

**Deconstructing the Myth of the Norden Bombsight**

by

Michael Tremblay  
B.A., University of Victoria, 2007

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## **Supervisory Committee**

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Dr. David Zimmerman (Department of History)  
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Dr. Gregory Blue (Department of History)  
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## Abstract

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The Norden Bombsight was a complex, 2000-piece mechanical computer. It was designed to solve the mathematical problem of dropping bombs from high altitude bombers in order to hit specific ground targets. Originally developed under the supervision of the U.S. Navy, the device was picked up by the U.S. Army Air Corps in 1935, and quickly became the Air Corps' most important military technology. For the Air Corps, the device not only defined its institutional relevance, but also enabled air power proponents to appeal to the American public's predilection for technology in order to gain popular support. By the time America entered the Second World War, the device was famous and it captured the hearts of many Americans due to its touted pinpoint accuracy and ability to make war more humane. The belief that the device would make war less brutal reinforced American notions of the link between progress and technology. During the war, the device proved to be a failure, yet the rhetoric and altruistic belief in the bombsight's ability to save lives persisted. This thesis deconstructs this enduring myth by investigating the language the mass media used to discuss it before and during the war.

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through years of my mental absence. Thank you. I love you. Darius, only through this scholastic adventure have we been able to spend so much time together. While other dads are working, we have played, rode, or hiked and I have enjoyed it immensely. I am the luckiest dad I know. Cassandra, although you are new to this world you have brought a whole bunch of smiles into it, thank you.

## Dedication

To Steve:

A lifetime, but it seems a lifetime ago. I miss you.

## Introduction

### Deconstructing the Myth of the Norden Bombsight

*On our first day at Norden, we were awed and even scared to be in the very building that housed the mysterious, secret, powerful and famous Norden Bombsight... It is a wonderful, superb instrument... It has made an unsurpassed contribution toward the winning of this terrible war, and we are sincerely proud housed with it.*

—*Norden Insight*, July 1944<sup>1</sup>

In 2006 PBS premiered a television documentary called *Warplane: A Century of Fight and Flight*, the program highlighted the history of military aviation from the earliest uses of lighter-than-air vehicles to modern stealth technology. The premise of the four-part documentary was to explore the changes in aviation technology and how those changes influenced the development of new devices to make war from the air. The documentary featured historians and aviation writers who explained the history of military aviation. In the second segment, “Air Force to Air Power,” a discussion surrounding the Allied strategic air campaign of the Second World War was undertaken. While the segment correctly differentiated between the American and British concept of strategic bombing, the focus of the segment on the American campaign was a decidedly favourable account of the Norden Bombsight (NBS), a device that despite the positive

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<sup>1</sup> *Norden Insight*, July 1944, Volume 2, No. 12. 1.

representation by PBS was, in large measure, a technological failure. The documentary in many ways reinforced the myth of the bombsight having been a war-winning weapon.

The segment of *Warplane* that deals with the American air campaign begins by explaining how the root of the American strategy of daylight precision bombing was not just about precision strikes; instead the “American approach to making war has always been that the use of technology can be a substitute for human casualties.”<sup>2</sup> The NBS is then compared with other examples of military technology, both ancient and modern, that have been developed with the ever-present goal of obtaining higher degrees of accuracy. The irony of course is that the result of making weapons such as the longbow or the machinegun more accurate is the more efficient killing of humans. In the case of American daylight precision bombing doctrine, it was originally developed with the intention of destroying the enemy’s ability to wage war through the complete destruction of the enemy’s industrial capacity and infrastructure. This, it was theorized by early proponents of air power, was the surest way to keep American ground soldiers out of another bloodbath reminiscent of the First World War. So precision bombing was developed as a means to protect the lives of American soldiers, not enemy civilians or others.

Beyond its fallacies that related the use of the NBS, *Warplane* delivers a glossy description of the NBS, which echoes the language long used by the United States Army Air Force (or Corps prior to 1941)(AAF) to justify its strategic bombing doctrine. According to *Warplane*, the NBS could “identify the exact moment to release a bomb, it

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<sup>2</sup> *Warplane; A Century of Fight and Flight, Air Force to Air Power*, Educational Broadcasting Corporation, 2005.

would even take control of the plane as the moment drew near.”<sup>3</sup> While it was no doubt not in PBS’s interest to get into the minute technical details of the NBS, the bombsight could not actually “identify” anything, nor would it simply start controlling the plane automatically as the aircraft approached the bomb release point. The bombardier’s job was to superimpose a reticle on a ground object such as a rail yard or factory compound and match the reticle with the speed of the plane, this would in turn keep the object on the ground within the crosshairs of the reticle. The bombardier used dials to input various forms of other data such as altitude, ordinance weight and crosswind into the device, but at no time did the NBS “lock-on” or “identify” a target. Not until the bombardier successfully matched the reticle speed with the aircraft speed would the bombardier initiate a stabilized bombing approach device (SBAE) to ensure stable flight until the bomb release point. It is true that the actual bombs were released by a signal from the NBS, but the bombardier handed over the “control” of the plane to the SBAE only after he was confident that the superimposed reticle was not creeping away from the intended target. Once the SBAE was in control of the plane the NBS became essentially a timer that released the payload at the designated time, the device had no way of determining whether the reticle had crept from its target or not.

The highlight of *Warplane*’s showcasing of the NBS was the use of a restored B-25 complete with an intact Norden to drop dummy bombs on a ground target. To work the NBS were two veteran bombardiers who had used the NBS during their respective conflicts. Bill Blair, a veteran of the Second World War, flew some fifty missions with the 13<sup>th</sup> Air Force. The other veteran, Jack Valente, flew “secret missions” during the

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<sup>3</sup> *ibid*

Vietnam conflict dropping listening devices with the NBS in its final active service role. Despite the fact that during the Second World War American bombers flew at over 20,000 feet, going 230 knots, the PBS B-25 was flown at only 3,000 feet going just 150 knots over a passive Arizona desert. The altitude flown for the documentary was actually the bottom of the NBS's operating ceiling, and it would have made the PBS attempts quite difficult as the telescopic sight on the NBS had a limited forward sighting angle. This said, the speed and altitude of the PBS drop, the pristine weather conditions during the drop, and the lack of enemy ground fire or pursuit aircraft made for an *ideal* bombing attempt.

The two bombardiers were taken up in the B-25 and each man attempted to hit the target. While the aged veteran Bill struggles to manipulate the dials of the Norden, Jack manages to drop a bomb close enough to the target that it would have been a destroyed had it been a structure. For PBS this near hit was conclusive evidence supporting the claims that the NBS was indeed a technological marvel. No mention is made of the fact that, had the plane been flying at wartime altitudes, the miss would have been exponentially greater. What the PBS documentary proves is that the same misconceptions that placed hundreds of thousands of young American airmen in hostile daytime skies during the war, are still held by many today. The use of veteran bombardiers to operate the antique device served only as a prop to add credence to an argument that is, and was, false.

Juxtaposed to the positive picture painted by the PBS account of the NBS in action is a story told by Ralph Golubock, a veteran B-24 commander, whose plane was critically damaged on a bombing mission over Pölitz in May of 1944. Gollubuck

described the events that occurred immediately after a German fighter crippled his plane: “I ordered the crew to dump everything overboard. All the ammunition, machine guns, even the Norden Bombsight which Lieutenant Fitzsimmons took a great deal of pleasure tossing out.”<sup>4</sup> This anecdote raises a question regarding the “pleasure” that the bombardier took in releasing the bombsight to gravity’s will. Golubock neither explains why Fitzsimmons was happy to dump the device, nor why the episode was important enough for the pilot to remember years after the event. What was it about the NBS that made it the target of this veteran’s cynicism? After all, the bombardier had sworn an oath to protect the device at all costs including his own life.<sup>5</sup> Perhaps it was the irony involved in dropping a bombsight, like a bomb, from a bomber, over German held territory. But more likely it could have been the fact that if not for the NBS, these young men would not have found themselves in a crippled plane, deep inside German territory on a daylight mission.

Regardless of Golubock’s reasons for mentioning the NBS in his story, he deemed the incident important enough to merit some comment and it suggests that he understood the fact that whoever heard his story would recognize the relevance of the NBS. It is this apparent *familiarity* with the NBS that this thesis will investigate, a familiarity rooted in the mythical qualities of a technological device that never lived up to its theoretical capabilities. *Warplane*, however, is not the only contemporary example of the NBS’s myth persisting. Albert Pardini’s 1999 book, *The Legendary Norden Bombsight*, is a much more blatant example of the tenacity of the myth that surrounds the

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<sup>4</sup> Gerald Astor, *The Mighty Eighth: The War in Europe as Told by the Men Who Fought It*. (New York: Donald I. Fine Books, 1997), 258.

<sup>5</sup> For a complete recitation of the bombardier’s oath see: Stewart Hasley Ross, *Strategic Bombing by the United States in World War II: The Myths and the Facts*. (Jefferson: McFarland & Company, Inc., Publishers, 2003), 131.

NBS. Like Golubock, Pardini seems to presume the public's familiarity with the NBS. Pardini actually explains in his introduction that increased interest in the NBS motivated him to write the book.<sup>6</sup> This statement immediately raises several questions: Is the Norden Bombsight legendary? Was it actually legendary at some earlier point in time? How did it become legendary and what were the circumstances that made it so? Did it perform in such a way as to make it legendary or was its reputation part of a larger wartime propaganda campaign to win the approval of the American public? Was publicizing its supposedly legendary status deliberate? If so, how was the process instituted and by whom? What methods were used to create the legendary perception of the device and was the information used selected for the specific purpose of glorifying the device or the role it played in the larger conflict? It is not the goal of my research to determine whether or not the USAF achieved their goal of precision bombing or to weigh in on the ceaseless debate concerning the morality of strategic bombing in general. Instead, the task at hand is to determine how and why a not-so-effective tool of war earned the epithet *legendary*.

### **The Norden Bombsight**

The NBS was a mechanism developed during the interwar period to answer a complex, yet fundamentally simple question. How could aircraft be used to drop ordinance from high altitudes accurately enough to destroy a specific target on the ground? Many factors needed to be taken into consideration in order to achieve this goal. These included, but were not limited to, air speed, wind direction, altitude, size and shape

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<sup>6</sup> Albert L. Pardini, *The Legendary Norden Bombsight*, (Atglen: Schiffer Publishing Ltd., 1999), 8.

of ordinance, etc. Although these individual factors or datum could be calculated with great accuracy using mathematics, the difficulty for the bombardier came in calculating these complex equations fast enough to deliver ordinance to the intended target. As aeronautic design and anti-aircraft weaponry improved, the ordinance delivery systems, in this case bombers, were forced higher while at the same time improved engine technology allowed them to reach greater speeds. Consequently, the increased speeds reduced the available time for the calculations that had become exponentially more crucial at the higher altitudes. A calculator was needed to speed up the sighting process and remove the time consuming and error prone calculation procedure. Thus, the development of a mechanism such as the NBS was crucial if the ultimate goal was precision targeting.

The sight itself was a mechanical calculator—in reality one of the most complex adding computators known to man at the time. Using various input selectors a bombardier would enter the critical information, and the device, with its two thousand intricately machined parts, then calculated the bombing solution instantaneously. The bombardier would search for his intended target through an optical telescope, once the target was located and marked within the crosshairs a motor and reflective mirror assembly would keep the crosshairs on the intended target for the duration of the bombing run. If the data were entered incorrectly the crosshairs would slowly drift off the intended target until the bombardier corrected the mistake. The controls of the bomber were handed over to an automatic pilot that the bombardier initiated after his calculations

were complete. Even the actual bombing release was under the control of the bombsight, further eliminating the possibility of human error.<sup>7</sup>

Although the NBS was a truly remarkable piece of technology, its record during the war not only failed to live up to the expectations of the Air Force Officers, but also hardly produced results resembling the predicted precision campaign. The major drawback of an optical sight was that the bombardier required visual contact with the ground. American air doctrine was based on the presumption that an attack on the economic heart of the enemy's country would result in a quick and relatively bloodless victory. To achieve this envisioned strategic victory, AAF leaders believed that the optimal strategy was a daylight precision bombing campaign directed at the enemy's war economy. So, in theory, by bombing during the day the Americans would eliminate the problem of maintaining visual contact with the ground. What the theorists neglected to take into account was that night was not the only hindrance to optical sighting and a cloudy day could negate whatever technological advantages they had achieved with an optical precision sight. As the Eighth Air Force would find out in Europe during its early involvement in the Second World War, Mother Nature can trump optical technology, no matter how sophisticated or precise.

More problematic for the NBS and daylight precision bombing was the fact that testing of the mechanism was always done in ideal conditions at reasonably low altitudes, whereas, in battle, situations were rarely, if ever, ideal. Furthermore, the tactics employed by the *Luftwaffe* were in essence tactics that were deemed unachievable during the

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<sup>7</sup> The description of the operation of the Norden can be found in numerous sources however Stephen MacFarland's work is easily read and generally unbiased. See: Stephen L. MacFarland, [America's Pursuit of Precision Bombing, 1910-1945](#). (Washington: Smithsonian Institution Press, 1995), 69-72.

formative years of American bombing doctrine.<sup>8</sup> This was due primarily to wartime advances in German aircraft—and weapon design—rather than to any serious lack of insight on the part of AAF officers. The use of 30-millimeter long-range cannons allowed *Luftwaffe* pilots to engage the high altitude bombers effectively from outside the range of the .50 caliber guns utilized by the Americans. Since *Luftwaffe* pursuit fighters were able to climb as high as the bombers, and more importantly, were fast enough to catch them, the theorized invincibility of the “flying fortresses” were further negated. In these conditions, bomber crews were expected to hand over the controls of their lumbering planes to an automated pilot leaving them exposed both to the German fighters and to ground fire for extended periods of time!

American daylight precision bombing and the NBS faced more problems than German guns, however, and in many ways the NBS project was critically ill prior to the outbreak of hostilities. The Army Air Force expansion program of April 1939 together with the AAF’s dogmatic adherence to its precision doctrine meant that thousands of Norden Bombsights were needed in a very short period of time. The NBS had been developed under the supervision of the Navy; and the Carl L. Norden Company, under the jurisdiction of the Naval Bureau of Ordnance, was the only supplier of Norden sights to the Army until 1943.<sup>9</sup> The material needs of the Air Force required mass production of the bombsight, which by April of 1943 was being undertaken by companies other than

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<sup>8</sup> For a more complete discussion involving the *Luftwaffe*’s technological advantages during the early stages of the American daylight strategic bombing campaign see: Geoffrey Perret, Winged Victory: The Army Air Forces in World War II, (New York: Random House, 1993), 253.

<sup>9</sup> The Navy did produce and supply the Army throughout the war, but the Army was forced to diversify its own sources for the sight. This was a process that resulted in a long negotiation between the Navy’s Bureau of Ordnance and the Army Materiel Division. The result was both a constant shortage of bombsights and the breaching of Carl L. Norden Co.’s patent rights in sights produced by the Army, see: Stephen L. MacFarland, America’s Pursuit of Precision Bombing, 1910-1945. (Washington: Smithsonian Institution Press, 1995), 114.

Norden. The device's extremely tight technical specifications together with wartime shortages resulted in units produced by both Army and Navy contractors that failed to reach the relatively good performance of the devices made by Norden. Needless to say, due to both the reality of air combat, and mass production issues, the overall performance of the NBS failed to meet the pre-war claims. As a result, the Air Force was forced to make critical adjustments to its tactics, these included area bombing by late 1943, and low-altitude incendiary attacks over Japan by 1944. Remarkably, despite the limitations and failures of the bombsight, its image remained glowing, and in many ways its fame grew.

### **The Norden in the Public Eye**

During the course of the war many factors helped to raise the Norden Bombsight to its legendary status. John Steinbeck's 1942 book, *Bombs Away*, stated that, "This isn't a war of flags and marching. It is a war of finding the target in the cross hair of the secret bombsight and setting the release." Steinbeck depicts the professional nature of modern air war and describes the bombardier's job as "a technical job, a surgeons job," a job that held no room for emotion, for according to Steinbeck "hatred does not operate a bombsight."<sup>10</sup> The language that Steinbeck used in his highly patriotic work was indicative of the language used in all cases to describe the Norden Bombsight and its all-important role within the Second World War.

Besides print, many stories circulated around the country explaining certain features of the "secret bombsight" that added to the mystique of the NBS. The reticle in

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<sup>10</sup> John Steinbeck, *Bombs Away: The Story of a Bomber Team*, (New York: Paragon House, 1990), 66. Also quoted in: *Norden Insight*, December 1942. (New York: Carl L. Norden Inc., 1942) pg 2.

particular was a prime target for rumours during and after the war. According to one story, the NBS reticle was actually the silk web of the deadly Black Widow, which was purportedly used because of its extreme tensile strength and the ultra fine thread.<sup>11</sup> Another story about the reticle was that each one was made from the hair of a young woman from the Midwest of the United States. This story not only eventually produced a woman who actually claimed to be the donor, but also resulted in thousands of prepubescent American girls volunteering their hair for service.<sup>12</sup> By the end of the war the NBS had become the focus of a Hollywood feature film; it had filled the pages of numerous special interest magazines, and it remained a highly debated and public subject within the country's largest newspapers. The Norden had been the target of two Nazi espionage rings, and a British RAF officer—the future commander of the RAF Arthur “Bomber” Harris—had even tried to steal information on the NBS by getting his American Air Corpsmen hosts drunk.<sup>13</sup>

### **Deconstructing the Norden Myth**

It is the popularity of the Norden Bombsight with the American public that this work will address: the myth that surrounded the device at the time, and that still persists today, despite the evidence that points to the failure of the NBS. Through an examination of the organizations and groups that served to gain the most from the fame of the device, this study will show that the Norden Bombsight's legendary status was a deliberate

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<sup>11</sup> Pardini, *The Legendary Norden*, 274.

<sup>12</sup> Pardini, *The Legendary Norden*, 276.

<sup>13</sup> The Nazi espionage cases are discussed in detail in chapter 2. For the reference to the Harris getting some American airmen drunk, see David Zimmerman, *Top Secret Exchange: The Tizard Mission and the Scientific War*, (Montreal: McGill-Queen's University Press, 1996), 38.

creation by several parties, each with its own agenda. This investigation will include not only those groups that would benefit directly from the Norden's success, but also those groups that would benefit simply from association with the famed device. What becomes clear on examination is that the Norden Bombsight and its relevance to the outcome of the Second World War meant different things to different people.

To the American public the NBS was the "secret bombsight," to the British it was the "Hush-Hush Sight;" and to the AAF bombardiers it was the "Blue-Ox."<sup>14</sup> However, these nicknames had little role in creating the popular reputation of the device, for in reality, the American public, the British, and even the AAF bombardiers had little if any stake in the device or the inflation of its status. Still, nicknames, rumours, and patriotic books added to the NBS's fame, and these examples demonstrate that there was much public speculation about the NBS even before the war.

The most obvious sources of the myth were both the United States Army Air Force, which had at stake its very survival and/or independence, and the Carl L. Norden Company, which benefited financially from the sale of its only product. Yet this work will demonstrate that other important groups had a vested interest in securing the Norden Bombsight's fame. These included but were not limited to: the United States government, the Victor Adding Machine Company and Boeing. Special interest magazines such as *Popular Science*, *Fortune* and *Flying*, as well as most civilian newspaper organizations most likely benefited from publishing articles that revealed any aspect of the "secret sight." For example, the cover of the June 1945 *Popular Science* claimed that the issue contained the "secrets of [the] Norden Bombsight," revealing how

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<sup>14</sup> *Norden Insight*, December 1942, Vol. 1, No. 4, 2.

the device was sometimes used to capture the interest of readers.<sup>15</sup> As this work will demonstrate, the AAF's exploitation of the media through publicity releases resulted in a very general yet common knowledge of the NBS by the American public. This public attention or, better yet, thirst for information regarding the NBS was then readily exploited by media organizations whose primary purpose was financial gain through the sale of its product. This public interest created something like a positive feedback loop that stimulated interest in the Air Force and helped the United States Government garner support for a type of war that until Pearl Harbour had remained fairly unpopular.

A fine line exists between the media publications which intentionally used the Norden myth to make money and those which were simply reporting news. Those publications that reported news only, may or may not have intentionally included myth-making material. Either way, however, both kinds contributed to the myth's proliferation. Those publications that sought to benefit directly from reporting stories contemporaneously to the events in question are considered as interest groups. These consisted of mostly special interest periodicals. That said, any form of media that included stories relating to the Norden bombsight are important sources, and may have been partly responsible for the actual propagation of the Norden myth.

Primary sources, both print and film, are the main source of material used in this investigation. It has been crucial to gather a sufficient amount of primary material to obtain a clear idea of the language and rhetorical devices used to create the Norden myth. The use of some secondary material has been necessary as well to both provide a clear analysis of this period of history, and to construct an overall narrative that can be

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<sup>15</sup> *Popular Science*, June 1946, Vol. 146, No. 1, cover.

followed without getting lost in a micro-history of small detail. The written materials used include archival material, editorials, special interest articles, biographical accounts, commercial advertising posters, and essays produced by various contemporary individuals. The material will be analyzed to isolate the language and descriptions employed to create a specific image or symbolism that can in hindsight be linked to the Norden myth.

Language and its use is key to this work. Although often it is difficult to gauge the impact of ideas and propaganda on a group of people in the past, the language used, often repetitively, to describe the NBS can help us determine what was deemed significant or what was popular at the time. For example the Air Corps, claiming that precision daylight bombing would save lives by shortening the war, presented the NBS as a means of waging a humane form of warfare. At the same time *Popular Science* described the device as a super computer, thus highlighting the technological prowess of the United States. In both examples the NBS was showcased in a positive light yet the positive gloss comes for two distinct reasons: in the first example, to promote a doctrine and secure legitimacy, and in the second, to sell magazines by including appealing subject matter. Through an examination of language, patterns become evident. These patterns are key to understanding both the creation and the promulgation of the Norden myth.

The main source of the Norden myth was the Air Corps, and as the first chapter will demonstrate, the Air Corps had been continually using propaganda to disseminate its ideas to the American public since the end of the First World War. The Norden Bombsight was a fairly late development in the Air Corps' long publicity campaign but in the end it was the most important. As far as the creation of the Norden *myth* is concerned,

the Air Corps' most significant contribution was its on going appearance within American media throughout the inter-war period. Jacques Ellul points out "continuing propaganda must slowly create a climate first, and then prevent the individual from noticing a particular propaganda operation in contrast to ordinary daily events."<sup>16</sup> Chapter 1 demonstrates how a climate receptive to the Air Corps' particular form of propaganda already existed as shaped by American notions of modernity and progress. Whether the proponents of air power latched onto these ingrained ideas wittingly or not is irrelevant because the Norden myth ended up taking on a life of its own. The long-running Air Corps media campaign simply built on what was already an "American" ideal. Propaganda in this sense is no longer used to transform an opinion, instead it is as Ellul argues, a tool used to "arouse an active and mythical belief."<sup>17</sup> American society in the early twentieth century was already accustomed to imbuing technology with positive attributes, thus it did not take much for the NBS to become a device synonymous with both American principles and humane characteristics.<sup>18</sup>

The hospitable climate within American society that I am referring to is what Ellul calls "pre-propaganda," and without such pre-propaganda the methods used to promote the NBS would have failed. This said, the methods themselves are crucial to understanding how the Norden myth took such firm root in American society. It is also important to remember, however, that contrary to Ellul's theory that all mass media must

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<sup>16</sup> Jacques Ellul, Propaganda: The Formation of Men's Attitudes, Trans. Konrad Kellen, (New York: Vintage Books, 1973), 20.

<sup>17</sup> Ellul, Propaganda, 25.

