pleasure craft, eventually adopted the more effective innovations that were developed during this conflict. This thesis, therefore, seeks to ask: was marine innovation spurred by conflict and economic factors during the period of Prohibition in the United States?

The Prohibition Era in the United States allows research regarding this subject to take place within a microcosm that has very few factors outside of the geographical location of North America affecting the outcome of developing maritime technology. Both sides of this conflict

began with very little in terms of equipment for carrying out their objectives; the rumrunners initially used whatever they had at hand while the Coast Guard was outfitted with craft that were large, steady, slow, and designed for saving lives, not for speed and maneuverability. As Prohibition wore on, financial limits were tossed aside on both sides, creating an arms race that resulted in technological innovation (Ensign 1997:8-13).

Theory

Theories involving conflict and change are ideal for a study of the Prohibition Era in the United States. During this time America seemed to be in a constant state of internal conflict because of economic despair in the form of a recession, high unemployment numbers, and the constant protest against terrible working conditions (Morrison 2008:4). The American people did what they needed to survive even if that meant breaking laws at the local or federal level. These actions can be defined both as physical and ideological conflicts as many, including the rumrunners, exploited a capitalist system that had fallen on hard times in order to further their own means (Thornton 2007:73-77).

One of the major theoretical viewpoints involving conflict comes from Marxism. Named for one of its founding developers, Karl Marx, Marxism focuses on class struggle. That class struggle “for Marx... will always be antagonism and conflict between these three elements: the forces of production, the state of society, and consciousness, can and must come into contradiction with one another...until they bring the whole structure crashing down, and a new social formation will rise on its ruins” (Johnson 2010:96). Since the inception of Marxist thought there have been many different schools striving to propel or build upon ideas within Marxist theory.

The Frankfurt School of Critical Theory that came about in the early 1900s is one such example of ideas based upon Marxist thought. Theorists within the realm of Critical Theory studied media and ways to break down ideology behind various societies' methods of domination over their own citizens. Critical theorists decided that one of the ways to go about building their theory was to use Georg Hegel's model of the dialectic (McGuire 2002:37). The dialectic within Critical Theory is defined as

Georg Hegel's philosophy of change through the resolution of opposites. In this the central tendency or thesis is opposed by its opposite or antithesis. When the tensions are resolved as a synthesis this in turn becomes the thesis(,) which generates a new antithesis and so on. Thus dialectics provides an interpretation of change(,) which emphasizes the clash of opposing influences or groups as the motor of social transformation (Darvill 2002:121).

This concept of the dialectic can be difficult to grasp due to preconceived notions ingrained in most societies that change and progress are linear and develop over time from groups with similar goals (McGuire 2002:91). However, this theory ties in perfectly when used to research the development of ships' innovations and technical changes during America's Era of Prohibition. This is because "the dialectic also offers us a method of studying change. It is a method that finds the dynamics of change in the contradictions that exist in all human relations, with each other, and with the natural world" (McGuire 2002:15).

With this theory several factions represent the contradictions of various influences. The most obvious is the conflict between the United States Coast Guard and the rumrunners. Of lesser notice at first glance was the conflict between the rumrunners themselves. Trade of any valuable commodity creates market demand, especially materials labeled as contraband. Supply and demand can lead to competition between rivals that can result in technological innovation (Thornton 2007:82-83). An example of this is the technical developments made by shipyards to compete in terms of speed to deliver their product before the market became saturated during the

opium and slave trades of the mid-nineteenth century (Layton 1997:40-51, 109-110). Prohibition also provides examples of the notion of evolving competing technologies being resolved into synthesis. Many of the rum-running vessels that were captured by the Coast Guard were later used as coastal patrol vessels against those that participated in the illicit trade (Willoughby 1964:147-148). Also, the technical knowledge gleaned from captured vessels helped to improve those of the Coast Guard.

The ideas and notions brought forth by Critical Theory and Hegel's dialectic were conceived to discuss issues of major social change and therefore seem to have no initial place when discussing the developments of ships and their technology. This belief instead supports the development of ship based technology when examined with the knowledge that watercraft of all kinds are deeply ingrained within multiple segments of societies. Maritime archaeologist Jonathan Adams has rationalized that "As both vehicles and machines, ships represented an enormous investment in resources. Shipbuilding has, therefore, been a complex social activity involving organization, co-operation and investment in the long term. Through the economic, social, and political mechanisms of which they were part, ships have thus deeply pervaded society" (Adams 2001:300). Adams then goes on to say that when "one goes beyond functional and system analyses we might add 'the ship as symbol,' as ideology afloat and the expression of social ideas, including those of the tradition within which the craft is constructed...(and) can be viewed as a manifestation of the maritime needs and aspirations of (the) society (that created it)" (Adams 2001:300). Thus, it could be argued that by examining the technology and purpose of a ship that cultural insight could be gathered on the society that produced it. By studying the various innovations adopted by the watercraft used during America's Prohibition Era, it is

possible to understand what the needs and aspirations were of the individuals or groups that created them and the means by which they were used.

Economics also plays a part in technological developments during periods of prohibition. However, “little progress has been made toward a theoretical understanding of prohibition” (Thornton 2007:71). This does not mean that other theories cannot be utilized to an understanding of the economics of prohibition. For purposes of simplicity, this thesis will view the United States’ free market economy in terms of the market-process approach that:

...begins with the truism that human action is purposeful and aimed at enhancing individual utility amid uncertainty and imperfect knowledge. Economic development occurs through exchange, learning, entrepreneurship, innovation, and the evolution of institutions (Thornton 2007:77).

All of this directs the products within the economy towards the concepts of price equilibrium. It also addresses the search for profit, which “results in a competition based not only on price but also on alterations of the product and the development of new products” (Thornton 2007:77-78). This market competition fits in with the aforementioned dialectic in that technology and methods will develop over a period of time through the conflict by entrepreneurs to increase profits. Those developments could be in the product themselves, such as making them last longer or increasing methods of efficiency, to better methods in meeting supply and demand through improvements in delivery technologies (Thornton 2007:77-78).

The concepts of prohibition go against the standards of a free market. Still, the market-process approach can help describe its effects on an economy or technological developments by focusing on the differences in the processes of each. Prohibition is more than simple government interventionism, which is “a form of governmental control or direction of resources that were private property” (Thornton 2007:79). Interventionism often utilizes “prohibition (which) establishes bureaucracy not to intervene in the market but to replace it” (Thornton 2007:80). The

developments of new technologies from various concepts such as the market-process approach, which explains these developments are due to competition for profits, does not exist in the bureaucratic model of prohibition that is dictated by laws and rules void of the need for profits:

Businesses are spurred on to implement new production methods, cost-cutting techniques, product enhancements, and new services in order to avoid losses and achieve profits. The discovery process is made easier because the market consists of many entrepreneurs who develop innovations that are generally recognizable and readily copied. The bureaucrat has no such luxury. Bureaus are centrally directed and guided by rules: they have little access to outside sources... there is little scope for encouraging discovery by bureaucrats or for rewarding bureaucrats for discovery (Thornton 2007:81).

Bureaucratic direction is considered even less effective on developments when the bureaucrats themselves are in no way rewarded for success. There are even cases of successful bureaucrats being punished for effectiveness. Take, for example, the dismissal of two agents during Prohibition known as Moe Smith and Izzy Einstein:

The two of them had raided three thousand speakeasies and arrested 4,900 people. They had confiscated five million bottles of bootleg liquor and smashed hundreds of stills... In every household from coast to coast Izzy and Moe were living proof that prohibition agents could be honest and incorruptible. But to be famous for honesty might seem an empty accomplishment when it was rewarded by dismissal (Coffey 1975:176-177).

The activities of the bureaucracy enforcing Prohibition shows by its own actions that development and success under bureaucratic guidance is not encouraged while it introduces a shortage in the commodity increasing cost and demand.

Still, developments in technology do take place during times of prohibition. These changes are not due to the market itself, but to the intervention in the market. "The elimination or control of a particular economic activity produces profit opportunities that previously did not exist" (Thornton 2007:82). These opportunities are produced in direct opposition to the rules placed by those enacting prohibition. This conflict for profit often culminates in the following:

The profit opportunities created by prohibition will result in new methods of production, transportation, inventory, distribution, and marketing. The product, its quality, and attributes will experience tremendous change moving from a competitive market environment to one dominated by prohibition (Thornton 2007:82).

This was the case with the Prohibition Era within the United States. Whiskey stills and speakeasies became commonplace during Prohibition as well as developments in the efficiency of transportation of illegal alcohol both on land and via waterways.

Discussion Format

This thesis, in seeking to find if the Prohibition Era spurred marine innovation, will discuss the history of Prohibition in the United States and then look at a variety of related subjects regarding technology, not only the vessels used during this period. The subject of marine innovation during Prohibition has not been directly focused on before, making it best to first examine some of the more obvious developments that came about during this time. Doing so requires a scope of research broader than one that concentrates only on the vessels themselves. This is in keeping with the notion of providing a base framework for future studies into Prohibition marine innovations as they are “rediscovered” due to their naturally clandestine nature (see Chapter Six: Further Studies). In discussing these innovations the history behind the technology will also be explored as well as any individuals involved in their creation. This may show the importance of not just the developed technology by comparing it to what came before, but also the reasons why further exploration of the overall topic could lead to significant discoveries in the history of marine technology utilized today.

CHAPTER TWO: HISTORY OF PROHIBITION

On January 16, 1919 the 18th Amendment to the Constitution of the United States was ratified, ushering in and setting the stage for America's Age of Prohibition:

The Eighteenth Amendment to the Constitution of the United States
Section 1.

After one year from the ratification of this article the manufacture, sale or transportation of intoxicating liquors within, the importation thereof into, or the exportation thereof from the United States and all territory subject to the jurisdiction thereof for beverage purposes is hereby prohibited.

Section 2.

The Congress and the several States shall have concurrent power to enforce this article by appropriate legislation.

Section 3.

This article shall be inoperative unless it shall have been ratified as an amendment to the Constitution by the legislatures of the several States, as provided in the Constitution, within seven years from the date of the submission hereof to the States by the Congress.
(United States Constitution)

After nearly a century and a half as an independent and free nation, suddenly the land of the free had elected to restrict a freedom that had characterized it. In fact, drinking had become a way of life amongst Americans. Captain Frederick Marryat was of the opinion that:

I am sure the Americans can fix nothing without a drink. If you meet, you drink; if you part, you drink; if you make acquaintance, you drink; if you close a bargain, you drink; they quarrel in their drink, and they make up with a drink. They drink because it is hot; they drink because it is cold. If successful in elections, they drink and rejoice; if not, they drink and swear; they begin to drink early in the morning, they leave off late at night; they commence it early in life, and they continue it, until they soon drop into the grave (Marryat 1839:124).

Drinking was a very ingrained part of American culture. It was said that "Americans drank from the crack of dawn to the crack of dawn" (Rorabaugh 1979:20-21). So why did America give up its national spirits of which it seemed so fond? A democracy does not simply give up one of its freedoms overnight and, indeed, this was not the case. The Prohibition movement was over a century in the making before culminating in the form of the 18th Amendment. It was the result of religious beliefs which coupled with very charismatic leadership and new political movements

such as women's suffrage.

Before ratification in 1919, the United States was not a stranger to the ideas of prohibition. There were attempts at it even before the nation was founded, during the colonial period. An example of this is in May of 1657 when the sale of strong liquor "whether known by the name of rumme [sic], strong water, wine brandy, etc." was made illegal by the General Court of Massachusetts (Blue 2004:73). This movement was mainly an effort to remove the "sinn [sic] of drunkenness" from Native Americans via colonial trade (Mancall 1997:104). Similar legislation was also passed in Maine by the end of the seventeenth century for similar reasons (Mancall 1997:104-105). Both of these instances were directly derived from Puritan religious beliefs; one of the main driving forces also behind the American Prohibition movement.

Despite alcohol being considered "the water of life" and "the good creature of god" by western Christianity, religious beliefs were not prepared for the "recent" invention of distilled spirits which led to a stronger form of alcohol (Clark 1976:14-15). Once Arnaud de Villeneuve translated Arabian alchemist Gerber's efforts, the thirteenth century saw not the creation, but the major introduction of the process for distilled spirits we know today. Villeneuve attributed healing properties to the distilling product, claiming it "prolongs life, clears away ill-humors, revives the heart, and maintains youth" (Curtis 2006:22). The distilled spirits were mainly used as medicines until records during the sixteenth century show their use for other more casual purposes:

During the French Wars of Religion and the Revolt of the Netherlands, when Europe was for years in a vast turmoil of massacre and riot, or religious refugees and political murders, of English, Spanish, Dutch, and French Armies... Then apparently millions of distressed people were learning that aqua vitae (water of life), even more than wine, could offer a warm if momentary comfort for misery or grief or despair. Only then did Western culture begin to accommodate "ardent spirits," or the "strong drink" of modern times (Clark 1976:15).

It was after this transformation of spirits from their medicinal uses to the more casual indulgence that public drunkenness became an issue and increased at a considerable rate. This is easily marked by legislation and punishments at the time. One example of such was the drunkard's cloak, which consisted of a barrel with holes cut out for the offender's hands and head. The individual being punished walked around town while wearing this heavy apparatus so that their peers and fellow townspeople could jeer them. Being put in the stocks was also proposed as appropriate punishment for public drunkenness in a 1605 act. King James I approved of this in 1623, leaving those convicted of public drunkenness the option of paying five shillings or spending six hours in the stocks (Andrews 1991:140).

Public drunkenness continued and led to efforts of containment not only in England, but also in the British colonies. In what could be described as a near prediction of what transpired after the passing of the 18th Amendment, the colony of Georgia's Governor prohibited the importation of distilled spirits into his colony in 1735, marking the first statewide alcohol ban. This act passed by British Parliament showed obvious flaws in the enforceability of prohibition. Farmers began to grow and sell the means to manufacture their own moonshine instead of tending to their regular crops, and law enforcement regularly took bribes instead of enforcing the law (Behr 1996:13). Rumrunners in America began to frequent Savannah harbor and even when caught they were "tried before a jury of their peers; (whom) few of them ever voted for conviction" (Clark 1976:16). The unpopularity of the Georgia law along with the inability to enforce it led to its abandonment in 1743, only seven years after its inception.

While not considered a movement in prohibition, the United States Government imposed whiskey taxes. These were to be used to help reduce the national debt after the American Revolution and were heavily supported by social reformers, who hoped that a "sin tax" might

raise public awareness of the harmful effects of alcohol (Slaughter 1986:100). The Whiskey Rebellion in western Pennsylvania was a direct result of opposition to the tax, which was later repealed by Thomas Jefferson during his presidency (Blocker 1989:16).

All of these movements for prohibition suffered from not only being unpopular amongst the American population, but also from an unwillingness of public leadership to support a total commitment to prohibition. One such example is that of Benjamin Rush. This Philadelphia physician was friend to both Thomas Jefferson and John Adams, along with being a signer of the Declaration of Independence. Rush mainly believed in temperance, or moderation in place of prohibition, and came up with the suggestion of a replacement beverage for distilled spirits: wine mixed with opium, commonly known as laudanum (Clark 1976:9).

Charismatic and dedicated leadership for prohibition eventually began to come about in the early 19th century. One such advocate was Neal Dow (Figure 1), who had already accomplished the previously unthinkable task of persuading the volunteer fire department in his home town of Portland, Maine to “ban alcohol at its musters” (Clark 1976:11). After successfully inheriting and running his family’s tannery, Dow set the precedent for other businesses to exclude their daily grog time. Through his passion for prohibition, Dow impressed not only individuals such as P.T. Barnum, who claimed in relation to the evils of alcohol “Neal Dow... Had opened our eyes,” but also enough Portland citizens to be elected Mayor of the city in 1851 (Clark 1976:11). Upon election, Dow “immediately persuaded the Maine legislature to enact the nation’s first statewide prohibitory law, mandating fines for those convicted of selling liquor and imprisonment for those engaged in its manufacture” (Clark 1976:11). Dow’s efforts inspired other like-minded individuals to take up the call for prohibition and resulted in several other states following Maine’s example, effectively making Dow somewhat of a national celebrity.

However, all of this came crashing down in 1855 when unrest broke out in Dow's hometown of Portland amongst "Irish immigrants who despised Dow and his law" (Clark 1976:12). After the unrest resulted in several deaths, laws were weakened by the belief of the Republican Party that "prohibitionism [sic] was divisive and might weaken the unity that had formed in the young party around the slavery issue" (Clark 1976:12). Several states had, by the end of the decade, repealed legislation similar to the Maine Law, including namesake law itself.

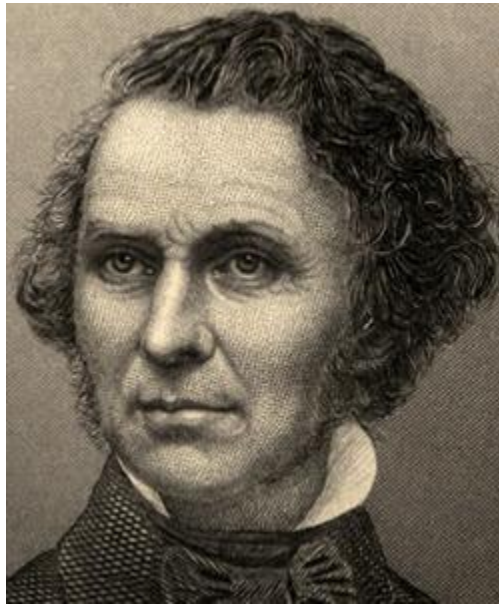


Figure 1. An engraving of Neal Dow, Mayor of Portland, ME (Clubb 1856:Frontispiece).

Religious organizations both in and out of the United States also began to move from simple temperance to the abolition of alcohol consumption altogether. Social evils were attributed to heavy drinking, even by leaders in the Catholic Church such as the Archbishop of Ireland, who said:

We have seen there is no hope for improving in any way or form the liquor traffic; there is nothing now to be done but to wipe it out completely. The state alone can save us. Would God place in my hand a wand with which to dispel the evil of intemperance, I would strike the door of every saloon, of every distillery, of every brewery, until the accursed traffic should be wiped from the face of the earth (Willebrandt, 1929:343).

The interesting portion of the Archbishop's urge for action is the call for the state to do something, not just the morality of the church. This call for law was also echoed by the Protestants, as the plea for prohibition went out from the General Assembly of the Presbyterian Church:

The experience of two hundred years proves that this evil can never be removed or effectively resisted while the traffic in intoxication liquors is continued, it being necessary, if we would stop the effect, to remove the cause...Laws prohibiting the sale of intoxicating drinks can interfere with the rights to no man; because no man has a right of any name or nature inconsistent with the public good, or at war with the welfare of the community; it being well known, universally acknowledged maxim of law the "no man has a right to use his own to the injury of his neighbor" (Colvin 1926:265).

