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PREVIEW

**AMERICA'S TECHNOLOGICAL SAILOR:
A RETROSPECTIVE ON A
CENTURY OF "PROGRESS"
IN THE UNITED STATES NAVY**

**A DISSERTATION SUBMITTED TO
THE FACULTY OF THE GRADUATE SCHOOL OF
SALVE REGINA UNIVERSITY
IN CANDIDACY FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY
DEPARTMENT OF THE HUMANITIES**

BY

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**NEWPORT, RHODE ISLAND
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SALVE REGINA UNIVERSITY

GRADUATE SCHOOL

The dissertation of Michael S. Casey entitled "America's Technological Sailor: A Retrospective on a Century of 'Progress' in the United States Navy" submitted to the Humanities Department in partial fulfillment of the requirements of the degree of Doctor of Philosophy in the Graduate School of Salve Regina University has been read and approved by the Committee:

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ABSTRACT

This study examines the effects of naval technology on the individual American sailor of the U.S. Navy between 1812 and 1912. It is the thesis of this study that naval technology in the broadest concept radically changed the sailor's profession over that hundred years. While specialization was always integral to sail technology, steam power added a mechanical dimension to the sailor's life. At the same time, some of the traditional elements of the sailor's relationships with the warship and the ocean were lost. The result was a "new" American sailor whose career was shaped by technology.

Through qualitative analysis, the study traces the causes of the concurrent "humanizing" and "dehumanizing" effects on the enlisted man caused by a naval transformation during this period of marked technological progress. A broad range of source material documents how technology changed the enlisted man. Naval technology took the multi-talented seaman of history and, over several decades, turned him into a mechanical specialist, a very small cog in a very large naval machine. The study also demonstrates, however, that technology also significantly improved the enlisted man's quality of life while it mechanized and, to an extent, depersonalized him. Technology gave the sailor education, advancement, and other personal advantages. It also eliminated controversial naval practices that diminished the self-worth of the common sailor.

The study concludes that these formative effects were an almost unavoidable by-product of the indoctrination, training, and education that led the sailor to war-time victory at sea. The pervasive nature of technology in the sea-going environment set the Navy at the forefront of American national ambition, a role that continues to this day.

Understanding this century-long evolution of the typical sailor should enable the Navy's commanders and political leaders to make humane as well as strategic decisions on the welfare and morale of the increasingly technological crews of the American Navy.

PREVIEW

To my wife and my sons,
without whom all personal accomplishment would be meaningless.

PREVIEW

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CHAPTER 1

INTRODUCTION

This study examines the significant changes that took place in the American sailor's career during an important period in the country's naval history. Many of these changes in the sailor's life and work were related to or resulted from the technology developed by the Navy during the 19th and early 20th century. Specifically, the dissertation analyzes the effects of technological progress on the common sailor during the period 1812 to 1912.

Four key arguments make up the thesis of this study. First, advances in technology improved the sailor's quality of life during this period. Second, the transition from sail power to steam power demanded specific new aptitudes and skills from the sailor. Third, naval administrative practices as technological systems became catalysts for change in the characteristics and attitudes of the naval officer and, through him, in the sailor. Fourth, by the end of this period, the Navy had developed into a highly complex technology of national defense that increasingly impacted, positively and negatively, on the ordinary sailor.

Technology was not the only factor that altered the sailor's life. Major social and political pressures contributed as well. A direct cause and effect relationship was not always evident between technological improvements and the sailor's life, but that relationship had always existed. By focusing on technology while not disregarding other factors, this study seeks to reach a better understanding of the shift in relationship between

technology and the sailor during a century of naval history. The emphasis here is not on technology in any strategic or tactical sense, but on the impact of a naval technological environment on the enlisted man.

A historical review of this period indicates that two basic, but related, trends were occurring simultaneously. On the one hand, shipboard living conditions improved dramatically during this time. Technical advancements in medical care, the preservation of food, and more humane disciplinary regulations represent improvements in the sailor's quality of life. Such advancements, all related directly or indirectly to changing naval technology, continued as the Navy progressed through this one hundred year span. Thus, technology, in addition to other factors, helped make the sailor's life less harsh.

Concurrently, other effects of naval technological development tended to make the typical sailor less a multi-skilled individual and more like a worker in a sea-going factory. By 1912, technology had driven the expanding Navy to operate as a vast bureaucratic machine made up of smaller systems that subsumed thousands of interchangeable sailors. The prior ideal sailor, the "jack of all trades," the proverbial "round peg," was forced by new naval technology to fit into a square hole. This technology-driven transformation was not without problems. Seamen had always served their ships, but now sailors were needed in vast numbers like cogs on one of the many wheels of a massive national defense "machine." While improving the sailor's life, technology to a great extent also mechanized and depersonalized him.