<sup>18</sup> James E. Coombs and Dan Nimmo argue that people generally respond not to reality but to whatever perceptions of reality they hold. "If people wish to believe in magical or mythical realities, then their desires for credulity can and will be discovered and appealed to." James E. Coombs and Dan Nimmo, The New Propaganda: The Dictatorship of Palaver in Contemporary Politics, (New York: Longman Publishing Group, 1993), 14.

be centralized in order to undertake propaganda, the Norden myth was created by centralizing, or more correctly consolidating, a set of images or symbols that became commonplace in regards to the NBS. Thus what enabled the Norden myth to proliferate was not centralized control of the media, but instead the control of the *idea* of the NBS and the repetitive use of the language used to form said idea. The result was that the device's myth persisted and grew beyond the original intentions of the Air Corpsmen who were attempting to secure an institutional foothold within the American armed forces. This momentum as it were, is a testament to the depth of both the pre-propaganda and the emotional link that the wider American public felt to the values imbued in the NBS.

Once the Norden myth took on a life of its own, manipulation was no longer necessarily deliberate, deliberate in the sense that the image was no longer being modeled by one group in order to achieve a specific aim. What occurred was a grasping of the accepted image to be exploited for some other means, and as this study will demonstrate in most cases the image was used for commercial gain. The second and third chapters of this work are organized first according to media form, and second chronologically where possible. That is, the promulgation of the Norden myth has been treated separately for the two most dominant media forms, print in chapter 2, and film in chapter 3. Each chapter is then separated according to different categories or genres for lack of a better definition. I have tried for both print and film categorization to determine the intended audiences, as well as, the specific intention of the producer or writer.

There is much overlap from the sources of myth making material, that is, audiences were influenced by NBS propaganda contemporarily through film,

newspapers, advertising, and magazines. It is crucial to understand that these overlaps in no way deter from the importance of each specific example of the Norden myth in the media. In fact, the overlap is in of itself a key to understanding how the Norden myth took such firm hold. In a society that was under the influence of the mass media, it was the barrage of like images and symbols from various mediums that ensured not only a uniform idea of the NBS, but also a collective image of the device. Once an accepted collective image of the device was established, the image itself became a means of promoting other ideas, or in some cases products. Using mass media to promote these secondary ideas or products reaffirmed the older established images of the NBS, further cementing the inherent misconceptions and fallacies within the collective mentality of broader American public. So despite the overlaps in media-produced myth-making material, it was necessary for the methodology of this work to categorize the material according to medium and/or genre. But it is important to remember that the overlaps in material and publications are one part of many that served to elevate a technical device to legendary status despite its failings.

### **The Norden Bombsight's Historiography**

The basis of this work is to analyze the creation and promulgation of the Norden myth within the American public consciousness. In order to deconstruct the Norden myth, a broad spectrum of media has been analyzed to determine how the falsehoods took such firm hold. Given the device's popularity during the war, as well as, the plethora of written works on the Second World War, especially the bombing campaign, it is somewhat surprising to find a general dearth of secondary material discussing this *famous* device. A

survey of the literature that exists specifically regarding the NBS produces an extremely short list. In fact, only one article and one book include the word “Norden” in the title, and neither can be considered truly academic.<sup>19</sup> According to Robin Higham, the sheer number of Second World War veterans and “an air-conscious world based on nuclear weapons, tactical air power, and the civil airlines,” has resulted in an increased amount of writing on aerial warfare, at least as compared to discussions of the First World War.<sup>20</sup> Given the *legendary* status of the NBS, Higham’s hypothesis might lead one to assume that there would exist a significant amount of modern or academic literature surrounding the device. Yet this is simply not the case.

As far as popular history is concerned, Albert Pardini’s 1995 book *The Legendary Norden Bombsight*, is the only “history” dedicated to the NBS. The book is an incredibly detailed account of the device, which draws almost exclusively upon government documents. Pardini claims that over a nine-year period, he and his nameless researchers assembled and attempted to organize as much of the information as they could find from various archival sources. In this regard, Pardini’s work is a valuable source of information regarding primary documents and their whereabouts. His apparent dismay at not being able to find “any definitive book or books on such an important subject” was his motivation to assemble the material.<sup>21</sup>

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<sup>19</sup> In this instance I am referring to an article written by Loyd Searle called, ‘The Bombsight War: Norden vs. Sperry.’ Searle is the president of an advertising and promotions firm specializing in electronic and high technology products. The article does not meet the standards of academia regarding footnotes or bibliographic references. The other work is Albert L. Pardini’s, *The Legendary Norden Bombsight*. I will discuss what I consider to be its limitations when I engage with Pardini’s work later in the paper.

<sup>20</sup> Robert Higham, ‘Air War History: The State of the Art.’ In *Military History and the Military Profession*. Ed. David A. Charters, Marc Milner, and J. Brent Wilson. (Westport: Praeger Publishers, 1992),91.

<sup>21</sup> Pardini, *The Legendary Norden Bombsight*, 8-9.

Pardini's work is essentially a technical history of the NBS and its numerous models. His analysis, however, tends to be a quite parochial, and he does not hide the fact that his work engages with very little secondary literature, academic or otherwise. Instead, Pardini attempts to provide a history of the *famous* device with only primary material and an obvious inclination towards his perceived brilliance of the NBS. For example, after a brief discussion of the USSBS statistics, Pardini declares:

There is no question that Allied air power was decisive in the war in Western Europe. The results of the study [USSBS] suggest that even a first class military power cannot survive for long under full scale use of air weapons over the heart of its territory. It seems that the NBS was able to live up to its name as a precision high altitude bombsight.<sup>22</sup>

Pardini's statement certainly has some merit regarding the "decisive" nature of Allied air power, but to suggest that the NBS performed anywhere close to what was expected is to simply ignore reality. Despite shortcomings in Pardini's work, it does provide a wealth of primary information including diagrams, charts and documents about the NBS.

Like Pardini, other NBS enthusiasts began to explore the device years after the war ended, and as a result articles began to appear that actually lauded the characteristics of the NBS. In the February 1976 issue of *War Monthly*, a picture of a bombardier operating a NBS occupies the cover with the sight being the focus of the feature article. The nine-page exposé is aptly titled, *Norden Bombsight*; however, the subtitle is reminiscent of the Second World War myth making trope: "Top Secret for years, a wonder-sight with 'pickle barrel' accuracy."<sup>23</sup> Although the article raises difficulties that confronted the USAAF in Europe and Japan such as adverse weather and widely

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<sup>22</sup> Pardini, *The Legendary Norden Bombsight*, 325-326.

<sup>23</sup> The subtitle continues with the sentence: "But later matched by a not-so-lauded RAF model." See: *War Monthly*, Issue 23, February 1976, (London, Marshall Cavendish Ltd., 1975) 1.

dispersed targets, for the most part the article served to rekindle the sort of awe that the public would have felt towards the device during the conflict. For example, the article details the 1943 raid against the Gumi-Wake factory in Hanover. Ignoring the fact that the USAAF was already using lead plane bombing tactics, the article credits the Norden with 21 direct hits. That a couple hundred heavy bombers only managed 21 direct hits with a sight capable of hitting a “pickle barrel” does not seem to bother the writer; if it occurred to him at all.<sup>24</sup> The accuracy statistics within the article give the same numbers that most writers use to criticize the AAF effort, yet this writer makes the statistics seem extraordinary. While the bombing results may have seemed remarkable to an audience in the mid-seventies, the results were nothing close to what the *legendary* device was supposedly capable of, at least according to the wartime dogma.

A year after *War Monthly*'s exposé, *Air Combat* published an article written by R. W. Koch called ‘Norden Bombsight: Examination of a Famous Weapon.’<sup>25</sup> Koch is much more critical in his approach to the subject. He is careful not to fall prey to the standard myth-jargon; instead, he acknowledges the mythical elements of the NBS and then sets out to tell the inter-war history of the device. In doing so, Koch avoids both the controversy surrounding the strategic bombing campaign and the nonsense surrounding the NBS's highly public wartime career. He succeeds in writing an early history of the device and makes it clear that he spent some time in the national archives. Like Koch's article, another work, D. Sherman's ‘The Secret Weapon,’ which appeared in the March

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<sup>24</sup> *War Monthly*, 5.

<sup>25</sup> R. W. Koch, ‘Norden Bombsight: Examination of a Famous Weapon,’ *Air Combat*, Vol. 5, Num. 1, January 1977. 44.

1995 issue of *Air & Space*, is a well grounded portrayal of the NBS's history.<sup>26</sup> Sherman too acknowledges how the NBS was perceived during the war but then sets out to relay the history of its development and combat use. The articles that appeared in *Air Combat*, *War Monthly*, and *Air & Space* were exposés in special interest magazines directed at an audience of enthusiasts, but with limited in circulation. From these few instances in which the NBS appeared in public after the war, it is thus difficult to measure public exposure to critical scholarship on the subject.

It is not difficult to find works that narrate the Strategic Bombing Campaign of the Second World War, and many of these books are written by superb academics who provide excellent analysis. Yet the NBS is hardly discussed in great detail.<sup>27</sup> Two fairly recent and easily read examples are Richard J. Overy's *The Air War 1939-1945*, and Williamson Murray's *War in the Air, 1914-45*.<sup>28</sup> Both cover the air campaigns of the Second World War, and Murray discusses the First World War and the interwar period as well. Neither of these works, however, adds to the historiography of the NBS, and in this regard are both typical of other air war surveys.

An abundance of veteran-written "regimental" histories exist, but these tend to be either operational narratives relating to each specific unit, or collections of individual accounts of a unit's members. *The Mighty Eighth* by Gerald Astor is one of the most popular if not the best collections of personal accounts, but it lacks any deep analysis of

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<sup>26</sup> Sherman, D., 'The Secret Weapon.' *Air & Space*, March 1995, Vol. 9, No. 6, pp. 78-87.

<sup>27</sup> I focus on larger works as opposed to articles because the numerous articles that exist relating to the Strategic Bombing Campaign of the Second World War do not add any new information on the Norden Bombsight. The limited length of this paper prohibited an inclusive discussion on articles that do not actually enhance the analysis of this work.

<sup>28</sup> Richard J. Overy, *The Air War 1939-1945*. (Washington: Potomac Books Inc., 1980). and Williamson Murray, *War in the Air, 1914-45*. (London: Cassell & Co., 1999).

the overall Strategic Bombing Campaign. Thomas M. Coffey's *Decision Over Schweinfurt*, is a good amalgamation of both these types of history. Although Coffey focuses upon the difficulties surrounding the formation of the Eighth Air Force, there is a wealth of primary material quoted within its well constructed narrative.<sup>29</sup>

The effectiveness and/or implications of the Strategic Bombing Campaign has become a very controversial subject, and there is an ever-increasing amount of revisionist work being produced that questions the morality of the campaign. The publication of data from the United States Strategic Bombing Survey (USSBS) has served to provide both sides of the morality debate with ample statistical data to interpret. David MacIsaac's *Strategic Bombing in World War Two* is both a guide to understanding the data of the USSBS, and an interesting look at how the USAAF and the American Government interpreted the data.<sup>30</sup>

Not surprisingly revisionist works tend to be high in emotive and subjective language, and low in technical and objective analysis. Despite the lack of technical data within revisionist discussions, some of these authors provide a great deal of information regarding the process of the development of air war doctrine and its implementation. For instance Michael Sherry, in *The Rise of American Air Power*, and Ronald Schaffer, in *Wings of Judgment*, argue that the USAAF policy of daylight precision bombing remained a theory only, and in actuality the Air Force practiced indiscriminate area

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<sup>29</sup> Thomas M. Coffey, *Decision Over Schweinfurt: The U.S. 8<sup>th</sup> Air Force Battle for Daylight Bombing*. (New York: Charter Books, 1977), v-vi.

<sup>30</sup> I am not presuming to place David MacIsaac within the revisionist camp, but his work simplifies the mass of data that the USSBS produced. He also provides a history of the development of the USSBS and treats the reason for its creation. David MacIsaac, *Strategic Bombing in World War Two: The Story of the United States Strategic Bombing Survey*. (New York: Garland Publishing, Inc., 1976), x-xi.

bombardment.<sup>31</sup> Both argue that in most cases military necessity trumped moral obligations, resulting in the death of thousands of non-combatants.<sup>32</sup> Conrad C. Crane's 1993 book, *Bombs, Cities and Civilians*, is a well thought out rebuttal of the revisionist argument. Crane argues that despite the increase in civilian casualties towards the end of the war, the objective of the USAAF remained the same, to deliver a knock out blow with minimal collateral damage.<sup>33</sup>

Crane's work seemed to stifle revisionist arguments for several years, forcing revisionists to reconsider their approach. Perhaps the most successful "new" revisionist is Tami Biddle. Biddle's *Rhetoric and Reality in Air Warfare* (2002) traces the evolution of the theory of Strategic Bombing and considers how both Britain and the United States adopted doctrines that suited the nuances of their respective populaces. Biddle maintains that, regardless of what USAAF commanders declared publicly, evidence indicates that by 1943 civilians were becoming the targets of Strategic Bombing. Biddle opines, "the claims they made and the policies they advanced reflected specific cultural, political, social, and institutional contexts."<sup>34</sup> By focusing on the nature of policy, Biddle sidesteps the moral debate, but at the same time her argument juxtaposed with the rhetoric makes discussion of Allied morality, because her revisionism is so clear. In any case, the ongoing revisionist debate about the strategic bombing campaign has produced very little detail about the NBS.

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<sup>31</sup> For an excellent breakdown of the argument put forward by these authors see: Peter Faber, Reviewed work(s): *Bombs, Cities, and Civilians: American Airpower Strategy in World War II*. by Conrad C. Crane, *The Journal of Military History*, Vol. 57, No. 4, (Oct., 1993), pp. 735-737, 736. <http://www.jstor.org/stable/2944115>

<sup>32</sup> Faber, Reviewed work(s): *Bombs, Cities, and Civilians*, 736.

<sup>33</sup> Faber, Reviewed work(s): *Bombs, Cities, and Civilians*, 736.

<sup>34</sup> Tami Davis Biddle, *Rhetoric and Reality in Air Warfare: The evolution of British and American Ideas About Strategic Bombing, 1914-1945*. (Princeton: Princeton University Press, 2002), 291.

In 1942 the U.S. Army Air Forces Commanding General Henry H. Arnold initiated an Air Force historical program at the behest of President Roosevelt.<sup>35</sup> Historians assigned to various military units throughout the war recorded the activities of the service “for the final analysis of accomplishments, as well as failures and responsibilities for each.”<sup>36</sup> The historian, and one time Chief of the Office of Air Force History, Richard Kohn, declares: “the histories are much more than aggregates of data; they are comprehensive, accurate, objective, and analytical narratives...”<sup>37</sup> Unfortunately the official histories contain almost no information regarding the development of the Army NBS program. Moreover, the device—when it is mentioned—does not fare well. The histories indicate that the testing of precision bombing had proved impressive, but the writers also admit that the “accuracy was exaggerated in the ‘pickle-barrel’ bombing which arose during that period, to the later discomfiture of the AAF.”<sup>38</sup>

The operational nature of the USAAF Official History and the fact that it was created so soon to the events they purpose to narrate has left little room for analysis. The limited amount of discussion of the NBS within the official history corroborates this statement. Other than a brief discussion of technical exchanges with the British, which did not involve the NBS, there is little more than anecdotal information regarding the role of this “legendary” device. This lacuna within the Official Histories might explain why so

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<sup>35</sup> Richard H. Kohn, ‘History as Institutional Memory: The Experience of the United States Air Force.’ In Military History and the Military Profession. Ed. David A. Charters, Marc Milner, and J. Brent Wilson. (Westport: Praeger Publishers, 1992), 158.

<sup>36</sup> Arnold to George Kenney, 8 November 1942, in the files of the Center for Air Force History, Bolling Air Force Base, District of Columbia. As cited in: Kohn, ‘History as Institutional Memory,’ 158.

<sup>37</sup> Kohn, ‘History as Institutional Memory,’ 160.

<sup>38</sup> Craven, The Army Air Forces in World War II, 599.

many of the general histories of the air campaign as well as revisionist arguments provide such limited information regarding the developmental or technical aspects of the NBS.

Like the USAAF, the United States Navy (USN) commissioned a written historical project.<sup>39</sup> In 1946 Robert Brown wrote an official USN history of the development and production of the NBS between 1926 and 1945. Brown's work is an easy read considering it is a technical treatise on a mechanical computer. Although lacking any analysis, the work does detail the USN's version of the dysfunctional relationship that existed between the Navy's Bureau of Ordnance and the Army's Materiel Division. It is also an extremely valuable asset in regard to the early developmental history of the device. Much like the USAAF history however, Brown's work is missing the depth of analysis that can come with distance in time. Instead, serious analysis of the NBS has been left to those historians who consider developments that the NBS played an integral, yet secondary, role.

Two things become immediately evident upon reviewing the *unofficial* academic literature that discusses the NBS: First, there is very little academic literature specifically dealing with the device itself. Second, the academic literature that does engage with the NBS does so in a supplementary way. That is, the NBS has for the most part remained a small part of a larger historical discussion. The prime example is David Kahn's 1978 book, *Hitler's Spies*. Kahn describes how Hermann Lang, an inspector for the Norden Company factory in New York, sold blueprints of the NBS to Nazi agents in 1938.<sup>40</sup> The

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<sup>39</sup> Robert V. Brown, The Navy's Mark 15 (Norden) Bomb Sight: Its Development and Procurement, 1920-1945. Department of the Navy, Office of the General Council, Washington D.C., 1946, 92-93.

<sup>40</sup> David Kahn, Hitler's Spies: German Military Intelligence in World War II. (New York: Macmillan Publishing Co., Inc., 1978), 302.

second chapter of this work describes just how important the Lang case was in publicizing the NBS, though the Lang case occupies only a few pages in Kahn's massive volume.

David Zimmerman's 1996 book, *Top Secret Exchange: The Tizard Mission and the Scientific War*, is another study in which the NBS plays a supplementary role in a larger study. Unlike Kahn's work however, Zimmerman's portrayal of the development of an Anglo-American technical exchange during the Second World War lays out the role that the famed capabilities of the NBS played. It was the RAF's desire for the NBS that drove them to pressure the British government for inter-Allied technical cooperation; thus, the NBS occupies a much greater position in *Top-Secret Exchange*, although the NBS still remains only part of a greater investigation.

Stewart Halsey Ross's *Strategic Bombing by the United States in World War II* is an exploration of the 'myths and the facts' surrounding the role of the USAAF in the strategic bombing campaign. Ross's work is an assessment of the myth that still persists today regarding America's attempt at precision bombing. What separates Ross's revisionist work from that of Schaffer, Sherry, and even Biddle is that Ross spends little time discussing the morality of strategic bombing. Instead, he pursues a less emotive and more fact based approach to the revisionist argument. His work is an attempt to "expose the deceits and cover-ups, purposeful as well as benign, that still crowd the realities of U.S. strategic bombing."<sup>41</sup> Ross has argued effectively that despite the claims of the USAAF high command, the technology of precision targeting was simply unable to produce the results that bombing doctrine demanded. This is not to say that Ross has

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<sup>41</sup> Ross, *Strategic Bombing by the United States*, 1.

produced a fully objective argument, but his stance regarding the American Strategic Bombing is clear, and his methodology, his attention to the technical aspects of the campaign, and his depiction of how the hype surrounding devices like the NBS and the B-17 culminated into a self-perpetuating myth, give much credence to his argument. Ross maintains that the precision campaign was a myth and that the NBS was simply part of the myth-making process. What he has failed to recognize is that one is hard-pressed to find anyone arguing that the strategic bombing campaign of the Second World War actually achieved precision targeting. It is true that precision claims were made at the time and that the NBS was used to strengthen the precision myth, yet even non-revisionists recognize the limitations of the period technology.

By far one of the most comprehensive studies of precision bombing and the NBS in the Second World War is Stephen McFarland's *America's Pursuit of Precision Bombing, 1910-1945*.<sup>42</sup> McFarland's work, like all others pertaining to American strategic bombing, starts with an analysis of the development of air power theory. What makes McFarland's work stand out is his technical approach to the subject. His investigation includes a critical analysis of all the options that both the Navy and the Air Corps considered. Thus, McFarland has constructed a systematic analysis of the NBS while at the same time discussing technical detail. He avoids the morality of strategic bombing yet points out the irony inherent in preaching precision bombing and then using the NBS to drop the atomic bomb. Much like all the aforementioned historians, McFarland's study does not focus on the NBS, but instead all other aspects of America's

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<sup>42</sup> MacFarland, *America's Pursuit*.

pursuit of precision bombing. However, McFarland's considerable attention to the NBS makes his work the most comprehensive study of the bombsight to date.

*America's Pursuit of Precision Bombing* has subsequently become the essential source for historians writing anything about the NBS. Timothy Moy's *War Machines* (2001), Michael Rip, James Hasik's *The Precision Revolution* (2002), and Paul G. Gillespie's *Weapons of Choice* (2006) are all prime examples of studies that have relied on McFarland's work for NBS related data. This is a testament to the high quality of McFarland's research as opposed to derivative character of other writers' work. While McFarland is to be commended for his work, however, there is much work to be done to uncover all the secrets of the *legendary* NBS. It is the hope of this author to add to the historiography of this subject.

## Chapter 1

### American Notions of Progress and the Air Corps

*Look back on the way in which, as World War II crept closer and closer, bombardment came to be classed as akin to the criminal in warfare, an attitude enlarged by the indiscriminate attacks of German and Italian planes on Guernica, Barcelona, and Badajoz during the Spanish Civil War, and by Mussolini's bombing of native hut villages in Ethiopia.*

—Hap Arnold, *Global Mission*<sup>43</sup>

The creation of the Norden myth was inextricably linked to the development of the United States Air Force. Working first under the umbrella of the Signal Corps, and then of the Army, the proponents of air power were concerned primarily with the development of an independent Air Force. The inter-war period witnessed incredible technological developments in both aeronautic design and application. For the proponents of air power these new technological innovations added to the belief that the future of successful warfare depended upon a marked superiority in the skies. This perception, or more correctly, dogmatic belief in the ability of technology to answer any complex problem, was not a characteristic solely possessed by Air Corps personnel, but instead was a characteristic inherent in American society. According to Michael Adas,

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<sup>43</sup> H. H. Arnold, *Global Mission*, (New York: Harper & Brothers, 1949), 159.

technological optimism had been a leitmotif in America's civilizing mission from its earliest days along the Atlantic coast, to its imperial mission in the Philippines.<sup>44</sup> The veneration of inventors and engineers was integral to the American admiration for technological prowess, which resulted in the construction of modern city skylines, railroads, automobiles and even the Norden Bombsight (NBS).<sup>45</sup> The proponents of the air war not only exploited American perceptions of technology, but also shared victims of the same perception, because technology as the symbol of progress was part of the American psyche.

Regardless of its specifically designed task, the NBS was one artifact within a broad technological culture, that is, it represented the culmination of many different technological systems utilized to create a device with the purpose of performing a specific task. On its own, the NBS was simply a machine that helped to solve the complex bombing problem, however, for the proponents of air power it represented much more. According to Timothy Moy, the NBS was the answer to the Air Corps' need to develop an independent strategic mission, which would in turn justify a separate and independent United States Air Force.<sup>46</sup> At the same time, however, the NBS represented *America*, for it represented applied ingenuity, it was a sophisticated technology used to solve complex problems that an unaided human mind would remain incapable of successfully dealing with. The NBS was the epitome of what America *was*, and even if the proponents of air power such as Hap Arnold, Carl Spatz, and Ira Eaker did not see the

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<sup>44</sup> Technology and America's civilizing mission is the theme of Michael Adas's recent work: Michael Adas, *Dominance by Design: Technological Imperatives and America's Civilizing Mission*, (Cambridge: Harvard University Press, 2006).

<sup>45</sup> Thomas P. Hughes, *Human-Built World: How To Think About Technology and Culture*, (Chicago: The Chicago University Press, 2004) 46.