The notion that two factions of a religion that had been known for considerable disagreements with each other since the Protestant Reformation in 1517 were now willing to see this issue in a similar manner led to a bond that culminated in the foundation of the Prohibition Party in 1869. This party campaigned on a platform of nothing less than a Constitutional amendment that exercised:

The legal prohibition in the District of Columbia, the territories, and in every other place subject to the laws of Congress, of the importation, exportation, manufacture and traffic of all alcoholic beverages, as high crimes against society; an amendment to the national Constitution to render these prohibitory measures universal and permanent; and the adoption of treaty stipulations with foreign power to prevent the importation and exportation of all alcohol beverages (Krout 1925:189).

The idea of prohibition also pulled together women all over the nation. While men prescribed to the original idea that consumption was good for their health and generally enjoyed drinking, women believed in the religious notion of true motherhood, part of which was refraining from the consumption of alcohol. Middle class women were often viewed as the moral authorities of their household and saw the drinking of alcohol as a threat to their homes (Blocker 1989:74-76). Men mostly took to saloons for their drinking, and women had the view that:

A drunken husband and father was sufficient cause for pain, but many rural and small-town women also had to endure the associated ravages born of the early saloon: the wallet emptied into a bottle; the job lost or the farmwork [sic] left undone; and, most pitilessly, a scourge that would later in the century be identified by physicians as “syphilis of the innocent”- venereal disease contracted by the wives of drink-sodden husbands who had found something more than liquor lurking in saloons. Saloons were dark and nasty places, and to the wives of the men inside, they were satanic (Okrent 2010:16).

The hatred of booze and saloons brought together many prominent women such as Susan B. Anthony, Elizabeth Cady Stanton, Lucy Stone and Amelia Bloomer, all of whom later became known for their pioneering efforts in women’s suffrage. “One could make the argument that without the ‘liquor evil,’ as it was commonly known to those who most despised it, the suffrage movement would not have drawn the talents and energies of these gifted women” (Okrent 2010:15).

The prohibition movement among women brought together not only the prominent but also the common women as well. The year 1874 saw the foundation of the Woman’s Christian Temperance Union (WCTU), an organization under Frances Willard (Figure 2), that had a membership of over 250,000 prohibition supporters (Okrent 2010:16). However, it was not simply prohibition that the WTCU supported. There were a number of beliefs Willard held as important and threw the weight of the WCTU behind. Examples of these beliefs were “agitating for the eight-hour day, workers’ rights...vegetarianism, cremation, (and) less restrictive women’s clothing” (Okrent 2010:19). This lack of focus on just one issue led to a straining of resources and focus among the WCTU, arguably making the group’s prohibition efforts not as effective as they could have been.



Figure 2. Frances Willard of the Woman's Christian Temperance Union (Willard 1889:Frontispiece).

The Anti-Saloon League, or ASL, was founded in 1893. When contrasted with Willard's "Do Everything" WCTU, the ASL suffered no distractions and focused solely on the goal of prohibition:

The Anti-Saloon League is not in politics as a party, nor are we trying to abolish vice, gambling, horse-racing, murder, theft or arson. The gold standard, the unlimited coinage of silver, protection, free trade, and currency reform, do not concern us in the least (Westheimer 1909:131-139).

Reverend Howard Hyde Russell founded the ASL and directed that "the League was to be staffed by paid workers," which meant individuals could dedicate their full time to the cause of national prohibition (Blocker 1989:96). Russell's first recruit for this full time endeavor was an Oberlin College graduate named Wayne Wheeler (Figure 3).

Wheeler was everything the ASL needed in leadership, often described as tireless, dedicated, and even referred to by a former classmate as a “locomotive in trousers” (Okrent 2010:39). As an organizer, Wheeler remained focused on using balance of power efforts in politics to place whomever the League believed would champion their efforts for the cause of prohibition within legislature. Wheeler also persisted on the ASL staying apolitical in their efforts. Whichever candidate was for prohibition was supported by the ASL come election time regardless of the candidate’s political party. This concept allowed the ASL a great deal of “flexibility; it was prepared to take advantage of every opportunity, and it could change direction at a moment’s notice, even when such a change involved the apparent reversal of policies which had long been regarded as fundamental” (Asbury 1968:121).

The ASL also focused its efforts initially on the ground level in politics, often referred to as the local option. The group “discouraged state-wide and national prohibition movements on the ground that the country would not be ready for them until the drying up of the towns and counties, or at least a sizable majority of them, had been accomplished” (Asbury 1968:121). Wheeler and the ASL accomplished this goal by working with the minorities during elections. In Wheeler’s own words:

I do it the way the bosses do it...with minorities. There are some anti-saloon voters in every community. I and other speakers increase the number and the passion of them. I list and bind them to vote as I bid. I say “We’ll all vote against the men in office who don’t support our bills. We’ll vote for candidates who will promise to. They’ll break their promise. Sure. Next time we’ll break them.” And we can. We did (Blocker 1989:96-97).



Figure 3. Wayne Wheeler of the Anti-Saloon League (Courtesy of the Library of Congress, Washington, D.C. 1910s.)

Over time these local efforts by the ASL collectively resulted in control of legislators in a multitude of states. This increase in support led to the natural evolution in changing from a local to a state-wide stance in the particular states that consisted of towns and counties that had adopted a dry stance. Eventually entire states began to pass dry laws:

In 1907 the Georgia Legislature passed a dry law, and that same year Oklahoma voted for a constitutional amendment by a majority of 18,103. Mississippi and North Carolina adopted statutory prohibition in 1908, Tennessee did the same in 1909, and in 1912 an amendment was added to the constitution of West Virginia by a dry majority of 92,342 (Asbury 1968:121-122).

Wheeler and the ASL were able to achieve this foothold in the American South through a collaboration of their non-bipartisan “any means necessary” methods and highly focused

propaganda. American geographic regions held different beliefs and ideologies, and each had to be taken into consideration when trying to win them over to the side of prohibition. In the case of the American South, “the southerners were ardent advocates of personal liberty; they deeply resented any attempt to interfere with their traditional rights and customs, one of which was to drink what and when they wished” (Asbury 1968:122). Wheeler and the ASL circumvented the South’s defense of personal liberties in regards to alcohol by appealing to another of their long held traditions: racism and the stereotyping of blacks. This is not to say that the majority of southerners were ardent racists, nor is to say that it was a belief shared only within the confines of the old Confederacy. The statistics to support either idea are just not available. Still, in keeping with the ASL’s tactics of working with marginalized populations to win local elections, the utilization of racism helped distract from the fact that they were advocating the voluntary signing away of personal liberty.

A multitude of different propaganda efforts were used in areas the ASL believed could be most effective when it came to the demonization of the “black man” and whiskey. Some attempted to take the moral highroad (if such a thing can be said in regards to racism) by appealing to a protective nature. An article in *Collier’s* suggests “white men are beginning to see that moral responsibility for the negro rests on them, and that it is a betrayal of responsibility to permit illicit sales of dangerous liquors and drugs” (Whaley 1913:32). Thomas Dixon Jr., a writer from the early twentieth century, did not choose a moral high ground and instead portrayed black men with “eyes bloodshot with whiskey (who) wander the streets and invade the homes of whites, their extravagant drunkenness intensifying the constant threat of plunder and rape” (Okrent 2010:43).

Many also tied in prohibition to Jim Crow laws, attempting to remove both bottle and ballot from hands of the black men. Images were made of “the waking nightmare of a black man with a bottle of whiskey in one hand and a ballot in the other” (Okrent 2010:43). All of these efforts eventually led to the many southern states falling in line with the ASL and prohibition.

The inevitable next step for the ASL and prohibition was to transcend from the state level and move onto the national platform. Issues began to arise with the transportation of liquor from “wet” states into those that had adopted “bone dry” (meaning the state forbid any possession or consumption of liquor) legislation. To address this, the ASL lobbied Congress to adopt the Webb-Kenyon Act, “which prohibited interstate shipment of liquor into a state contrary to the laws of that state” (Blocker 1989:112). This piece of legislation showed how much control and influence prohibition was gaining on a national level when:

In February of 1913 Congress passed the Webb-Kenyon Law, which President William Howard Taft vetoed when his Attorney General, George W. Wickersham, expressed the opinion that it was unconstitutional. Both branches of Congress immediately passed the bill over the President’s veto, the Senate on February 28 by a vote of sixty-three to twenty-one, and the House on March 1 by a vote of 244 to ninety-five. Some years later the law was upheld by the Supreme Court (Asbury 1968:124).

Webb-Kenyon proved to be “disappointing, for it provided no penalties, and for many months Congress neglected to appropriate funds for its enforcement” (Asbury 1968:124). Despite the setback in enforceability, the Webb-Kenyon Act was hailed as a success by the ASL.

Another hurdle that was soon to be overcome by the Anti-Saloon League was that of the revenue issue. America had a liquor tax in place since 1862 to help fund its efforts during the Civil War. In the eyes of the prohibition movement, this “made Uncle Sam to some extent a partner in the profits of the distilling and brewing industries and so would discourage him from helping to exterminate them” (Furnas 1965:210). In 1913 America adopted the 16th Amendment,

which gave Congress the power to collect income tax. Shortly after the passing of this Amendment, the ASL gave a statement:

The chief cry against national prohibition...has been that the government must have the revenue...The adoption of the Income Tax Amendment to the Federal Constitution furnishes an answer to the revenue problem...National Prohibition...can be secured through the adoption of a Constitutional Amendment (Okrent 2010:58).

With both support in Congress and help from the Income Tax Amendment, the drafting and passing of prohibition legislation seemed inevitable.

The ASL and the national prohibition movement continued to gather steam. Rather than forcing moves that could be considered strong-arm tactics in Congress, the ASL and Wheeler went back to placing more members in Congress that supported a vote for prohibition. Despite gaining many seats during the elections of 1914, “the leaders of the Anti-Saloon League were under no illusion as to their strength in Congress; they didn’t control two thirds of the votes in either house, and knew they couldn’t hope to do so for at least another two years” (Asbury 1968:128). The ASL put as much effort and fervor as they had with all of their other endeavors into the campaigns of 1916. In the end, these efforts were successful, as Wayne Wheeler put it:

We laid down such a barrage as candidates for Congress had never seen before... On election night the lights burned late at our Washington office... We knew late election night that we had won... We knew that the prohibition amendment would be submitted to the states by the Congress just elected... (Asbury 1968:128-129).

Wheeler was correct. On January 16, 1919, the Sixty-fifth Congress (elected in 1916) passed the 18th Amendment to the United States Constitution, instituting prohibition on the Federal level.

It is worth mentioning the commonly held belief that the outbreak of World War I helped the efforts of the Anti-Saloon League and other groups seeking prohibition. The aforementioned belief, usually referenced by those who opposed the 18th Amendment, was to attribute “the amendment’s adoption to the absence of two million soldiers from American shores and voting

booths” (Okrent 2010:97-98). This assumes that, not only were those Americans that were serving in Europe for the war effort opposed prohibition but also that they were of age to vote. While the legality of serving the country underage makes the research of finding out exactly how many of those in the armed service during World War I were below the legal age to vote, an extreme example can be made of Albert Cohen of Memphis, Tennessee. Cohen is reputed to be the youngest American to see combat during World War I due to his enlistment at age thirteen (Rosen 2005:8). President Woodrow Wilson’s War Revenue Acts, “which increased liquor taxes to help finance the war effort, (which) in effect made the purchase of alcoholic beverages in the early days of World War I a patriotic act” were also in opposition to this belief (Okrent 2010:98).

Heavy anti-German sentiments that World War I had brought to the forefront also worked against the patriotic notion that the liquor tax had put into effect. These sentiments were easily exploited by supporters of prohibition. America’s breweries were owned by those with clear German heritage. Names such as Busch (Figure 4), Hamm, Pabst, Ruppert, and Schmidt were at the forefront of the breweries and anti-prohibition groups. The public image of the German brewery owners was also easy to exploit due to some of their own actions:

The Busches were especially attached to their ancestral home... Adolphus (Busch) had been decorated by the Kaiser (who had visited Villa Lilly, the Busch family estate in Langenschwalbach); two of Adolphus and Lilly’s daughters were married to German military officers; and son August- head of the family after Adolphus’s death- threw annual parties at his Missouri farm in honor of the Kaiser’s birthday. Vacationing in Langenschwalbach in the summer of 1914, Adolphus’s widow had even chosen to remain there when World War I broke out (Okrent 2010:85).

These actions were easily made into propaganda that took root in typically xenophobic areas such as the American South.



Figure 4. Portrait of Adolphus Busch. Oil on canvas (Courtesy of Anders Zorn 1897).

With the passing of the 18th Amendment, Prohibition was implemented into effect on January 16, 1920, exactly one year after ratification. Prohibition introduced multiple major problems, including ways to enforce the law itself. Further legislation was needed to “engrave into law the procedures, penalties, appropriations, exceptions, and hundreds of other necessary details that the 112 words of the Eighteenth Amendment didn’t begin to address” (Okrent 2010:106-107). The legislation that set about to accomplish this was the Volstead Act, which saw its own share of problems.

The Volstead Act

With the adoption of the Eighteenth Amendment in January, 1919, the knowledge became commonplace to the American public that prohibition was to be enacted a year later. The issues that were not made clear through the broad verbiage of the amendment were the enforcement policies involved with the prohibition of alcohol. The Eighteenth Amendment prohibited the manufacture, sale or transportation of intoxicating liquors. However, the Amendment failed to provide definitions for terms such as “intoxicating liquors” or establish penalties for any violations. The intentions of the Eighteenth Amendment were brought forward, defined, and coded for enforcement in the National Prohibition Act, also known as the Volstead Act.

The Volstead Act was named for the Chairman of the House Judiciary Committee, Andrew Volstead (Figure 5), who was a Minnesota native and had been a member of Congress since his election in 1903. After serving sixteen years in the House of Representatives, Volstead assumed “chairmanship of the Judiciary Committee and, therefore, responsibility of the National Prohibition Act” (Okrent 2010:109). Volstead, whose defining feature was a large moustache that covered his entire upper lip, approached matters of Congress systematically and adhered to the law. Of note was that Volstead had not been placed in his position in any way by the Prohibition Party. In fact, Volstead “had never used the Prohibition platform as part of his election campaign strategy... [and] On two occasions... his unsuccessful challengers to his House of Representatives seat had even been Prohibition Candidates” (Behr 1996:77). Volstead applied his systematic and law abiding spirit to the creation and application of the National Prohibition Act.

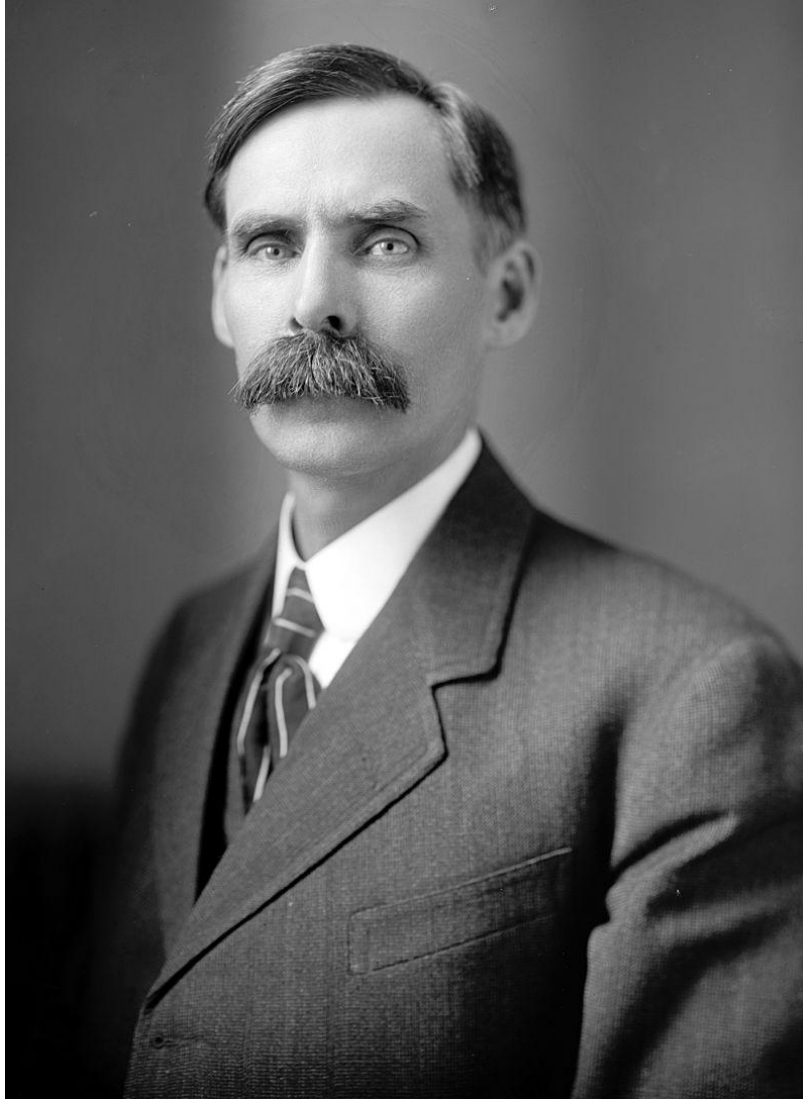


Figure 5. Andrew Volstead (Courtesy of the Library of Congress, Washington D.C. 1920s).

Common belief attributes much of the writing of the National Prohibition Act to Wayne Wheeler of the Anti-Saloon League. This may stem from the “fact Wheeler did fashion a version of a Prohibition enforcement law out of a number of existing state laws and presented it to Volstead and to the measure’s Senate sponsors” (Okrent 2010:110). Volstead, falling back on his career as a lawyer prior to employment in Congress, found Wheeler’s recommendations “too loosely drawn,” (Volstead 1934) leaving obvious loopholes in the legislation that could be exploited. After several months of deliberation by the committee assigned to draft the National

Prohibition Act, which included visits by Wayne Wheeler, the measure was completed. Not one of the sixty-seven sections of the Volstead Act was ever found to be unconstitutional, a testament to the work put into the act by Andrew Volstead and the rest of the Congressional Committee that helped draft the bill.

Despite its framework being upheld legally, the National Prohibition Act did meet with some opposition. It was expected, as this:

Was the last chance of the wets to modify the Eighteenth Amendment, and the Anti-Saloon League anticipated, and prepared for, a hard fight in both the House and the Senate. But the wets were so dispirited and disorganized that they made little resistance, and the Volstead Act passed the House in October 1919 by a vote of 287 to 100 (Asbury 1968:134).

The unexpected part came in a veto by President Woodrow Wilson. After the Act's introductory statements, the first section deals with control and enforcement of wartime prohibition. America had already entered World War I, and:

He [President Wilson] pointed out that the war emergency no longer existed, and urged the repeal of that section of the law. Two hours after Congress received the President's message, the House voted overwhelmingly to override his veto. Similar action was taken [the] next day by the Senate (Asbury 1968:134).

Despite President Wilson's claims that the Act was unconstitutional and unethical, it still went into effect along with the Eighteenth Amendment.