Between 1812 and 1912, few naval observers officially noted these parallel trends. Improvements in the sailor's quality of life were obvious and easily attributable to a general

sense of “progress.” Many did not realize that a prime cause of these changes was the shift from sails to steam power. Nor for decades was it apparent that the “old salt” of the sailing ship must inevitably disappear. Naval officers who were involved in the ongoing technological change focused on the fascinating technology, rather than on the sailor. Conversely, traditionalists pretended to ignore technological change, preferring customary sailing ship practices. These leaders also sometimes failed to recognize how technology was transforming the sailor.

Significance

Many volumes have been written about naval history in relation to technology. Few works, however, focus on the sailor when discussing this technology. The impact of technology on the individual seaman has gone largely without notice. This study fills that void, primarily through a reexamination of historical data and anecdotal information. This work addresses the subject as a humanities-based survey rather than an empirical study. Exploration of technology’s impact on the human condition through an in-depth look at the sailor’s career represents a socially significant theme that is especially timely, considering that the Navy is poised to begin a new century with a new technological revolution. Between 1812 and 1912, the enlisted man’s work and life changed dramatically both directly and indirectly through the advent of mechanical and administrative technology. While this study concludes in 1912, this theme is open to further investigation.

Because of naval technology, the sailor became better educated and highly trained, but this technical aptitude became the key to his value to the Navy, not his sea-going skills or experience. This gradual shift in manpower skills has increased rapidly in recent years. The

Navy of the 21st century is embracing advanced technology, from computers to sensors to weapons, at a pace never reached before. Within professional military circles, today's technological phenomenon has been called a "Revolution in Naval Affairs." The Navy of the new millennium will soon make technical decisions that have immediate and long-term implications for the American sailor. The assumptions of this study about a century of naval technology and its effect on the sailor are thus crucial to making informed decisions for the future.

A grim preview of the coming era suggests a Navy totally manned by highly technical, relatively compartmentalized, wholly replaceable crews. Before technical changes further diminish the sailor's role, it is time to take stock of how the Navy has functioned in the past to determine the impact of naval technology on the men and women who today serve the fleet and the nation. This study does not presume to suggest that today's Navy can or should somehow turn back the clock and recapture the seagoing ethos of a bygone era. The intention is to highlight the enduring human values always involved in naval operations with a view to preserving these essential interests in a technology-driven age.

Methodology

This study approaches the process of technological impact from a non-judgmental point of view. The importance of naval technology to national defense is not at issue here. From the practical perspective of the American enlisted sailor, it can be further argued that this technology offered definite advantages to the sailor. The problematic area concerns the adverse effects of technology on the typical seaman's profession—challenges that will only increase with the rapid deployment of an increasingly technological Navy.

This study takes a qualitative approach to the subject matter. There is a compelling reason for this method. In exploring the often subtle or intangible ways that the sailor's life was changed by technology, a statistical approach would be impractical. Establishing the American sailor's quality of life at any given point in time requires extensive qualification. Furthermore, for the first fifty years of this period especially, the statistics and the other precise data are incomplete. The Navy had not yet developed the information-gathering, processing, and recording systems that are prevalent today.

For the first half of this study period, most of the evidence of the impact of technology must be drawn from personal testimony and incomplete information. This recorded evidence consists primarily of personal diaries, cruise journals, and service memoirs of American naval officers. As the officers were invariably better-educated, they were far more likely than the enlisted men to put their thoughts into writing. They also had the leisure to spend on the popular pastime of writing cruise journals. Once retired from the naval service, these personal memoirs could sometimes find a publisher.

Illustrative Method

The overall qualitative approach to the gradual modifications in the sailor's status through technology includes descriptive portraits. Each example attempts to capture the characteristics of an average enlisted man at the key periods in the development of the Sail Navy and the Steam Navy. The relative degree of self esteem or satisfaction can be attributed to the role of the sailor in these periods. In other words, whether the average sailor of each era felt valued for himself and his skills or was treated simply as a means of getting the job done is significant. These composite sketches, representative of typical

sailors, graphically demonstrate the altering roles and living conditions during these two overlapping technological eras.

Each sketch includes background on the contemporary warship and the crew. Vessel design and shipboard practices during each period are examined because they contribute the specific context or daily environment in which the sailor lived (and sometimes died).

Moving from one composite sketch to the next, it is possible to follow the Navy advance from wooden sailing ship to steam-powered iron-clad and to the steel battleship. Along the way, however, the human implications of these technologies are the basic focus.

The critical component in each period is the sailor. The investigation reviews the demographics of enlisted personnel of each period so as to draw a sketch of the typical enlisted man. Key questions on each time period would include the following:

- ◆ What drew an enlisted man to the naval service?
- ◆ How was the enlisted sailor trained?
- ◆ What was the general character of the enlisted sailor?
- ◆ How did the sailor see himself?
- ◆ How did the naval officer view the enlisted man?
- ◆ How did the living conditions and disciplinary practices affect the enlisted man?
- ◆ When not on duty, how did the American seaman spend his time?