<sup>46</sup> Timothy Moy, *War Machines: Transforming Technologies in the U.S. Military, 1920-1940*. (College Station: Texas A&M University Press, 2001) 4.

NBS in this light, the American penchant for technology, and its exploitation by these airmen must be considered a source of the Norden myth. Thus the objective of this chapter is twofold. First, it will demonstrate *why* the method used by the Air Corps officers to promote a modern strategic bombing mission was so effective. In order to understand the effectiveness of Air Corps methodology, the investigation provides an examination of certain perceptions Americans held of themselves and of the ways the Air Corpsmen exploited these perceptions. It will be necessary to determine what it was about the link between technology *and* American society that raised technological artifacts such as the NBS to legendary status.

The second objective of this chapter is to demonstrate how the officers of the Air Corps created an atmosphere conducive to myth-making through their unabashed use of the American mass media. While initially the Corps' publicity campaign was undertaken to strengthen the argument for an independent Air Force, as the war loomed near, the Air Corps campaign shifted to promote the new doctrine of precision daylight bombing. Wittingly or not, the Air Corps' struggle for independence created an atmosphere favourable to the creation of the Norden myth. The impact of the Air Corps' campaign, together with American perceptions of technology, are an underlying theme throughout this entire work, and must be considered within each of the chapters of this study. In large measure it was the highly public position that the Air Corps occupied in the inter-war period that enabled the mythical qualities of the NBS to take such firm hold, both during and after the conflict.

Throughout the nineteenth-century technological innovation became an ever-increasing force within American society, this trend increased dramatically in the decades

following the First World War. By 1940, ninety percent of American homes had electricity, whereas in 1917 less than twenty five percent of American homes had been electrified.<sup>47</sup> Americans were quickly ushered into the machine age by motion pictures, automobiles, airplanes, and mass consumption. Mass consumerism was fuelled by the mass media, which in turn exploited the very technologies it served to sell.<sup>48</sup> Those members of American society that invented or engineered technologies were celebrated as national heroes with the solution to the “manifold social ills that beset” modern America.<sup>49</sup> According to the historian, Merritt Roe Smith, this deterministic view of technology “took root when people began to attribute agency to technology as a historical force.”<sup>50</sup> To Americans, technology was the tool for progress as well as the symbol.

While technological determinism has its beginnings in the Industrial Revolution, the vastness of the New World, the American dependence upon technology to solve critical labour shortages, and the strong belief in progress all contributed to a uniquely American view of technology.<sup>51</sup> This is not an argument supporting a generic American exceptionalism, but instead is a specific claim made to stress the idea that the perceived inextricable link between technology and progress was—and in many ways still is—exceptionally American. According to Roe Smith, for early Americans “progress meant the pursuit of technology and science in the interest of human betterment and

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<sup>47</sup> Michael Adas, Machines as the Measure of Men: Science, Technology, and the Ideologies of Western Dominance, (Ithica: Cornell University Press, 1989) 409.

<sup>48</sup> Adas, Machines as the Measure of Men, 409.

<sup>49</sup> Adas, Dominance by Design, 142.

<sup>50</sup> Merritt Roe Smith, *Technological Determinism in American Culture*, in: Merritt Roe Smith and Leo Marx, Does Technology Drive History? The Dilemma of Technological Determinism. (Cambridge: The MIT Press, 1994) 2.

<sup>51</sup> Smith, *Technological Determinism*, 3, and Adas, Dominance by Design, 80.

material prosperity.”<sup>52</sup> Consequently, technology was seen as the vehicle to democratizing society as it moved toward a more affluent lifestyle. One special feature of this American idealistic view, specifically in regards to technology, is that as the nineteenth century closed and the twentieth began it actually rang true for many Americans.

The more accessible technology became, the easier it became for people to see it as both the progenitor and symbol of progress. Roe Smith indicates that American writers at the close of the nineteenth century displayed a unique enthusiasm for technology. The enthusiasm gave Smith the impression that “heavier and heavier doses of technology [were] being prescribed for the solution of societal ills.”<sup>53</sup> In this way technology became not only a cure, as it were, for the difficulties of everyday life, but also a symbol for the values that remained central to American life.<sup>54</sup> This is how, as Michael Smith put it, the material “artifacts of technical innovation” came to “signify progress;”<sup>55</sup> and as Michael Adas indicates, “many Americans regarded machines as objects of aesthetic pleasure; others proclaimed them divinely ordained instruments for building the nation and strengthening its moral resolve.”<sup>56</sup> Moreover, the perception in America was that invention and technological innovation became the foremost characteristic of American

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<sup>52</sup> Smith, *Technological Determinism*, 3.

<sup>53</sup> Smith, *Technological Determinism*, 8.

<sup>54</sup> Smith, *Technological Determinism*, 23.

<sup>55</sup> Michael L. Smith, *Recourse of Empire: Landscapes of progress in Technological America*, in: Merritt Roe Smith and Leo Marx, Does Technology Drive History? The Dilemma of Technological Determinism. (Cambridge: The MIT Press, 1994) 38.

<sup>56</sup> Adas, Machines as the Measure of Men, 405-406.

society: in this respect, America surpassed all other nations, including the previous seats of Western civilization in Europe.<sup>57</sup>

Early in the nineteenth century Ralph Waldo Emerson had recognized that the human-built world was a reflection of the values inherent within society.<sup>58</sup> This was certainly the case with the NBS in the twentieth. The apparent ability of the NBS to hit specific targets was credited both with sparing civilian casualties and with potentially lessening the overall human-cost of conflict by destroying the industrial capacity of the enemy nation. It mattered not to the public that at the same time the NBS helped secure the somewhat tenuous position of the Air Corps, because, the NBS represented American ingenuity at work. The NBS represented technology solving a complex problem; therefore, it was the embodiment of progress and American ideals. The Air Corps had developed a new type of war, a more humane war dependent upon the application of technology.

The trope that advances in technology would somehow shorten wars and make them less horrific was preached in the years prior to the First World War as well. Even after new technologies like the machine gun and mustard gas produced such horrifying results during the Great War, the pundits of Strategic Air Power were successful in spreading the false hope of a quick and bloodless end to future war based upon technological superiority.<sup>59</sup> The First World War had not yet finished before American proponents of air power were already indoctrinating young airmen to believe in the ability of strategic bombing campaigns to decide war. A revealing portion of a lecture

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<sup>57</sup> Adas, Machines as the Measure of Men, 406.

<sup>58</sup> Hughes, Human-Built Word, 37.

<sup>59</sup> Adas, Machines as the Measure of Men, 366.

given to Air Service trainees in Europe during the war's last stages of the provides evidence of Air Service beliefs: "Bombardment from occupying a practically non-existent and unimportant part in the war has become the most important branch of the air service and it is believed by many that if carried out in sufficient numbers it will win the war."<sup>60</sup>

Interestingly the strategic air doctrine that first developed occurred independent of the technical means later crucial to accomplishing its ends.<sup>61</sup> In its simplest form, the doctrine described an air force that could effectively fly over the defensive—or offensive—ground forces of the enemy, and strike at the heart of the enemy nation. The targets would be military, industrial and civilian infrastructure. The earliest proponents of air power, such as Giulio Douhet and Billy Mitchell, and contemporary military theorists such as Basil Liddell Hart, described attacks upon the civilian populations as the means to a quick end of war through intimidation and the creation of chaos.<sup>62</sup> The majority of America's air proponents, however, considered this method a waste of often-limited resources and instead developed a doctrine based focused upon the destruction of targets essential to the opposing country's ability to wage war.<sup>63</sup>

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<sup>60</sup> 'Lecture 1. General Outline of Bombardment.' *U.S. School of Bombardment, 7<sup>th</sup> A.I.C.*, as delivered by Captain G.C. Evans, Research Information Committee, Paris, to Research Information Committee, Washington D.C., 19 August 1918, NA RG189, E-2 Box 5, Records of the National Academy of Sciences.

<sup>61</sup> Moy, *War Machines*, 52.

<sup>62</sup> Douhet describes a "battlefield no longer limited to actual combatants. On the contrary, the battlefield will be limited only by the boundaries of the nations at war...There will be no distinction any longer between soldiers and civilians." Giulio Douhet, *The Command of the Air*, trans. Dino Ferrari, (Coward-McCann, Inc., 1942) 9-10. Liddell Hart insisted that, "Aircraft enables us to *jump over* the army which shields the enemy government, industry, and people, and so *strike direct and immediately at the seat of the opposing will and policy* (italics in original). Liddell Hart, *Paris or the Future of War*, (New York & London: Garland Publishing, Inc., 1972) 37.

<sup>63</sup> For the history of the earliest development of American strategic bombing doctrine, see Robert Frank Futrell, *Ideas, Concepts, Doctrine: Basic Thinking in the Air Force 1907-1960*, (Maxwell Air Force Base, Air University Press, 1989) 62-65.

As the perceived role of the Air Corps developed, so did aeronautic technology, this in turn resulted in a broadening of the real and perceived capabilities of air power. The Norden Bombsight, although developed by the United States Navy, became by April 1935 the final key to the new American Air Corps' way of war.<sup>64</sup> The NBS was then sold to the American public as a technological solution to avoiding the inhumane way in which air war, and war in general, had been fought in the First World War, and more recently during the conflict in Spain. Michael Smith describes the process of instilling societal values into technical devices as “a curious cultural and political fetishism whereby artifacts stand in for technology, and technology in turn signifies national progress.”<sup>65</sup> In this case America's obsession with technology and the Air Corps officers' desire for independence, came together with the development of the NBS.

Keeping in mind the American predilection for technological determinism, and American society's value-laden perception of technology, it becomes clear how the Norden myth could take hold in American society. Opposition to both the Air Corps' perceived self-importance, and the destruction—both human and material—of war, however, meant that the Norden myth was not necessarily inevitable. An investigation into the methods of persuasion used by the proponents of an independent Air Force does however perceptibly reveal an exploitation of the American public's value-laden perceptions of technology.

The inter-war period was rife with institutional instability for the fledgling Army Air Corps. The late entry of America into the First World War meant the Air Corps was

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<sup>64</sup> While the Army had purchased twenty-five navy designated Mark XI bombsights in March 1932 from the Navy, it was not until the Navy had successfully tested the Mark XV in 1935 that the Army began the process of equipping all its bombers with Norden units. See: 'Summary of the Norden Bombsight,' R&D Branch Case Histories, 1941-1946, NA RG 18, E-22, Box 27.

<sup>65</sup> Smith, *Recourse of Empire*, 39.

largely untested at the war's end. In fact, the United States night bombing squadron of DH4 airplanes was only assigned to the front on 9 November 1918, two days before the armistice.<sup>66</sup> As a result the Air Corps remained an underling, first within the Signal Corps, and then as a tactical arm within the Army, whose one mission was infantry support. Unlike its counterparts in the other nations, the US Army Air Corps (Air Service until 1926) remained bound to the overall defence of the nation, and the role of the Air Corps was anything but independent. The officers of the nascent Air Corps, including William Mitchell, Hap Arnold, and Carl Spaatz were thus forced to fight for the recognition and independence of the Air Corps. Early on, these men recognized the power of the media both to create public awareness and ultimately, they hoped, to form pressure groups to influence Congress in their favour. By capturing the attention and imagination of the American public it was believed that the Air Corps could gain valuable political support.

Fortunately for the men of the Air Corps, the public was genuinely receptive to its ambitions. While the technological predilections of the nation remained always in the airmen's favour, romantic notions of air combat were also on their side. Williamson Murray identifies this romanticism as one of the main reasons that a strategic bombing mission developed in the first place. Murray states: "Throughout the interwar period, popular views accorded aircraft, airmen, and flight itself with attributes of almost mythological proportions."<sup>67</sup> The romanticism can be largely attributed to the glamorous, yet historically distorted, memoirs and tales of adventure produced by the various "aces"

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<sup>66</sup> Tami Davis Biddle, Rhetoric and Reality in Air Warfare: The evolution of British and American Ideas About Strategic Bombing, 1914-1915, (Princeton: Princeton University Press, 2002) 53.

<sup>67</sup> Williamson Murray and Allan R. Millet, Military Innovation in the Interwar Period. (Cambridge: Cambridge University Press, 1996) 97.

that survived the First World War.<sup>68</sup> At the same time, John Morton Bloom links the hero worship of airmen directly to technology. Bloom writes: “More than the cleft chin or big heart, the aviator’s facility with and affection for machinery stamped him for Americans as a hero, an amalgam of Dan’l Boone and Henry Ford.”<sup>69</sup> Moreover, the romantic image of the airman and his plane was an image actually encouraged by officers within the early Air Service. As early as 1918 Air Service trainees were subjected to romantic flattery while learning to fly as bombardment wings:

If anyone thinks that bombardment is a banal and unromantic branch of aviation, let him stand some midnight on the aerodrome of a large bombing squadron and witness the take-off of eight or ten of these great night raiders, and their clusters of unpleasant eggs nestling closely under the spread of their huge wings. There is an excitement in the air that can be better felt than described...<sup>70</sup>

Regardless of the popular public image of airmen, or their own notions of grandeur, evidence suggests that the men of the Air Corps took it upon themselves to both educate the public and defend their position in the military establishment which was traditionally Navy-dominated. Adding to the Air Corps’ subordinate position was the economic hardships of the interwar period, and the resurgence of isolationist opinion after the First World War.<sup>71</sup> The fiscal stringency resulted in restricted budget allowances stunting Air Corps research and development, as well as operational growth. The latter problem led to the insistence by the upper echelon of the military that the Air Corps be restricted to a tactical role to support ground forces. The only option for the airmen was a publicity-campaign designed to garner support. The intensive campaign undertaken by

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<sup>68</sup> Robin Higham, *Air War History: The State of the Art*. In: Military History and the Military Profession. Ed. David A. Charters, Marc Milner, and J. Brent Wilson. Westport: Praeger Publishers, 1992.

<sup>69</sup> John Morton Bloom, V was for Victory, (New York: Harcourt Brace & Company, 1977) 62.

<sup>70</sup> Evans to Research Information Committee, Washington D.C., 19 August 1918.

<sup>71</sup> Stephen L. MacFarland, America’s Pursuit of Precision Bombing, 1910-1945. (Washington: Smithsonian Institution Press, 1995), 3-4.

the Air Corp and its supporters eventually led to an atmosphere in which Air Corp technology and doctrine became public knowledge.

The Army and Navy Air Service Association took an active role in publicizing both the existing state of aeronautic development, and the future needs of the developing military branches. Through their publication, *U.S. Air Service*, the Association attempted to “bring before the public the needs of the Air Service and its peace time uses.”<sup>72</sup> The association wished to produce an “attractive magazine and [by] not making it too technical [they could] get people outside the service to read it.”<sup>73</sup> In a letter written to Carl Spatz, the author C.P. McDerment opined: “No one is going to do anything for the Air Service unless we show some interest ourselves. There has never been a more propitious time than now to cooperate and help get before the public the needs of the Army Air Service.”<sup>74</sup> Clearly the Air Corps’ upper echelon understood the need for publicity, however, in order to spread the Air Corps message to the wider American public it was first necessary to gain support from civilian media.

An example of the type of civilian media that the Air Corps encouraged is an article printed in the 17 February 1923 issue of the *Saturday Evening Post*:

It is a common place among military men that the next war will be won in the air. The nation without an adequate air force will be absolutely helpless, and it is likewise true that without a commercial air fleet it will be outstripped by its rivals in the markets of the world. The development of aircraft and air transportation is necessary if we are to maintain our economic and our national independence.<sup>75</sup>

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<sup>72</sup> C.P. McDerment to Major Carl Spatz, C.O. Selfridge Field, Mt. Clemens, Michigan, 16 June 1923, Box 3, Spatz papers, Library of Congress.

<sup>73</sup> McDerment to Spatz, 16 June 1923.

<sup>74</sup> McDerment to Spatz, 16 June 1923.

<sup>75</sup> The passage of the *Saturday Evening Post* was found in: Mason M. Patrick, Chief of Air Service, President Army and Navy Air Service Association to Commanding Officer Selfridge Field, Mt. Clemens, Michigan, 17 March, 1923, Box 2, Spatz papers, Library of Congress.

That the civilian media was taking such an interest in the development of both military and commercial aviation provoked the enthusiasm of Air Service officers. In a letter to the Commanding Officer of Selfridge Field, the Chief of the Air Service, Mason Patrick, responded positively to the *Post's* article:

The fact that this widely read magazine in its editorial columns so stressed the importance of aeronautics indicates that there is a popular interest in the subject and this should be encouraged in every way possible.<sup>76</sup>

Highly publicized events such as Billy Mitchell's 1921 publicity stunt of sinking of the captured German battleship, *Ostfriesland*, had fuelled the public's desire to read stories about the nascent Air Service. To the public, the sinking of a battleship by a squadron of airplanes must have seemed revolutionary, and no doubt this is what Billy Mitchell wanted. However, the strategic or tactical importance of this event was far from what the public may or may not have perceived. As Stephen McFarland points out, "there was nothing especially profound about aircraft dropping hundreds of bombs to sink immobile ships unprotected by anti-aircraft artillery."<sup>77</sup> Regardless of McFarland's poignant statement, the message had been sent: Navies were vulnerable to air attack, and the public now knew it.

Publicity on the level of the *Ostfriesland* sinking was a rarity, however, so the airmen were forced to come up with other stunts such as Hap Arnold's highly publicized 1922 Portland to San Francisco race against a squadron of messenger pigeons. Despite

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<sup>76</sup> Patrick to Commanding Officer Selfridge Field, 17 March, 1923. Interestingly, the exploitation of media began earlier than even the First World War. In his book *Global Mission*, Hap Arnold indicates that prior to the war "the press kept reporters at the field (College Park). Though we knew that they were there primarily to await a newsworthy accident that was bound to occur sooner or later, they became our friends and the first regular 'aviation writers.'"H.H. Arnold, *Global Mission*. (New York: Harper & Brothers Publishers, 1949) 33.

<sup>77</sup> MacFarland, *America's Pursuit*, 46-47.

some early mechanical setbacks, Arnold arrived 48 hours before the first pigeon, effectively relegating the messenger pigeon to the past.<sup>78</sup> Publicity stunts by the Air Service took on many forms, and preparation to ensure the widest media coverage became a priority for the officers before any stunt was undertaken. One early publicity act involved a mass air attack against a central location in Los Angeles. The attack was initiated from San Diego and was undertaken by a combat formation flying at 30,000 feet, “above the zone of sight and sound.”<sup>79</sup> In order to create surprise, the attack occurred early in the morning; however, the time was chosen not only to “draw a large crowd but also [to] have the event occur in time to catch afternoon papers and European morning papers.”<sup>80</sup> It was so important for the Air Service to create a media sensation that the national media were alerted to the event a month in advance in order to “permit nation-wide publicity by mail, as well as through the distribution of pictures.”<sup>81</sup>

Air Service publicity, however, was not always in the form of massive flying expositions. Another favourite of the Service was cross-country trips involving multi-day stopovers in different communities. The idea here was to expose the broader American public to the Air Service equipment and doctrine. The high-tech flying machines of the Air Corps were put on display for the communities before they were flown in combat formations above the awestruck crowds. These cross-country trips were executed only after contact had been made with the various newspapers in each city along the route. Detailed lists of papers and their respective recipients were forwarded to the planning

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<sup>78</sup> Thomas M. Coffey, Hap: The Story of the U.S. Air Force and the Man Who Built It. (New York: The Viking Press, 1982) 107.

<sup>79</sup> The altitude of 30,000 feet, although unbelievable, was indicated in H.J. Adamson to Major Carl Spaatz, Rockwell Field, Coronado, California, 1 May 1930, Box 5, Spaatz papers, Library of Congress.

<sup>80</sup> Adamson to Spaatz, 1 May 1930.

<sup>81</sup> Adamson to Spaatz, 1 May 1930.

officers in an attempt to ensure that not only the biggest audience was reached but also to ensure communities that had yet to be introduced to the Air Service, or airplanes for that matter, were visited.<sup>82</sup> Thus, even rural American media became an integral part of building up the Air Service.

Understanding the public penchant for aviation technology and technology in general, Air Corps officers exploited whatever means of publicity or influences at their disposal. For example, the close working relationship that existed between civilian aeronautic developers and the Air Service authorities created powerful interest groups used by the Air Service Officers to assist in pushing through legislation. Both the Air Service and civilian engineers, whether developing military or commercial aviation, would benefit from any laws giving the Air Service its much-wanted independence. Moreover, any funding directed towards the Air Service would eventually make it into the hands of these civilian manufacturers, so, a close working relationship between the two was seen as essential to the development of both.<sup>83</sup> Thus, prominent civilian entrepreneurs were unabashedly recruited to help promote the cause of Air Service independence. In a letter to William Stout of the Stout Aircraft Company, Carl Spatz asked if he could use his position within Detroit's elite "to see whether [he could] assist the cause by inducing some of the more prominent citizens like Mr. Henry Ford, to publicly espouse the cause of the department of Aeronautics."<sup>84</sup>

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<sup>82</sup> H.J. Adamson to Carl Spatz (Tooley) 3 July 1930, Box 5, Spatz papers, Library of Congress.

<sup>83</sup> Carl Spatz believed that a "separate department of Air, headed by a minister in the cabinet, who can be held directly responsible by the country for the development of aviation, should provide the impetus now lacking for the proper development of civil aviation and should place our military aviation in a more satisfactory condition to meet our defensive needs." See: Carl Spatz to William B. Stout, Stout Aircraft Company, 305 General Motors Building, Detroit Michigan, 20 January 1925, Box 3, Spatz papers, Library of Congress.

<sup>84</sup> Carl Spatz to: William B. Stout, Stout Aircraft Company, 305 General Motors Building, Detroit Michigan, 20 January 1925, Box 3, Spatz papers, Library of Congress.

Air Corps policy also promoted public education regarding the Air Corps and its role; this reflected the Air Corps' need to ensure *its* version of Air Power was heard by the public. In a November 1935 general Air Corps memorandum, the acting Chief of the Air Corps, Brigadier General O. Westover indicated "it [was] desired that every opportunity be taken by Air Corps Officers, particularly in the senior grades, to participate in public speaking programs or in the discussion of military aviation at meetings of associations or societies." Westover wished to enlighten the public regarding "the part which the Air Corps and the G.H.Q. Air Force play in the Army team of national defence."<sup>85</sup> The traditional dominant role of the Navy meant that resistance to an independent Air Corps went well beyond the advocates of small military budgets and isolationism. It was necessary for the proponents of air power to inform the public as to *why* its position was *as* important, if not more, than the Navy's in national defence.

The battle between air proponents and naval traditionalists led to an intense inter-service rivalry, especially between Naval flyers and the Air Corps. This ongoing struggle for tax dollars was always a highly public affair, as demonstrated by the *Ostfriesland* sinking. Competitions such as the annual bombing matches at Langley Field, not only showcased the development of aeronautics, but also created a database for the War Department regarding bombing results that could later be used for statistical analysis.<sup>86</sup> For an institution such as the Air Corps to promote its needs and wants, it needed to

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<sup>85</sup> Memorandum By O. Westover, Brigadier General, Air Corps, Acting Chief of the Air Corps, 6 November 1935, Box 13, Foulis Papers, Library of Congress.

<sup>86</sup> It was important for the Air Corps to ensure that it performed better than its Navy rivals, so much so that Carl Spatz indicated "it was essential that the Air Service avail itself of its best bombing personnel for this competition inasmuch as the records obtained there from are very likely to be used by the war department to demonstrate what accuracy can be expected by aerial bombardment." Carl Spatz, Major, A.S., to: Major E.A. Lohman, Aberdeen Proving Ground, Maryland, 10 September 1925, Box 3, Spatz papers, Library of Congress.

perform when called upon, even if national defence was not at stake. The inter-service rivalry went well beyond that of friendly annual bombing matches, however, and turned into an all-out verbal war between Naval flyers and Air Corpsmen who both insisted they should be given the role of coastal defence.