Following the section on wartime prohibition, the Volstead Act proceeded to address rules and regulations for common American citizens in regards to prohibition. "Intoxicating liquor" was defined early on as those liquids containing one-half of one per centum or more of alcohol by volume which is fit for use for beverage purposes. The name it might fall under, such as brandy, whiskey, rum, etc., beer, ale, porter, and wine was also included with the mention that even if they were below the requirement of being branded intoxicating liquor, they still were considered a controlled substance and could only be produced under certain strict criteria

(National Prohibition Act Title I Sec. 1, Title II Sec 1). The guidelines for penalties were also stated along with defining the agency in charge of enforcing prohibition. Rather than have the United States Justice Department handle the enforcement of the 18th Amendment, Wayne Wheeler lobbied heavily for control to be given to the Treasury Department, a decision reinforced through the passing of the National Prohibition Act. This handed the responsibility of enforcement over to the Internal Revenue Service, Customs Services, and the United States Coast Guard (National Prohibition Act Title II Sec. 2). Rules and regulations for prescribed alcohol used for medicinal purposes along with those liquids to be utilized in religious practices were also included in this section.

The last section of the National Prohibition Act detailed the guidelines for manufacturing industrial alcohol. This ranged from the production of alcohol for use in dyes and fuels all the way to usage for scientific purposes. This section also covers the importation or introduction of alcohol within “the Canal Zone,” which included the Panama Canal and the Panama Railroad. As with the first and second sections, penalties were assigned to violations of the regulations that had been set (National Prohibition Act Title III).

Despite the efforts made by Andrew Volstead to make the National Prohibition Act void of legal loopholes, flaws eventually started to show. These were mainly due to the human element of enforcement once the law was set into motion. A large portion of these flaws came from the assignment of enforcing prohibition to the Treasury Department, a division of government that was ill prepared to handle the task at best. These problems were compounded even more when the Treasury Department had only been given a year of preparation for their expected duties (Okrent 2010:134-137).

The United States Coast Guard During Prohibition

In response to handling their newfound task of enforcing prohibition, the United States Treasury Department founded the Bureau of Prohibition. These 1,500 individuals, along with state law enforcement officials and the Customs Service, were responsible for upholding the law of prohibition. The duty of enforcing the laws of Prohibition at sea was given to the United States Coast Guard as part of the Treasury Department's doling out of responsibility (Ensign 1997:4).

Contrary to popular belief, the United States Coast Guard was not originally founded as only a life saving, sea based organization. The Coast Guard is actually the combination of five Federal agencies: the Lighthouse Service, the Revenue Cutter Service, the Steamboat Inspection Service, the Bureau of Navigation, and the Lifesaving Service (Willoughby 1964:21-24). Many of these organizations had overlapping duties and unclear lines with their jurisdiction and responsibilities. Over time, in an attempt to establish a simpler bureaucracy and alleviate complications, these organizations were folded into one branch under the control of the United States Treasury Department. This led to the formation of the United States Coast Guard.

However, combating smuggling was an original duty of the Revenue Cutter Service:

With the construction of 10 revenue cutters [in 1790], the Revenue Cutter Service was tasked with the protection of customs, as smuggling deprived the Treasury Department of legal duties on imports. In 1915, the Revenue Cutter Service was joined with the Lifesaving Service and renamed the Coast Guard. Although the Coast Guard continued to be tasked with the prevention of smuggling, in the years immediately following the Coast Guard's reorganization, the preservation of life and property at sea became a major focus for Coast Guard efforts (Ensign 2001:7).

The Coast Guard found itself unprepared for dealing with rumrunners at the start of Prohibition despite one of the organizations folded into the more comprehensive Coast Guard having its foundation in stopping smuggling activities. This was due to a few reasons, but the one at the

forefront was that most members of the Coast Guard viewed the unpopular duty of enforcing prohibition not as important as their other responsibilities. This led to Coast Guard Cutters not actively pursuing rumrunners. In the words of one former Coast Guard member:

The few rummies we caught during those early days of National Aridity were more the result of accident than design, like those which became temporarily crippled because of motor failure and the odd ones our “sandpounder” patrols [patrols along beaches by Coast Guard personnel on foot or vehicle] stumbled upon during the course of an unloading operation (Waters 2007:45).

Another reason the Coast Guard was initially considered ineffective at enforcing prohibition was due to the equipment being used by them in comparison to those being utilized by rumrunners:

Our fleet [the Coast Guard] of seagoing cutters was designed more for humanitarian duties than law enforcement- Ice Patrol, Bering Sea Patrol, Winter Cruising, salvage and rescue operations. Their top speed was around twelve knots, and many were coal-burners. They posed not the slightest worry or threat to the rummies (Waters 2007:45-46).

This led to many of the seized rumrunner vessels being turned around for use by the Coast Guard to catch similar vessels. These halcyon days for the rumrunners lasted from the onset of Prohibition into 1924, when the United States Coast Guard underwent major changes to its budget in order to accomplish its mission goals. This was due to “the amount of liquor coming into the United States from the sea... steadily increasing” (Willoughby 1964:29).

This increased amount of smuggling created the need for a much improved Coast Guard that could keep up with its prohibition responsibilities and also to keep those at sea safe. This concept included even the rumrunners. With the induction of prohibition came a rise in piracy off the coasts of the United States. One such serious example took place on:

The Nova Scotia schooner *J. Scott Hankenson* [that] was lying 15 miles off Rockport, Mass., waiting to dispose of her cargo. The motorboat *Grayhound*, a previous customer, came alongside with apparently two men who boarded *Hankenson*. One whipped out a gun and summarily shot the captain in the back. This was the signal for seven more heavily armed men to climb over the side. Not satisfied with shooting the skipper, they shot the cook when he moved to defend himself, and the crew were confined to the forecastle. The pirates helped themselves to all the liquor which remained, and departed with cash variously reported as between \$35 and \$20,000! (Willoughby 1964:41)

These kinds of events, along with territory disputes involving seizures of liquor cargos past the three mile limit, put pressure on the United States Federal Government in regards to prohibition concepts and policies. The time had come to take the policing of the seas seriously and the solution was found to be an increase in the budget for the Coast Guard. The Annual Report of June 30, 1923 by the Secretary of the Treasury stated:

With a view to lessening the smuggling of liquor into this country, it is recommended that the appropriation for the Coast Guard be increased by \$28,500,000 for the next fiscal year. This will enable the department to purchase 20 additional seagoing cutters, to purchase or construct 203 motor boats of the cabin cruiser type, and 91 small motor boats to be used at Coast Guard stations, and to increase the personnel of officers and enlisted men of the Coast Guard by 3,535. The seagoing Coast Guard cutters will serve as bases for the large fleet of motor boats intended to be used in patrolling inlets and the entrances to harbors, and will watch 'rum vessels' lying off the coasts and follow them as occasion requires. It is hoped that with such equipment the smuggling of liquor may be reduced to a minimum (United States Treasury Department 1923).

This expansion was accepted and opened what has been referred to as the second phase in the Rum War (Willoughby 1964:43).

The United States Navy loaned out twenty destroyers that were assigned to the Coast Guard (Figure 6). These destroyers still needed to be refurbished and refitted as they had been mothballed in the channels behind the Philadelphia Navy Yard, but they were just what the Coast Guard needed:

All the old “tin cans” were oil-burners, with steam turbines for propulsion. Top speed ranged from twenty-six knots up to thirty. They had been stripped of their wartime torpedo tubes and depth charge-throwing guns, but had been left with their main batteries of 4” 50 and 3” 50 caliber guns. In addition each mounted a one-pounder quick-firing gun for close-in work, and of course a formidable armory of machine guns, rifles and pistols (Waters 2007: 52).

Various smaller craft were acquisitioned along with these destroyers as well as the implementation of quickly recruiting and training personnel to be Coast Guard crews. With its newfound budget combined with an increase in equipment as well as the numbers of crew, prohibition could now be considered enforceable by the Coast Guard. This resulted in many successful cruises against rumrunners. However, these increases prompted a response from those involved in the smuggling of liquor in the United States, mainly in the form of more organized crime syndicates replacing the usual “rummie.”



Figure 6. A group of Navy Destroyers given to the United States Coast Guard (Carse 2007:93).

The Rumrunners

The United States officially went “dry” the morning of January 17, 1920. However, Prohibition did little to curb the consumption of alcohol by its citizens. As Oscar Wilde once said, “You can’t make people good by Act of Parliament.” Strangely enough prohibition had the opposite effect that groups like the ASL and the WCTU had hoped it might have. Drinking had instead become the new fad of the 1920s. Even though legitimate drinking establishments had been abolished, it was still considered easy to find a drink with every town having speakeasies and other lower-class establishments that sold alcohol (nicknamed blind pigs) springing up to take their place. New York had 32,000 such “hidden” places where an individual could “wet their whistle.” The alcoholic beverages themselves were provided through various sources such as:

Medicinal, sold by doctors’ prescriptions and through drugstores; “near beer” that was often given a strengthening squirt of alcohol just before it was sold over a speakeasy bar; industrial alcohol from existing stocks; still-made alcohol and its less potent cousins, home-brew beer and home-pressed wine; and smuggled liquor from the Bahamas, Bermuda, Canada, Mexico, Cuba and Europe (Carse 2007:5).

With the onset of Prohibition there was money to be made in the providing of illegal spirits to those who wished to continue to purchase it. Many considered the importation of alcohol a victimless crime and prohibition had almost overnight made criminals out of scores of Americans and people of other nationalities that had never broken a law in their lives. A portion of these individuals were those who imported one-third of the alcohol America saw during Prohibition by sea. These individuals came to be known as rumrunners.

During the early years of Prohibition, rum-running vessels came in all shapes and sizes. All that was needed to transport alcohol into the United States was a source of alcohol, knowledge of a waterway that led into the country and an adequate vessel to cross said

waterway. An extreme example of this was what one reporter witnessed on the Canadian side of the St. Lawrence River when Canadian customs officials issued “a bill of lading for Mexico and (watched) a two-seated boat rowed into the river” (Okrent 2010:152). However, organization soon started to increase among the rumrunners even if the vessels did not change. Captain Bill McCoy is credited with establishing the precedent of what became known as Rum Row when McCoy’s vessel, *Henry L. Marshall*, sailed into St. Catherine’s Sound, Georgia in 1921 and unloaded a cargo of rye whiskey for a total of \$20000. *Marshall* was:

A 90-foot fishing schooner, built of white oak by James, of Essex, Massachusetts, with pole masts, a semi-knockabout rig, and twin-screw engines with a speed of 7 knots. She had a capacity of 1,500 cases in wood or 3,000 cases in burlap packages (Van de Water 2007:6).

McCoy’s original plan had been to anchor off the coast of Georgia near St. Catherine’s Sound and unload the cargo at sea via smaller motorboats. Bad weather forced off the lighters and McCoy was forced to take on a pilot and bring *Marshall* in under high tide. McCoy later delivered a load of liquor off the coast of New York through unloading the cargo onto smaller motor boats from *Marshall* while four miles out to sea. Fishing schooners and other vessels of this type were perfect for the importation of illegal spirits. Being a vessel type originally made for fishing, they were sea worthy and had ample storage along with the ability to cruise for long voyages via sails or in and out of inlets through use of their motors (Van de Water 2007:208).

Other potential rum smugglers took note of McCoy’s exploits and soon either copied the methods employed by McCoy or developed their own. United States territorial limits had been set at three miles offshore before prohibition had been put in place. This also created the jurisdiction that the Coast Guard was allowed to patrol. The obvious solution for the rumrunners in this situation was to park a large vessel loaded with liquor from other countries outside of the three mile limit and to have smaller, faster boats unload the cargo and bring it into shore. This

system created a line of large vessels over three miles out from the major cities on the United States' east coast that soon came to be known as Rum Row. Smaller and faster craft, known as contact vessels, were responsible for transporting the liquor from the cargo ships to shore. These varied from "excursion boats, pleasure launches, motor dorys [sic], sailing yachts, cabin cruisers, tugboats, even garbage scows" along with small seaplanes (Waters 2007:45).

This continued until the Coast Guard expansion in 1924. The Coast Guard became more effective in stopping the flow of liquor into the United States via Rum Row with extra personnel and craft at sea patrolling for rumrunners. Helping this along was the adoption of the "twelve-mile treaty" that President Coolidge had recently ratified with Britain, Germany, and Sweden. This increased the range of the Coast Guard while performing prohibition duties to "an hour's steaming distance- merely 12 miles on the average" (Willoughby 1964: 51). This hour's steaming distance was in relation to the boat in question of violating prohibition, not the Coast Guard vessel. This meant that boats with higher speeds could cover more ground in an hour and needed to anchor farther than the twelve miles to unload a liquor cargo. This expansion and new legislation put many of the small time rumrunners out of business and allowed for more organized crime groups to take their place.

With the crime syndicates becoming involved in rum-running, the vessels began to change. Boats such as pleasure craft were no longer being utilized to ferry liquor from the sea onto the shore. The boats were now all fast, high powered vessels equipped with radios and other technology such as:

Their Diesel engines (that) give them only a maximum of 16 knots, but these have Maxim silencers over their exhausts and run with absolute silence. Every ship has a short-wave wireless apparatus and is in constant communication with a mob headquarters somewhere on the coast which is similarly equipped (Van de Water 2007:212).

Many had been designed by boatyards in the United States, along with Nova Scotia and Newfoundland, with the sole purpose of transporting liquor (Figure 7). As one former rumrunner out of Nova Scotia described them:

A (typical) rum runner (was) very low, everything low constructed; and her engines were all muffled- when her engines were running you couldn't hear a thing (Fultz and Meister 1984).



Figure 7. A Newfoundland Built Rumrunner (Photo Courtesy of J.P. Andrieux, 1920s).

These increases in technology and investments being made by the syndicates came with a level of violence as well. Acts of piracy out at Rum Row became more common along with shootouts. These actions even forced out Bill McCoy, as stated by the former rumrunner after a brief prison sentence in 1925:

My crowd has left the racket, squeezed out by big business. They and I belonged to the time before modern efficiency took hold, when the old era of sail came back into the world for a little while, and racing schooners were talked of and praised; when every man took his own risks and played his own game. It was a cleaner game than they play today. It was more of a sport than a business (Van de Water 2007:214).

The costs of vessels participating in the actions out at Rum Row were now in excess of \$100,000. In comparison, McCoy had first purchased *Marshall* for \$20,000. With this constant

escalation, along with ever increasing budgets on either side of the conflict, new maritime technologies and their applications were tested, utilized, enhanced and perfected (Figure 8).

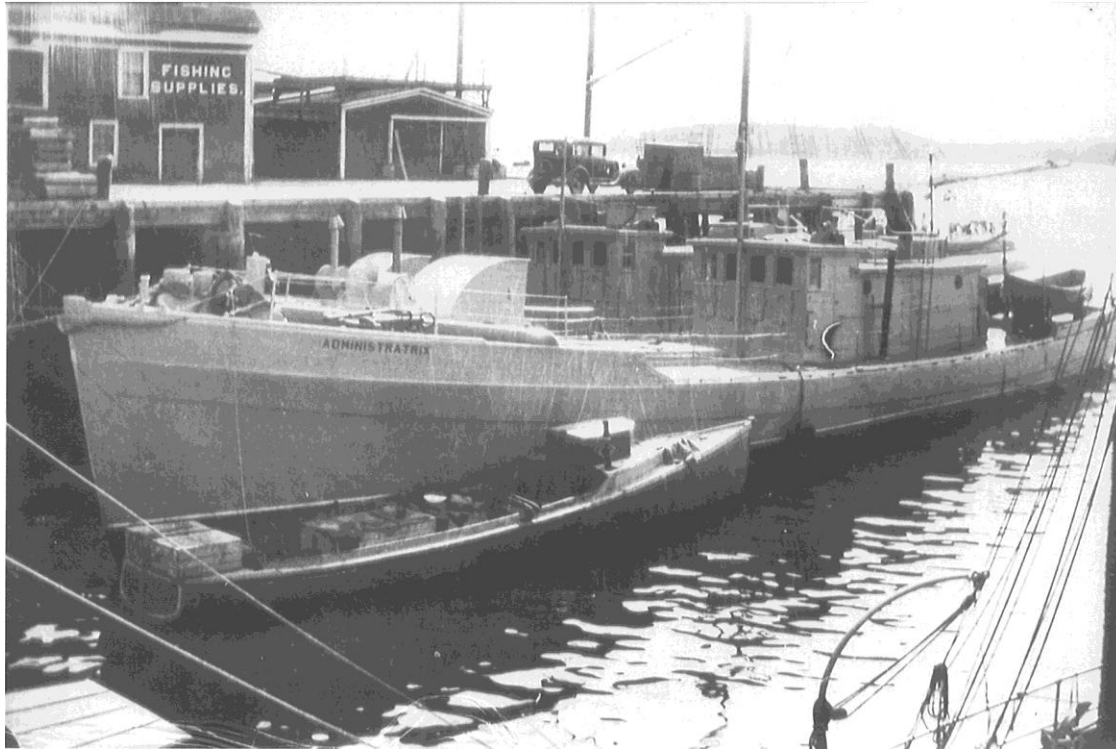


Figure 8. Two Newfoundland Built Rumrunners. Side by side it is easy to see that these were produced mainly in numbers for rum-running purposes (Courtesy of J.P. Andrieux, 1920s).

CHAPTER THREE: DEVELOPMENTS WITH RADIO EQUIPMENT

The first quarter of the 20th century ushered in the technological advances of wireless communications and their use at sea. Communications had gone from simple flag signals in the 19th century, to the use of Morse Code, as well as licensed radio operators onboard vessels during the First World War (Bone 1919:120-124). After the sinking of *Titanic* in 1912, the importance of communication at sea was recognized and radio service became more regulated and commonplace (Department of Commerce 1916). Along the shorelines of the United States and Canada, radio stations for communicating with ships offshore, along with wireless radios on seagoing vessels, became the norm (Morrison 2008:6). From the onset of Prohibition, rumrunners exploited this system of communications for their own benefit in transporting alcohol to the American coast and it fell upon the Coast Guard to find ways to use the rumrunner's own communications against them (Ensign 1997:25).

Communications between the shore and rumrunners were greatly enhanced after being taken over by the crime syndicates that introduced systems of organization along with increased funding to their operations. Through radio communications, rumrunners “would receive clandestine radio messages designating a rendezvous, the name of the contact boat, the specific cargo to be transferred, and other details” (Willoughby 1964:108). These communications were done in code and were generally undetected with the exception of when they interfered with other radio operations. Even after investigations into the interference resulted in the findings of unlicensed radio station transmissions little could be done. This was due to “The Radio Division of the Department of Commerce, ... charged with the supervision of radio communications in the United States, could do little about these unlicensed transmitters, as it was limited to the

United States, could do little about these unlicensed transmitters, as it was limited to inspecting only licensed stations, and its investigators had no police authority” (Mowry 2012:2). After this problem started to come to light more and more frequently suspicions began about their connection to rum-running activity:

Comdr. Charles S. Root at Coast Guard Headquarters, the officer then most concerned with such matters, felt that these unlicensed stations were connected with smuggling operations. Aside from the fact that the rummies were known to be using radio, there was little to go on. From time to time, Coast Guard radiomen had copied radio signals which they believed were transmitted by the rum runners (Willoughby 1964:109).