Operative Definitions

Key terms that are used throughout the study require some explanation. Because many of these terms have various or alternative meanings, the operative definitions provided here are not meant to be all inclusive. They are offered because they best apply to the concepts

under study. The broader implications of these definitions in reference to the positive and negative effects of technology on the human condition should become obvious as the study progresses.

Technology

For the purposes of this study, the term technology has several meanings. The basic or most common definition is that technology is applied science. Within the historical framework of this study, however, steam propulsion or advances in the power and effectiveness of naval gunnery are other examples of technology, as are organized systems of knowledge and procedures applied by the Navy for personnel and equipment.

Hard (Naval) Technology

Technology, therefore, is not limited to machinery or weapons. When Langdon Winner, for instance, formulates his definition of technology as “apparatus ... the physical devices of technical performance,” he is describing “hard” technology (1977, 11). Here, technology is used in a broader connotation to include all the mechanical and electrical systems found on a warship -- not merely ship propulsion and naval weapons systems. These are all examples of what will be referred to as hard naval technology, that is, any tangible device or system that improves naval efficiency.

Soft (Naval) Technology

The third operative definition of technology is broadest in scope. John Galbraith's The New Industrial State offered a comprehensive view of technology as “... the systematic application of scientific or other organized knowledge to practical tasks” (1978, 12). Similar broad definitions are provided by Barbour, Capra, Ellul, and others. (See

Bibliography.) Examples of this sweeping explanation of technology would include all administrative and disciplinary methods, procedures, and techniques utilized by the Navy in shore administration and on ships to carry out, effectively and efficiently, assigned naval tasks and missions.

In applying this broad definition to naval practice, scientific principles, organized knowledge, and naval experience all provided the basic framework. The Navy organized that knowledge and determined the practical tasks to be addressed based on centuries of experience. At the shipboard level, naval officers, applying Navy policy, defined and prioritized practical tasks requiring technological solutions. In this sense, the Navy was the final arbiter of the overall effectiveness of this applied technology, thus superseding larger social and ethical considerations.

While the broad view of technology as system may be difficult for some to grasp, it is fundamental in influence on naval discipline and procedures. This definition will be referred to as “soft” naval technology, that is, technology as an intangible but consequential method of action. Soft technology makes hard technology “usable” by translating the necessary operating parameters into a form that can be readily understood by the typical operator. Much more than the mechanical operations of shipboard weapons and engineering systems themselves, this technology includes the immense number of naval administrative practices without which a U.S. warship could not put to sea, let alone fight and win a naval battle. Naval organization, administration, and logistics must be recognized as integral to the related processes of humanization or conversely the mechanization or depersonalization of the sailor.

As warships became technologically more complex, the Navy developed its own internal practices for the efficient or systematic management of ships and personnel. One example was the development of individual service records. Initially, these records were kept to describe the skills or experience of officers, as most enlisted men were more or less interchangeable as generalists. By the final decades of the century, service records were maintained for enlisted men as well, since sailors were by then distinguished by their various mechanical or electrical specialties. Service records allowed the Navy to match each sailor with a specific job. These service records, to be of practical use, required standard criteria. Standardization was applied to the selection and training of the sailor in an ever-expanding Navy. Thus, systematic employment of service records clearly represented a management technology. Advances in naval recruitment, education, and training also fall into this general category of naval technology.

As the Navy modernized, naval administration and logistics often became difficult to categorize because of the ever-increasing degree of “systems integration” on board ship. The difficulty was an inevitable by-product of those factors that encouraged in bureaucracy the rise in impersonal attitudes toward the enlisted man. The single most significant soft naval technology is the management of the naval officer corps by the Navy bureaucracy. The Navy’s ability to find prospective officers with desired character traits, to educate those officers in the required professional standards, and to hold those officers accountable for their behavior is arguably the prime determinant with regard to the daily life of the American sailor who serve under them. Under sail technology, the value of such an effective soft technology was not specifically recognized. Whether a sailor worked under a

good or bad officer was largely a matter of chance. With steam power, the naval requirements of hard technology dictated that such an accompanying soft technology be developed, and the sailor largely benefited from more intelligent leadership.

The Navy as Technology

In relation to the Navy as technology, the government can be seen as the ultimate provider of the practical purposes associated with the application of Galbraith's definition. These practical purposes were ultimately based on the prevailing requirements of national defense. Even when the government set the defense priorities, however, the Navy was inclined to have its own views on global strategy. Through subtle and direct pressure, the naval command structure brought its influence to bear on national decision making. For example, the Battleship Navy was an integral part of the alliance between the military, industry, science, education, and bureaucracy that Lewis Mumford described as the "Pentagon of Power" (1970, 263-8). At the highest level, the Navy has played an interactive role in the larger technology of national defense. It helped to form the defense policies that shaped the Navy as a tool of national defense. This is the connotation implied when the term "Navy as technology" is used.