A 1930 letter from Spaatz to the Secretary of War indicates that Spaatz wished to have an article he wrote published in a civilian paper, but only with permission of the Air Chief. The letter describes the action of attacking a fully loaded carrier with its deck covered in planes. Spaatz pointed out that recent joint Army-Navy exercises showed that pursuit aircraft needed only to wait for the ship-borne aircraft to return to the carrier and then the pursuit aircraft could drop incendiaries onto the fully loaded deck putting the ship and the aircraft out of commission. Included with the article Spaatz sent a picture of a fully loaded carrier at sea. This article was in response to an earlier one that espoused the use of ship-borne aircraft for both defensive and offensive operations. The earlier article apparently argued against the use of land-based aircraft as coastal defenders because of the advantage of mobility obtained with aircraft carriers. Spaatz argued against this, stating that “to utilize a carrier for coast defence places the defence forces on the same sort of highly vulnerable airdrome (the carrier) as the attacking forces.”<sup>87</sup> This of course would have placed coastal defence in the hands of a force vulnerable to all forms of naval surface attack as well as submarine attack. Articles such as the one that Spaatz felt the need to reply to were exactly the type of argument that the Air Corps sought to undermine. Traditional military thinking demanded that the Navy be fully responsible for coastal defence and no doubt these conservative thinkers had many supporters within the

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<sup>87</sup> Carl Spaatz to H. J. Adamson, Care assistant secretary of War, Washington D.C., 29 August 1930, Box 5, Spaatz papers, Library of Congress.

general public. What was needed to promote the Air Corps' future role was an unquestionably superior technological advantage.

In 1928 after a decade of costly experimentation that included the construction—and colossal failure—of a giant bomber called the Barling Bomber, heavy bomber technology still failed to meet the requirements of the perceived strategic bombing doctrine.<sup>88</sup> The speed, payload, and range of aircraft fell far below the estimated operational requirements for successfully waging a strategic air offensive. Yet, rather than wasting the limited funds available to the Air Corps on costly experimentation, the officers of the Air Corps spent the next decade training pilots to use the techniques developed earlier for strategic bombing regardless of the technological deficiencies of their equipment.<sup>89</sup> However, two separate yet crucial technological developments gave credence to the theory of strategic bombing in the early 1930's. The first was the improved accuracy of anti-aircraft weaponry, and the second, was the rapid transformation of aeronautics.

Superior artillery, and anti-aircraft weaponry forced attacking aircraft to altitudes heretofore unseen. It was theorized that the alternative to high altitude bombardment was low-altitude massed aerial attack, which would incur heavy loss of aircrew lives, a concept antithetical to initial strategic bombing theory.<sup>90</sup> As aircraft were forced higher, the requirements for the bomber changed. Fortunately for the proponents of air power, the modern aircraft had finally been designed: with features from flaps and all-metal

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<sup>88</sup> The Barling Bomber, named after its designer Walter Barling, was designed and pressed into service for the sole purpose of proving that strategic bombing was a technical reality. The plane had six engines, three main wings, and a tail wing that was as large as a conventional bi-plane. The XNBL-1 (experimental bomber, long-range-I) cost 525,000 dollars to build and was designed to carry a payload capable of sinking a capital ship in a single run. Moy, War Machines, 45-46.

<sup>89</sup> Moy, War Machines, 46-47.

<sup>90</sup> MacFarland, America's Pursuit of Precision Bombing, 69.

stressed-skin monocoque construction complete with enclosed cockpits and retractable landing gear, to variable pitch propellers, superchargers and 100-octane aviation fuel, faster stronger planes were being produced.<sup>91</sup>

In 1934 the Air Corps initiated a competition between aircraft manufacturers to design and build a long-range, four-engined bomber capable of fulfilling both civil and military roles. In August 1935, the Boeing model 299 flew the twenty-one hundred miles between Seattle, Washington, and Dayton, Ohio, at an average speed of 232 miles per hour, and did so without stopping.<sup>92</sup> The B299 (Army designated XB-17) was to compete in Air Corps evaluation tests at Wright Field, where it would be pitted against its rivals from Douglas and Martin. The thirty-five thousand pound bomber bristled with gun emplacements, and its polished aluminium skin made it a spectacle for both military men and civilians alike.<sup>93</sup> On 30 October 1935 in a bad twist of luck, the prototype plane crashed and burned as the result of ground crew error and was subsequently passed over by order of the Army General Staff.<sup>94</sup> Nevertheless, bomber proponents were convinced that the XB-17 was the plane they had been waiting for, and through a legal loophole that allowed them to order a squadron of developmental aircraft, the Air Corps ordered thirteen of the slightly revised Y1B-17's.<sup>95</sup> A bi-product of the increased speeds and flying altitudes of these new planes, however, was an exponential need for accuracy at the bomb release point. As Stephan McFarland pointed out "These gleaming, silver-

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<sup>91</sup> MacFarland, America's Pursuit of Precision Bombing, 67.

<sup>92</sup> Geoffrey Perret, Winged Victory: The Army Air Forces in World War II, (New York: Random House Inc., 1993) 27.

<sup>93</sup> Timothy Moy indicates that the XB-17 had a "technical appeal that was irresistible" see: Moy, War Machines, 76.

<sup>94</sup> Perret, Winged Victory, 28.

<sup>95</sup> Perret, Winged Victory, 28, and Moy, War Machines, 78-79.

winged bombers were but toothless marvels of American technological prowess without bombsights or tactics to aim their bombs accurately.”<sup>96</sup>

By the early 1930’s over a decade of expensive research, development, and testing by the Air Corps had resulted in an acceptable and inexpensive low-altitude sight, the D-1, D-4, and D-5 Estoppey. Unfortunately a high-altitude sight that produced acceptable results had yet to be developed.<sup>97</sup> In fact, the Air Corps’ attempts to promote its doctrine was frustrated by a series of failed but highly publicized demonstrations: First, in 1927, when six days of bombing the defunct Pee Dee River bridge in North Carolina from 6,000 feet produced dismal results. Then an even more humiliating episode occurred while attempting to sink the *SS Mount Shasta* in 1931. Nine bombers of the 2<sup>nd</sup> Bombardment Group attacked the *Shasta* but only managed to hit it twice, and one of the bombs was a dud.<sup>98</sup> In a highly public and humiliating twist the *Shasta* had to be sunk by a Coast Guard vessel in order to protect commercial shipping. It was crucial for the Air Corps—not to mention strategic bombing doctrine—to develop a sighting mechanism capable of hitting targets from high altitude. Fortunately for the Air Corps, the Navy had been busily developing just such an instrument since Mitchell sank the *Ostfriesland*.<sup>99</sup>

In early October 1932 the Navy undertook several high altitude level bombing tests against the decommissioned *USS Pittsburg*. A new bombsight, the Navy Norden Mark XV, was to be tested against its predecessor the Norden Mark XI. After two days of testing the Mark XV proved substantially better than the XI, with the XV achieving a 50

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<sup>96</sup> MacFarland, *America’s Pursuit of Precision Bombing*, 67.

<sup>97</sup> MacFarland, *America’s Pursuit of Precision Bombing*, 41.

<sup>98</sup> MacFarland, *America’s Pursuit of Precision Bombing*, 42.

<sup>99</sup> MacFarland, *America’s Pursuit of Precision Bombing*, 42-43.

percent overall hit score and the XI only 21 percent.<sup>100</sup> While the Navy officers remained fairly ambiguous in regards to the tests, the Army observers were said to be “red hot on the subject.”<sup>101</sup> Shortly thereafter, on 27 November 1932, the commanding general of the Materiel Division at Wright Field received a report on the bombing tests and determined that “the procurement of a bombsight which is considered inferior to another now in existence in this country cannot be recommended.”<sup>102</sup> The Army then requested twenty-five Mark XV bombsights, cementing a relationship with the Norden Bombsight that would last for some forty years and would propel the NBS to legendary status.

Through a campaign of constant praise for the new NBS, Theodore H. Barth, the president of Carl L. Norden Inc., created an environment where the precision of the device became common knowledge in military circles. Prior to the Japanese attack on Pearl Harbour, Barth was recorded as saying: “We do not regard a fifteen foot square... as being very difficult to hit from an altitude of 30,000 feet, provided the new Army M-4 Bombsight, together with the Stabilized Bombing Approach Equipment is used.”<sup>103</sup> Furthermore, Barth has been credited with coming up with the famous phrase attributing “pickle barrel” accuracy to the sight.<sup>104</sup> Nonetheless, prior to the war, the NBS’s role had more to do with eliminating the technological deficits within the Air Corps’ strategic doctrine than filling the need for a myth. The Air Corps after all that had been striving to ensure its survival, and after a decade of battling against their opponents, the champions

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<sup>100</sup> Robert V. Brown, The Navy’s Mark 15 (Norden) Bomb Sight: Its Development and Procurement. 1920-1945. Department of the Navy, Office of the General Council, Washington D.C., 1946, 92-93.

<sup>101</sup> Brown, The Navy’s Mark 15, see: Note 25, 93.

<sup>102</sup> Report to Commanding General Materiel Division, Wright Field, 27 November 1932. See: Brown, The Navy’s Mark 15, see: Note 25, 93.

<sup>103</sup> Ross, Strategic Bombing by the United States, 128.

<sup>104</sup> MacFarland, America’s Pursuit of Precision Bombing, 56, and: Ross, Strategic Bombing by the United States, 128.

of strategic air power had finally acquired the tools they believed necessary to undertake a viable air offensive.

The long running media campaign that the Air Corps had undertaken to promote its position in the military establishment now shifted towards promoting a doctrine of daylight precision bombing. According to the Official History of the Army Air Forces, the apparent reversal in tactics was *directly* related to the development of new technology. The post-1945 official Army Air Force historians, Frank Craven and James Cate, juxtaposed the British strategic doctrine to that of the Air Corps':

American tactical principles, originally quite similar to those of the RAF, had been profoundly modified during the decade before Pearl Harbor. In 1941, AAF schools were teaching that strategic targets could best be destroyed by daylight precision bombing, delivered by compact formations of heavy bombers in level flight at high altitudes. The central idea was precision...<sup>105</sup>

Civilian media picked up the shift in doctrinal focus and credited it to advances in technology. The *New York Times* printed a multi-page editorial on the Air Corps' strategic bombing doctrine, assuring readers that "an accuracy that would have been regarded as phenomenal fifteen years ago is commonplace in the Army's bombing squadrons now."<sup>106</sup> This article appeared almost two years before the war began in Europe and reflects the attention received by the Air Corps almost twenty years after the beginning of their publicity campaign. More importantly, the article also indicates that the Air Corps' doctrine of daylight precision bombing was undertaken not for humanitarian reasons but instead: for practical reasons. The bombing of civilians was viewed pragmatically as a waste of limited resources. Moreover, the official role of the

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<sup>105</sup> Wesley Frank Craven and James Lea Cate, The Army Air Forces in World War II, Volume One: Plans and Early Operations, January 1939 to August 1942. (Chicago: The University of Chicago Press, 1958), 597.

<sup>106</sup> Harold B. Hinton, "Army Bars Bombing of Civilians As Futile Tactics in Warfare," By Special to THE NEW YORK TIMES. *New York Times (1857-Current file)*; Feb 14, 1938; ProQuest Historical Newspapers The New York Times (1851 - 2005) pg. 1

Air Corps at the time was still that of a defensive force, which meant that the offensive nature of Air Corps strategic doctrine had yet to be fully assimilated within the military establishment. In fact, as the article points out, the targets the Air Corps bombers would most likely be attacking would be the grounded planes of an invasion force potentially stepping off from Mexico, Canada, or one of the Caribbean countries.<sup>107</sup>

Regardless of the public's or the military's acceptance of the doctrine proposed by the Air Corps, the progress of technology—in this case the development of a precision sight—became the new focus of the Air Corps publicity campaign. The purpose of the campaign remained, as before, to secure an independent status for the Air Corps; the new publicity focus simply highlighted the fact that now the technology to destroy specific enemy targets was available. As Stephen McFarland points out: “High-altitude daylight precision strategic bombing may not have been that accurate, but it was all the Air Corps had.”<sup>108</sup> Furthermore, for Americans, the word “precision” invoked:

Visions of frontier marksmen always hitting their mark – the guilty and never the innocent. It raised images of a special American way of war. It satisfied a deep-seated American need for the moral high ground in war while satisfying an American hunger for technological achievement.<sup>109</sup>

Interestingly, the public had no idea that the bombsight chosen by the Air Corps as the centerpiece for its new doctrine was the NBS. Instead, the public was fed the trope of a “secret sight” that would deliver precision and accuracy. Described in pre-war newspapers as the “country's most jealously guarded air defence weapon” and a device

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<sup>107</sup> Hinton, “Army Bars Bombing of Civilians.”

<sup>108</sup> MacFarland, America's Pursuit of Precision Bombing, 99.

<sup>109</sup> MacFarland, America's Pursuit of Precision Bombing, 5-6.

“regarded as superior to those in use anywhere,” the NBS became famous before it was identified as the NBS.<sup>110</sup>

The “top secret” classification of the NBS kept even its name from the public until 1941, but even after that, the device itself was known only by name. Stewart Halsey Ross believes that this veil of secrecy was part of an Air Corps’ publicity campaign. Certainly the Air Corps *added* to the device’s fame by shrouding the NBS in a cloak of secrecy; in this way, according to Ross, the Air Corps created “an aura of mystic omnipotence.”<sup>111</sup> Ross argues that the American public was deluded through all forms of media including a film that showed a bombardier carrying a bulky bag walking away from a B-17 accompanied by two armed guards. The film’s narrator indicates that the party was headed towards the base’s safe where all of the top-secret bombsights were stored for reasons of National Security.<sup>112</sup> The NBS covered by a canvas bag and escorted by armed guards became a fairly common image during the war to promote the importance of the NBS’s secrecy, and the publicity strategy suggests that perhaps Ross is correct in his assessment.

Initially the secrecy surrounding the sight was due to Norden patent protection. Since patents granted to private concerns could not be protected by military security classifications, Charles F. Adams, the Secretary of the Navy, undertook patent applications for the NBS in the name of the Navy in September 1932.<sup>113</sup> This process

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<sup>110</sup> “U.S. BOMB SIGHT SOLD TO GERMANY, SPY JURY IS TOLD,” *New York Times (1857-Current file)*; Sep 9, 1941; ProQuest Historical Newspapers The New York Times (1851 - 2005) pg. 1 and; Harold Denny, “U.S SELLS BRITAIN 26 AIR FOR TRESSES,” By Special to THE NEW YORK TIMES. *New York Times (1857-Current file)*; Nov 21, 1940; ProQuest Historical Newspapers The New York Times (1851 - 2005) pg. 1

<sup>111</sup> Ross, *Strategic Bombing by the United States*, 130.

<sup>112</sup> Ross, *Strategic Bombing by the United States*, 130.

<sup>113</sup> Ross, *Strategic Bombing by the United States*, 73.

served two purposes that benefited both the Navy and Carl Norden. The Navy now officially controlled production rights to the device and was responsible for pursuing patent infringements, the latter a pressing issue for Norden who was being attacked by Sperry for his use of gyroscopic stabilization. Furthermore, the Navy patents ensured Carl Norden's anonymity. This was what Norden desired from the beginning, and it was one of the reasons he would later come to despise the Air Corps. Thus, the "top secret" classification of the NBS, at least in respect to the Navy and Carl L. Norden Inc., had more to do with patent law than national security.<sup>114</sup>

The Air Corps, however, initially understood the importance of keeping the device secret, in regard both to national security and its agreement with the Navy. In a 1933 memorandum to the Deputy Chief of Staff, the Air Corps Chief of Staff, Major General Foulois, points out:

The necessity for the strictest secrecy, agreed upon by the Navy Department, the Air Corps and the manufacturer, in order to prevent disclosure of any of the design features of the sight, made imperative the issuance of very definite yet workable set of instruction regarding its shipment, storage and use...<sup>115</sup>

The Foulois memorandum later indicates that the Air Corps understood the need for prudence regarding national security. Foulois stated that the NBS was "the most important military secret project under development by the Air Corps".<sup>116</sup> That the NBS was in fact the most accurate sight available to the Air Corps is unquestionable, and given the dogmatic belief in the—as of yet unproven—doctrine of strategic bombing, it is no

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<sup>114</sup> MacFarland, *America's Pursuit of Precision Bombing*, 114.

<sup>115</sup> Major General B.D. Foulois, Air Corps, Chief of the Air Corps to Deputy Chief of Staff, 23 November 1934, RG 18 E-22 R&D Branch Case Histories, 1941-46 (Norden and C-1) Box 27.

<sup>116</sup> Underlines in Original. Foulois to Deputy Chief of Staff, 23 November 1934.

wonder that Air Corps personnel also believed they needed to protect the NBS in the interests of national security.

Yet, despite the Air Corps' apparent understanding of the importance of secrecy, articles that appeared in October 1939 in *Time Magazine* and *Colliers* also suggest that the Air Corps was still more concerned with ensuring the American public knew broadly what it was doing.<sup>117</sup> The information for the articles was presented to journalists through the Air Corps publicity office, and as a result the "secret bombsight" was depicted as a product developed and perfected by the Air Corps.<sup>118</sup> This slip in security protocol infuriated the Navy, which had spent hundreds of thousands of dollars developing the sight only to have credit taken by its rival, the Army Air Corps. According to McFarland "the Navy felt robbed by the general perception of the American public that the Norden Bombsight was an Army achievement."<sup>119</sup> More importantly, Admiral Furlong of the Navy Bureau of Ordnance (BuOrd) feared that the Air Corps's publicity would only make "foreign agents try harder to steal the sight from our various stations."<sup>120</sup>

Regardless of the validity of the security classification, Ross' argument is compelling in regards to the media hype that the security classification created among the pre-war public. The armed guards, the canvas bag, and the bombardier's oath all fed to the mystery surrounding this new technological marvel. Once the United States was drawn into the global conflict, these "security measures" definitely became symbolic of

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<sup>117</sup> *Time*, October 9 1939 and *Colliers*, October 14 1939 both discuss the Army's bombsight in such a manner as to make the bombsight a product of the Air Corps' ongoing commitment to technological superiority. See also: Ross, Strategic Bombing by the United States, 73, and David Zimmerman, Top Secret Exchange: The Tizard Mission and the Scientific War. (Montreal: Alan Sutton Publishing Limited, 1996), 44.

<sup>118</sup> Zimmerman, Top Secret Exchange, 28.

<sup>119</sup> Ross, Strategic Bombing by the United States, 148.

<sup>120</sup> W.R. Furlong to CNO, "Subject: Recent Publicity on Bombsights," 6 November 1939, NARS, RG 72, F41-8, Vol. 5. As cited in: Zimmerman, Top Secret Exchange, 29.

the NBS and the air war; and, as subsequent chapters will demonstrate, numerous interest groups other than the Air Corps (by then Army Air Force) would exploit the public's familiarity with them. If the "top secret" classification was just hype, as Ross suggests, then the hype must be viewed as an extension of the already long-running media campaign undertaken by the Air Corps rather than as something altogether new. Interestingly, the Air Corps media campaign had two important implications for the future wartime development of the NBS, and for the success of the Allies during the war. Primarily, the distrust and animosity that developed between the Navy and the usurper Air Corps—as a result of the media hype—led to a dysfunctional relationship between the Army NBS producers and both BuOrd, and Carl L. Norden Inc. This enmity between them ultimately led to the failure of the Army NBS production program.<sup>121</sup> The second, and ultimately much more important implication, relates directly to the perception of the NBS that developed in Britain as a result of the NBS' mythical qualities and to the remarkable relationship that developed between the United States and Britain as a result.

The highly publicized exploits of the Air Corps, and their successful new "precision" weapon, piqued the interests of Royal Air Force officers who, like the Americans, had wedded themselves to the concept of strategic bombing. The publicity that the Air Corps received during 1939 heightened the RAF's interest in obtaining the already famous NBS. When the British assistant director of intelligence, Major A.R. Boyle, approached the U.S. Army to exchange bombsight technology, he was informed that the Army was powerless to trade because the Navy owned the rights to the

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<sup>121</sup> See: Forthcoming article by Michael Tremblay, 'The Norden Victor Connection: Making Bombsights and Selling Adding Machines in World War II,' *Bulletin of Science Technology & Society*,

bombsight.<sup>122</sup> By 1938 the RAF had approached the USN in an attempt to purchase the device, but the Navy indicated that it was not for sale. The Navy's subsequent refusal to pass on any information regarding the NBS simply fuelled the desire of the RAF to acquire it and resulted in a deadlock regarding technical liaisons between the two nations.<sup>123</sup> At the same time however, the RAF's desire to obtain the secrets of the famous sight escalated the intensity of diplomatic discourse between Britain and the United States.

In *Top Secret Exchange: The Tizard Mission and the Scientific War*, David Zimmerman describes the high level and top-secret exchange of technology between the United States and Great Britain that occurred during the war. According to Zimmerman, the Tizard Mission was a crucial factor in the eventual defeat of the Nazis because "in almost all [technological] aspects of this war, either directly or indirectly, some mention must be made of the mission."<sup>124</sup> The relationship that existed between the U.S. and Great Britain before the Atlantic Charter was not initially one that included a free flowing exchange of technology or information. As Zimmerman points out, the British were reluctant to exchange technical information with their closest Allies, "and the United States was not an ally."<sup>125</sup> There was also an atmosphere of what Zimmerman identifies as "technical chauvinism" by both parties, which created a scenario in which both countries believed that the other could not possibly have better technology.<sup>126</sup> The relationship that existed between the two countries until August 1940 was one that was

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<sup>122</sup> Zimmerman, *Top Secret Exchange*, 35.

<sup>123</sup> Zimmerman, *Top Secret Exchange*, 5.

<sup>124</sup> Zimmerman, *Top Secret Exchange*, 4.

<sup>125</sup> Zimmerman, *Top Secret Exchange*, 29.

<sup>126</sup> Zimmerman, *Top Secret Exchange*, 28-29.

based upon a *quid pro quo* mentality, that is, “no classified information should be shared unless something of equal value was offered in return.”<sup>127</sup> The US military’s perception that the NBS was unequalled, eventually led the British to reveal what would in fact turn out to be one of the war’s most important technical secrets, radar.<sup>128</sup>

Despite the fact that the USN refused to reveal the secrets of the NBS to the British until later in the war, the NBS was key in the development of technical exchanges between the US and Britain, as well as in the establishment of an effective dialogue between the two eventual allies. While Theodore Barth’s constant praise of the NBS’s capabilities ensured that members of the military knew of the NBS, the Air Corps’ tendency to exploit the media at every opportunity most certainly served to heighten the RAF’s desire to obtain the now famous device. The Air Corps had spent the better part of twenty years developing a working relationship with American media. And while the relationship at first served to protect the fledgling Air Corps from administrative expunging, it shifted to a campaign that aided the promotion of a new doctrine, a doctrine reliant upon the latest technologies developed within the United States. The Air Corps’ media campaign was rooted in the public’s proclivity towards being fascinated by technology, specifically aeronautic development. So it is easy to see how the RAF officers came to desire the NBS: they bought the hype, just as the American public had. However, once war enveloped Europe in 1939, the Air Corps’ campaign acquired the most powerful ally in the United States, the President.

On 1 September 1939, President Franklyn Roosevelt delivered a speech that was a humanitarian appeal to contemporary world leaders. Roosevelt declared that bombing

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<sup>127</sup> Zimmerman, Top Secret Exchange, 29.