Root (Figure 9) began to investigate these previously intercepted messages from possible rumrunners and set to work on deciphering their codes. Root asked the United States Navy for help in these efforts, a request which the Navy promptly obliged. However, when the Navy’s efforts in code breaking resulted in a successful operation against a rumrunner, the Navy opted out of helping Root, given that it “could not lawfully handle work of this nature” (Director of Naval Communications 1931). It was then suggested by the Navy that the Coast Guard might benefit from its own cryptology unit, the formation of which Commander Root promptly set into motion.



Figure 9. A rare photo of United States Coast Guard Commander Charles Root (Photo Courtesy of the United States Coast Guard, Washington, D.C, 1900s).

Root's first step in the formation of a Coast Guard cryptology unit was in the formation of what Root referred to as Radio New York, which was set up with the help of Robert J. Iversen, who was an employee of the *New York Times* Radio Station. The purpose of Radio New York was to establish an "intercept site in New York City" (Mowry 2012:3). This site monitored both rum-running communications at sea and discovered the locations of unlicensed radio stations along the coast (Figure 10). Root spent several months dealing with considerable red tape in getting Iversen and a crew consisting of two Canadian resident aliens into the Coast Guard, along with obtaining equipment for intercepting rumrunner communications. Eventually, Radio New York intercepted its first communication from a rumrunner (Mowry 2012:4-7):

Radio New York's first rum-runner intercept was apparently accomplished on 4 December (1925) with the copy of a message from the *SS Copeman* to its principals in Cardiff, Wales, announcing its arrival date. The *Copeman* had been formerly known as the *SS Avontown* and had, under that name, been a rumrunner. As a Result of this intercept, the Coast Guard was able to estimate the ship's location at 40°N 73°W. Root immediately ordered Iversen to monitor its frequency continuously and forward intercept by Special Delivery since her cipher was readable and analysis could lead to the discovery of her shore connection (Mowry 2012:7).

After this initial intercept, Radio New York began successfully monitoring rumrunner traffic ranging from onshore communications to those coming from outside of territorial waters on Rum Row. International stations were also monitored by the Coast Guard, including the circuit between New York and London that led to the copying of a transmission from the ill-fated *I'm Alone* in December (Flemming 1998). Communications from other countries were targeted for monitoring, including “stations on St. Pierre et Miquelon (off the southern coast of Newfoundland), which had both radio and cable communications and was a major source of liquor” (Mowry 2012:7).



Figure 10. A wireless radio set used to communicate from the an unlicensed radio station on shore to rumrunners at sea on display at the Fisheries Museum of the Atlantic in Lunenburg, Nova Scotia (Photo by author, 2014).

Once it became known that the Coast Guard possibly had the ability to intercept radio transmissions the rumrunners began to change their techniques and acquire better equipment (Figure 11). “New communications developments by the rumrunners or the Coast Guard always

engendered new means of combating them; just as in war new weapons bring about new countermeasures” (Willoughby 1964:109). Once the crime syndicates became involved in 1925, the rumrunners also had the means to buy the best equipment and to place well trained individuals who knew how to use said equipment on the payroll. As a result “The liquor smuggler in 1927 had at his command, both on ship and ashore, the newly developed and very efficient high frequency radio communication equipment” (Willoughby 1964:109). The onshore stations were widespread, along with being well equipped:

The illicit stations were equipped with the best and newest radio apparatus, capable of working with stations in foreign countries, and manned with first-class, experienced operators. English and French traffic, both plaintext and encrypted, was transmitted; and radio procedure was primarily amateur and commercial, although... the occasional use of naval procedure indicated that some of the illicit operators were ex-Navy or ex-Coast Guard (Mowry 2012:11).

Subterfuge in regards to intelligence became the policy of both sides of the Rum War conflict. As a result of the need for secrecy for both the rumrunners avoiding the Coast Guard and the Coast Guard needing to communicate their locations and orders, encryption became commonplace within the communications of both sides.



Figure 11. Various examples of radio equipment used by the syndicates to listen to transmissions from shore to *Reo II*, a late Prohibition Era Nova Scotia based rumrunner. On display at the Fisheries Museum of the Atlantic (Photo by author, 2014).

Originally, the Coast Guard utilized the same codes as the United States Navy. However, increased usage during the Rum War caused the Navy to become concerned that overexposure could lead to their codes being broken. This forced the Coast Guard to develop its own system of codes:

Lt. Frank M. Meals, who had been both a telegraph operator and a radioman with a good background of commercial and Government communications, was given the task, along with his other duties, of preparing a suitable code for use strictly by the Coast Guard. He was on familiar ground, for he had previously worked on ciphers and solutions. He teamed up with Mr. Robert T. Brown, a civilian employee at Headquarters, and sought the friendly help and criticism of the Army's Chief Cryptanalyst, Maj. William F. Friedman, and his wife...Meals and Brown finally produced the Coast Guard's first official code book (Willoughby 1964:108).

With the establishment of a cryptology all its own, the Coast Guard then turned its efforts towards solving the ciphers of the rumrunners.

Very little effort had been directed towards cryptanalysis of the ciphers believed to be under use by the rumrunners. Most of it had been done by individuals or groups within agencies that had been pulled in for consultation by the Coast Guard. “By spring of 1927, an enormous number of encrypted messages had accumulated in the Coast Guard Intelligence Division” (Mowry 2012:14). Former Commander Charles Root, who now had achieved rank of Captain within the Coast Guard, organized the effort and obtained the equipment for radio intercept stations in both Florida and California. Elizebeth S. Friedman, who had previously worked on establishing the Coast Guard’s first code book, was tasked with the backlog of materials that had been previously intercepted (Figure 12). Friedman took two months to dispense with the backlog and get the Coast Guard up to date. The amount of materials being intercepted by the Coast Guard increased exponentially with intercept stations in place, leading to the founding of an official intelligence service within the Treasury Department dedicated to the illegal encrypted messages. These were all actions that “would put the enforcement agencies (Coast Guard, Customs, and Justice) in immediate possession of specific knowledge of the smugglers (which) as a consequence... would be able to launch seizure actions or initiate preventive measures while the smuggling operations were still in the planning stage” (Mowry 2012:16-17).



Figure 12. Elizebeth and William Friedman in 1957 (Courtesy of George C. Marshall Library, Lexington, VA).

With radio intercept stations in place, along with a dedicated intelligence service involved with the cryptanalysis of messages used by rumrunners, it was now possible for the Coast Guard to gain intelligence on those involved in the illicit activity. The problem now for enforcement agencies was to develop a way for practical enforcement with the information the Coast Guard was receiving. While some rumrunner messages contained information such as contact points and ships involved, many simply contained details such as meeting times. These latter messages were useless in terms of intercepting those involved in the rum trade without other details. It was decided that the best way to combat the situation was to develop technology

that could detect onshore radio stations and their high frequencies. Unfortunately, “Until the very early 1930s there were no adequate high frequency direction finders for locating rummy ships and stations (and) about the only means of judging the probable location of a radio station was the strength of its signal” (Willoughby 1964:110). This meant Coast Guard destroyers cruising aimlessly about the seas while hoping that a signal, which could be terminated at any moment became stronger or weaker based on the determination of the radio crew’s skills. These methods were unacceptable by the Coast Guard and “the problem of locating outlaw radio stations ashore (had) created a need for light, compact, highly portable yet sensitive and serviceable high frequency radio direction finding equipment” (Solt 1930:1).

Lieutenant Frank Meals, who also had worked on the Coast Guard’s first code book (Figure 13), was tapped for the task of creating suitable equipment for high frequency direction finding. Lieutenant Meals was given command over the Coast Guard “six bitter” (the nickname given to the 75 foot patrol boats designed for Prohibition duty due to their size) *CG-210* in order to conduct tests on intercepting radio transmissions while at sea. “This patrol boat had been fitted out ostensibly to conduct certain experimental radio work, but actually the purpose was to intercept and record certain radio traffic for the purpose of detecting and identifying persons, ships and stations engaged in illicit operations” (Willoughby 1964:109). Initial results were painfully slow and, eventually, Radio Electrician Clyde T. Solt was assigned to *CG-210* to help with the experiments. This was because “Solt was an expert on radio direction finders (which resulted) in (the development of suitable equipment)” (Willoughby 1964:110).



Figure 13. United States Coast Guard Lieutenant Frank M. Meals who helped create the Coast Guard's first codebook (Courtesy of United States Coast Guard, Washington, D.C., 1920s).

The Type X high frequency radio finding equipment (Figure 14) was a result of the efforts of Meals and Solt during their time aboard *CG-210*. The Type X was very successful in efforts to locate shore radio stations along with “good radio bearings on offshore rum vessels” (Willoughby 1964:110). Major William F. Friedman added to the work of Meals and Solt onboard *CG-210*. Major Friedman devised a system for the quick deciphering of codes being used by the rumrunners that were operating around New York Harbor. Friedman then read the decoded operating orders back to the rum ships, which had the effect of halting delivery of all alcohol along the New York coastline for several days (Kahn 1967:806).

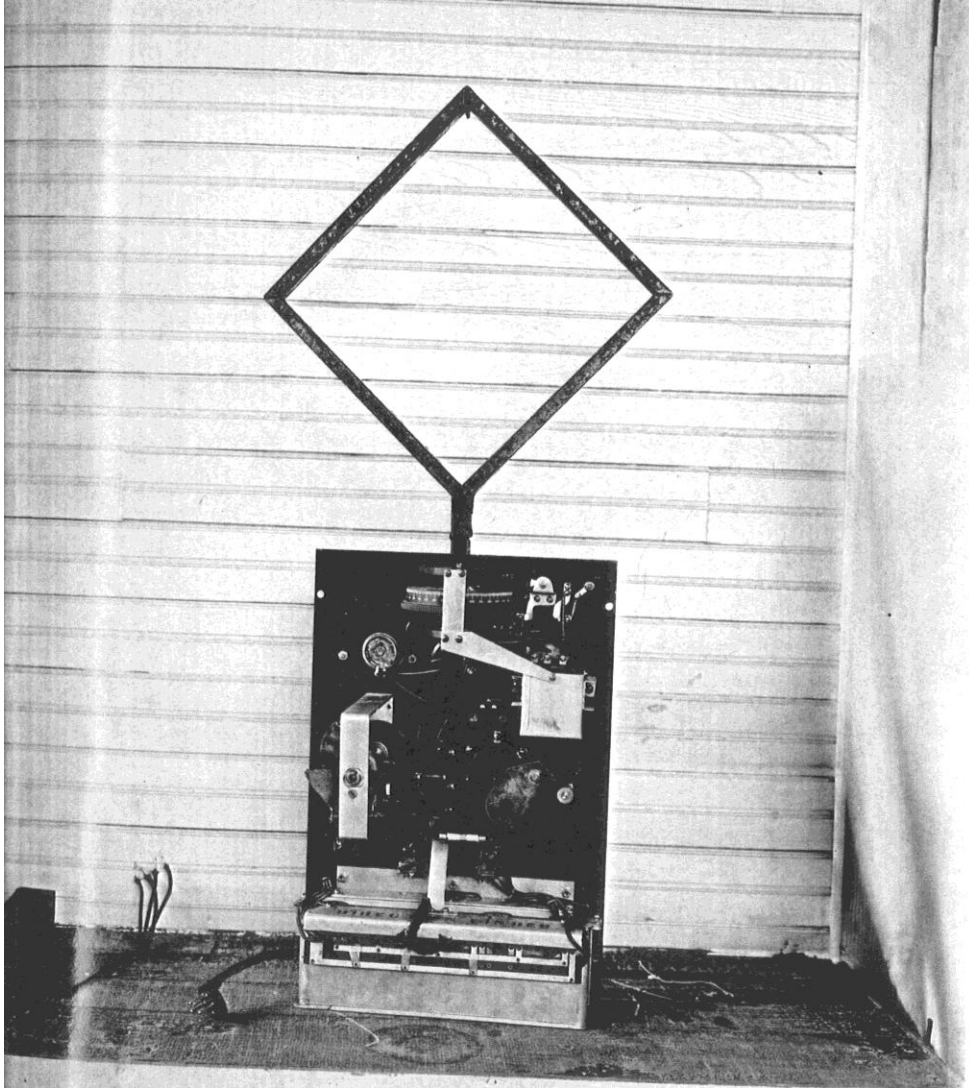


Figure 14. The Type X Radio Finder (Courtesy of the United States Coast Guard, Washington, D.C., 1924).

The success that the crew of *CG-210* had brought about was unprecedented in the Rum War. Lieutenant Commander Frank J. Gorman, who was head of the Coast Guard intelligence unit, made the comment that the “resulting confusion to this group of rum ships was more than all the efforts of the destroyer force and the other units combined have been able to effect in months” (Kahn 1967:806). The development of a more portable Type X to be used ashore added to their success:

A small portable direction finder, concealed in a conventional leather suitcase, could be used in public without revealing its nature. When the clandestine signal was received at right angles to the sides of the suitcase, it was emitted by a small concealed loudspeaker unit. Many radio sets in houses or buildings were detected by this means (Willoughby 1964:110).

The Coast Guard successfully used these suitcase sized devices (Figure 15) to locate and shut down, in the New York area, six unlicensed radio stations (Commandant, US Coast Guard 1930).



Figure 15. The suitcase sized radio direction finder (Mowry 2012:Frontispiece).

Once the value of gathering communications intelligence was realized, the Coast Guard outfitted three more six-bitters with high frequency intercept and directional finding equipment similar to that which was on *CG-210* (Figure 16). These were *CG-131*, *CG-214*, and *CG-141* (Commandant, US Coast Guard 1930). Needing personnel as well “the Unit was staffed with

eleven officers and 45 enlisted men, performing rudimentary cryptanalysis and providing time-sensitive (communications intelligence)-derived information to the anti-smuggling fleet” (Unidentified Correspondent: LCDR Gorman). The onboard crew tasked with the interception and immediate cryptanalysis resulted in more immediate results with regards to stopping the illicit activity associated with intercepted communications.

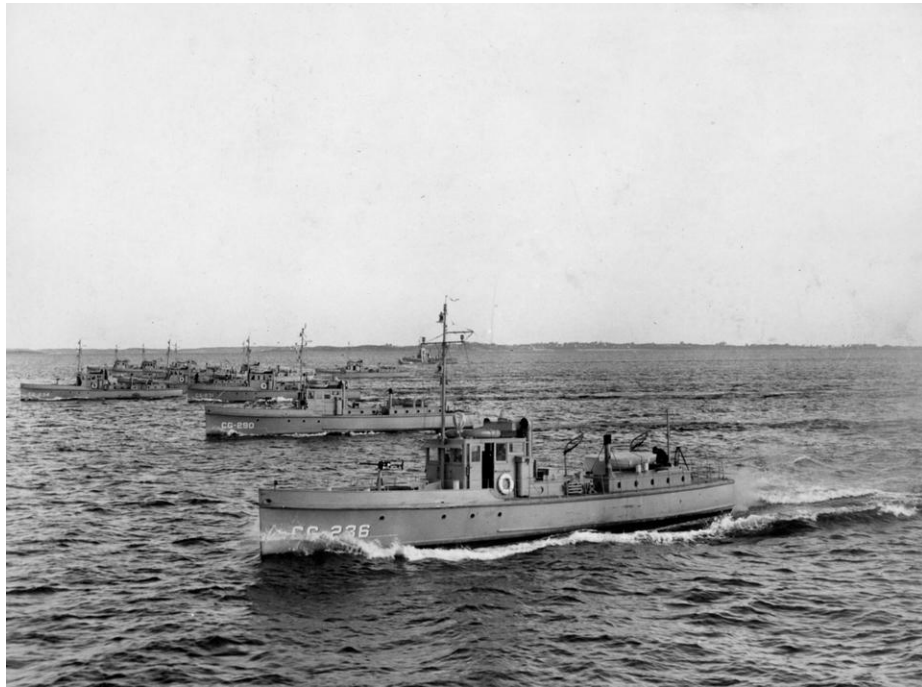


Figure 16. United States Coast Guard “Six Bitters” of the same build as *CG-210* on patrol (Courtesy of the United States Coast Guard, Washington D.C., 1920s).

This represented a change in methodology for what the Coast Guard and other organizations were using the intercepted messages for in the Rum War. Originally, the Coast Guard put the focus on the location and interception of illegal onshore radio stations. While these operations were successful in finding the onshore stations, convicting the individuals responsible for the illicit transmissions in any meaningful manner proved difficult, even with the cooperation of several government agencies:

Convictions for violation of the radio laws could often be obtained with relative ease. Convictions for conspiracy, however, were difficult and involved, and required revelation of methods used by enforcement agencies which would have defeated the whole program. Efforts to build up conspiracy cases involved the offshore vessels, the radioman ashore, their “higher ups,” and information gained through interception of the radio messages. Proof was required of an agreement between individuals to commit an illegal act, and of an overt act such as actual smuggling or the use of an illegal radio station (Willoughby 1964:112).

Violations of radio laws simply meant fines, which the rumrunners could dismiss by paying them. Convictions of conspiracy resulted in higher fines and possible prison sentences for the individual convicted of the crime, but the gains of removing an easily replaceable radio operator and station did not outweigh the loss of revealing the current system of communications intelligence being utilized by the Coast Guard:

The campaign against the unlawful shore radio stations had produced such meager punitive results that it was decided to leave the stations alone and let them transmit. With cryptanalysis being carried on successfully, the best results were obtained by gaining usable information from the rummies themselves, and the unit concentrated on that. Thereafter, the Coast Guard had better success by taking bearings on the offshore vessels, picketing them, and making seizures on the basis of intercepted information (Willoughby 1964:113).

This was the standard methodology for using communications intelligence by the Coast Guard against the rumrunners for the remainder of the conflict (Figure 17).



Figure 17. Coast Guard agent listening in to radio traffic (Mowry 2012:5).

Even with the methodology of the interception of intelligence remaining consistent, the Coast Guard still invested time and finances into the further development of more precise high frequency direction finders. Radio Electrician C. T. Solt was heavily involved in this process:

Subject equipment is the result of more than three years intensive research and development work for the purpose of providing satisfactory high frequency radio direction finders, suitable for use on small vessels and capable of consistently reliable results in obtaining bearings on smugglers of contraband and other illegal radio stations. The performance of this equipment during the tests described herein was highly satisfactory and indicates that the actual worth and practicability of the equipment is well worth the effort and money expended incident to its creation (Solt 1932:1).

Solt's report included future uses for the recently developed high frequency direction finder:

In order that the mass of valuable data obtained as a result of this work might be used to the greatest advantage by those concerned, the writer is compiling a text describing in detail the characteristics, limitations, and application of the various types of high frequency radio direction finding equipment which, in the event of war, could be used to excellent advantage against an enemy in locating secret radio stations which would most certainly exist for espionage purposes (Solt 1932:2).