Navy as technology is also intended to convey a sense of bureaucratization. Ian Barbour went further than Galbraith in defining technology as "the application of organized knowledge to practical tasks by ordered systems of people and machines" (1993, 3). As Barbour pointed out, "Reference to 'ordered systems of people and machines' directs attention to social institutions as well as to the hardware of technology"

(Ibid.). In this instance, the Navy is the social and bureaucratic institution or the “Megamachine” described by Mumford (1970, 263-8).

This idea of ordered systems of people or bureaucracy as technology is crucial to this study. This expanded concept of naval technology is consistent with the views of several modern theorists, historians, and philosophers. While Winner criticized overly broad definitions of technology, he did not dispute the relationship between bureaucracy and technology. He used the term organization to describe this particular facet of technology as “... some (but not all) varieties of social organizations—factories, workshops, bureaucracies, armies ...” (1977, 12).

Galbraith, who was also aware of this relationship, noted: “The inevitable counterpart of specialization is organization More perhaps than machinery, massive and complex business organizations are the tangible manifestation of advanced technology” (1978, 16). In this study, technology includes both apparatus and organization, which are described as hard and soft technology respectively. Thus, the broad definition of technology perfectly captures the characteristics of the battleship of the Steam Navy as described by Kenneth Hagan:

... Not until late in the century did anything like a modern advanced weapons system come into being—the gigantic, expensive, steel-plated, steam-propelled, heavily armed and armored warship. This advanced weapons system required vast sums of capital to support the physical facilities for fabrication, materials and manpower, as well as long lead times for planning and coordination so that countless components might be produced and integrated at the proper time. (1976, 10)

Just as a steam engineering plant represents technology, so does the comprehensive filing system required for every warship in the Navy. The first attempts by the Navy of

1912 to make a system of everything connected with the service, from physical fitness to personnel legislation, were based on the application of scientific principles to naval logistics. Technology, therefore, is not limited to the ship, even the mighty battleship; technology is also the Navy itself. As Hagan concluded:

No longer can what we call technology be equated with a thing only; it must be seen also as a particular kind of knowledge, and further, as a way of organizing social structures and institutions in systematic forms analogous to machine design. Technology therefore is thing, knowledge, and system. (1976, 101)

Humanization

The term “humanization” is used in this study to describe what might generally be accepted as improvements in the living and working conditions, or the “quality of life,” of the American sailor. This study employs Daniel Boorstin’s common-sense definition of this imprecise term. He calls quality of life “... anything and everything that cannot be grasped quantitatively. This would include, of course, faith, love, literacy, art, human fulfillment, history, and life itself” (1994, 157). The very breadth of the definition allows one to focus on the sailor’s personal degree of fulfillment rather than on the more quantifiable aspects of his life such as salary and length of duty.

Humanization in a further sense describes not only the individual sailor’s self image but how he was perceived by his officers. The process of humanization can be roughly equated with the basic reforms over this period. Primarily through its on board officers, the Navy progressively came to recognize the sailor as a human being worthy of the basic dignity afforded to other American citizens. This enlightened perception is most striking in comparison to the public perception of the American sailor in the earlier era. While the idea

that the enlisted man was a human being and full citizen seems fairly obvious today, a review of the deplorable shipboard conditions of the first fifty years of naval operations makes it painfully clear that this liberal view did not always obtain in the American Navy.

Mechanization

The word “mechanization” is an awkward but necessary term to describe the process by which the sailor was transformed by naval technology from a generalist into a technical specialist. In the early Navy, a full-rigged sailing ship was a machine in its own right, and a large crew was needed to keep that mechanism in operation. The kind of sailor most essential under sail technology was the able-bodied seaman, one who could be trusted with practically every task on board. The performance rating of the sailor under sail correlated directly to the amount of time he had spent at sea. Shipboard experience meant high proficiency. Some crew members, such as gunners, carpenters, sail makers, and blacksmiths, required special skills, but the vast majority of the crew was basically proficient in handling the ship.

The steam-powered warship required a totally different kind of skill in the sailor. No longer primarily occupied with sails and rigging, this new sailor would usually evolve into either a mechanic or an electrician. This sailor generally received technical training in order to perform one specialized task. His performance under steam correlated directly to his technical training, and longevity at sea was almost inconsequential to his job requirements. “Mechanization” connotes this understanding of the growing machine-driven technical specialization of the sailor. There is no conscious attempt to judge this process—the same mechanization that may have contributed to depersonalization of the sailor just as likely