<sup>128</sup> Zimmerman, Top Secret Exchange, 29-30.

civilians from the air was a “ruthless” undertaking which had “sickened the hearts of every civilized man and woman, and ha[d] profoundly shocked the conscience of humanity.”<sup>129</sup> The President went further than simply making humanitarian statements, however; attempted to secure a gentlemen’s agreement that even his country would eventually find hard, if not impossible, to adhere to:

I am... addressing this urgent appeal to every government which may be engaged in hostilities publicly to affirm its determination that its armed forces shall in no event, and under no circumstances, undertake the bombardment from the air of civilian populations or of unfortified cities...<sup>130</sup>

With this statement the United States Government publicly acknowledged the doctrine that Air Force officers had been promoting for over a decade. The difference between what the Air Corps had proposed and what the President demanded was the latter’s focus upon the humanitarian aspect of precision bombing. The role of the NBS had shifted: instead of just being the technological answer to the problem posed by the Air Corps’ Strategic Bombing doctrine, a doctrine prioritized destroying enemy industrial capacity, the NBS had now become a symbol of a more humane means of waging war. The NBS had been assigned its humanitarian value by the President himself, who at the same time vindicated the Air Corps’ long running media campaign.

Less than a year later, Roosevelt advised Congress to reconsider America’s position, not regarding the bombing of civilians, but of where the country stood mentally and materially. On 16 May 1940, Roosevelt delivered a speech drawing attention to the fact that developing technology, especially aeronautics, put the global conflagration at

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<sup>129</sup> Franklyn D. Roosevelt, ‘Appeal Against Aerial Bombardment of Civilian Populations,’ from U.S. Department of State, *Foreign Relations of the United States, 1939*, (Washington: G.P.O., 1956), pp. 541-42. Reprinted in: Eugene M. Emme, *The Impact of Air Power: National Security and World Politics*. (Toronto: D. Van Nostrand Company, Inc., 1959) 68.

<sup>130</sup> Roosevelt, ‘Appeal Against Aerial Bombardment,’ 68.

America's doorstep.<sup>131</sup> The president imagined that the country could produce 50,000 planes a year. According to Roosevelt: "combat conditions [had] changed [most] rapidly in the air. With the amazing progress in the design of planes and engines, the airplane of a year ago is out of date now."<sup>132</sup> The United States was not yet at war, and the President was already echoing the voices of Arnold, Mitchell, Spatz and the like. The bomber of the day "is too slow, it is improperly protected, it is too weak in gun power."<sup>133</sup> Finally, after just over twenty years, the proponents of strategic bombardment were given the go ahead—precision daylight bombing was now America's new means of waging air war.

The federal support offered to the Air Corps at this critical juncture is consistent with the historian Thomas P. Hughes' model for *technological momentum*.<sup>134</sup> The development of the Air Corps had been underway for two decades; it had been a struggle carried on by strategic bombing proponents the entire time. The coming war meant that the interests of the American state as a whole and the Air Corps in particular finally merged with the hastening of the agendas of both institutions—the Government's need to prepare for war, and the Air Corps' desire for an independent operational mandate. It was not that aeronautic technology was reinvented or reconsidered; instead, as Hughes points out, "political interests reinforced the institutional momentum."<sup>135</sup> The full might of the American industrial machine was initiated at the command of the President in order to

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<sup>131</sup> Franklyn D. Roosevelt, 'Fifty Thousand Airplanes,' in Emme, The Impact of Air Power, 71.

<sup>132</sup> Roosevelt, 'Fifty Thousand Airplanes,' 71.

<sup>133</sup> Roosevelt, 'Fifty Thousand Airplanes,' 71.

<sup>134</sup> Hughes describes the theory of Technological Momentum in an article of the same name. He states "the momentum of technological systems is a concept that can be located somewhere between the poles of technical determinism and social constructivism." Thomas P. Hughes, *Technological Momentum*, in: Merritt Roe Smith and Leo Marx, Does Technology Drive History? The Dilemma of Technological Determinism. (Cambridge: The MIT Press, 1994) 112.

<sup>135</sup> Hughes, *Technological Momentum*, 112.

speed the end of the war. What had been a trickle of money dedicated to research and development in the Air Corps for two decades turned into a flood overnight. The contrasting images of the NBS as a device designed to end war as quickly as possible and as a mechanism with humanitarian values attributed to it came together in public perception, as well as government policy.

Within three years of Roosevelt's humanitarian rhetoric, the Army Air Force (AAF) would be engaged in its "precision bombing" campaign over Europe; within five years Japanese cities would be torched by incendiaries, and in just under six years the AAF would be responsible for dropping atomic bombs on Hiroshima and Nagasaki, both arguably unfortified civilian cities. Regardless of the inability of the AAF to adhere to Roosevelt's humanitarian vision, the NBS remained at the center of the AAF's public version of its strategic campaign. During the war, however, the NBS would become much more than the AAF's public relations icon. The NBS instead took on several roles, each to be described in the following chapters. The purpose of this chapter has been to demonstrate that the emergence of the Norden myth was not a spontaneous development during the Second World War. Instead, the Norden myth was a result of the popular American penchant for technology and of the Air Corps' long lasting interaction with American media. American society venerated technology by instilling technological artifacts, such as the NBS, with value-laden characteristics. Therefore, it was easier for American popular culture to accept the NBS for what it was supposed to be—a precision device that saved lives—then what it actually was, and then what it would ultimately turn out to be; a myth. The long running Air Corps media campaign simply fed an atmosphere

within American society that was receptive to Air Corps ideas and ultimately to the Norden myth.

## Chapter 2

### The Norden in Print

*Nero fiddled while Rome burned. But could he have found the right notes, while preparing to ignite a city, in the midst of flak and running gun battles in the sky? That is comparable to what American bombardiers learn to do.*<sup>136</sup>

Volta Torrey  
*Popular Science*, June 1945.

During the Second World War public opinion was often influenced by the stereotypical images produced in all forms of media. Whether through Disney cartoon, Hollywood feature film, or newspaper special report, public opinion was shaped, and manipulated by mass media. Prior to the popularity of television, the public received its war news and information from the radio, print media, or news-shorts that appeared before feature films. The ubiquity of print media, however, makes it an excellent, if not necessary, avenue for exploring the Norden Myth as it appeared in print during the Second World War.

This chapter undertakes an analysis of the ways in which the Norden Bombsight (NBS) appeared in the various forms of print media shortly before and during the Second

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<sup>136</sup> Volta Torrey, 'How the Norden Bombsight Does Its Job,' *Popular Science Monthly*, June 1945, Vol. 146, No. 6. Pp 232.

World War. The purpose of this analysis is to determine whether the NBS was represented to the public in a means conducive to the proliferation of the myth surrounding the device. Three forms of print media are analyzed here to gain a broad perspective on the language and imagery used regarding the appearance of the NBS in print. The first form of print media analyzed is newspaper editorials, exposés, and special reports. The three papers reviewed: *The New York Times*, *The Washington Post*, and *The Wall Street Journal*, represented perceived national interests and were read by a national audience numbering in the millions. The second form of print media examined is contemporary special interest periodicals. These periodicals provide longer, more detailed exposés of special interest topics including the NBS and the Army Air Force (AAF). All forms of periodicals have been grouped into this second category, that is, news periodicals such as: *Time*, *Life*, and *Popular Science* as well as airplane enthusiast magazines such as *Flying*, and business oriented works such as *Fortune*. The third form of print media investigated consists of print advertisements, and more precisely those of the Victor Adding Machine Co. Advertisements cross over the first two categories as these ads appear in both groups. While less discursive than editorials or exposés, advertisements were generally notorious for using popular phrases or idioms to get the desired point across to the reader. In this way advertisements are a valuable source to gauge what the actual popular image of the NBS was during the war.

To understand how the messages presented in media were perceived or absorbed by the public, C. Wright Mills, in his 1956 article, "Mass Society," considered the U.S. media during the period of the war and introduced the concept of "psychological illiteracy" to describe the efficacy of the mass media that was hegemonic during this

epoch.<sup>137</sup> Mills explained how very little of the public's conscious awareness of the world, what he calls the "social reality," was based upon first hand experience. Instead, opinion and reality was formed by the mechanisms used to spread information. So effective were the means of media that in many cases people did not believe what they had heard until they read it in the paper or heard it on the radio. Thus, any stereotypes or social nuances that had been promulgated by the media became the collective image or experience of the mass public.

While *Mass Society* may be a dated work, in the years following the Second World War Mills did witness the mechanisms the media used in to reporting news during the previous decades. Mills explained that media "not only gives us information; they guide our very experiences. Our standards of credulity, our standards of reality, tend to be set by these media rather than by our own fragmentary experience."<sup>138</sup> So pervasive is this "psychological illiteracy" that, according to Mills, even first hand experience becomes shaped and organized by stereotypes, thus in some cases actually altering reality. In the case of the NBS, reality was indeed altered by the media coverage. This chapter will demonstrate how.

During the twentieth century newspapers were a major source of news within many societies. As the previous chapter has illustrated, the advocates of air power had long exploited the press to articulate their ideas and doctrines, and to establish their institutional relevance. This public profile of the Air Corps in print prior to the US entry into the war resulted in a civilian audience that was sensitive to and somewhat educated

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<sup>137</sup> C. Wright Mills, 'The Mass Society,' *The Power Elite* (New York: Oxford University Press, 1956). Reprinted in: Robert Jackall. Ed., Propaganda: Main Trends of the Modern World. (London: MacMillan Press LTD., 1995). 87.

<sup>138</sup> Mills, 'The Mass Society,' 87-88.

about Air Force operations. The first portion of this chapter will highlight two themes. The first theme was described in the *Washington Post* as “The Great Air-Power Controversy,” and the second theme involves the NBS and Nazi espionage. The newspaper writers themselves were interested in appealing to audiences, and thus while it was not necessarily their intention to promulgate the Norden myth, they did seek to publish stories using the descriptions, images, or symbols already recognizable to their audience. Therefore, the investigation of newspaper thematic stories, that is, long running stories, illuminates both the established ideas as well as the process in which these said ideas were embedded within the broader wartime public.

In fact the air war advocates’ interwar publicity campaign flowed into the war period. The American doctrine of daylight precision bombing came into question even before the U.S. was involved in the European conflict. Daylight precision bombing was untested in combat, and the early British and German experience—or rather failure—in daylight bombing created a heated controversy in the national newspapers of the United States. In the summer of 1942 when US operations began in Europe, the doctrine was questioned publicly, but Air Force press releases used optimistic language to allay the public’s fears:

The first American heavy bomber attack in Europe seems to have been an unqualified success... A dozen Flying Fortresses... laid their eggs on Rouen in broad daylight, apparently scored heavily, fought off enemy fighter attacks, and returned to their bases without loss... one thing is certain. The American Bomber Command is going right ahead with its plan for daylight ‘precision’ bombing from high altitudes.<sup>139</sup>

Even though AAF commanders publicized American daylight bombing successes, the heavier-than-expected losses together with the fewer-than-expected sorties suggested

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<sup>139</sup> ‘Fortress Performance,’ *The Washington Post*; 19 August 1942; ProQuest Historical Newspapers, *The Washington Post*, (1877 - 1992), pg. 10.

to some RAF observers that perhaps AAF doctrine had been far too optimistic in regards to their ability to destroy enemy infrastructures, not to mention shorten the war. Three arguments developed exposing the weakness of the AAF's daylight precision bombing doctrine to the American public. The first two arguments pertained to the fact that without long-range fighter escorts the light bomb loads of American bombers would not justify the losses that the AAF would incur while attacking targets in daylight deep within Germany.<sup>140</sup> The third point, however, exposed a true weakness of the NBS and the AAF reliance on an optical sight—no matter how precise. A March 1943 *Washington Post* exposé aptly titled 'Seeing Daylight' opined, "Daylight bombing is practicable only in relatively fine weather—the sort of weather characteristic of Texas and California, but not of western and central Europe." In typical fashion the AAF reply came from the highly public figure of Ira Eaker, the commander of the Eighth Air Force in Europe. Eaker indicated that American losses so far were "proportionally no larger" than the losses suffered by the RAF, and that "hundreds of new and bigger bombers" would be appearing in Europe shortly.<sup>141</sup> As far as the third point, which referred indirectly but damningly to the NBS, Eaker was forced to remain silent except for a remark regarding the commencement of successful operations "when weather conditions remain[ed] favourable for 24 hours."<sup>142</sup>

Regardless of this poignant and somewhat pejorative *Washington Post* article, the NBS actually came out unscathed. While the efficacy of visual sighting is questioned, at

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<sup>140</sup> I have merged the two first arguments into this one sentence. The first argument against American doctrine was that daylight precision bombing was too costly without fighter escort. The second argument was that the bomb loads of the American B-17's were too light to inflict any substantial damage against German installations. 'Seeing Daylight,' *The Washington Post*, 29 March 1943; ProQuest Historical Newspapers, *The Washington Post*, (1877 - 1992), pg. 8.

<sup>141</sup> 'Seeing Daylight,' 8.

<sup>142</sup> 'Seeing Daylight,' 8.

no time was the ability of the American bombardiers to hit specific targets challenged, nor was the NBS directly disparaged in any way. Furthermore, the somewhat negative criticism directed at AAF doctrine highlighted some of the immediate problems the AAF was facing in early 1943, in particular shortages. The lack of stunning successes so far in the war was blamed upon supply not on doctrinal shortsightedness or the NBS's obvious technical shortcomings. If the United States could match the number of planes that the RAF managed to put in the air, then according to Eaker the "offensive will be so powerful that we won't give a damn whether the Germans know we're coming or not."<sup>143</sup> By focusing upon the AAF's material needs, Eaker diverted any negative attention away from the NBS and the failures of AAF doctrine onto the shortages in American production and supply. The serious, and ostensibly critical, problem with the NBS, that is its dependence upon clear skies, was left virtually unchallenged by the media hereafter. The article concludes leaving the reader to ponder the strength of the AAF command's commitment and Eaker's character:

Thus if the Army air command is now ready to risk hundreds of bombers and trained crews to expand its tactic of precision daylight bombing, we may be sure that this faith has been based on something better than mere obstinacy. There is every reason to believe that General Eaker has not in the least exaggerated the success of his 'experiments.'<sup>144</sup>

By May of 1943 the controversy seemed to have been decided in the favour of AAF doctrine and the NBS. According to the *Washington Post* military critic, Ernest K. Lindley: "Experience has proved to the overwhelming satisfaction of the American High Command, that daylight bombing bombings[sic]... are tremendously effective. They are

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<sup>143</sup> 'Seeing Daylight,' 8.

<sup>144</sup> 'Seeing Daylight,' 8.

more precise than the night bombings by the British.”<sup>145</sup> While the British were responsible for more destruction overall, the AAF doctrine was seen as more effective due to the ability of American bombers to “strick[e] certain types of targets, including Submarine bases.”<sup>146</sup>

The 14 October 1943 daylight attack against the Schweinfurt ball-bearing works in Germany reinvigorated the controversy surrounding American tactics. The loss of 60 bombers and 593 airmen brought into question the worth of daylight precision bombing in terms of both human lives and material losses. Paul Miller’s *Washington Post* article, ‘Air Achievements Justify Cost Overwhelmingly, Arnold Says,’ which appeared just five days after the raid, was meant to once again assuage American doubts about daylight precision bombing and the efficacy of the NBS.<sup>147</sup> Arnold is quoted as saying that “regardless of our losses, I’m ready to send over replacement crews for every one lost and at the same time building up our strength.”<sup>148</sup> Despite the heavy losses incurred by the Eighth Air Force in the Schweinfurt raid, the overall air campaign, as pointed out by Arnold was moving in favour of the Allies. In Arnold’s words the Japanese were only able to put their “fifth or sixth team” in the air, and the Germans were now forced to remove vital fighter strength from the periphery of occupied territories, including Italy and Russia, in order to meet the Anglo-American onslaught.<sup>149</sup> Arnold displayed a remarkable amount of hubris when he then stated, “some feared we’d never be able to reach our objectives with sufficient density for effective precision bombing, now there is

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<sup>145</sup> Ernest K. Lindley, ‘Our Bombers Justify High Altitude Raiding,’ *The Washington Post*; 9 May 1943; ProQuest Historical Newspapers, *The Washington Post*, (1877 - 1992), pg. B2.

<sup>146</sup> Lindley, ‘Our Bombers Justify High Altitude Raiding.’

<sup>147</sup> Paul Miller, Associated Press Staff Writer, ‘Air Achievements Justify Cost Overwhelmingly, Arnold Says.’ *The Washington Post*; 19 October 1943; ProQuest Historical Newspapers, *The Washington Post* (1877 - 1992), pg. 1.

<sup>148</sup> Miller, ‘Air Achievements Justify Cost Overwhelmingly, Arnold Says.’

<sup>149</sup> Miller, ‘Air Achievements Justify Cost Overwhelmingly, Arnold Says.’

no challenge as to the merits of precision bombing.”<sup>150</sup>

The “Great Air-Power Controversy” was an effective means for the AAF at war to publicly reaffirm their dogmatic belief in the doctrine of daylight precision bombing and the efficacy of the NBS. The highly publicized debate allowed the AAF to assuage the fears of the public in the face of heavy criticism; Criticism regarding both the heavy loss of American life and the pre-war overestimates of their bombers’ ability to be not only precise, but also destructive.

While the “air-power” controversy continued throughout the war and well after, the most dramatic long-running story during the war involved the NBS and Nazi espionage. On 10 December 1938 the *New York Times* printed a first page article titled ‘Roosevelt Starts Big Drive On Spies.’ The article explained that President Roosevelt had initiated “coordination of all Federal intelligence agencies for a counter offensive against foreign espionage activities.” The article stated “Roosevelt referred to the spy menace as a situation in which the roots went deep.”<sup>151</sup> While the President insisted that the United States did not require a secret police, he did call upon the American public “to watch the secret agents of certain other nations.”<sup>152</sup> By 1939, films such as Anatole Litvak’s, *Confessions of a Nazi Spy* highlighted—or created—the menace of espionage in the United States and fuelled domestic paranoia. The entry of the United States into the war two years later served to increase the fear of Nazi espionage; thus when news of the NBS falling into Nazi hands broke, the media covered every minutia of the affair.

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<sup>150</sup> Miller, ‘Air Achievements Justify Cost Overwhelmingly, Arnold Says.’

<sup>151</sup> ‘Roosevelt Starts Big Drive On Spies,’ Special to THE NEW YORK TIMES. *New York Times*; Dec 10, 1938; ProQuest Historical Newspapers, *The New York Times*, (1851 - 2005), pg. 1.

<sup>152</sup> ‘Roosevelt Starts Big Drive On Spies,’

David Kahn provides a quick summary of the background to the case in his book *Hitler's Spies*. According to Kahn, Hermann Lang, an inspector for the Norden Company factory in New York, met an *Abwehr Luft* (IL) agent, Nikolaus Ritter, in 1937. Ritter was responsible for gathering intelligence on British and American aeronautics.<sup>153</sup> Lang, who had only immigrated to the United States in 1927, had access to portions of the NBS blueprints. For security reasons each inspector was permitted to see only a segment of these drawings. Rather than securing the blueprints at the end of the working day, however, Lang took them home and traced each draft.<sup>154</sup> He offered them to Ritter, “not for money, but to help the land of his fathers grow rapidly strong and free.”<sup>155</sup>

It was Ritter's task to get the drawings back to Germany, and this he did by wrapping them around an umbrella shaft that was to be used by his courier as a cane. On 30 November 1937, the Hamburg-Amerika Line ship *Reliance* delivered the first drawings related to the United States' most tightly guarded secret to the *Luftwaffe*. Subsequent drawings were cut up and carefully hidden in newspapers for the voyage.<sup>156</sup> Once the *Luftwaffe* engineers had enough of the drawings they constructed a model of the bombsight and tested it. In a *Luftwaffe* report to the *Abwehr*, an engineer wrote:

The device contains a number of interesting technical solutions, shows a good structural development, and forms the end result of a thorough development. The target results attained with it in the U.S.A. [sic] are extraordinarily good. In Germany such results have not yet been attained. Through the delivery of the documents, considerable experiment costs have been saved. Flight testing of the apparatus showed that the principle realized in it worked satisfactorily for bombing. As a result the documents about the bombsight delivered by the

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<sup>153</sup> David Kahn, *Hitler's Spies: German Military Intelligence in World War II*. (New York: Macmillan Publishing Co., Inc., 1978), 302.

<sup>154</sup> Kahn, *Hitler's Spies*, 328-329.

<sup>155</sup> Kahn, *Hitler's Spies*, 330.

<sup>156</sup> Kahn, *Hitler's Spies*, 330.

*Abwehr*... have successfully influenced the development of the German bombsight.<sup>157</sup>

Regardless of the rather positive testing results, however, the *Luftwaffe* did not replace their existing *Lothfe* bombsights with the Norden, so little was gained by Lang's treason.

Despite the fact that Lang's efforts were apparently in vain, the national papers from September 1941 to April 1942 covered the Lang treason case extensively. Lang was introduced to the public as a former inspector at the Carl Norden plant in New York who was accused of selling vital Norden information to Germany as early as 1938.<sup>158</sup> Thanks to Lang, according to *The New York Times*, "the secret of the Norden Bombsight, this country's most jealously guarded air defence weapon, has been in the hands of the German Government since 1938..."<sup>159</sup> The *Times* used language similar to Roosevelt's when he initiated his "spy hunt." According to the paper Lang was a member of a "gigantic spy plot, with ramifications that extended around the world..."<sup>160</sup> Writers at *The Washington Post* likewise released the Lang case using dramatic language: "The United States' closely guarded military secret—the Norden Bombsight—has for several years been examined by a man now charged with espionage..."<sup>161</sup>

The papers revealed that the FBI had been involved in an elaborate sting that lasted some sixteen months. Using short-wave transmitters the FBI had been providing worthless "defence secrets" to Nazi agents in Hamburg. The hoax owed its existence to

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<sup>157</sup> Kahn, *Hitler's Spies*, 331.

<sup>158</sup> 'U.S. Bomb Sight Sold To Germany, Spy Jury Is Told,' *New York Times*; Sep 9, 1941; ProQuest Historical Newspapers The New York Times (1851 - 2005) pg. 1.

<sup>159</sup> 'U.S. Bomb Sight Sold To Germany, Spy Jury Is Told.'

<sup>160</sup> 'U.S. Bomb Sight Sold To Germany, Spy Jury Is Told.'

<sup>161</sup> Norman Lodge, 'Spy Suspect Saw Bombsight Several Years,' By J. Norman Lodge Associated Press Staff Writer, *The Washington Post*; Jul 1, 1941; ProQuest Historical Newspapers, The Washington Post, (1877 - 1992), pg. 1.

William G. Sebold, who had been harangued by the Gestapo to initiate transmission while on a trip to Germany in 1939.<sup>162</sup> Upon his return to the United States in 1940 Sebold immediately went to the FBI and explained what had happened and what the Gestapo wished to do. A German veteran of the First World War, Sebold, became the United States' primary witness against Lang, as he was essentially the communications middleman between Nazi spies in America and Germany. While in Germany Sebold, fearing for his life, acted as a willing accomplice, and in doing so became privy to information concerning the NBS. His immediate superior in the spy ring was one Nikolas Ritter, also known as Dr. Rankin. Sebold testified that, "I told Dr. Rankin, in an effort to make an impression, that I might get the famous American bombsight and hand it over to him as a present."<sup>163</sup> According to Sebold, Rankin told him not to worry "it's already in our possession."