Solt also incorporated the obvious benefits of such equipment in combating smuggling which, in the years this equipment had been developed, had led to the knowledge that "many rummies dealt not only in liquor, but also in Swiss watches, French perfume, contraceptives, firearms, and ammunition for Cuban revolutionists, and aliens" (Willoughby 1964:113). The techniques and equipment were proven to have further effect after the repeal of prohibition in 1933. An example was when "In 1936 the Coast Guard had begun to cooperate with the Bureaus of Customs and Narcotics to suppress the smuggling of illegal drugs into the United States" (Mowry 2012:29).

A big part of what this equipment and methodology was capable of accomplishing was put into effect with the outbreak of the Second World War in Europe. The United States Coast Guard was initially tasked with keeping the country's neutrality. Its expected duties included "the sealing of communications equipment on all belligerent vessels entering U. S. ports and the prevention of communications concerning shipping of the movement of belligerent ships,

communications which would compromise the neutrality of the United States” (Mowry 2012:30). Some of these communications were similar to the ciphers used by rumrunners in the years prior. When decrypted, the communications turned out to be those of Axis agents. The methods and equipment developed and practiced during the Rum War came to be a large part of the Coast Guard’s contribution during the Second World War (Farley 1942).

The use of radio by the rumrunners, and the resulting development of radio finding equipment by the United States Coast Guard, is a great example of Hegel’s dialectic at work. Before Prohibition the Coast Guard had no reason to develop or employ radio direction finders. With the steady use of radio by rumrunners it became a near necessity to get a lock on the location of a rumrunner ship in very large bodies of water. This task was nearly impossible through only visual methods. Thus, through the conflict of the Prohibition Era, developments in radio and radio directional finding equipment took place.

CHAPTER FOUR: THE CONTRIBUTIONS OF ANDREW HIGGINS

Details on developments in ship innovations during the Prohibition Era are not easily come by due to a number of reasons (as discussed in Chapter Six: Further Studies). Many new technologies came about from individuals wanting to keep their companies open during the hard times of recession and the Great Depression. One such person was Andrew Higgins (Figure 18). Higgins was a New Orleans native who built boats mainly for the lumber exportation and importation business out of Louisiana (Strahan 1994:15). The boats designed by Higgins Industries had design roots in American Prohibition and greatly inspired the later designs of Higgins' company during the Second World War. Two of these designs, the PT Boat and the Higgins Boat, are great examples of technology developed due to economic factors and the conflict between rumrunners and the United States Coast Guard during Prohibition. In this chapter, each of these vessels will be discussed in length including the history of these innovations and their uses.



Figure 18. Andrew Jackson Higgins onboard a Higgins Industries constructed PT Boat (Strahan 1994:Frontispiece).

The PT Boat

Prohibition may not have been directly responsible for the development of a vessel that could serve as a torpedo platform, but it did play a role in the effect and superiority that American Patrol Torpedo, or PT Boats, had during World War II (Bulkley 2003:489-509). This section will show how the economics of Prohibition, as well as the need for fast craft on the part of the rumrunners, led to the Higgins-made PT Boat. Included in this section is also a brief history that displays the importance of the torpedo in modern naval warfare, specifically a craft design needed to deliver a torpedo payload that was developed alongside the ordnance.

The development of large armored vessels at the turn of the 20th century resulted in the need for weapons capable of destroying them. The self-propelled torpedo was a weapon capable of destroying a ship that had been in one form of development or another since the 19th century. The torpedo was showcased during the Russo-Japanese War, which has been called “the first great war of the 20th century,” when both Imperial and Japanese navies launched nearly 300 self-propelled torpedoes (Olender 2010:233). Despite their heavy use, the weapons only sank one battleship, two armored cruisers, and two destroyers. Most other ships were sunk during the conflict by gunfire, mines, and scuttling (Olender 2010:234-236). Despite this relatively small percentage of successful uses of the weapons relative to the 80 or so vessels that were sunk in action during the conflict, the torpedo was recognized as having potential during the battle of Tsushima in May of 1905. After silencing the Russian flagship *Knyaz Suvorov* with 12 inch guns, Admiral Togo ordered torpedo boat destroyers to finish the battleship so that the Japanese fleet could pursue the fleeing Russian Navy. After the Japanese launched a total of twenty-one torpedoes, the pre-dreadnaught Russian vessel was damaged below the waterline enough to sink it, killing over 900 crew members in the process (Olender 2010:225-235).

The Japanese ships that sank the Russian flagship were considered full size destroyers. Most ships of this time were constructed with deep draft hulls to allow enough structure to carry the large guns that were the popular forms of ordnance during this period in warfare. With the recognition of what the torpedo could do against even the largest ships, as shown during the sinking of *Knyaz Suvorov*, many navies began looking into arming smaller and faster motor boats with the developing technology. Italy was the first nation to combine the technology of torpedoes and motor boats shortly before the outbreak of World War One:

They were of a ten-ton design and were 52 feet long. By 1916, the Italian boats were from 50 to 69 feet in length, carried from two to four small torpedoes and one or two machine guns. In general, they were capable of a speed of about 33 knots and had little freeboard. To enable them to approach their objective in silence, they were equipped with two electric motors furnished with storage batteries. These motor torpedo anti-submarine boats, MAS as the Italians called them, were used for attacking surface vessels and submarines, for coastal reconnaissance, escorting seaplanes and mine sweeping (Electric Boat Company 2010:3).

The Italians continued development of fast vessels capable of launching torpedoes through World War One. These vessels proved their worth in terms of harassing Austria's maritime trade and communications, even during their first action:

...in the form of a raid on the night of June 6th, 1916, on the Bay of Durazzo, carried out by two MAS's from a Brindisi base. The boats were supported by destroyers which towed them most of the way. In the bay, they sighted a large steamer, the *Lukrum*, at anchor. One torpedo was fired resulting in the sinking of that vessel. During that night the Austrians did not discover the presence of the MAS and thus they were uncertain as to the method by which the *Lukrum* was destroyed (Electric Boat Company 2010:3).

The Italians continued their success using the MAS (Figure 19) against the Austrians through further raids in the Adriatic, with "the most notable successes being the sinking of the light cruiser *Wien* at Trieste on December 9, 1917, and the sinking of the battleship *Szent István* in the Straits of Otranto on June 8, 1918" (Bulkley 2003:40).



Figure 19. The Italian Navy Motorbarca Anti-Sommergibile or MAS. This particular drawing is of MAS 15, which along with MAS 21 attacked and sank *Szent István*, one of the largest battleships in the Austro-Hungarian fleet as it lay at anchor near Premuda Island, Croatia. (Art Courtesy of Joseph Hinds, 2014).

The British paralleled the success of the Italians in terms of developing more modernized small craft capable of delivering a torpedo payload. These were built by Thornycroft in 1915 and known as coastal motor boats, or CMB's (Figure 20), of which Thornycroft made two different models. One was forty feet long and capable of speeds up to 33.5 knots. The other was a 55-footer. There were plans made for a seventy foot vessel had the war continued past the fall of 1919. These boats functioned not only as vessels capable of making torpedo attacks, but also were capable of laying mines, smokescreens, and the rescuing of downed pilots during the war (Bulkley 2003:40).

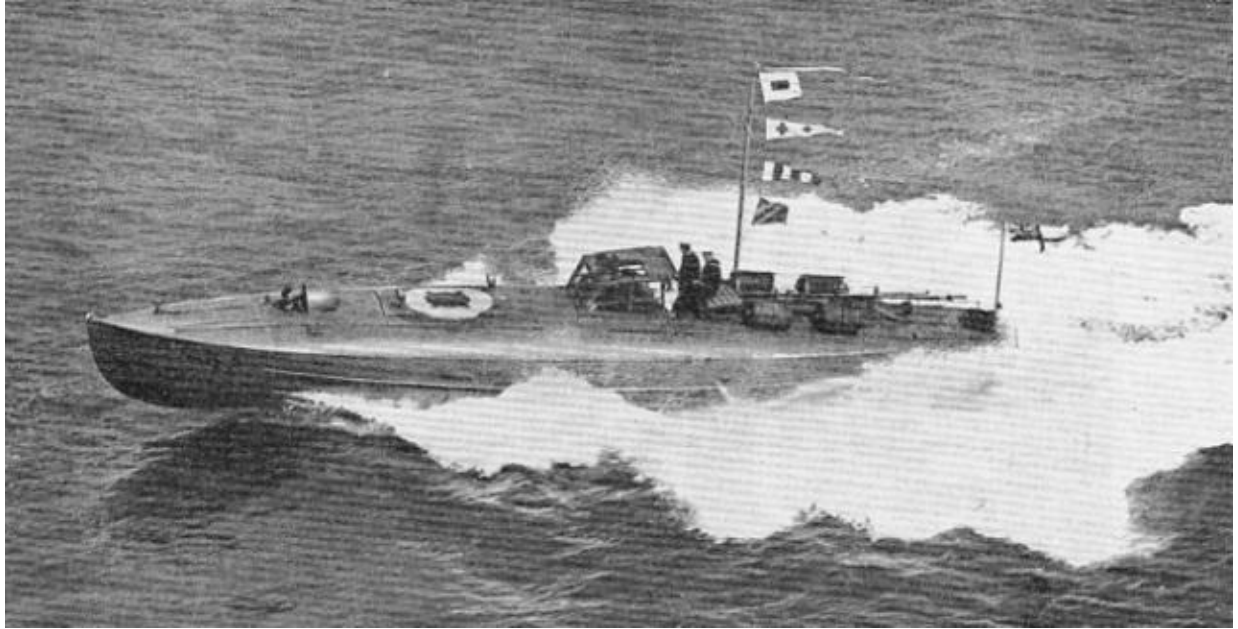


Figure 20. A 55 foot Thornycroft Coastal Motor Boat (Winchester 1936:529).

America, with its advantage of geographical isolation, had very little need for fast, short ranged ships capable of delivering torpedoes during the First World War. Torpedo armed motor boats were mainly being used to strike against maritime shipping in Europe and the only thing coming close enough to American shores for such boats to target was the occasional German U-boat. However, due to inquiries as to their possible uses, the American Navy still experimented with the technology of torpedo motor boats between the First and Second World Wars (Electric Boat Company 2010:44).

Various efforts were made by the Navy Department between 1915 and 1917 to acquire or test torpedo motor boats, none of which were deemed acceptable (Buckley 2003:41). In 1920, the American Navy purchased from the Britain two Thornycroft CMB's; a 55-footer and a 40-footer. The American Navy still did not put plans for a torpedo motor boat into production despite the usage of these craft until 1930 and 1934, respectively.

The opposite could be said in regards to foreign production of torpedo motor boats. The demand in Europe for the fast boats was consistently high and the technology was also always improving. Eventually, the Royal Navy settled on one type of CMB. These were the Vosper 70-foot boats that were the mainstay torpedo boat of the Royal Navy and were developed by Hubert Scott-Paine and the British Powerboat Company. These boats even saw production in the United States as part of the lend-lease program during the early stages of World War II, even though they were never picked up for production by the United States Navy (Buckley 2003:42).

Foreign interests in the design of torpedo motor boats continued to increase the interests of the United States. In 1936, this led to the Chief of the Bureau of Construction and Repair, Rear Admiral Emory S. Land, writing a letter to the Chief of Naval Operations in regards to possible uses of such craft:

Developments since the War of the motor-torpedo-boat type, then known as Coastal Motor Boats, have been continuous and marked in most European Navies... The results being obtained in the foreign services are such as to indicate vessels of considerable military effectiveness for the defense of local areas, are being built the possibilities of which should not be allowed to go unexplored in our service. It is, of course, recognized that the general strategic situation in this country is entirely different from that in Europe, so that motor torpedo boats could not in all probability be used offensively by us. It appears very probable, however, that the type might very well be used to release for offensive service ships otherwise unavoidably assigned to guard important geographic points such as an advance base itself. If the department concurs this Bureau suggests the inauguration of an experimental program for such boats and will endeavor to have included in its appropriations for experimental work, funds for the construction of two boats each year, preferably one by contract on designs of private naval architects and one from Departmental designs (Tredinnick and Bennett 1946:420-14).

After these recommendations being given to the Secretary of the Navy, they were eventually approved by the General Board with the agreement that the geographic isolationism of the United States decreased the importance of such vessels. However, it was viewed that “future situations can occur under which it would be possible for such small craft to be used on directly

offensive missions- as is no doubt contemplated in certain foreign navies” (Tredinnick and Bennett 1946:420-14, 407).

In order to determine a design which could be the most effective, the Navy publicly invited ship designers to engage in a contest and submit their designs for several different types of vessels. Among the vessel types requested were plans for a large motor torpedo boat, with the criteria for design consisting of “an overall length of 70 feet, not to exceed 80 feet; trial speed of 40 knots; minimum radius of 275 miles at top speed and 550 miles at cruising speed (along with) Armament (that was) to include at least two 21-inch torpedoes, four depth charges, and two .50-caliber machineguns” (Buckley 2003:44). When the final results were released in March of 1939, it was announced that the winners of the 70-foot class were sailboat builders Sparkman and Stephens. This design, designated by the Navy to be Patrol Torpedo or “PT,” was then contracted out to various other naval architectural companies for improvements on the design as well as production.

The first company to receive a contract for the Sparkman and Stephens design was Higgins Industry. Andrew Higgins accomplished this by turning in the lowest bid, seeing “the chance to build the 81-foot Sparkman and Stephens model as the opportunity that he needed” to establish ties to future Navy contracts (Strahan 1994:42). Higgins, who was happy to be awarded the contract, set to looking over the designs of the craft. After recognizing flaws in the design and reporting them even before building the craft, Higgins was told by the Navy Department to follow the designs without modifications. Tests of the first craft built by Higgins Industries resulted in “the objectionable characteristics and performance we (Higgins Industry) had prophesized” (Navy Department Price Adjustment Board 1943:49). Never one to let bureaucracy stop innovation and good craftsmanship, Higgins promptly set about building a modified version

of the Sparkman and Stephens design. This craft was built utilizing the resources and capital of Higgins and “when it was delivered in February 1941, it was a Higgins design rather than a modified Sparkman and Stephens, and was accepted enthusiastically by operating personnel, many of whom considered it superior to any previous type” (Bulkley 2003: 49).

Higgins was able to accomplish the redesign of the Sparkman and Stephens while still designing several other craft that Higgins hoped might help to acquire Navy contracts at the same time, including the later discussed Eureka design, due to Higgins Industries’ familiarity with the type of craft they were contracted to build with the PT boat. This knowledge was a direct result of the company’s involvement with rumrunners during Prohibition. In the words of Andrew Higgins:

During the Prohibition Era we (Higgins Industries) had opportunities of having a free hand for the design of fast boats, boats that would be strong and seaworthy, yet as light as possible to obtain maximum speed, the boats at the same time to have weight carrying capacity and ability, the type of boat that would have a long cruising radius and at the same time be of such shallow draft as to operate in shoal waters or make entrances into estuaries infrequently navigated (Navy Department Price Adjustment Board 1943:46).

In as close to a confession as even someone as brash as Andrew Higgins dared to allow themselves when presenting before the authority of a branch of the United States military, Higgins was admitting to the low design costs, quick production turnaround, and high quality of the PT boat designed by Higgins Industries being a direct result of the company’s collective experiences in designing craft for rum-running during the Prohibition Era.

After further testing and reviews, the United States Navy made an effort at the standardization of the PT boat (Figure 21). Most of the standardizations were pulled from ideas gleaned from a series of tests known as the Plywood Derby, consisting of testing PT designs through a 190-mile full throttle sea trial. The standardizations were “the boats were to be powered by three Packard engines equipped with silencing mufflers (and) their length was not to

be less than seventy-five feet or over eighty-two feet” (Bulkley 2003:92). During the Plywood Derby Higgins Industries had entered the 76-foot PT 70, which finished with the second highest average speed behind Elco’s PT 21. Both boats were considered to be even despite the speed difference due to the “77-foot Elcos (running) the roughest” during the trials (Bulkley 2003:55).



Figure 21. The Elco built 77-foot PT 34. PT 34 was assigned to MTB Squadron 3 and was one of six PT boats that were in service when the United States entered the Second World War in December of 1941. (Art Courtesy of Joseph Hinds, 2014).

Higgins Industries eventually was allowed to submit another bid to build PT boats for the Navy. Higgins built 24 boats, while another company named Huckins manufactured 8. However, with both of these companies being smaller and with the United States officially entering World War II, Elco was also awarded a contract due to their ability for large-scale production for 36 boats. Once given official contracts, both Elco and Higgins changed their initial designs for the production of PT boats in interesting ways, according to Ted Sprague, one of Higgins Industries top engineers:

We went to a boat that wasn’t quite so beamy, was stronger, was steeper, and heavier. Elco went to a boat that was more like that 76-footer [of Higgins] than their previous boat. You’d swear somebody must have gone in there and taken the lines off the [Higgins] boat which isn’t that hard to do when you know how and used that for their design. Of course who would ever admit it. Though I think Mr. Higgins suspected it. I went to Elco’s yard when we took PT 71 and 72 up to Melville. We stopped at Bayonne and I went through Elco’s yard there. It sure looked to me like our 76-foot hull. At any rate that’s all fair. We went one way [with the design] and they went the other (Strahan 1994:92).

Whether this was simply Sprague's opinion or fact, Elco put their newly-designed PT boats into service in 1942, followed shortly by Higgins Industries' PT boats a few months later (Figure 22). Huckins produced their PTs into service last and, eventually, lost out on their contract due to the standardization and quality of both Elco's and Higgins' PT boats.



Figure 22. PT Boats being assembled at Higgins' City Park Plant (Strahan 1994:123).

The PT boat had a very illustrious career filling many roles that the United States Navy required of it during World War II. By the end of the war in 1945, there were 30 squadrons of PT boats in commission. The versatility of this boat showed in the numerous operations that were asked of it:

PT's met the Tokyo Express at Guadalcanal. They cut enemy barge supply lines in the upper Solomons and along the New Guinea coast. They torpedoed German cargo lighters in the Mediterranean, and overcame E-boats in gunnery duels in the English Channel. They contributed to the rout of Japanese task forces in the Battle of Surigao Strait, and successfully countered vicious Kamikaze attacks at Mindoro. Under cover of darkness they freely landed agents, scouts, and reconnaissance parties throughout the Solomons, New Guinea, and the Philippines, and on the coast of France and Italy. PT's were in more frequent contact with the enemy, and at closer range, than any other type of surface craft. They specialized in close-range, close-to-shore attack, and everywhere demonstrated that they could hurt the enemy with proportionately small damage to themselves (Bulkley 2003:2).

In a reflection of the ideas of the dialectic, this superior design in vessel construction was a direct result of the experiences gained from the conflict between rumrunners and the United States Coast Guard. Higgins industries was prepared to design a boat meeting the specifications listed by the Navy for the PT's due to their prior involvement with constructing craft for use specifically during Prohibition, which evolved to the design used for the Navy's standardized PT boat during World War II (Figure 23).