During the trial Lang's character was attacked; one article reported him as "a cautious individual who refused repeated proffers by the Nazis... until he was assured of the validity of the offers and reasonable financial security..." Thus Lang was depicted as a man willing to betray the United States for financial gain. Sebold, the main government witness, testified that he had met Lang at the latter's home to discuss his espionage role. The meeting process had included the use of passwords provided by Nazi officials in Hamburg. During one visit to Lang's home, Sebold testified that there were other members of Lang's extended family present. When Sebold inquired as to their knowledge of Lang's Nazi affiliation, Lang assured Sebold the he was "the only man who knows the American secret." When Sebold was asked if the NBS was discussed at the latter meeting

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<sup>162</sup> 'FBI Radio Traps Nazi Spy Secrets,' *New York Times*; Sep 10, 1941; ProQuest Historical Newspapers, The New York Times, (1851 - 2005), pg. 1

<sup>163</sup> 'FBI Radio Traps Nazi Spy Secrets.'

he replied that it was. During another clandestine meeting between Sebold and Lang in July of 1940, Sebold had asked Lang whether or not he was afraid of being cheated by the Nazis. Lang said he was not worried due to his relationship with Goering and the fact that he had fought alongside Hitler from 1923 to 1927.<sup>164</sup> Lang apparently told Sebold “he was personally acquainted with the Chancellor Hitler and could also rely on the friendship of Reich Air Marshall Hermann Goering.”<sup>165</sup> Sebold further revealed that Lang had told him that Goering regarded the NBS as “the most important thing in the world.”<sup>166</sup>

An article in the *Times* of 25 September 1941 demonstrates how the newspapers were complicit in spreading certain elements of the Norden myth. “Detailed testimony relating to the famous Norden Bombsight, believed to have been this country’s most jealously guarded aerial defence weapon, was barred yesterday as being ‘inimical to the interests of the United States...’”<sup>167</sup> It was revealed during Sebold’s testimony that Lang had told him that as a “reward for disclosing the bombsight to Germany he [Lang] was to be taken care of” by the Nazis.<sup>168</sup> When the United States attorney asked Sebold questions relating to the information Lang had provided, the judge refused to permit any further questions that might have revealed the particulars of Carl L. Norden Inc. Sebold had been asked whether Lang had told him how many bombsights were produced per month. The judge declared that he “deem[ed] it inimical to the United States to permit

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<sup>164</sup> ‘Court Bars Talk.’ *New York Times*; Sep 25, 1941; ProQuest Historical Newspapers, *The New York Times*, (1851 - 2005), pg. 27

<sup>165</sup> ‘Court Bars Talk.’

<sup>166</sup> ‘Court Bars Talk.’

<sup>167</sup> ‘Court Bars Talk,’.

<sup>168</sup> ‘Court Bars Talk.’

any closer inquiry on that subject.”<sup>169</sup> Thus the newspapers reinforced the position of the AAF as regards to the “top secret” nature of the NBS.

Throughout the trial, and in subsequent media coverage, Lang denied handing defence secrets to anyone and insisted that Sebold had coerced him by using threats against his family and promises of money and women. Lang also denied that he intended to return to Germany, yet the evidence indicated that he had arranged for a large sum of money to be transferred to the German *Volksbank*<sup>170</sup> According to Lang, during his 1938 trip to Germany he spent his time in Northern Bavaria “collecting mushrooms and chopping wood” rather than selling the secrets of the NBS.<sup>171</sup> Lang argued that the \$3500 of deposits to his German bank account between July 1939 and May 1940 were made out of fear of a ruinous inflation in the United States. Lang did admit that he failed to mention to both his employer and the Federal Government that the Nazis were actively pursuing the Norden bombsight, or that they had contacted him while in Europe.<sup>172</sup>

The trial unfolded like that of a typical Hollywood plot complete with a heated verbal battle between Lang’s defence counsel, George Washington Hertz, and the court judge. The national security ramifications of some material produced as evidence forced Judge Byers to censor certain FBI statements taken after Lang’s arrest. After reading the evidence brought forward by the Government lawyer, Byers insisted that “in the interests of national defence I am going to physically cut out portions of this statement before it is shown to the other side (the defence).”<sup>173</sup> After physically removing the segments of the

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<sup>169</sup> ‘Court Bars Talk.’

<sup>170</sup> ‘Lang Denies Plan to Return To Germany,’ *The Washington Post*; Nov 6, 1941; ProQuest Historical Newspapers, *The Washington Post*, (1877 - 1992), pg. 8.

<sup>171</sup> ‘Lang Offers Alibi In Bombsight Sale.’

<sup>172</sup> ‘Lang Offers Alibi In Bombsight Sale.’

<sup>173</sup> Brackets in original. ‘Clash In Court Marks Spy Trial,’ *New York Times*; Nov 6, 1941; ProQuest

text with scissors, Byers allowed the defence to review the evidence. Herz objected to the censorship of material relevant to his client's case. To Herz's objection Byers replied, "Of course, of course, you may have your objection for the record."<sup>174</sup> To this quip, Herz responded as if the court had verbally attacked him. "I resent the sarcasm in Your Honor's voice. I am endeavouring to do my duty as an officer of the court."<sup>175</sup> In response to Herz, Byers alluded to the fact that there was much more at stake than the rights of a Nazi spy. "There are two sides to this case, I resent your evident lack of understanding that your first duty is that of an American citizen."<sup>176</sup> To which Herz replied, "I resent your Honor's implied reference to my Americanism." By this time Byers had had enough of Herz's drama; he said: "No more speeches, sir. Sit down and read the statement."<sup>177</sup>

Prior to Lang's sentencing Herz requested clemency for Lang due to his "weakness" and insisted that Lang had never "given the German Government any information."<sup>178</sup> Judge Byers dismissed Herz's requests of insisting that Lang "knew the value of the Norden Bombsight. He of all men knew what use it might be put by the 'chivalrous' powers of the Axis waging their war against civilization." Byers sentenced Lang to a total of twenty years in prison.<sup>179</sup>

Despite the evidence and testimony produced in Lang's espionage trial, officials in the military and those civilians associated with the NBS production insisted that the

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Historical Newspapers, *The New York Times*, (1851 - 2005), pg. 25.

<sup>174</sup> 'Clash In Court Marks Spy Trial.'

<sup>175</sup> 'Clash In Court Marks Spy Trial.'

<sup>176</sup> 'Clash In Court Marks Spy Trial.'

<sup>177</sup> 'Clash In Court Marks Spy Trial.'

<sup>178</sup> '33 In Spy Ring Get Heavy Sentences,' *New York Times*; 3 January 1942; ProQuest Historical Newspapers, *The New York Times* (1851 - 2005), pg. 1

<sup>179</sup> '33 In Spy Ring Get Heavy Sentences.'

secrets of the NBS remained secure. Even high-ranking members of the government were dragged into the drama surrounding the Lang trial. Secretary of War Henry L. Stimson was quoted in the *Washington Post* as denying the likelihood that NBS blueprints were in German possession. According to a 24 October 1941 article Stimson had “no reason to believe that the prized secret Norden Bombsight used by the Army and Navy bombers has reached the Germans.”<sup>180</sup> Stimson, however, unwittingly jeopardized the position of the United States’ case regarding Lang and the NBS. While Stimson may have been attempting to allay the fears of the public that the NBS was in German possession, he at the same time inadvertently implied that Lang was indeed telling the truth. Lang’s attorney indicated on 24 October 1941 that he “would seek a deposition from Secretary of War Stimson” in order to prove Lang’s innocence.<sup>181</sup> After Herz announced his plans Judge Byers reserved his decision about subpoenaing the Secretary of War until he could decide whether or not Stimson’s deposition was admissible without his physical presence. Herz claimed it would be an “unpatriotic act” to summon Stimson while he was so obviously occupied “with the defence program.”<sup>182</sup> Despite Herz’s stance a subpoena was issued to Stimson on 28 October. According to an article in the *New York Times*, “the document was sent immediately to Washington for service on the Secretary by a United States Marshal there.”<sup>183</sup> Clearly it was difficult for US officials to indicate that the secrets of the NBS were intact while at the same time charging a citizen for selling the

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<sup>180</sup> ‘Stimson Doubts Nazis Obtained Norden Bombsight,’ *The Washington Post*; 24 October 1941; ProQuest Historical Newspapers, The Washington Post, (1877 - 1992), pg. 17.

<sup>181</sup> Pat McGrady, ‘Spy Suspect's 'Love Interest' Wilts on Stand,’ By Pat McGrady Associated Press Staff Writer, *The Washington Post*; Oct 25, 1941; ProQuest Historical Newspapers, The Washington Post, (1877 - 1992), pg. 4.

<sup>182</sup> ‘Stimson May Get Call To Spy Trial,’ *New York Times*; Oct 25, 1941; ProQuest Historical Newspapers, The New York Times, (1851 - 2005), pg. 19.

<sup>183</sup> ‘Stimson Subpoenaed To Spy Trial Here,’ *New York Times*; Oct 29, 1941; ProQuest Historical Newspapers, The New York Times, (1851 - 2005), pg. 7.

same secrets to the Nazis. This conundrum, however, extended beyond the Government and its officials.

On 11 April 1942, an article in the *Washington Post* declared, “The secret of the deadly Norden Bombsight, one of the most valuable of wartime instruments possessed by the United States, is unknown to the Nazis.”<sup>184</sup> Theodore Barth was quoted in the article as actually saying “there was no truth in the frequent rumours that the Germans had gotten possession of the secret.”<sup>185</sup> According to Barth, evidence gathered from captured *Luftwaffe* aircraft indicating that German sights were “crudely made devices and haven’t the slightest resemblance to the highly perfect Norden sight” proved that the Norden remained unknown to the Germans.<sup>186</sup> The fact that the Germans had given up on daylight bombing, and more importantly did not have heavy bombers capable of undertaking a strategic mission on the scale of Anglo-American air force’s seems to have eluded Barth.

The Lang case was not the only espionage case that involved the NBS, for just as that episode stopped making headlines another espionage case grabbed the media’s attention. According to a 30 October 1942 *Washington Post Special Dispatch*, a former *Luftwaffe* pilot from the First World War had been entrusted with the manufacturing of secret weapons, including “the Norden Bombsight—supposedly priceless and super-secret.”<sup>187</sup> Andreas C. Grunau, the ex-pilot, was general manager of the Simpson Optical Company, which manufactured high-grade lenses and fittings for the Navy. Grunau

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<sup>184</sup> ‘Norden Bombsight Secret Is Still Unknown to Nazis,’ *The Washington Post*; Apr 11, 1942; ProQuest Historical Newspapers, The Washington Post, (1877 - 1992), pg. 7.

<sup>185</sup> ‘Norden Bombsight Secret Is Still Unknown to Nazis.’

<sup>186</sup> ‘Norden Bombsight Secret Is Still Unknown to Nazis.’

<sup>187</sup> Dillard Stokes ‘German Veteran Made Bombsights,’ Special Dispatch to The Post, By Post Staff Writer Dillard Stokes, *The Washington Post*; Oct 31, 1942; ProQuest Historical Newspapers, The Washington Post, (1877 - 1992), pg. 1.

began some experimental work on the device in 1937, but by 1939 he had redesigned the optical lenses so they could be mass-produced.<sup>188</sup>

Although the article's title highlighted the fact that a German veteran was making the NBS, the article itself actually focused on the espionage case of Herbert Haupt, a former employee of Simpson Optical. Grunau testified that in 1939 Herbert Haupt had been employed by the company and "worked on the production line where the Norden bombsight was being manufactured."<sup>189</sup> Haupt was apparently on the Simpson payroll until June 1941 when he left the company and subsequently made his way to Germany to be trained as a spy. "Haupt and the others were trained intensively for eighteen days in April in a secret sabotage school two miles from Brandenburg, Germany."<sup>190</sup> Haupt was reportedly decorated with the Iron Cross shortly after his arrival in Germany, and according to an article in the *New York Times*, he had been instructed to "return to work in this optical goods factory" and to "get inside information... and turn the information over to our [espionage] groups."<sup>191</sup> Once Haupt's training was complete in Germany, he returned to the United States via a German U-boat whence he began his mission of sabotage and espionage. On 22 June 1942 Haupt approached Grunau and asked for his old job back. Court evidence revealed that this was just five days after Haupt's return. To allay public fears, Government officials indicated that Simpson Optical was not contracted to construct entire NBS's, "but only certain optical parts."<sup>192</sup>

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<sup>188</sup> 'Says Haupt Helped Make Norden Sight,' Special to The New York Times. *New York Times*; Oct 31, 1942; ProQuest Historical Newspapers, The New York Times, (1851 - 2005), pg. 6.

<sup>189</sup> 'Says Haupt Helped Make Norden Sight.'

<sup>190</sup> 'Nazi Spy Tells Way Saboteurs Studied,' Special to THE NEW YORK TIMES. *New York Times*; Oct 28, 1942; ProQuest Historical Newspapers, The New York Times, (1851 - 2005), pg. 1.

<sup>191</sup> 'Nazi Spy Tells Way Saboteurs Studied.'

<sup>192</sup> 'Says Haupt Helped Make Norden Sight,' Special to THE NEW YORK TIMES. *New York Times*; Oct 31, 1942; ProQuest Historical Newspapers, The New York Times, (1851 - 2005), pg. 6.

Haupt's case was handled much differently than Lang's. Whereas Lang was sent to prison for his actions, Haupt was executed. The difference was of course that Haupt undertook his espionage while the United States was at war. What is most striking about the Haupt case is how minute the link between Haupt and the NBS actually was. That the Simpson Optical Company only manufactured small portions of the device did not matter; it was still America's most important top-secret weapon. As in the Lang case, officials in the government downplayed the impact of Haupt's espionage, yet at the same time the very fact that the NBS was involved was a measure of the seriousness of the charges.

The national newspaper's influence, and the public propensity to seek affirmation of facts within the pages of these papers, ensured that the NBS remained a hot topic for newspaper editors throughout the war, whether as a part of a Nazi spy scandal or of criticism of AAF doctrine. The images, symbols, and descriptors used to depict the NBS in newspapers all contributed to the collective *public* image of the device, and it was their role in shaping this fabricated *public* image that made newspapers so significant in both the development and maintenance of the NBS myth.

*Time Magazine*, a weekly news periodical, covered the first public showing of the NBS in its 4 December 1944 edition. According to the magazine, "The famed Norden bombsight" was "perhaps the most closely guarded U.S. military secret of the war."<sup>193</sup> However, for just thirty cents any member of the public could have an up close look at the device and even look through the scope. For those of the public who did not wish to

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<sup>193</sup> *Time: The Weekly Magazine*, December 4 1944, Vol., XLIV. No. 23. Pp. 50.

spend the thirty cents, there was a public viewing at Manhattan's Museum of Science and Technology. The article was quick to point out that "not even a spying engineer could learn much from this glimpse." In case anyone was worried, *Time* reassured the public that the NBS "is so complex that, although a number of sights had fallen into enemy hands, its inventors are confident that enemy technicians can not duplicate it in time for World War II."<sup>194</sup> While this article is similar to those covering the same story in the newspapers, *Time*'s prestige added weight to the article and reinforced the perception that the NBS was both "famed" and a device of such technical superiority that no country other than the United States could possibly duplicate it.

For many avid readers and individual enthusiasts, special interest magazines were a way to become informed and to stay informed. Whatever one's interest may have been there was almost sure to be a magazine in this era that discussed the relevant issues or interests on a regular basis. While such special interest magazines may have reached a smaller audience than the newspapers, they also tended to cover the particular subject matter in much more detail. The focused nature of these periodicals provided a sense of legitimacy to those who read the exposés within. The credibility of the articles, together with the prestigious reputations of some of the periodicals combined to create the overall perception that what was read must be true. For this reason, such periodicals were an important source of the Norden myth.

In many cases the authors of articles in special interest magazines were quite knowledgeable in their field of study. While not experts, these writers were certainly more in tune with their particular subjects than the regular newspaper journalists.

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<sup>194</sup> *Time*, December 4 1944, 50.

Consequently a much deeper explanation of the material was provided within the pages of special interest magazines; yet, in many cases this did not mean a deeper analysis. It must be noted that such articles—not to mention the magazines they were in—were directed at specific audiences, and their limited readership ensured that a certain amount of sensationalism was included in order to sell more magazines. For example, the June 1945 *Popular Science*'s cover was headlined: “Secrets of the Norden Bombsight.”<sup>195</sup> Once the reader turned to the page of the Norden article another title trumpeted “The War’s Most Closely Guarded Secret Revealed,” thus giving the impression that the magazine purchaser was privy to heretofore-unseen material relating to the NBS.<sup>196</sup>

Adding credence to the legitimacy of articles appearing in both special interest magazines and weekly news periodicals was the placement of the articles in sections dedicated to science. This played upon the notions that Americans held of themselves and the association between science, technology, and progress. Thus when an article appeared in a magazine such as *Popular Science*, the NBS—and every thing written about it—was awarded an aura of truth thanks to the association with the omnipresent force of *science*. In Volta Torrey’s, ‘How the Norden Bombsight Does Its Job,’ the author introduces the NBS to his *Popular Science* readers with flair:

The Norden Bombsight, one of the most fascinating, hush-hush tools used in winning World War II, is both a magician and mathematician. It creates an illusion, and uses that bit of magic to solve two problems in trigonometry faster than a professor of mathematics could do it.<sup>197</sup>

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<sup>195</sup> *Popular Science Monthly*, June 1945, Vol. 146, No. 6, 70.

<sup>196</sup> *Popular Science*, 70.

<sup>197</sup> Volta Torrey, ‘How the Norden Bombsight Does Its Job,’ *Popular Science Monthly*, June 1945, Vol. 146: No. 6. Pp70.

According to Torrey once the bombardier sets the sight “so that the illusion is perfect, his work is done.” Once the bombardier’s job is finished “Lady Luck can relax too—because the bomb’s destination has then become a mathematical certainty.”<sup>198</sup>

Torrey reduces the messy reality of a bombing mission to fantasy in which the NBS is portrayed as a “mechanical Wizard” and the automatic pilot is reduced to a group of “robots” used to fly the plane.<sup>199</sup> Consequently, according to Torrey, “as surely as two and two make four, a bomb will then be released where and when the laws of physics will carry it to that target.”<sup>200</sup> Yet despite Torrey’s literary license his article is quite informative, and the reader would have come away with a fundamental understanding of the bombing problem and how the NBS “solved” it.

What made an article such as Torrey’s complicit in the promulgation of the Norden myth was its un-analytical approach. The bombardier’s reliance upon visual contact with the ground remains unmentioned. Furthermore, while Torrey acknowledges the fact that the bombardier has a role to play in entering various data, the NBS remains unquestionably precise. Once the bombing problem is handed over to the sight, the ability to hit its target followed simply from the laws of science and physics. On the one hand, Torrey describes the device as a magician and awards it mystical powers, yet on the other hand Torrey indicates that the NBS’s accuracy is based upon the absolutes of science. The paradox of Torrey’s article is even more transparent when considered in combination with his final sentence. Torrey writes that the bombardiers in training “are acquiring the

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<sup>198</sup> Torrey, ‘How the Norden Bombsight Does Its Job,’ 70.

<sup>199</sup> Torrey, ‘How the Norden Bombsight Does Its Job,’ 70.

<sup>200</sup> Torrey, ‘How the Norden Bombsight Does Its Job,’ 71.

skill needed to set bigger fires in the heart of Japan with their Norden Wizards.”<sup>201</sup> In hindsight, one is left to wonder if the readership questioned the need to accurately drop incendiaries on wooden cities, for clearly Torrey did not.

Other magazines catered to airplane enthusiasts specifically, and these sometimes provided a somewhat more objective analysis of the NBS due to the knowledge of both the writer and the intended audience. In October 1943 a special issue of *Flying* was dedicated to the “U.S. Army Air Forces at War.” Within the special issue was a complete breakdown of the AAF and its relevant departments and wartime operations. One section dedicated to “The Bombsight” is the polar opposite of the article written by Torrey. In this article a concise and often complex discussion of the bombing problem, and of how modern bombsights have been designed to solve that problem, is undertaken. The reader is not mollified by metaphors or digressions into fantasy. Instead, the article is a step-by-step discussion of inertia, gravity, resistance, air speed and trail, all of which are part of the bombing equation. The author tackles each problem during the article with calculations, charts and sometimes diagrams. Near the end of the article the author indicates that with modern precision sights, the bombing problem has been addressed by the application of technological innovation. These innovations in turn “make it possible for our Air Forces to put into action the only concept of air power which is not utterly destructive and inhumane.”<sup>202</sup> In other words, while not deluding the readers with fictive analogies, this article still manages to project at least two mythical aspects of the NBS, that is the idea that by using precision sights the AAF was able to hit specific targets and

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<sup>201</sup> Torrey, ‘How the Norden Bombsight Does Its Job,’ 232.

<sup>202</sup> *Flying*, Special Issue, October 1943, Volume 33, Number 4, pp 344.

therefore injure or kill fewer innocent civilians. Added to these two claims, however, is another much more pragmatic set of reasons for using precision sights:

Reducing bombing errors by 50 percent has the result of multiplying the actual effectiveness of a given number of airplanes by over four times. It enables the job to be done with less than one fourth of the formerly required number of bombs. Such a real saving in gasoline, planes, and lives demands that our unrivalled bombsights be exploited to the limit.<sup>203</sup>

Thus, the readership of *Flying*, while too expert for symbolic images, is provided with far more practical reasons for the use of the NBS. Once again, however, far too little time is spent analyzing the realities of the device in combat, and because of this the article simply adds to the misperception that the NBS actually did what was commonly purported.

The material that made up the pages of these special interest magazines, specifically *Flying*, naturally covered subjects that the editors thought readers wanted. Often however, the staffs of these magazines were fervent believers in what they chose to print as well. In the forward to the special NBS issue of *Flying*, the editor, William Ziff wrote, “No one can now deny that the American military air establishment... has been the saviour of our civilization.”<sup>204</sup> As a result of Ziff’s enthusiasm, articles that were much less objective than the one that appeared in the special issue also made it into print. In an earlier issue of *Flying*, an article by Kurt Rand, aptly titled ‘The Norden Bombsight’ is a prime example of the use of metaphorical language when discussing the NBS: “Delicate as a pharmacist’s balances, fine as a thoroughbred colt, closely guarded as a Sultana—but sturdy as a stone barn—the Norden Bombsight is the most discussed

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<sup>203</sup> *Flying*, Special Issue, 344.

<sup>204</sup> *Flying*, Special Issue, 48.

yet least known of the tools of today's war."<sup>205</sup> Rand asks his audience: why in 1943, in the midst of the war, has the Navy unveiled some of the mystery surrounding the NBS? "Is it because, at last, the Air Forces have ruefully discovered that it's not as good as they thought it was? Not at all," Rand wilfully replies to his own query; if anything, he says "it's even better."<sup>206</sup>

Despite Rand's maintenance of common misperceptions regarding the better-than-expected qualities of the NBS, he did engage differently with a topic that had already received much press coverage, for example when he discusses the controversial subject of the Norden in possession of the enemy. Like all other commentators who discuss this issue, Rand argues that there was no way that any nation other than the U.S. had the ability to produce or use the NBS. However, rather than stressing only the technical complexity of the device, Rand points out that the NBS is "more than an instrument. It is also a system of training and a technique."<sup>207</sup> The very fact that the AAF had been using and developing the NBS for over a decade meant that the training, maintenance, and nuanced use of the device had all been carefully considered by the AAF, and even if "they could manufacture it—a matter of considerable doubt—the Germans would still" have to adopt an entire new approach to strategic bombing.<sup>208</sup> In this way, Rand not only reinforces the common perceptions of the technical prowess of the device, but also adds a new dimension to the discussion.

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<sup>205</sup> Kurt Rand, 'The Norden Bombsight,' *Flying*, July 1943, Volume 33, Number 1, pp 37.

<sup>206</sup> Rand, 'The Norden Bombsight,' 37.

<sup>207</sup> Rand, 'The Norden Bombsight,' 37.

<sup>208</sup> Rand, 'The Norden Bombsight,' 37.

Thus, Even though Rand raised an interesting point regarding the capture or copying of the NBS, it would be a stretch to say that he had produced an objective analysis of the NBS and its role. According to Rand, the bombardier needed only “a few seconds to squint at his target, and the properly trained man just can’t miss.”<sup>209</sup> Like a salesman, Rand praises the device and the ingenuity of its designers without engaging in any critical dialogue. The same analogies are used over and over again: bombs are “eggs”; the NBS “thinks,” and the device somehow guides the bombs to the destination that the bombardier has skilfully entered into the “magician.” In this sense Rand’s particular form of colourful writing is reminiscent of the next type of writing to be explored in this chapter, that of print advertising.

The field of professional advertising is, according to Merritt Roe Smith, “characterized by historians as the distinctive institution of American technological culture.” Thus, according to Smith “advertising became the instrument by which big business, in need of ever-expanding markets for its mass produced products, imprinted instrumental values... on the populace.”<sup>210</sup> Even the President recognized the efficacy of advertising during the war. While encouraging the use of media to sell war bonds, Roosevelt wrote: “For the duration... there are many messages which should be given the public through the use of advertising space.” Roosevelt also believed that “advertising [should] have a patriotic place in the nation’s war effort.”<sup>211</sup> The following portion of this chapter will demonstrate how the NBS became a useful tool for several civilian

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<sup>209</sup> Rand, ‘The Norden Bombsight,’ 37.

<sup>210</sup> Smith, *Technological Determinism*, 13.

<sup>211</sup> Quoted in: John Morton Bloom, *U Was for Victory*, (New York: Harcourt & Brace Company, 1976)18.

commercial companies to sell their products. Commercial advertising played an important role in the promulgation of the NBS myth due to its popular nature, and even an association with the famed NBS was deemed advantageous.

One almost comical ad from the August 1943 issue of *Fortune* unabashedly exploited the NBS association. The ad shows a picture of a bombardier stuffed into the plexiglas nose of a bomber; beside the image is the caption, “Carl L. Norden, Inc. manufacturer of the Famous Norden Bombsight uses Dictograph Intercommunication as an essential war production tool.”<sup>212</sup> The placement of the caption fools the reader into believing that the ad relates solely to the NBS. However, the small print of the ad clears up any confusion when it reads, “The highly secret nature of the administration, planning and production of the famous Norden Bombsight naturally requires unquestioned privacy.”<sup>213</sup> In this case the Dictograph Company is selling its product by highlighting the fact that the employees of Carl L. Norden use their product in the factories.

Even large corporations such as Boeing printed ads linking their company to the famed device. An ad from 1943 shows a bombardier walking towards a grounded B-17. The bombardier carries a canvas bag, which according to the ad contains the Norden Bombsight. The ad informs the reader that the NBS is called the “Blue Ox” by the bombardiers and that “an American bombardier, a Blue Ox and a Boeing Flying Fortress are the most formidable bombing team in the world.”<sup>214</sup> As well as reinforcing the popular image of the top-secret device, this ad places the NBS within its working context. The image of a bombardier and a B-17 became synonymous with the NBS. This

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<sup>212</sup> *Fortune Magazine*, August 1943, Volume XXVIII, Number 2, pg 56.

<sup>213</sup> *Fortune*, August 1943, 56.

<sup>214</sup> *Fortune*, 1943, 161.

combination of images would become a useful tool for another company that wished to make its association with the NBS known.

During the early 1942 rush to arm the nation, the need to produce the Norden Bombsight in quantity became a serious issue for the Army Air Force as we saw above. Contractors were needed who had the ability to produce the intricate devices fast enough not only to replace the units lost in combat, but also to equip those aircraft to be used in the ever expanding role of the American Air Force. The Victor Adding Machine Company was one of the companies selected to take on this job. Victor became the Army's primary contractor for the bombsight in 1942 and subsequently produced close to 1900 complete units.<sup>215</sup> Victor Adding Machine Company later exploited its association with the Norden Bombsight to sell adding machines. Needless to say, to do so required the evocation of the NBS' fame in order for the company to profit from Victor's Norden-producing contribution to the war effort. Conversely, Victor's exploitation of Norden's fame perpetuated the Norden myth through its advertising campaign. Victor ads appeared in all three of the afore mentioned newspapers as well as in at least one special interest magazine.

The problem for the Victor Adding Machine Company was that their product was not made for the mass consumer market, but instead, the business community. Mechanical adding machines were too complex and expensive for home use. This meant that it was pointless for Victor to use standard advertising techniques by trying to appeal

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<sup>215</sup> Captain E.C. Koerper Air Corps Resident Representative to Commanding General Materiel Command Headquarters Army Air Forces, Washington D.C., 19 May 1944, Box 764 E-294 RG-18 452.26 National Archives.

to the emotions or irrational “fears, anxieties, and day-dreams,” of the general public.<sup>216</sup>

These emotive devices are easily the most effective means of selling consumer goods, but clearly would not work when trying to market adding machines.<sup>217</sup> Thus, the Victor ads needed to be directed towards those consumers who required dependable and accurate devices to meet the needs of their businesses. The link in the advertising between Victor Adding Machine Company and the *famous* Norden Bombsight, recalls the one criterion that should be asked of any advertisement: Will the ad(s) help sell more product?<sup>218</sup>

Victor’s pre-war success at selling adding machines helped Victor capitalize on its association with the NBS and not worry about introducing its product. This is just to say that Victor had secured a sizeable market before the war, and therefore certain advertising fundamentals could be left out of some of its wartime ads. These ads were instead used to exploit the association with the commonly known and revered NBS, rather than simply focusing on the features of the Victor products. According to the advertising analyst John Hobson, “The consumer finds it far easier to identify, and therefore to remember at the time of purchase, a product which has some single claim associated with it.”<sup>219</sup> The exploitation of Victor’s production of the NBS was used to create both a conscious and subconscious association between Victor adding machines and the NBS. Hobson points out that association “is something quite apart from the substance of the claims one makes for the produc[t] yet it is of very real significance in

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<sup>216</sup> Frank Whitehead, ‘Advertising.’ In: Michael Barnes, ed., The Three Faces of Advertising. (London: Gatesbury Ltd., 1975) 35.

<sup>217</sup> Frank Whitehead, in his article aptly titled ‘Advertising,’ posed the question of whether or not an ad did what it was supposed to, that is, sell a specific product. For Victor, the use of emotive language that related directly to an adding machine clearly would not work. See: Whitehead, ‘Advertising,’ 36.

<sup>218</sup> Whitehead, ‘Advertising,’ 35.

<sup>219</sup> John Hobson, ‘The Techniques of Modern Advertising,’ in: Michael Barnes, ed., The Three Faces of Advertising. (London: Gatesbury Ltd., 1975) 205.

the selling situation.”<sup>220</sup> Essentially what Victor’s, Boeing’s and Dictograph’s ads were attempting to do was to invoke an emotional link with the NBS and the subjective values inherent in the NBS myth, that is, precision, efficiency, and accuracy. Moreover, Victor machines would automatically be associated with the war effort and sacrifice that all Americans made during the conflict, because Victor *was* recognized as a contributor.

Once the NBS was officially revealed, Victor took the opportunity to begin its marketing campaign in 1944 with a full-page ad in *Fortune Magazine* that was simply a picture of a Norden Bombsight. In the middle of the page, covering a small portion of the sight, a diminutive caption aptly titled, “This is IT!”, was followed by a brief paragraph and Victor’s logo. The text explains how the once top-secret device had now been exposed because even if the enemy were to capture the blueprints, “no technology other than this nation’s is currently capable of producing this delicate dealer of doom.”<sup>221</sup> This sentence clearly alludes to the superiority of American technology, and by extension, to Victor’s. Carrying on, the ad mentions that Victor has been the prime contractor for the Army since the “outset.” The language of the ad is very ambiguous regarding *what* Victor was contracted to do and *how long* they had been doing it. According to the ad, the secret of the Norden Bombsight was less to do with the device itself and more to do with “the incredible accuracy that fashioned its component parts.”<sup>222</sup> The passage in this add that forms the strongest link between the Norden myth and Victor follows: “That this *same* skill will return to building Victor Adding Machines... under the *same* roof that housed the Norden Bombsight... using the *same* precise know-how... is no secret at all.” The

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<sup>220</sup> Hobson, ‘The Techniques of Modern Advertising,’ 206.

<sup>221</sup> *Fortune Magazine*, 1943, 45.

<sup>222</sup> *Fortune Magazine*, 1943, 45.

stress placed upon the word “same” appears in the original text and is clearly the message Victor executives wanted the reader to pick up on. The message is simple, everything that the Norden is, was produced by Victor—so go buy Victor adding machines.

Regardless of Victor’s solid pre-war status, status alone could not protect the company from outside competition. It was therefore necessary for the company to make Victor machines stand out from the rest. The purpose of Victor’s advertising was to explain *why* Victor Adding Machines stood out from the competition. For example, a full page Victor ad in another issue of *Fortune Magazine* later in 1944 depicts an image of Japan under the shadow of a plane that is easily recognizable as a Boeing B-29 Super Fortress. The title caption reads: “Putting the Rising Sun in the Shade... Six Months Sooner!”<sup>223</sup> Together, the title caption and the image take up two thirds of the advertisement, the remaining third consists of text. The text refers to the teamwork involved in producing reliable and precise Norden Bombsights. The teamwork, which facilitated attacks upon Japan six months earlier than initially expected, was fostered, according to the ad, by Victor’s Norden Bombsight team. The teamwork that is stressed in the ads is the same teamwork that goes into producing Victor adding machines; therefore, Victor products are superior.

The focus of this ad is not directly upon Victor adding machines; instead, a certain type of teamwork that Victor possesses. Only the bottom right corner of the page, approximately one fifteenth of the entire page, is occupied by a small Victor logo segment, including Victor’s slogan: “Still Working with right answers.”<sup>224</sup> This formulaic style was reproduced in several different ads, in several different venues, each extolling a

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<sup>223</sup> *Fortune Magazine*, 1944, 198.

<sup>224</sup> *Fortune Magazine*, 1944, 198.

different Victor company virtue, including: punctuality, precision manufacturing, and attention to detail. The images represented the symbols of the air-war as it would have been recognized by the American public, these included: The Norden sight itself, a B-17 cut away showing the combat positions of the crew, Japan being attacked by an American bomber, and the forward fuselage of a B-29 named “Tokyo Rose.”

While the ads that Victor produced during this period were meant to sell Victor Adding machines, they also inadvertently served to perpetuate the myth of the Norden bombsight. The language used to articulate the values to be associated with Victor adding machines is the same language associated with the NBS. That the NBS myth existed already is proven by Victor’s association with both the NBS itself and the language familiar to the public at large. The ads, therefore, confirm the public’s collective memory of the war and the role of the NBS in it, as well as, perpetuating the collective image of what the Norden was to the war effort. That is, the NBS was a high-tech American-made precision instrument built by teams of highly trained and efficient manufacturers in order to defeat the enemy quickly through accurate bombing. Through advertisements such as the Victor collection, the ideas and concepts that created the Norden myth became more widely exposed to the public and served to supplement the collective memory that perpetuated the myth.

The Victor advertising campaign was not the only way that Victor participated in promulgating the Norden myth. Victor Adding Machine Company and the NBS will forever remain linked through its role in producing one bombsight in particular. On 6 August 1945, the famous B-29, *Enola Gay*, dropped the first Atomic bomb on Hiroshima. The *Enola Gay* was equipped with a Victor-made Norden Bombsight, bombsight No.

4120.<sup>225</sup> A.C. Buehler, the president of Victor, capitalized on this fact and forever fused the name of his company with the NBS. Buehler purchased the sight after the war in a Government surplus sale and on 10 February 1947 presented the device to the Smithsonian Institute.<sup>226</sup> The group of prestigious presenters at the Smithsonian included Buehler, Rear Admiral W.S. Parsons of the U.S. Navy, and General Carl Spaatz of the U.S. Air Force.<sup>227</sup> The device remains to this day on display at the Smithsonian Air and Space museum in Washington DC, a testament to Victor's contribution to the war effort and to the Norden myth. Incidentally, the bomb, *Little Boy*, missed its target, the Aioi Bridge over the Ota River by some 800 feet—hardly an issue however considering the ordinance in question.<sup>228</sup>

The purpose of this chapter has been to present the NBS as it appeared in print media shortly before and during the Second World War. This investigation reveals several important considerations regarding the NBS and public perceptions. Both the frequency and the repetitious nature of the language used to describe the device reveal certain preconceived notions of what the device was and what it could do. While national newspapers offered space for criticism they also allowed AAF officers the opportunity to argue away those same criticisms. The relationship that the air war advocates had developed in the interwar period certainly seemed to facilitate this process. At the same time special interest periodicals offered the more “technical” reader a chance to

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<sup>225</sup>Edwin Darby, *It All Adds Up: The Growth of the Victor Comptometer Corporation*. (U.S.A. Victor Comptometer Corporation, 1968), 85.

<sup>226</sup> ‘Bombsight Going to Smithsonian’ *New York Times* (1857- current file); Feb 9, 1947; ProQuest Historical Newspapers, *The New York Times* (1851-2005) pg. 42.

<sup>227</sup> Darby, *It All Adds Up*, 85.

<sup>228</sup> Ross, *Strategic Bombing*, 192.

accumulate more knowledge on a specific subject. As this investigation shows, however, special interest magazines tended to sensationalize without asking critical questions. Thus, the reader of these sometimes prestigious periodicals “legitimized” his/her knowledge, but was also offered information sanitized by the authors’ inclination towards the subject. The final form of print investigated is that of advertising. Print advertising pervaded both previous forms of media, and highlighted—or summed up—public perceptions. Limited space coupled with a desire to sell a product through an association with the NBS meant that advertising used and thereby reinforced the most common symbols or language associated with the NBS. The very prominent and effective nature of advertising, as well as the fact that these advertisements appeared in both previous types of print media, meant that the NBS myth was disseminated—or “sold”—to a very broad audience.

What this chapter demonstrates is that print media not only played a crucial role in maintaining preconceived notions of the NBS, but also served as a means to form new ideas or introduce the NBS in detail to a broader public. The ubiquity of print media coupled with the language and imagery used to describe the NBS ensured that the myth remained a topic of discussion throughout the war. Controversial or not, the presence of the NBS in print ensured that the misconceptions—or myth—surrounding the NBS outlived the wartime crisis.

## Chapter 3

### The Norden in Film

*The film makes him laugh, cry, wonder, and love. He goes to bed with the leading lady, kills the villain, and masters life's absurdities. In short, he becomes a hero. Life suddenly has meaning.*

—Jacques Ellul, *The Technological Society*<sup>229</sup>

Motion pictures presented a significant means of disseminating information and propaganda during the Second World War. Jacques Ellul, a philosopher of technology, insisted that propaganda was particularly effective in modern industrialized societies such as America. Ellul argued that the repetition of ideas—valid or not—in different forms of media created an atmosphere un-conducive to independent rational analysis.<sup>230</sup> The ubiquitous nature of media, especially during the period of the Second World War, coupled with the highly emotive response to events during this period, created the perfect scenario for the adherence to ideas presented through motion pictures. The relative newness of motion pictures and the ability to show fantastic images while presenting

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<sup>229</sup> Jacques Ellul, *The Technological Society*, (New York: Vintage Books, 1964) 377.

<sup>230</sup> Clayton R. Koppes and Gregory D. Black, *Hollywood Goes to War: How Politics, Profits, and Propaganda Shaped World War II Movies*. (New York: The Free Press, 1987) 50.

ideas via dialogue or narrative made motion pictures exceptionally suited for the delivery of explicit points of view.

This chapter will explore the NBS as it appeared in motion pictures during the war. Three genres of film will be investigated to determine both what effects motion pictures had on the NBS myth and how film writers and/or producers perceived the bombsight. The three genres investigated here are the military training film, government sponsored propaganda films, and the full length Hollywood feature film.<sup>231</sup> It is important to understand the distinction between what I have categorized as a military training film, and a government sponsored propaganda film. The military training film in this study refers to films produced to facilitate in the training of highly skilled military personnel, specifically bombardiers. Whereas government sponsored propaganda films, were produced to “educate” the civilian population at the behest of the U.S. state. High security classification ensured that the NBS remained secret during most of the conflict and this limits my ability to make a direct link to the device in some popular film; however, the use of allegory and/or references to the “secret sight” were obvious enough.

The film genres will be presented as they developed chronologically. Curiously, this chronology presents first the films that arguably had the least impact on the general public and then moves to those that had the most; the temporal chronology just happened to coincide with the degree of *plausible impact* of each genre. I use the phrase “plausible impact” to highlight the impossibility of quantifying the exact effect that these films had on the audiences and/or their perception of the NBS. James Myers indicates in his study

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<sup>231</sup> The films designated in this paper as “propaganda” films are the same films called training films by film historians such as Clayton Coppes, Gregory Black, and David Culbert. The reason for the reclassification in this paper is that an actual Norden Bombsight training film will be discussed making the aforesaid historians’ classification process somewhat problematic for this work.

of the Bureau of Motion Pictures during the war that “the impact of motion pictures upon the public, except for relaxation, has been overrated.”<sup>232</sup> Myers argues that individual Americans went to the movies maybe once a week for entertainment purposes rather than news. Yet close to 2500 films were released by Hollywood in the six years between 1939 and 1945,<sup>233</sup> and seventy-two films were classified as “war features” in the eight-month period between December 1941 and July 1942 alone.<sup>234</sup> Furthermore, some eighty million Americans went to the movies at least once each week, almost two-thirds of the entire population.<sup>235</sup> These statistics clearly indicate that, despite Myers’ cautions, major audiences were being subjected to a large amount of war-related information—factual or otherwise—regardless of their quest for relaxation, thus making film an important venue for the Norden myth.

This chapter will primarily be an examination of language and imagery. Specifically, the exploitive use of paradigmatic language and fantastic imagery by filmmakers to get their respective points across to the audience. Although a relatively recent development at the time, film was recognized by leaders on both sides of the Second World War as a powerful propaganda tool. A chilling example of this usage is seen when we compare the language of Joseph Goebbels, the Nazi chief of propaganda, to that of Elmer Davis, the head of the Office of Wartime Information (OWI) in the United States:

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<sup>232</sup> James M. Myers, The Bureau of Motion Pictures and Its Influence on Film Content During World War II: The Reasons for Its Failure. (New York: The Edwin Mellen Press, LTD., 1998) 193.

<sup>233</sup> Koppes, Hollywood Goes to War, vii.

<sup>234</sup> Koppes, Hollywood Goes to War, 60.

<sup>235</sup> Koppes, Hollywood Goes to War, 1.

To be perceived, propaganda must evoke the interest of an audience and must be transmitted through an attention-getting communications medium.<sup>236</sup>

The easiest way to inject a propaganda idea into most people's minds is to let it go in through the medium of an entertainment picture when they do not realize that they are being propagandized.<sup>237</sup>

It is difficult to determine which of these statements belongs to the totalitarian politician or the democrat; but either way, it is clear that both leaders understood the significance of propaganda and film as its medium. The impact of film upon the Norden myth was a bi-product of the Government's attempt to ensure the war remained popular; that is, promulgating the Norden myth was not the government's intent, yet films arguably contributed to the myth's longevity.

To determine what factor or factors helped to create the mythology surrounding the NBS, it is important to understand how those individuals responsible for the promulgation of this myth through film understood the dissemination of information and ideas. The fast rise of fascism after the First World War left Western leaders wondering how it was possible to establish such powerful popular regimes. It was quickly recognized that a campaign of political propaganda that affected the daily lives of every individual in the nation helped produce the coercive effect that both the Italian and German fascists had upon their respective peoples. Theorists in the 1930's began to deconstruct the methods utilized by the Fascists by attempting to isolate the features of propaganda that made it so effective. The exploitation of mass media was clearly the quickest and easiest way to reach the general public scattered across large areas of any

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<sup>236</sup> Leonard W. Doob. 'Goebbels' Principles of Propaganda.' In: Robert Jackall. Ed., Propaganda: Main Trends of the Modern World. (London: MacMillan Press LTD., 1995). 198.

<sup>237</sup> Clayton R. Koppes and Gregory D. Black. 'What to Show the World: The Office of War Information and Hollywood, 1942-1945.' *The Journal of American History*, Vol. 64, No. 1, (Jun., 1977), pp. 87-105. 89. <http://www.jstor.org/stable/1888275>.

country. It is not surprising that propaganda was used so unabashedly after the First World War when one considers how much communication technology began to expand dramatically beyond print... to telephone, wire service, radio, and film.<sup>238</sup> It was now possible to expose the public not only to abstract or intellectual ideas, but also to the sounds, moving images, and symbols of whatever the subject happened to be.

The first genre of film to be investigated is the military training film. Training films were films used to facilitate the process of training servicemen, generally those men who had to learn complex or highly technical jobs. Produced by the various branches of the military, the training film became a very useful means of indoctrinating in the least amount of time the vast numbers of men called up for service. The same characteristics that made film so useful to the propagandist were equally, if not more, useful to the military trainer.

In 1942, The AAF Training Film Production Laboratory, at Wright Field in Dayton Ohio produced five films that constituted the *Norden Bombsight* training-film program. The complicated operation of the NBS was introduced to prospective bombardiers through five successive films, each to be watched during the various stages of bombardier training. Each film—*Principles*, *Operation*, *Preflight Inspection*, *Conduct of a Mission*, and *The Levelling System*—simplifies through detailed explanation and example, the complexities of the NBS and the new high-tech means of waging war. These films played an especially important role in the training of bombardiers as the

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<sup>238</sup> The premise of this paragraph was taken from Robert Jackall, 'Introduction,' in Propaganda: Main Trends of the Modern World. (London: MacMillan Press LTD., 1995) 4.

trainees were forbidden to take notes during class for fear they might fall into enemy hands.<sup>239</sup>

The movies follow the training of a young army lieutenant who yearns to become a bombardier. The officer, Lt. Williams, begins as a raw recruit who understands that his task is to destroy enemy targets using the highly sophisticated Norden Bombsight, but Williams has no concept of how to do so. In the first film of the series, *Principles*, the bombardier is taught bombsight terminology and the basics of aerial bombardment theory. The film begins with the narrator asking the audience where their bombs will fall. As the narrator begins the screen changes to aerial photos seen through what appears to be a bombsight telescope, complete with a reticle.

Where will they fall those bombs of yours? On the Runway of this Japanese held Airfield? Or one hundred feet off? Five hundred feet? That will depend on how well you have taught your fingers and your eyes to match the precision that has been built into your Norden Bombsight.<sup>240</sup>

This caption is an example of the type of associative language used that helped to spread the myth of the NBS. In this case it is up to the bombardier to meet the standards that are inherent within the NBS. The bombsight will *always* hit the target *if* the bombardier is good enough. Both the enemy and the ultimate goal of precision targeting are identified; the only variable left in the bombing equation is the skill level of the bombardier.

Throughout the *Norden Bombsight* series, the bombardier is portrayed as possessing two distinct characteristics. First, he is seen as an imperfect man, prone to error, errors which can only be avoided through training and memorization. His success or failure is dependant only upon his aptitude and execution. For, as the narrator points

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<sup>239</sup> Ross, Stewart Hasley. Strategic Bombing by the United States in Word War II: The Myths and the Facts. Jefferson: McFarland & Company, Inc., Publishers, 2003, 130.

<sup>240</sup> The Army Air Forces, 'Principles,' *The Norden Bombsight*, AAF training Film Production Laboratory, Wright Field, 1942.

out, “There is no use wishing [the bombardier] luck because there isn’t any luck in this business. You either learn it or you don’t, and you are either right or you are wrong.”<sup>241</sup>

In this version, the bombardier carries the weight of the entire mission because the perfection of the NBS remains infallible while the bombardier is the dynamic—and questionable—variable.

The second characteristic of the bombardier is the opposite of the first, yet it ultimately places the bombardier at the same disadvantage as the first. Whereas the first version portrays the bombardier as being the limiting factor in the bombing equation due to his innate humanness, the second character is seen as somewhat mystical, or imbued with powers beyond that of the average soldier or man. According to the narrator, a good bombardier has “a sixth sense,” which enables him to “move through space at 200 miles per hour 20,000 feet up, and know second per second exactly where [he is] in relation to the target on the ground.”<sup>242</sup> While the second character is portrayed as possessing almost superhuman qualities, he is still presented as potentially the weak link in the bombing equation. In this instance if he misses his target it is his sixth sense that has faltered, not the NBS. In both cases the bombardier must live up to the perfection of the NBS in order to succeed in their all-important mission.