Figure 23. The Higgins built 78-footer PT 84 (Bulkley 2003:57).

The Higgins Boat

The transporting of large numbers of personnel directly to shore has been a problem since vessels were created large enough to be able to deliver great numbers of people. Issues of having such a craft arise, such as the need for a shallow draft and a means to propel the vessel through the shallow water (Krulak 1984:92). Even the launches of sailing ships had a hard time getting personnel to shore through unfavorable conditions such as oceanic waves and river currents. Modern motor boats even suffer from problems of grounding in shallow waters due to prop placement or even from the shape of their hull. The condition of the shore itself could compound the problem of getting personnel ashore, resulting in the need for a dock to transcend past tough terrain. As can be imagined, all of these problems become even more strenuous and difficult during times of war in any era (Krulak 1984:73). Despite advances in technology, infantry remains the backbone of the military force of any nation. Getting these personnel to where they are needed most, especially in terms of amphibious landings, has never been an easy process. Doing it in the era of concepts such as advanced artillery, combat air support, and other notions of modern warfare simply increases the difficulty of the operation (Alexander 2006:198). The problem of having the means of landing modern infantry directly onto a hostile shoreline in the face of adversity as safely and efficiently as possible in the early onset of the modern era was solved by a creation of New Orleans resident Andrew Higgins (Krulak 1984:98-99). The design of the vessel able to accomplish this task was the Landing Craft, Vehicle, Personnel (LCVP), also referred to as the Higgins Boat.

The design process of the LCVP stems from the Prohibition Era, as will be shown later in this chapter. However, to fully understand the importance of such a ship it is necessary to take a look at its place in history. While the LCVP's utilization during World War II makes it easy to

summarize it simply as a “ship as an element in a military...system,” its purpose represents more than that (Muckelroy 1978:216). Doing this requires “going beyond functional and systems analyses to achieve fuller explanations of the roles of ships in a broader social context (that) necessitates invoking the ship as a symbol” (Adams 2013:22). In order to view the LCV properly as the symbol it is means looking at the mentality that it helped to change by exploring the history of the landing craft that came before it.

The operation of landing troops via ships onto a hostile shore goes back to ancient times. In the Iliad, Homer speaks of Greek troops landing onshore after crossing the Aegean Sea in their war with Troy around 1200 BC. Several hundred years after that in 490 BC, Persian invaders used the concept of amphibious warfare against the Greeks during the landings in the Bay of Marathon (Holland 2005:168). Marine landings became less common during the Medieval era. Norse raiders out of Northern Europe were perhaps some of the best at applying the concept of landing troops ashore during this time period (Graham-Campbell 2013:20-21).

While some of the amphibious landings during ancient times were made in the face of opposition, none of them were done while facing down modern enemy artillery. The invention and application of gunpowder into combat is considered to be the moment that ushered in the concept of early modern warfare. This era, known as gunpowder warfare, also corresponds with the Age of Sail. Ships, along with the cannon they carried, began to evolve together into more formidable weapons of war (Archer et al. 2002:217-219). In response to this mobile threat, nations built constructs such as octagonal forts and coastal batteries to prevent ports of strategic importance from the dangers of a sea invasion.

The British Empire began to show its dominance in naval warfare during this time period. Due to the geographic isolation of the British Isles in relation to other European countries,

Britain could afford to invest more heavily into its navy than other nations. The amount of personnel that was available with the necessity of a smaller army to defend the islands and the readily available number of trained seamen due to life on an island were a large part of these investments (Lambert 2005:126-127). These resources, along with some of the most brilliant and inventive naval tacticians of the day, resulted in a very effective navy and doctrine. This included concepts such as improved health awareness and ships being re-victualled at sea (Macdonald 2006). Navigation at sea also became more of a science than an art, greatly increasing the effectiveness of a navy when planning alongside the more predictable timeframe of troops moving on land.

Britain's high quality naval doctrine soon resulted in the concept that once again troops could make land assaults from the water despite the advances in military ordinance. This was put into practice by William Pitt during the Seven Years War in a series of offensives made in the Americas during the years 1757-1759. It was Pitt's objective during this time to stretch French and Canadian resources to a breaking point by advancing along lakes and inland waterways from the Atlantic Seaboard toward the Ohio. Pitt also used these assaults to test how much of an advantage Britain had in "superior sea-based logistics and larger forces" (Lambert, 2005:119). While not every effort made by Pitt during this time was successful, the belief stood that the landings of troops ashore could still be accomplished and British tactics of amphibious warfare continued to develop.

One of the developments that came about during this time was specialist flat-bottom boats to be developed and used for landing large numbers of troops and cargo ashore with open-beach embarkation methods (Foster 1998:14). The development of the flat-bottomed boats produced two types of beach landing craft that were, essentially, the same with differences in

dimensions. The larger of the two, which was 36 feet in length, 10 feet 2 inches in the beam and with a crew of twenty oarsmen, was ideal for cargo transportation but could carry up to sixty personnel. The other design was slightly smaller at 30 feet and required a crew of sixteen oarsmen. This smaller design could carry forty personnel (Harding 1989:37). These boats, along with constantly evolving strategies to make amphibious warfare more successful, continued developing even after the end of the Age of Sail.

The onset of the Industrial Age saw its share of amphibious warfare. During the American Civil War, Union troops made several landings on Confederate shores (Anderson 1962:11-21). However, no specialized craft were used. The opposite held true during the War of the Pacific in 1879. Several times, Chilean forces used amphibious techniques to get their troops ashore. In November of 1879, Chilean forces successfully took the city of Pisagua from a combination of Peruvian and Bolivian defenders. This was accomplished through a combination of artillery support from Navy ships bombarding the forces while open oared vessels landed troops and sappers to clear the beach for future waves of infantry. The unfortunate side of this was that due to the shape of the vessels, troops were forced to disembark in waist deep water and walk to shore while under fire. Later during the war in 1881, Chilean forces, having learned from prior efforts, utilized special purpose built flat-bottomed boats in their actions to take Lima. These thirty six boats were capable of delivering troops right up to the beach and “able to land three thousand men and twelve guns in a single wave” (Farcau 2000:159).

The First World War also saw its share of amphibious operations. One of the areas of the war where amphibious warfare saw the most developments was during the Battle of Gallipoli in 1915. The Gallipoli Peninsula belonged to what was then the Ottoman Empire and formed the northern edge of the Dardanelles, which was a straight used by the Russian Empire. Britain and

France invaded the peninsula in an attempt to keep those straights open so their Russian allies could continue to provide naval support and supplies. This resulted in an invasion which is considered to be the first modern amphibious landing, consisting of the combined forces of ground, sea, and air efforts (Aspinall-Oglander 1992:25-30).

Troops were landed during the initial operations in Gallipoli via unmodified rowboats which, as can be imagined, were very vulnerable to fire from the shore. Work began on developing purpose-built landing craft, but until their production some ideas were put into place. One concept was the modification of *River Clyde*, a collier that was used in the landing at Cape Helles. Openings were cut on the ship and gangways created to allow troops to move from the hull and on to a bridge of smaller boats. Sandbags were stacked to create a protective barrier for eleven machine guns that were staffed by Royal Air Navy Service troops on the bow boiler plate (Alexander 1997:10-12).

On the morning of April 25, 1915, British aircraft from *Ark Royal* began to bombard the shoreline and Ottoman defenses. They also reported back targets via radio and light signals for naval bombardment. The first troops to arrive on shore were from the 1st Battalion, a company of Royal Dubliner Fusiliers. This company arrived via vessels that were towed or rowed onto shore. These vessels came under heavy fire from the shore almost immediately and casualties were high. Eventually *River Clyde* arrived with the remainder of the invasion force and grounded before the tows that had carried the 1st Battalion ashore. Once the modified collier was in place, the plan called for the flat-bottomed steam hopper *Argyll* to beach in front of *River Clyde* to act as a floating bridge (Figure 24). *Argyll* ended up beaching itself parallel to the beach and was no help in transporting troops ashore. In response to this, the captain of *River Clyde*, Commander Edward Unwin, placed three lighters between the troop carrying collier and the shore as an

attempt to bridge the ship to the mainland. This allowed some platoons to get to shore, but many were victims to the shore defenses or from simply drowning after falling off the makeshift bridge and into the water with heavy equipment. The efforts were so poor in taking the shore that, eventually, further actions were postponed until dark, leaving *River Clyde* as a target for shore defenses. Eventually, through further attempts, the beach was taken and *River Clyde* became a source of fresh water and a field dressing station throughout the rest of the invasion (Hart 2011:1-22, 157).



Figure 24. *River Clyde* beached at Gallipoli (Courtesy of the National Army Museum, London, England, 1915).

The cost in lives to take the beach at Gallipoli set the British to designing purpose-built craft for the carrying of troops from ship to shore. These craft had a spoon-shaped bow for taking beaches, along with a drop down front ramp to allow for the quick disembarkment of troops, and bulletproof sides. These boats were known as 'X' lighters, but soon were nicknamed by soldiers as "beetles." The lighters were based on London barges and had similar dimensions of 105 feet six inches length, 21 feet in beam, and a draught of seven feet six inches (Figure 25). They were capable of self propulsion of five to seven knots and could carry five hundred troops (Friedman 2014:214).

The 'X' Lighters first saw action towards the end of the Gallipoli campaign at the Landing at Sulva Bay in August of 1915. A fleet of "Beetles" were to be under the command of Commander Edwin Unwin, formerly of *River Clyde*. Unwin was tasked with getting IX Corps to the shore of Sulva Bay. This operation met with disaster virtually from the start, with the destroyers deploying the force unloading the boats in the wrong location, resulting in the groundings of 'X' Lighters in the shoals, forcing the troops within to wade to the beach in water up to their necks. The landing was total chaos amplified by the fact that the operation was done at night (Nevinson 1919:392-340). Despite the failure of the Landing at Sulva Bay, the concept of the 'X' Lighters as purpose-built craft for the landing of troops during amphibious operations proved to be a useful one (Friedman 2014:214).



Figure 25. An 'X' Lighter bringing troops ashore at Mudros, Lemnos in 1915 (Courtesy of Library of Congress, Washinton, D.C.).

Unfortunately, the failures during the actions at Gallipoli left many believing that amphibious assaults in the modern age were considered impossible in the face of shoreline defenses. This belief only grew during the time period between the First and Second World Wars and it:

Emphasized that amphibious assaults must be essentially like the innumerable failed frontal assaults on the Western Front 1914-1918, because inherently an amphibious assault must be a head on attack and not a flanking maneuver. An amphibious assault would be yet more hopeless than attacks on the old Western Front because of the necessity to attack out of the water, with soldiers' movement impeded and even minor wounds likely to result in death by drowning (Krause and Phillips 2005:393-396).

This paradigm of thought had a direct effect on the planning of Operation Overlord: the plan to invade German occupied Normandy in 1944. Further enhancing the effect of “Gallipoli syndrome” was that:

The only amphibious assaults of that time in World War II that had contended against serious resistance on the beaches were Salerno in Italy on 9 September and Tarawa in the Gilbert Islands in the Pacific on 20 November 1943; both had brushed uncomfortably close to failure. Neither Salerno nor Tarawa had presented defenses nearly so formidable as those with which the Germans would guard the northwest coast of France by the Spring of 1944 (Krause and Phillips 2005:396).

Nevertheless Operation Overlord became an undertaking of necessity with the Allies needing to get a foothold somewhere within “Fortress Europe” if there was to be any success against the Germans. As a result of this Overlord took a considerable amount of planning.

A large portion of Operation Overlord consisted of landing troops onto the beaches of Normandy in the face of heavy adversity. Carrying out an amphibious assault as efficiently and safely as possible in the age of modern warfare, as noted previously, posed quite a few problems. The largest of these issues is having a vessel capable of dropping infantry and vehicles directly onto the beach without leaving them in deep waters or stranding the vessel itself. Thankfully, the United States Marine Corps already had such a vessel in the LCVP (Krulak 1984:98-99). This vessel was capable of carrying large numbers of infantry, vehicles, or supplies and depositing them directly onto a hostile beach. The Higgins boat, which was capable of 12 knots, was 36 feet 3 inches in length, 10 feet 10 inches in beam, and only had a draft of 3 feet 3 inches aft and 2 feet 2 inches at the bow (United States Navy 1944). It could hold up to 36 troops and, after depositing those on the beach via the boat’s bow ramp, the Higgins boat could then reverse itself off of the beach and return to continue its mission goals. However, the design for this vessel did not happen overnight. It was the result of ingenuity and the tenacious, hard work of both its designer

Andrew Higgins and Higgins Industries that had spanned decades and has its origins deep in America's Prohibition Era.

Part of the legacy of Andrew Higgins is the sturdy and reliable work boats that Higgins and Higgins Industries designed and built. One early example of these kinds of craft is what Higgins called the Eureka (Figure 26), which was created out of the necessity and demand of companies that worked within the swamps and bayous of Louisiana. These companies were in the businesses of the fur trade and oil refining, both lucrative trades in the early 1930s. Their needs to reach either their traps or the rich oil deposits found deep within the Louisiana marshes inspired Higgins to design a boat capable of traversing over fallen trees, sandbars, and thick vegetation. These craft needed to have a shallow draft, be rugged, safe and durable while carrying both personnel and equipment through the hazards of Louisiana waterways (*Eureka News Bulletin* 1942:1). After several years of changing designs, the need for such a vessel resulted in Higgins Industries' spoon-billed Eureka, a boat that inspired the design for the Higgins boat that performed so famously for World War II amphibious landings.



Figure 26. Early Model Eureka Boat (Strahan 1994:119).

However, even the Eureka had a predecessor. Advertised by Higgins as “the homeliest but most efficient boat ever built,” the Wonderboat was a full-tunnel stern craft capable of navigating the harsh swamps and marshes of Louisiana. The full tunnel system allowed for the propeller and shaft to operate with a shallow draft. The only downside was that this system created a loss of power due to the aeration of the water around the propeller, an effect known as cavitation. Later models of this vessel experimented with a tunnel stern system utilizing only a semi-tunnel in an attempt to increase power (Strahan 1994:22).

The Wonderboat was an achievement in design, which allowed the company that produced it an advantage in marketing. Higgins Industries was a small business and was constantly in financial difficulties before being awarded contracts shortly before and during World War II. Higgins solved this problem through Higgins Industries creation of desirable workboats, one of which was the aforementioned Wonderboat. The Wonderboat was purchased by the Biological Survey Agency and the Corps of Engineers for their use in undeveloped waterways, but those small contracts proved not to be enough to keep the company out of financial straits. Higgins needed a larger contract to keep Higgins Industries going (Strahan 1994:24-27).

Higgins found this contract by gaining the United States Coast Guard as a customer. Higgins approached the Coast Guard in the early 1930s with notions of advertising the Wonderboat as a craft capable of patrolling anywhere within the Gulf of Mexico. It was found that “After testing the craft, ... (the United States Coast Guard) agreed that the Higgins boat would give it a decisive advantage over the increasing number of rumrunners operating in the coastal waters” (Strahan 1994:26). Higgins was never completely satisfied with the Wonderboat

and knew that constantly evolving it would take considerable funds. These funds were acquired by selling to both sides of the conflict during the Prohibition Era:

With the Coast Guard as a customer, Higgins approached the smugglers. He suggested that now that the Coast Guard had new, faster patrol boats they too needed a better craft. He assured them that he could design and produce a boat capable of keeping the rum flowing. Later, Higgins returned to the Coast Guard, recommending that it replace the Wonderboat with a newer, faster model (Strahan 1994:26).

This worked well for Higgins Industries. The cost of the Wonderboat seemed too steep due to the limited budgets of most companies at the time. By selling to both the Coast Guard with the United States Treasury as its backer and to the rumrunners that were making considerable profits during Prohibition, Higgins was able to keep the doors to Higgins Industries open and further develop concepts such as the ones utilized by the Wonderboat. In keeping with the ideas of the dialectic furthering innovation through conflict as well as economic factors present in Prohibition, Higgins Industries was able to develop ways to land personnel on shore in a highly successful manner.

One of the main unique features of Higgins' Wonderboat development was the design of the bow. Rather than utilizing a standard pointed bow, the Wonderboat showcased a curved piece of pine shaped by hand that formed a solid block known as a head-log. This head-log included holes that were drilled into it that were filled by wooden pegs and loaded with marine glue, increasing the strength of the bow. This essentially acted as a bumper for the front of the boat, allowing it to traverse difficult waterways and obstacles in the water with ease (*Eureka News Bulletin* 1942: 2).

The change in the bow of the Wonderboat also resulted in a difference in the amount of aerated water under the front of the craft. The head-log essentially increased the amount of aerated water under the bow and reduced the amount of friction against the craft while it was

moving in the water. This increased the amount of speed the craft was capable of achieving. It also increased the vessel's ability to turn sharply. This was a plus in regards to amphibious operations as well as "Once the craft had retracted itself from the beach and reached deep water, its engines could be reversed so it could turn swiftly enough to face the next wave" (Strahan 1994: 22). This had been a problem in prior craft that were not turned in time and often caught an incoming wave while parallel rather than perpendicular to it, which often resulted in capsizing.

Of course, with a greater amount of aeration caused by the new design in the bow, the ever-evolving Wonderboat ran the risk of too much cavitation when this aerated water reached the propeller. Solving this problem was the main focus of the designers working to improve the Wonderboat. The solution to this issue came about quite by accident. Two metal plates had been pulled out of the molding floor of one of the Wonderboats in production. This went unnoticed by the foreman on duty and the distortion of the shape of the boat resulted in a reverse curve aft and a "V" section at midship. After the ensuing tirade that Higgins threw upon seeing the mistake, he still ordered that the boat be completed. Strangely enough, the accident in fabricating caused the problem of cavitation to be fixed and increased the speed of the craft to over twenty miles per hour. The new shape of the hull caused the aerated water being created by the head-log to be forced out while more solid water was brought in midship and over the propeller. Higgins felt the name Eureka fit the new design better with the difference in shape than the original Wonderboat (Oakes 1944:13).

The performance of the Eureka was remarkable. Due to its design, it was efficient with power and able to travel over objects and through vegetation in waterways for extended periods of time. Of course, with such groundbreaking design and innovation Higgins faced doubters:

Higgins occasionally had Andrew, Jr. (Higgins' son) take such doubters out on Lake Pontchartrain and through a test course in which a Eureka would jump floating logs, turn in its own length while at full speed, and then finish by running up the step-type concrete sea wall of the lake (Strahan 1994:24).

For nearly every doubter in its abilities, the Eureka craft had its supporters. Higgins was able to sell the craft to Oil companies working all through Mexico, the East Indies, Columbia, and the Amazon River (Strahan 1994:24).

The United States Marine Corps was included in the group of Eureka supporters. The Marine Corps mission was being responsible for the deployment of the concept of an Advanced Base force, but they were having trouble moving equipment and personnel onto what were often undeveloped beaches. Military exercises in the early 1920s utilizing the "Beetle Boat" only further proved the problem:

That our landing craft had not advanced far beyond what it was during the Revolutionary War. It was still a matter of manhandling what could be manhandled over the sides of conventional Navy ships' boats- whose hull design had not changed materially for more than forty years- or just doing without until a harbor became available (Krulak 1984:90).

Ship to shore transportation was still a problem within the Marine Corps, thanks to a shortened budget and lingering Gallipoli syndrome, and they looked to Andrew Higgins and the Eureka to solve it. Higgins, who was already trying to get naval contracts and having to deal with the bureaucracy of those processes with the United States Navy, was more than happy to do business with the Marines:

The Marines first saw the Eureka in 1934 and perceived it to be a big step toward what they were seeking. They quickly formed a pact with Higgins, an alliance fertilized by their mutual impatience with the Navy's Bureau of Construction and Repair (later Bureau of Ships) for what they saw as its dilatory approach to the landing craft problem. Pressure generated by that alliance resulted in the Navy's cautious purchase, in late 1937, of just one of Higgins's boats (Krulak 1984:92).

After tests of the craft, the Navy ordered five more Eureka craft for further testing. These performed quite well during the Marine trials they endured during exercises in the Caribbean,

warranting the commanding officer of the Marines, Major General Holland M. Smith, to say in regards to future amphibious landings “If we had 300 of those boats and the ships to carry them, we’d be in business” (Krulak 1984: 94).

Ideas of Marine Corps Lieutenant Victor Krulak, gained from witnessing the Japanese amphibious assault at the mouth of the Yangtze River in September of 1937 (Figure 27), added to the improvements of the Eureka. Here Krulak saw:

In action, exactly what the Marines had been looking for- sturdy, ramp-bow-type boats capable of transporting heavy vehicles and depositing them directly on the beaches (Krulak 1984: 90).



Figure 27. Japanese landing craft with a ramp-type bow landing troops at the mouth of the Yangtze River in 1937 (Krulak 1984:91).

By March of 1941, Krulak found himself, along with Major Linert of the Equipment Board, in the offices of Higgins explaining the need for a redesigned Eureka with the bow ramp similar to

the one witnessed by Krulak in China. Higgins not only put the ramp on the Eureka, effectively creating the Landing Craft, Personnel (LCP) that was used throughout World War II, but also designed a larger version capable of transporting vehicles directly to the same beaches known as the Landing Craft, Vehicle and Personnel (LCVP) (Krulak 1984:92-95).

The LCVP became the workhorse of the United States Marine Corps during the Second World War. It saw action at every beach United States Marines took in both the European and Pacific theaters. This ingenious craft was the direct evolution from the Eureka design, which, in turn stemmed from the concepts developed in the Wonderboat design (Figure 28).



Figure 28. Models of the Eureka, LCP, and LCVP (Photo by author, 2014).

Without those developments the quality and effectiveness of the LCVP which “contributed more to our common victory (in World War II) than any other single piece of equipment” may never have come to be (Smith 1949:72). This further reinforces the idea of the LCVP as a symbol. One of the concepts behind the United States Marines philosophy is the ability to establish an Advanced Base Forward (Krulak 1984:74). This idea, which requires the possibility of an

amphibious assault as well as the moving of equipment over various shore terrain that is possibly hostile, was seen as impossible because of the events in Gallipoli in 1915. Thanks to Marine officers such as Eli Kelley Cole who “had become intensely interested in Gallipoli-what went wrong there and why,” amphibious assaults in the modern era started to become realized as a possibility again (Krulak 1974:79). The faith in the mission of the Marines as well as the design of Higgins Industries led to a shift in mentality when it came to amphibious assaults, all of which were centered on the success of the LCVP and what it represents, that:

Our (The United States Marine Corps) dreams of the true amphibious assault were, until then (success of the LCVP during tests), just dreams. Now they had become a reality. For the first time there was a reliable way to make tanks, trucks, tractors, artillery, antiaircraft weapons, and heavy engineer equipment a part of the beach assault (Krulak 1984:98).

None of this was possible without the shift in mentality due to the LCVP and its history of design.

CHAPTER FIVE: SMOKE SCREENS

Utilizing a smoke screen is a military tactic that dates back for hundreds of years. Cutting off visuals to troop, vessel, or vehicle movements is beneficial for the concealment of military maneuvers (Latimer 2001:71-74). However, early forms of creating a smoke screen were dangerous to the troops that used them due to their combustible nature, most especially at sea, where fire is always a hazard. All of this changed during American Prohibition when a rumrunner named Alonzo Patterson developed a safe method of applying a smoke screen in order to evade the Coast Guard.

Concepts for the use of smoke screens for military purpose have been around since ancient times. Examples include their use by the Greeks during the Peloponnesian War (Latimer 2001:6-14) and even propositions by Sir Thomas Cochrane of the British Royal Navy in 1812 for use as an asphyxiate against the Russians (Cordingly 2007:347). However, the first documented purposeful use of a smoke screen at sea belongs to Captain John Wilkinson of the Navy of the Confederate States of America. Captain Wilkinson was in command of the CSS *R.E. Lee* (Figure 29), a blockade runner during the American Civil War. Tasked with running supplies to and from ports all along the American southeast coastline, Wilkinson deployed numerous techniques of subterfuge to avoid the blockade the United States Navy had set in place. During one such supply run, *R.E. Lee* was pursued by USS *Iroquois* in 1863. Wilkinson successfully used the steam engine that propelled *R.E. Lee* to provide a smoke screen to hide the ship, allowing Wilkinson to escape the blockade (Wilkinson 1877:167). This manner of employing a smoke screen in order to avoid a blockade is in the same manner as those utilized during Prohibition.

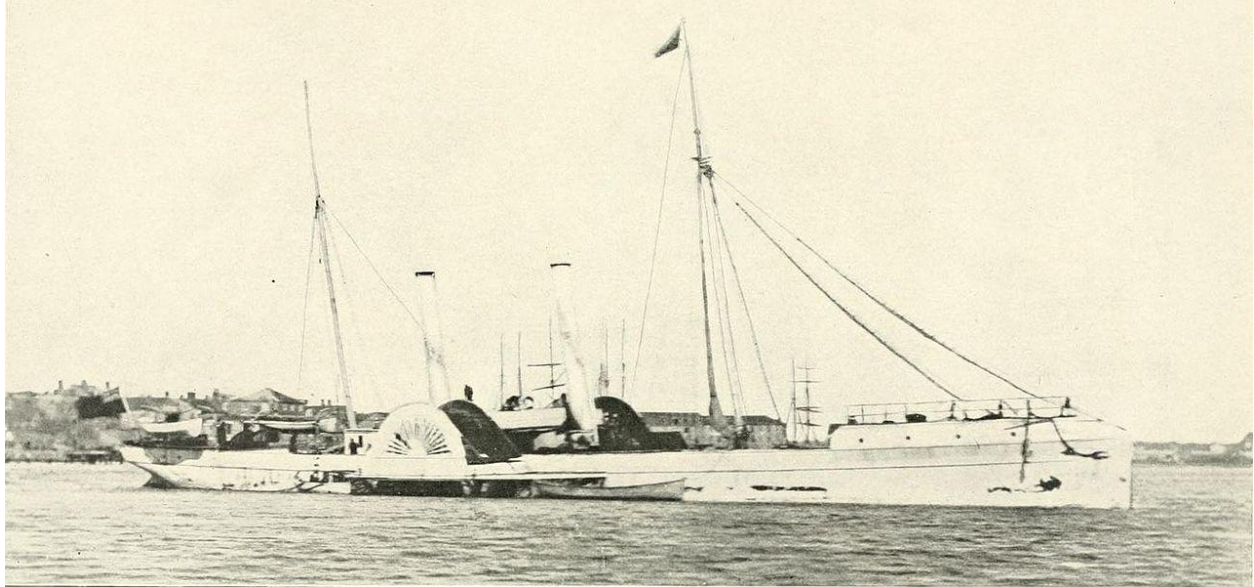


Figure 29. The blockade runner CSS *R. E. Lee* (Barnes 1911:108).

The importance of smoke in naval combat became fully realized during the closing parts of World War I. The prime example of successfully deploying a smoke screen in naval combat during this time period was during the Battle of Jutland in 1918, which was fought in the waters of the North Sea just off Denmark. During this battle, the German fleet had fallen into a trap laid by the British. In an attempt to retreat, German vessels created a smoke screen that was so thick it deterred any attempt at pursuit and further engagement by the Royal Navy. Even though both sides suffered heavy losses, neither country could claim a conclusive victory in the battle (Allen 1919:399-430; Griffiths 2003:88-89).

Until after the First World War, smoke screens were created at sea using the engines of a vessel in some manner. Ships during World War I changed the fuel-to-air ratio of their engines to create a smoke screen. The unfortunate downside to this method of creating a smoke screen is that it is hazardous to the friendly forces whose movements you are trying to obscure due to their toxic nature as they are being formed from phosphorous compounds, which could result in possible short-term, as well as long-term, health issues when inhaled. Adding to this was the

unpredictability of smoke screens created using these techniques due to differences in their consistencies and the uncontrollable movements of the smoke.

Eventually, the usefulness of smoke screens as applied to modern military efforts became internationally recognized, resulting in the funding of research and development from multiple countries (Brodie and Brodie 1973:195). Even the United States formed a Chemical Warfare Service (CWS) as a section of the Army. Although this was mainly in response to the chemical weapons utilized by the Germans during the war, the CWS also researched the application of smoke and how it affected certain battlefield scenarios (Butler 1998:7-8).

All of the issues of creating a smoke screen at sea that of a non-toxic nature to those who deployed it were solved not by those in the military, but by the rumrunners during the Prohibition Era of the United States. Alonzo Patterson, who was a native of New Orleans, was somewhat of a media darling during this time period. Patterson was a high profile trafficker of liquor, who controlled a vast network of methods and materials capable of accomplishing a considerable smuggling operation. This methodology ranged from a fleet of ships in operation within the Gulf of Mexico to bribed officials throughout Louisiana and the federal levels (Jackson 1978:273-277). Patterson was the center of a case utilizing an undercover agent that, at the time, was hailed as one of the largest liquor conspiracies ever exposed in the United States (Jackson 1978:274-276). Eventually, Patterson was brought to trial and convicted of violation of the Volstead Act, which resulted in a prison sentence. Upon release, Patterson proceeded to shoot and kill Harry Sempe, Patterson's brother-in-law. This happened during an altercation while Patterson was trying to reconcile with Mamie Patterson, Alonzo's estranged wife. No charges were ever filed, which was believed to be a result of the control Patterson had on local officials within New Orleans.

Patterson, despite colorful run-ins with the law that resulted in eventual incarceration, maintained a high degree of success rum-running during Prohibition. Part of this was due to Alonzo's development of a successful formula for creating a thick and reliable smoke screen for use by ships in Patterson's employ hoping to avoid contact with the United States Coast Guard (*Corpus Christi Caller-Times* 1941:34). The effectiveness of Patterson's smoke screen was later recalled by Captain R. M. Sykes of the Coast Guard:

The one day we thought we had Pat (Patterson) he laid down the screen and literally disappeared in smoke. We tried everything we had at the spot where we thought he'd be, but didn't score one hit. I was so damned mad I threw my .45 in the ocean! (*Corpus Christi Caller-Times* 1941:34)

This innovation is a direct result of the conflict transpiring during Prohibition. With the knowledge that the Coast Guard relied on visuals to track rumrunners, Patterson developed a working smoke screen to obscure vessels in order to evade capture. Alonzo also had made sure the formula was non-corrosive as to maintain the structural integrity of vessels under Patterson's employ which insured a favorable economic outcome to his rum-running endeavors.

Upon the repeal of Prohibition, Patterson ironically took work as a customs agent and utilized knowledge of the local waters as a navigator in pursuit of smugglers continuing to bring in liquor to avoid taxes. Eventually, Patterson quit this line of work and reopened a nightclub previously owned by the smuggler before being incarcerated. Patterson was found in this nightclub shortly before the involvement of the United States in World War II.

A.J. Higgins, also a New Orleans resident, was conducting trials for the United States military at the time Patterson had reopened the nightclub. These trials were mainly demonstrations of landings of naval craft for the transportation of troops, something Higgins believed might benefit heavily from Patterson's smoke system. Higgins approached Patterson to ascertain his methods only to learn that both Dutch and British governments were after the

formula for the smoke screen and that Patterson had forgotten exactly what the formula's ingredients were (*Corpus Christi Caller-Times* 1941: 34).

Patterson proceeded to work on recalling the smoke screen formula with Harold A. Levey, who was founder and president of American Products Manufacturing Company, Inc., known for its production of "the development and manufacturing of equipment for use in manufacturing transparent packaging materials, chiefly plastic sheeting" (White 1967:242). Together, Patterson and Levey were able to reproduce both the smoke screen formula and the equipment for its deployment. The composition of the invention:

Contains a smoke producing ingredient such as a combination of a mineral oil hydrocarbon and an inorganic salt which will vaporize at a temperature of approximately 300 F to 750 F or less... and will also have the property of imparting to the smoke screen generated by the composition an opacity and density which enables the smoke screen to hug the ground or articles which it contacts, and which also increases the longevity of the smoke screen (Levey and Patterson 1947).

The results of the smoke screen were also expanded upon further testing:

The Patterson screen can be spread in any desirable density. (Patterson) can make it so thick that men on the same boat can't see each two feet apart. Addition of certain other chemicals makes the smoke blue to match deep water, and green to match the shallow, and it is possible to lay a luminous screen which can be used as a marker at night (*Corpus Christi Caller-Times* 1941:34).

The smoke screen chemical composition created by Patterson for use during Prohibition and the equipment for its use designed by Levey were adopted for research and experimentation by the United States Navy during the opening stages of World War II. Reflecting the economics of conflict during an interwar period, shortages in a precious resource such as mineral oil during the war resulted in Patterson's formula being modified, which led to the creation of similar smoke formulas that produced some corrosive effects.

Patterson's ideas of combining fast boats with smoke screens worked to great success during the Second World War. Even naval experts described the Patterson smoke screen as "the

most effective and most desirable ever used” (*The Corpus Christi Caller-Times* 1941:34). When used in combination with torpedo boats or by destroyers, the smoke screen allowed for cover from aerial bombardment in an otherwise open expanse of water (Figure 30). Even though Patterson’s exact formula was not used during the war, the ideas that Alonzo applied during time spent as a Prohibition Era rumrunner contributed greatly to the safety of Allied naval operations throughout the Pacific theater of war and beyond.

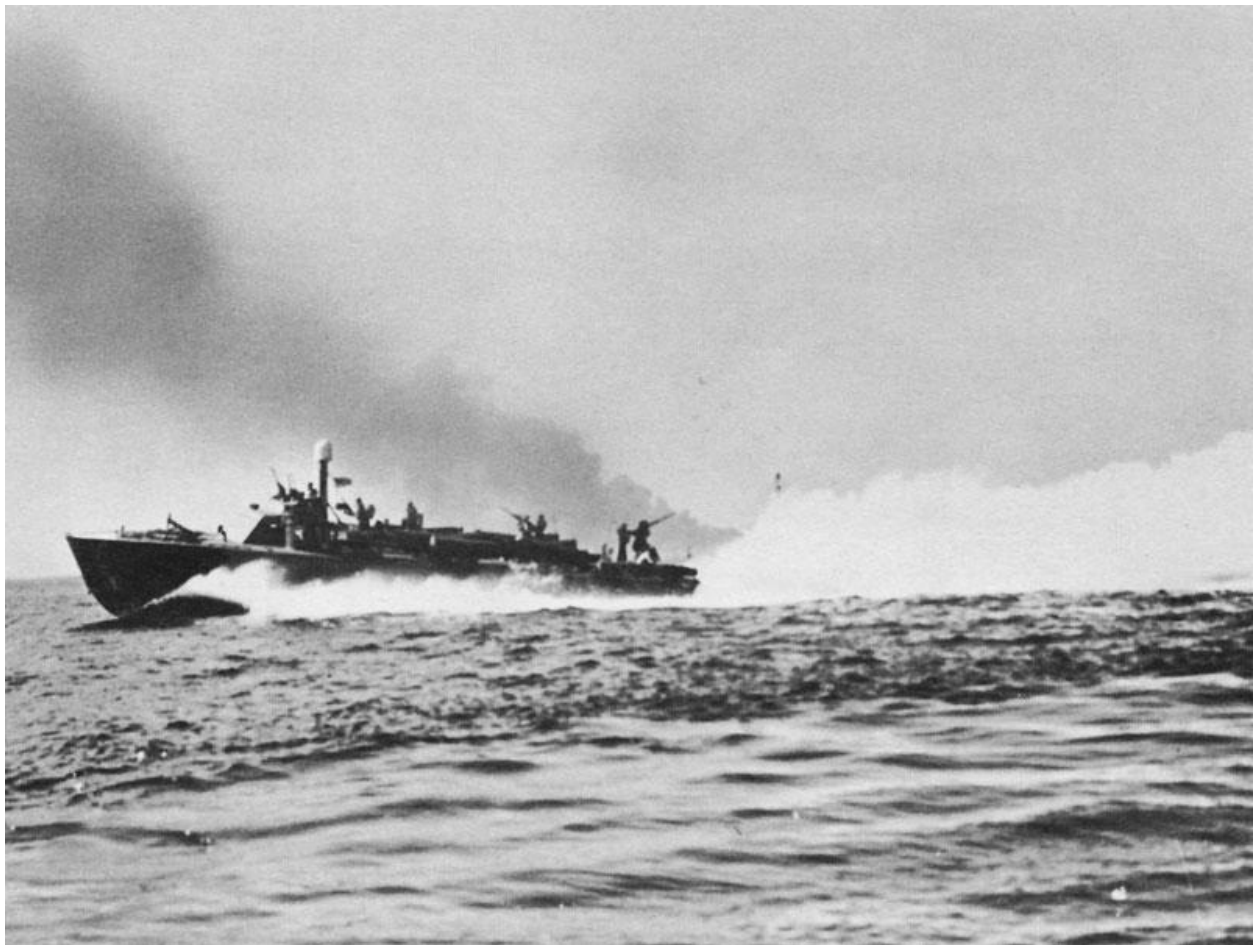


Figure 30. A PT boat lays a smoke screen at Salerno during World War II (Bulkley 2003:294).

CHAPTER SIX: FURTHER STUDIES

Researching the technologies that helped to come about during the early part of the twentieth century has its share of difficulties. Furthering this is the concept that the rumrunners, who were major contributors to the conflict, were breaking United States law. While the individuals involved usually made no secret about their involvement with smuggling booze onto the coastline late at night, they did not keep written records on their actions. Once prohibition was repealed, many of those involved in rum-running went back to their ordinary lives, and many of those refused to talk about it because it had been the one time in their entire lives that they had broken the law. Rumrunners had a code of silence that persisted among them and those they had contact with add to the secrecy. As a former rumrunner said to Everett Allen:

They would rather forget than remember, they will protect the others, because they expect the others to protect them, and they don't want their second wives and their grandchildren to know where the family money came from (Allen 1965: xvi-xvii).

The United States Coast Guard is the other side of this conflict. While some of the events that transpired during the Coast Guard's enforcement of prohibition, such as the taking over of rum-running vessels and court cases involving rumrunners, are well documented, the records regarding many aspects of the vessels are not detailed. This is surprising, since many vessels seized during Prohibition for rum-running were utilized by the Coast Guard due to their speed and other modifications to apprehend other boats in violation of the 18th Amendment. However, this utilization of seized vessels to improve their technology was more of a direct result of a lack of funding along with the immediate need for technical advantages capable of achieving desired results. The United States Coast Guard's main mission has always been saving lives at sea. Rum-running vessels were not designed with this in mind; in fact, one could say the opposite with many of them being designed to be as fast as possible while also being cheaply manufactured.

The utilization of captured rum-running vessels to apprehend other rumrunners was more a matter of convenience and economics in an attempt by the Coast Guard to be successful at their new mission during Prohibition while circumventing bureaucracy and a limited budget. Nevertheless, despite those involved with the conflict keeping detailed accounts of action at sea during the Rum War, descriptions of vessels seem to be practically nonexistent.

The matter of sources complicates the issues of research even further. With little to no written records, most of what can be gathered about rumrunners was collected as a result of interviews. With most of the individuals involved in rum-running either deceased or elderly, many details involving their methods are now lost. The questions being asked by the interviewer increase the loss in information in regards to the subject. Many historians interviewing rumrunners asked questions simply to get stories involving rum-running, not the details of the craft utilized by rumrunners (Croft and Meister 1984, Fultz and Meister 1984). Some details do leak through into interviews, such as use of wireless communication (Croft and Meister, Harold Crouse Interview 1984) or descriptions of the dimensions of the vessels (Croft and Meister, Capt. Amos Crouse Interview 1984).

A good example of lost technology during this era comes from an interview with a rumrunner:

There was a fellow in New Bedford who was a tool and die maker. He had a shop in his backyard as a hobby and he wouldn't bother with regular jobs, but he would take in one that was a real puzzler. He could turn stainless steel that you would swear was mirror-plated. So what we wanted was two engines driving to one gear box and a shaft from the gearbox to the propeller, so that you could run either engine or singly or both together. We asked him if he could do it and he said, "Come back and see me in a week" (Allen 1965:176).

This crafter in New Bedford completed this task, creating a system of gear boxes that could run four liberty V-12 engines on two propellers, resulting in what the rumrunner claims was easily a

speed of over 30 knots. Years later, in the early 1940s, the rumrunner being interviewed came across a member of the Coast Guard that recognized the rumrunner from their days during Prohibition. Apparently, the boat with the gear boxes had been seized by the Coast Guard, and the Coast Guard officer had told the rumrunner in regards to the gear boxes that they “took them all apart and the government tried for three-four years to duplicate them, but they have never yet made one work” (Allen 1965:177). This shows a considerable technological development that came about during Prohibition, but has no basis with any historical record other than the interview with Everett Allen. Increasing the difficulty in tracking records brought to light by Allen is the belief that:

In the cases of people whom I have interviewed, I have concealed identities because otherwise there would have been no interview and since this (Allen’s book) is, in essence, a history, it seemed to me that what they had to offer was worth more than giving the public a name that would mean nothing to most (Allen 1965: xvi).

In regards to the vessel with the gear box, Allen also states that it was “installed on the rumrunner *Maybe*, which evidently was seized by the government at some point” (Allen 1965: 177). It could be assumed that *Maybe* was most likely seized by the Coast Guard, but the only vessel on record that corresponds with anything close to this name is *May B*, which was utilized by the Coast Guard under the designation *CG-998*. As another example of a lack of detailed records in regards to seized vessels, the Coast Guard simply states that *May B* was used and then later burned (Willoughby 1964:168). There is no mention of a gear box or the efforts by anyone to reproduce the technology.

Word of mouth can often be misleading when it comes to acts of a criminal nature and sometimes word in print can be as well. United States Marine Corps Lieutenant General Victor H. Krulak said in regards to Andrew Higgins and the Eureka design that “In 1924 Higgins had designed a powerful shallow draft thirty-six-foot boat with a novel underwater hull, for use by

rum-runners in the Mississippi Delta during prohibition” (Krulak 1984:92). Higgins biographer Jerry Strahan has disputed this claim made by Krulak, stating that the connotations suggested by Krulak lead to the belief that Higgins designed the Eureka strictly for the illegal importation of alcohol during Prohibition. This simply is not true and has been vouched for through Strahan’s interviews with Ted Sprague, who was Higgins’ chief PT Boat designer, as well as Richard McDerby, who was the chief instructor of Higgins’ landing boat school, and Graham Haddock, one of Higgins key landing boat designers (Jerry Strahan July 11, 2014, pers. comm.). As shown in the chapter of this thesis entitled “The Contributions of Andrew Higgins,” A.J. Higgins was involved in Prohibition, but the Eureka design did not stem from the strict purpose of simply creating a boat for use by rumrunners, as Krulak suggests.

Higgins is not the only individual responsible for technological innovations during prohibition to have attained a certain mythical status. The former rumrunner and smoke screen designer Alonzo Patterson, although lesser known than Higgins, also received a certain legendary status. Even in the early 1940s, Patterson was being compared to a “modern glamour gal or a snake-dipped all-American pigskin-toter” due to the number of headlines Patterson received during Prohibition (*The Corpus Christi Caller-Times* 1941:34). The infamous Patterson Case, which involved one of the first ever uses of an undercover agent to expose what many believe was one of the largest liquor conspiracies ever exposed in the United States with Alonzo Patterson at the head of the organization, added fame to Patterson (*New York Times* 1925:273-77). While this thesis ties Patterson’s contributions to more than just Prohibition, what remains unclear is Patterson’s involvement in stepped hull design. After being pressed by several governments to make public the formula of Patterson’s smoke screen, Alonzo applied for a

patent for the smoke screen composition on May 2, 1942. On May 4, 1942, Alonzo Patterson and Hugh C. Ganter applied for a patent in boat design, which was for:

The present invention relates to a boat construction and more particularly to a novel hull and step construction particularly effective in shallow draft boats of the hydroplane type (Ganter and Patterson 1946).

This design in a boat hull, with its shallow draft and stepped hull, results in a greater overall speed and effectiveness of the craft. This development is interesting because often the development of the stepped hull design is credited to Reverend Ramus of Sussex England in 1872. However, the steam power plants of the day could not propel a vessel to the speeds needed to take advantage of the design that utilized pontoons and various planing surfaces in tandem (Figure 31). Following this are the patents applied for by William Henry Fauber in 1907 and 1908 for a multiple stepped hydroplane (Fauber 1909, 1910). Fauber soon left for Europe after being unable to generate interest within the United States.

unclear as to when this technological development came to be or its involvement, if any, with Prohibition.

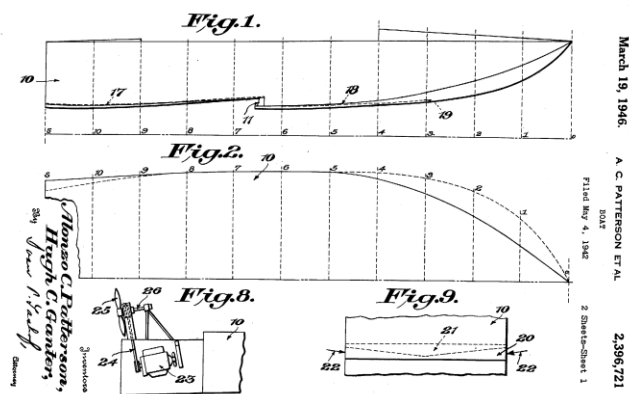


Figure 32. The Patterson step hull design. Its patent was applied for in 1942 just two days after Patterson also filed to patent a smoke screen formula and apparatus (Ganter and Patterson 1946).

Other Examples of technology that was possibly lost or its roots remain unspoken of comes from other individuals involved in Prohibition. Boat designer and former rumrunner Bill McCoy, in memoirs, speaks of a couple of vessels that never made public record:

Of the craft that outwitted the government armada during the last days of Rum Row the most successful were the “fresh fish” boats. Two of these were built in utter secrecy in an old shed on Long Island. Their success and efficiency is attested by the fact that the government never found out anything about them. These boats were 60 feet long by 12 wide and equipped with two Liberty motors which gave them a speed of 35 knots empty and 25 laden. Their novelty and the secret of their great success lay in the fact that their holds were divided by watertight bulk heads into five compartments, each with a capacity of seventy-five cases and each having a trapdoor in its bottom. Hence the “fresh fish” nickname. If they had gone out after fish instead of liquor, they could have brought their catches still alive to market (Van de Water 2007:211).

There are even reports of the use of submarines to smuggle liquor into the United States during Prohibition. After requesting the use of aerial photography from the Fairchild Aerial Camera Corporation, the Coast Guard produced a picture of “two subsurface craft, each approximately 100 feet in length, transiting the Hudson River” (Ensign 2001:34). Even though it has never been officially proven that these vessels were being used to transport liquor, this stands as possibly either a case of misdirection or another loss of technology that was involved during Prohibition, one that has been revived during the current era in the form of the Narco submarine that is utilized to smuggle drugs into the United States (Ramirez and Bunker 2014, Figure 33).



Figure 33. Possible rum-running submarines in the Hudson River (Courtesy of the United States Coast Guard, Washington, D.C., 1924).

These are just a few examples of misdirection and lost information within the study of America's Age of Prohibition. Even with those issues in regards to studying this timeframe of American History, the technological developments that came about during this era are still highly relevant and apparent, making it worthy of further study while also reinforcing concepts of innovation being spurred through conflict and economic need.

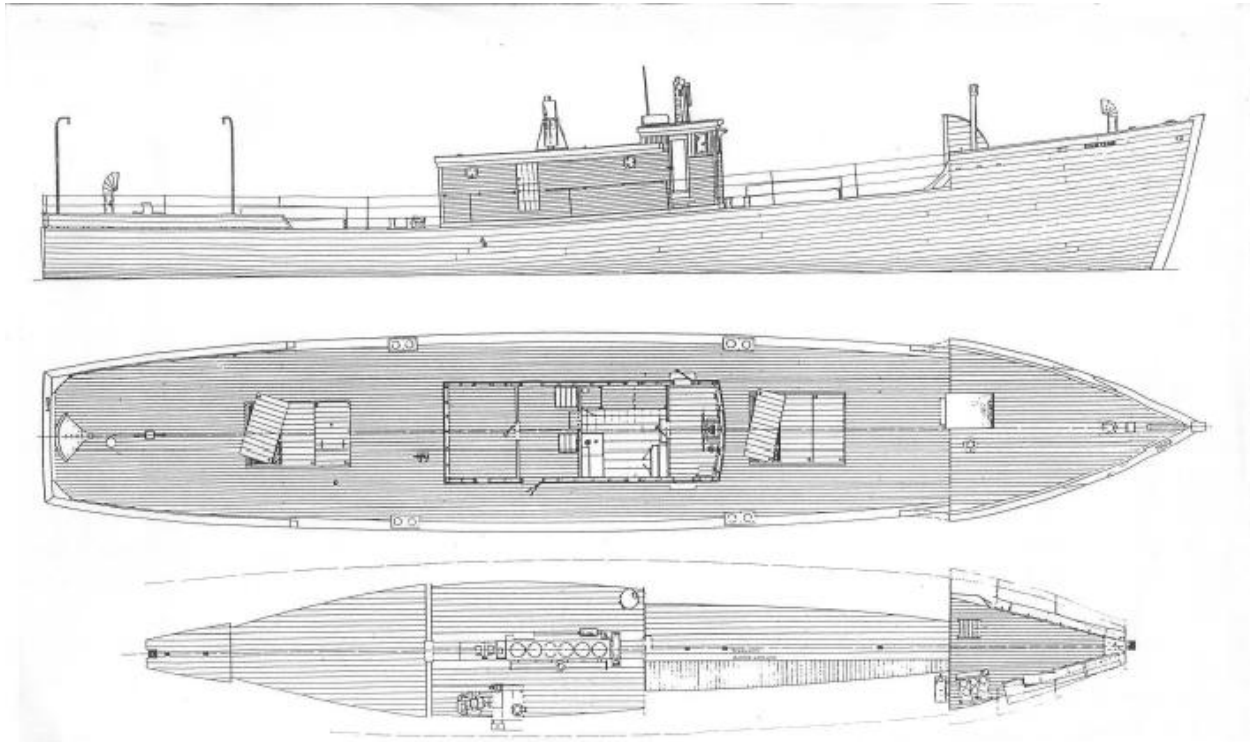


Figure 34. The lines of a typical and mass produced Canadian rumrunner. In this case *Reo II* (Courtesy of the Fisheries Museum of the Atlantic, Lunenburg, Nova Scotia).

CHAPTER SEVEN: CONCLUSION

National prohibition in America lasted from 1920 to 1934 (Figure 35). This time period challenged many American institutions, from religion and politics to international relations, and affected each American differently. Prohibition helped to usher in an age of organized crime that is still romanticized in current times. It also helped the Federal Bureau of Investigation become the organization it is today, for better or worse in regards to the privacy of the individual. Many people lost their lives during Prohibition, oftentimes in violent ways. Despite the negative connotations involved with America's Era of Prohibition, the conflict that erupted between government officials and those who opposed Prohibition resulted in major changes and developments in technology, many of which helped propel America and its allies to victory during the Second World War and on to more evolved technologies used today.



Figure 35. A celebration of Repeal in Chicago, 1934 (Courtesy of John J. Binder).

Prohibition also forged government organizations into states recognizable in the modern era. The need to enforce the 3-mile limit and to curb the importation of booze illegally into the United States via waterways forced more pressures on the fledgling United States Coast Guard to perform its duties. After a string of early unsuccessful efforts to combat the ever-rising tide of rum-running, the Coast Guard began to receive funding appropriate to its responsibilities. This resulted not only in more personnel and craft for the Coast Guard to utilize, but also in departmentalization of areas such as cryptography and intelligence. These departments not only functioned to help apprehend rumrunners, but also defended the American coast against actions involving Axis forces, and, today, against smugglers and other enemies of the United States and its policies. The standardization and expansion of the United States Coast Guard into the internationally known organization it is currently was related to its experiences fighting the rumrunners.

The conflict between the United States Coast Guard and rumrunners has often been referred to as “the Rum War.” With war being defined as “an organized and often prolonged conflict that is carried out by states or non-state actors,” this moniker is certainly warranted. Oftentimes, the importance of the Rum War gets played down due to the modern media’s take on the era along with how ingrained the consumption of alcohol has become with facets of American culture. Adding to this are the notions that the violence that happened during that time period either happened at sea, such as in the case of the *I’m Alone* (Fleming 1998, Figure 36), or were perpetrated by individuals that have become cultural icons, such as Al Capone. Regardless, the Rum War had all the makings of a war with comparisons that can be drawn to the American Civil War due to the conflict oftentimes being fought between not only residents of the same nation, but between neighbors. It even draws parallels to the modern war on drugs and the war

on terror with the rumrunners being non-uniformed opposition facing portions of the United States military branches. War inherently breeds competition and the conflict within exposes necessities. It has been said that necessity is the mother of invention, and the Rum War, particularly the parts of it fought at sea, reinforces that adage.



Figure 36. The Canadian rumrunner *I'm Alone*. In 1929 this schooner became the focal point of controversy when it was sunk off the coast of Louisiana for prohibition violations by United States Coast Guard cutter *Dexter*. This event resulted in the death of one of *I'm Alone's* crew members as well as a settlement case that brought into question everything from ownership of *I'm Alone* to the methods used by the United States Coast Guard in determining a vessel's distance from shore (Courtesy of the Trinity Historical Society Archives, Trinity, Newfoundland).

This thesis contended to ask if marine innovation was spurred by conflict and economic factors during the period of Prohibition in the United States. While most certainly organizations such as the aforementioned United States Coast Guard and the Federal Bureau of Investigation benefited from Prohibition Era economic factors, such as increased budgets, what is less apparent at first glance are the marine innovations.

As shown in the chapter entitled “Developments in Radio Equipment,” the need for clandestine meeting places between rumrunners and shore operations necessitated modern radio equipment onboard the Prohibition vessels. These devices, which were uncommon at the time,

were expensive and needed trained personnel to operate which further exacerbated the cost of their usage. Prohibition made up for the costs of having an onboard radio on a sea going vessel, even the smaller ones tasked with retrieving product from Rum Row. The ever-pressing need for profit by the crime syndicates involved in rum-running led to more effective use of radios at sea until they “could operate with a fair degree of secrecy over great distances with very low power” (Willoughby 1964:109). These radio operators consistently had to do their best with what equipment was available to them at the time which led to improvements of various degrees (Miles 1992:103-108).

The means to track down rumrunners by using their own radios was in a constant state of development during this time as well. With “radar...unknown...in the 1920s” radio direction finders did the job of tracking down rumrunners at sea (Willoughby 1964:109). As also shown in the chapter titled “Developments in Radio Equipment” these radio direction finders that were developed during Prohibition were used to great success during the early stages of World War II to track down Axis spies.

The economic factors of Prohibition helped to keep some operations in business as well as further their innovations. Higgins Industries found itself having to transfer due to dwindling markets from the timber industry into building boats. This change in operations was easily facilitated thanks to Higgins’ willingness to play both sides of the Prohibition conflict by selling designs to both rumrunners and the United States Coast Guard. Higgins Industries was able to keep its doors open and continue to manufacture boats of a design nature never seen before thanks to the contracts obtained during the Prohibition Era. The lessons learned while building these boats also led to improvements of the PT Boat and the creation of the LCVP (Strahan 1994:19).

Effective use of the smoke screen at sea also came into a more common use during the Prohibition Era. As shown by Alonzo Patterson's achievements in design, smoke screens that were non-corrosive could even be created. These smoke screens were deployed throughout World War II by the United States Navy. However, developments in technology such as radar and guided missiles have made the smoke screen at sea obsolete by modern standards.

There is also potential for future studies to reveal further innovations that were spurred on by Prohibition. Most of the topics covered in this thesis are based in the macro level of developments, or ones that are more obvious and widespread due to their nature or use during a high profile conflict such as World War II. As shown before in the chapter "Further Studies" gaining knowledge on developments created by the actions of law breakers that took place during a time period nearly a century ago is not the most simplest of tasks. However, there is no doubt that through further research developments in ship innovations during this time period can be found on both the micro and macro level. These studies could come about through deep research in the historic records of shipyards cross-referenced by those ships that remain from the Prohibition Era.

This thesis concludes that during the Prohibition Era, economic factors that culminated into conflict between rumrunners and the United States Coast Guard directly resulted in marine technological innovations and confirms that Hegel's theory of dialectic social transformation through stress of conflict also translates to technological change through social conflict.

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