Throughout the film series certain elements of the myth are reinforced, such as the extreme importance of secrecy and the NBS’s ability to hit precision targets. More than likely this emphasis was an attempt to instill proper habits with the young recruits as opposed to spreading the Norden myth. However, if the bombardiers themselves began to

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<sup>241</sup> The Army Air Forces, ‘Conduct of a Mission,’ *The Norden Bombsight*, AAF training Film Production Laboratory, Wright Field, 1942.

<sup>242</sup> The Army Air Forces, ‘Principles,’ *The Norden Bombsight*, AAF training Film Production Laboratory, Wright Field, 1942.

believe in the impeccable qualities of the NBS then this would no doubt help form the opinions of other members of each crew. Archival evidence indicates that there was a perceived link between the performance of the bombardiers and their NBS's, and the morale of the entire AAF; that is, if the aircrews thought they were precise then their morale remained high.<sup>243</sup>

The most obvious mythic element in the *Norden Bombsight* series was the utmost regard for safeguarding the device. The trainee, trainer, or armed guards are constantly seen covering the Norden with a canvas bag. Whether the device is mounted on a stand in the classroom, on a wheeled trainer, or in the actual nose of a training aircraft, someone is putting on, or taking off, a cover. The historian Stewart Halsey Ross remarks quite sceptically that, "the bombardiers... during their twelve weeks of training were treated to [an] orchestrated hokum of the unique capabilities of the bombsight and therefore the need for unwavering security."<sup>244</sup> The "hokum" that Ross refers to included the fact that the trainees were not allowed to take notes, and, that they were forced to memorize the bombardier's oath in which they vowed to trade their lives for the protection of the device. The "top secret" classification of the device was most certainly one of the defining characteristics of the NBS mystique, and the training films certainly reinforced this aspect of the NBS myth.

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<sup>243</sup> A comment by Colonel J.F. Phillips to Major General O.P. Echols reveals how he feared that failures of the NBS may affect the moral of Air Force personnel. "The Air Service Command is preparing technical orders to their depots covering the new test procedure. When these technical orders are distributed and the service, as a whole, realizes the sights they are now using are not sufficiently accurate to hit the 'pickle barrel,' the question immediately arises as to what will happen and what affect this will have on morale." Colonel J.F. Phillips Air Corps Chief, Materiel Division to Major General O.P. Echols, 25 August 1944, Box 27 E-22, Research & Development RG-18, National Archives.

<sup>244</sup> Ross, *Strategic Bombing by the United States*, 130.

One part of the film series that blatantly attempted to make the trainee accept the repetition built into the training regime was the change in Lt. Williams' demeanour and his physical appearance. In the first film, *Principles*, he is portrayed as a curious yet naïve man lacking confidence. The trainers all seem to show an ambivalent disregard for the “green” recruit. This ambivalence turns to actual distrust when Williams misses a crucial step in his pre-flight inspection and forces the training bomber to return to base without releasing a single bomb. As each film progresses and Williams spends more time working with the NBS, a black ring—first faint but slowly getting darker—appears around his right eye. The “bombardier’s eye,” as it became known, was recognized as the difference between a novice bombardier and an experienced veteran.<sup>245</sup> Not until Williams successfully completes his minimum bombing runs is he shown with a ring around his eye as dark as that of the trainer. This mark of a true bombardier is portrayed as the true testament to the hard work and dedication it takes to become a successful operator of the NBS. This same black ring around the eye of the bombardier was featured on the cover of the May 1942 issue of *LIFE* magazine, indicating that this *symbol* was recognized not only by the Air Corps and its personnel, but also by the American public.<sup>246</sup>

The *plausible impact* of the training films upon the Norden myth must be assessed with some caution. While the bombardiers were indoctrinated to believe in the ostensibly superior qualities of the NBS, their numbers, that is, the number of bombardiers who completed the training program and survived the war, remained small as compared to the

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<sup>245</sup> According to Stephen MacFarland this condition was a problem exacerbated by clear air and the cooler temperatures of high altitude bombing. Not until late in the war did B.F. Goodrich manufacture a soft “free resisting” neoprene eyepiece. See: MacFarland, *America’s Pursuit of Precision Bombing*, 129.

<sup>246</sup> *LIFE magazine*, May 18 1942, Volume 12, Number 20.

greater American public. The example of Ralph Golubuck's bombardier, who with enthusiasm threw his NBS out of his crippled plane, suggests that once bombardiers' lives were threatened in combat, and multiple missions were needed to destroy single targets, the mystic qualities of the device may have worn off. Arguably, the audiences who actually watched these training films were of a select group who would have had the capacity to determine, through experience, whether or not the NBS lived up to its mythical qualities. However, juxtaposed to Golubuck's story is the example of the two bombardiers who attempted to hit the white X for PBS.<sup>247</sup> They did so all the while displaying a certain nostalgic belief in the NBS' purported effectiveness. An article that appeared in the 12 August 1944 *New Yorker* reveals the effect that bombardier training had upon these young men. A bombardier was quoted, saying, "The more I found out about the bombsight, the more ingenious and inhuman it seemed. It was something bigger, I kept thinking, than any one man was intended to comprehend. I ended up with a conviction... that a bombardier can't help feeling inferior to his bombsight."<sup>248</sup> Although impossible to gauge, the impact of the indoctrination not only of the bombardiers, but also of other crewmembers who risked their lives day after day in bombing missions, most certainly played a role in how these men viewed the NBS and their own role in the war. Thus, the training films, through the indoctrination of the bombardiers, played a role in the myth of the NBS.

The most prodigious—and controversial—role of motion pictures during the war was its use as a means of "educating" not the soldiers, but the public. The use of film to

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<sup>247</sup> Golubuck's story and the PBS attempt are both referred to directly in the introduction of this work.

<sup>248</sup> Brendan Gill, 'Profiles: Young Men Behind Plexiglass,' *New Yorker*, 12 August, 1944, 26-37, cited in: Stephen Budiansky, *Air Power: The Men, Machines, and Ideas That Revolucionized War, From Kitty Hawk to Gulf War II*. (New York: Penguin Group, 2004) 174.

“educate” the public was at the start of the war so anathema to Hollywood producers that they refused to make any “information” films longer than three minutes.<sup>249</sup> Yet film historian David Culbert reminds us that Second World War propaganda films answered a *strong* “need to give citizens an emotional feeling of patriotic community in total war.”<sup>250</sup> Culbert goes on to argue that: “Each nation in World War II had the major problem of spelling out war aims so as to instil sufficient civilian zeal for sacrifice.”<sup>251</sup> World events quickly made Hollywood producers and the U.S. government realize the necessity of “educational” films. Although pre-war propaganda films were generally short and lacked the sophisticated special effects of Hollywood production features, after Pearl Harbour propaganda films quickly became an instituted means of indoctrinating American society.

Once America officially joined the conflict, hundreds of anti-fascist films were produced. The first three years of America’s involvement witnessed a large influx of Hollywood writers, editors, and producers into the field of propaganda movie production.<sup>252</sup> These film-makers absorbed lessons from Leni Riefenstahl’s *Triumph of the Will* and quickly developed a style of film that followed some basic principles of propaganda including the idea that “the simpler, more direct, and more readily comprehensible an argument is, the more likely people are to believe it.”<sup>253</sup> President Roosevelt recognized the relationship between film and the dissemination of information, and he used Hollywood’s already positive record in discrediting fascism to the favour of

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<sup>249</sup> Myers, *The Bureau of Motion Pictures*, 52.

<sup>250</sup> David Culbert, “‘Why We Fight’: Social Engineering for a Democratic Society at War.’ In K.R.M. Short, Ed., *Film & Radio Propaganda in World War II*. (Kent: Croom Helm Ltd., 1983) 187.

<sup>251</sup> Culbert, “Why We Fight,” 188.

<sup>252</sup> Meyerson. ‘Theater of War,’ 226.

<sup>253</sup> Meyerson. ‘Theater of War,’ 242.

his administration. This meant that the role of the Air Force and its Strategic Bombing Campaign became a major focal point of many propaganda films, to the benefit of the Norden myth.

While the most well-known propaganda-filmmaker of this period remains Frank Capra with his film series *Why We Fight*, his 834<sup>th</sup> signal corps detachment was only one of three army film teams in service. Another unit, and certainly a more-well known group during the war, was the 'Office of Strategic Services Field Photographic Branch' under the leadership of the famous western filmmaker John Ford.<sup>254</sup> However, it was the third group that contributed the most to the NBS mystique through film. The Combat Photographers of the US Signal Corps attempted to capture the *human* side of the war by producing thought provoking documentaries that brought the daily life of the men in the field to audiences back home.<sup>255</sup> Although John Houston remains the most well known of the Signal Corps producers, William Wyler's film, the *Memphis Belle* (1944), was clearly a masterful work of wartime propaganda. Wyler spent weeks with the crew of the famous B-17, *Memphis Belle*. The film explains the inner workings of the strategic bombing campaign against Germany and ends with the successful 25<sup>th</sup> flight of the *Belle* on 20 May 1943. The language used in the film invokes a strong emotional response to the experience of these men while at the same time promoting the strategic air campaign through glorifying aerial warfare. The film begins with scenes of a B-17 sitting on a runway in the idyllic countryside of England. A narrator begins to speak in a deep

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<sup>254</sup> Meyerson. 'Theater of War,' 227.

<sup>255</sup> Meyerson. 'Theater of War,' 246-247.

foreboding tone. “This is a battlefield. A battlefield like no other in the long history of mankind’s war. This is an Air front.”<sup>256</sup>

The Air War is portrayed in *Memphis Belle* as something altogether unique to the war; in reality of course it was, especially on the vast scale undertaken by the allied armies. The American B-17’s are seen being loaded with bombs to be “taken from England to be dropped on specific targets in Wilhelmshaven Germany.”<sup>257</sup> The objective of the American bomber “is to seek out the enemy, not his infantry, or his artillery, not his Panzer divisions, but the greater menace, the industrial heart of his nation. The foundation on which the Nazi Empire and its armies stand. The power behind the German lust for conquest.”<sup>258</sup> This language is indicative of that utilized by the Air Corps to promote not only the strategic bombing campaign but also their independence. During the film the bombardier remains a central figure, always hunched over his Norden. The narrator actually calls the bombardier to his sight, because after all, the plane was built “around the sight.” Only with this sight can the US Air Force hit “pin points on the map of Europe, which mean Rubber, Guns, Ball Bearings, Shells, Engines, Planes, tanks, targets... Targets to be destroyed.”<sup>259</sup> It was impossible for the military to quantify the actual damage inflicted upon the German war machine and no doubt some members of the public demanded numbers. To the doubters there was a simple answer. “Who can tell the number of German torpedoes that will not be fired, the number of our own convoys that will get through now, the soldiers’ and seamen’s lives that will be saved, or the

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<sup>256</sup> William Wyler, Prod., *Memphis Belle*. 1945. Cinemocracy, Internet Archive, The Memphis Belle. <http://www.archive.org/details/memphisbelle>.

<sup>257</sup> Wyler, Prod., *Memphis Belle*.

<sup>258</sup> Wyler, Prod., *Memphis Belle*.

<sup>259</sup> Wyler, Prod., *Memphis Belle*.

battles that will be won instead of lost because of what these bombers and airmen did today.”<sup>260</sup>

In another Air Force produced film, *Combat America* (1945), Clark Gable, the famous Hollywood actor subsequently called up for duty, documents the training, deployment and combat history of the 351<sup>st</sup> bombardment Group. Gable is not only the narrator of the film, but also the interviewer. This film uses language almost identical to that of the *Memphis Belle* except that in this 1945 film the added weight of Gable’s prestige is used to influence the audience. Like Wyler’s film, *Combat America* attempts to capture the everyday lives of the men of the 351<sup>st</sup>, and in many ways this film is more successful than *Memphis Belle*. Whereas Wyler’s film followed a small group of men at the end of their tour, *Combat America* reveals the entire wartime experience of American airmen from training back home in the United States to missions deep over Germany late in the war.

While not the focus of *Combat America*, the NBS is referred to both directly and indirectly. Early in the film a young bombardier is introduced as being able to “bat 1,000 with the Norden Bombsight.”<sup>261</sup> Later while showcasing a failed mission due to inclement weather, Gable reminds the audience that American strategy disallows wanton destruction because: “that’s an order while over France. No indiscriminate bombing, just German installations.” Certainly when showing the final mission of the film, a great deal of time is spent with the bombardier as he prepares to bring his ship into its bombing run all the while he is hunched over his Norden sight, yet the Norden remains unseen. As the

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<sup>260</sup> Wyler, Prod., *Memphis Belle*.

<sup>261</sup> *Combat America*, U.S. Army Air Forces. Cinemocracy, Internet Archive, *Combat America*. <http://www.archive.org/details/CombatAm1945>.

bombardier diligently works levers, Gable's voice-over cheers them on: "Yes, make it count, bombardiers. They build these ships around you. Bombs Away!"<sup>262</sup> Bombs are then shown dropping from the B-17's and are followed to their destinations on the ground. Ironically, as the bombs are clearly seen exploding in open farmland Gable's voice breaks in again saying: "Nice pattern bombardier... You can't hear what's going on down there, five miles below, but marshalling yards and chemical tanks, ships and warehouses, spare engines and bearing factories are disintegrating in molten chaos."<sup>263</sup>

While neither *Memphis Belle* nor *Combat America* were dedicated solely to the NBS, they both served to inform the American public about the air war in Europe. In doing so, both films explicitly point to the importance of the NBS and its role in the destruction of the German ability to wage war. The bombardier and his bombsight are portrayed as the most important elements in America's mission to both preserve democracy and shorten the war. These films were used to "educate" the American public and also to maintain public zeal for war; thus, they play an important role in the creation of public perceptions of the war and of America's part in the conflict, as well as in the creation of the Norden myth.

Not all patriotic films were produced by the military or government during the war, and in many ways the films produced by Hollywood for general audiences were more powerful. According to Jessica Meyerson, Hollywood's fundamental goal was to sell tickets and make money, feature films used a language quite similar to that employed in propaganda films. The wide audience that wartime feature films were able to reach made them an extremely useful tool for the government. The result was that the feature

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<sup>262</sup> *Combat America*

<sup>263</sup> *Combat America*

film became a contributor to the war effort through government censorship and control, and ultimately helped to solidify the Norden myth.

The fact that Hollywood moviemakers were generally a pro-war and patriotic group made government interference a simple and largely un-protested undertaking. The ability of Fascist regimes to stifle freedom of expression frightened the libertarian Hollywood elite, which in turn led to a rise in anti-Nazi films.<sup>264</sup> As early as 1939, anti-Nazi feature films such as Anatole Litvak's, *Confessions of a Nazi Spy*, began to appear for mainstream audiences. However, the ideological motivation of Hollywood need not be overemphasized, since the Hollywood producers were ultimately motivated by profit. In order to maximize profits the films needed to be aimed at the broadest possible public. The equation was simple: mass audience meant mass product, which resulted in greater profit. According to film historians Clayton Koppes and Gregory Black, this belief on the part of producers resulted in "assembled audiences that were perhaps as diverse in class and status as any type of gathering."<sup>265</sup> In an effort to play to the patriotism of this highly diverse audience, Hollywood producers made movies that were highly stylized, that is, the films consisted of highly paradigmatic plots, with characters that varied only superficially from movie to movie. Thus, Hollywood's quest for mass audience had the effect of making patriotic propaganda within film especially effective due to its broad dissemination amongst most classes in American society.

Under direct order from President Roosevelt the 'Office of Wartime Information' was created on 13 June 1942 to "enhance public understanding of the war; coordinate the

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<sup>264</sup> Jessica A. Meyerson. 'Theater of War: American Propaganda Films During the Second World War.' In Robert Jackall. Ed., *Propaganda: Main Trends of the Modern World*. (London: MacMillan Press LTD., 1995). 225-226.

<sup>265</sup> Koppes, *Hollywood Goes to War*, 3-4.

war-information activities of all federal agencies; and to act as the intermediary between federal agencies and the radio and motion picture industries.”<sup>266</sup> The OWI was actually an amalgamation of several “information” agencies including the Bureau of Motion Pictures.<sup>267</sup> Under the direction of the OWI, writers and producers were not only to illuminate the issues of the war but also to garner support for certain ideas, concepts and/or symbols. Thus, the OWI was a formal means of the US government to achieve a non-formal or indirect influence upon film, and a method to ensure the government’s message was heard by the people.

Elmer Davis, the director of the OWI insisted that, “The motion picture could be the most powerful instrument of propaganda in the world, whether it tries to be or not.”<sup>268</sup> Almost 500 movies released annually during the war and some eighty million paid admissions per week make the truth of Davis’ statement clear.<sup>269</sup> Davis instituted the OWI’s mandate through the creation of a *Manual for the Motion-Picture Industry*. This manual was a step-by-step guide designed to advise Hollywood how it could serve the American war effort by drawing a line between good and evil, democracy and fascism, and right and wrong.<sup>270</sup> Intellectual reasoning was pushed aside to create a paradigm laying down these highly defined boundaries that had to be met by the production companies if a Hollywood film was to make it to the big screen.

Perhaps even more of an influence upon film—films about war anyway—was the armed forces themselves. During the 1930’s and 1940’s any war film produced by

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<sup>266</sup> Koppes, ‘What to Show the World,’ 88.

<sup>267</sup> Myers, *The Bureau of Motion Pictures*, 192-195.

<sup>268</sup> Quoted in: Koppes ‘What to Show the World,’ 88.

<sup>269</sup> Koppes ‘What to Show the World,’ 89.

<sup>270</sup> Koppes ‘What to Show the World,’ 91.

Hollywood were essentially made at the direction of the military. Access to military equipment—from uniforms to battleships—was only possible with the permission of the armed forces. The good will of the military actually determined if a war film was to be produced at all; this ensured that Hollywood remained at least somewhat pro-military if at least uncritical.<sup>271</sup> One such film was Warner Brothers' 1942 feature, *Air Force*, which was made successful through the cooperation of the Air Forces commander, General Hap Arnold.<sup>272</sup> *Air Force* followed the story of a B-17 that arrived at Pearl Harbour just after the Japanese attack began, and followed the crew until its encounters with the Japanese army in the Philippines. The influence of the OWI and the military itself played a large role in the quality of Hollywood produced films that dealt with any war related material. This meant the military and things associated with the military (such as the NBS) would be portrayed in a positive manner in film. This kind of clout together with the persuasive language used, ensured that a sanitized version of both the war and the strategic bomber offensive were presented to the public. Thus the stage was set, as it were, for Hollywood to help promulgate the Norden myth.

Although there were numerous films dedicated to the Army Air Force, RKO Radio Pictures' 1943 feature, *Bombardier*, starring Pat O'Brian and Randolph Scott directly related to the NBS. Fitting the OWI paradigm perfectly, *Bombardier* is the history of the NBS in classic Hollywood glaze-over-the-truth fashion. The long-running debate over high altitude bombing versus dive-bombing is settled in the film by a bet between two Air Force officers. The two men agree to test their respective doctrines in a

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<sup>271</sup> Koppes, Hollywood Goes to War, 114.

<sup>272</sup> Koppes, Hollywood Goes to War, 78.

highly publicized contest.<sup>273</sup> The dive-bomber is the first to attempt to hit the target, which he misses by several hundred feet. As the spectators grow impatient waiting for the high altitude test to begin the target suddenly explodes without any of the on-looking group even seeing the attacker. The debate is thus settled in favour of high-level bombardment, and the high-altitude bombing advocate is placed in charge of the US's new bombardier school.

Every feature of the NBS legend is alluded to in this movie except the name: the Norden is called the "U.S. sight." Its nickname of *Blue Ox* is replaced with *Golden Goose*. Armed men are seen as at all times guarding the bombsight, which is stored in concrete bunkers. The *Golden Goose* makes only one appearance in the movie when in the closing scene a bombardier dies at his post after shooting the sight several times with his side arm. This was foreshadowed early on in the film when all the bombardiers swear an oath not unlike the actual bombardier's oath to protect their country's most valuable top-secret weapon.

Interestingly, even with the Air Force's participation in this production, the film is full of inaccuracies. The initial target of the squadron is an industrial city in Japan. The attack is made at night by a flight of B-18's, the Air Corps' already obsolete medium bomber. The American Air Force credo of only attacking targets during daylight has been completely ignored just as has the fact that the actual bomber used for high altitude bombing was the B-17. In the film the Japanese targets were to be lit up by an earlier path-finding attack that would result in fires giving the bombardiers something to see in

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<sup>273</sup> *Bombardier*, released 14 May 1943, RKO Radio Pictures Inc., United States.

their bombsights, yet inexplicably the initial attacker would be able to see the ground, and would also have the ability to discern industrial targets.

Throughout the film the prospective bombardiers are expected to live up to a certain moral, intellectual, and physical standard. Bravery and steadfastness are seen to be the most admirable traits of the bombardier. Even those men who do not successfully complete the training are portrayed as noble warriors for even trying, but ultimately they were just not good enough to make it with the best, and only the best could be a bombardier.

The morality of Allied strategic bombing is addressed in the film when a young bombardier's less than spectacular test scores are evaluated. The young man is brought before his instructor and the base commandant together where he is questioned regarding his worsening results. He acknowledges his poor results but indicates that when he looks through the sight he cannot help but picture the innocent women and children who would be killed. According to the young bombardier his mother had been sending him letters telling him that he was going to be killing babies and that he should be ashamed. In response, one of the officers launches into the following diatribe reassuring the boy that his mission will not endanger innocents:

The enemy's targets are everywhere, but yours are clear and confined—not women and children, but their arsenals for spreading death. That's why American bombardiers are trained to hit their target. There is a little prayer for that Paul (the prospective bombardier). God give me not the spirit of fear but of power and love for the oppressed, a sound mind and a clear eye. God make me a good bombardier that I may destroy the poison in his cup and quench the violence of fire and overcome the false Gods who make war upon the land. For he is the lord of lords and king of kings and those who are with him are called and chosen... and faithful.<sup>274</sup>

The young bombardier goes on to be one of the best in his class and later recalls the prayer to steady his hand while in combat.

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<sup>274</sup> RKO pictures, *Bombardier*

The language utilized in the movie is formulaic and constructs for the audience the ideal image of the perfect bombardier, young, fit, brave, honourable, and stoic. All these characteristics make up the man whose mission, whose chosen role, the role that only he is able to undertake... is the operation of the United States Bombsight... *The Golden Goose*. The Norden Bombsight... *the Blue Ox*. The forces of good back the bombardier, including none other than God himself. The willingness of the enemy to attack innocents is juxtaposed with the American goal to minimize civilian death. The film's characters draw on well-established stereotypes such as the cunning and ruthless Japanese officers, the stern yet affable American commanders, and most of all the young innocent American boys from diverse ethnic backgrounds who are ready to die for the cause of freedom. The movie ends with these final words for the audience: "To put out fires with fire, that is the crusade of the bombardiers who are already building a great American tradition, and there are others on the way..."<sup>275</sup>

While the NBS remains unnamed in *The Bombardier*, there was no mistaking the obvious reference to the famous device. If the audience viewed this film with no previous knowledge of either the Air Corps' strategic doctrine or the NBS, they would have walked away from the theatre with a basic understanding of both. Although the film's characters were stereotypes that filled flat roles, and while there were some obvious technical mistakes, the film reinforced the images that the Air Force had created of both the bombardier and the NBS. The fact that the film was actually nominated for an academy award for its special effects probably added to the public perception that the

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<sup>275</sup> RKO pictures, *Bombardier*

movie closely related the truth.<sup>276</sup> Indeed, the advertising posters designed for the film actually declared that, if you saw this film, you would actually “see the bombing of Tokyo before your very eyes.”<sup>277</sup>

When *The Bombardier* was released early in 1943 the Allies had only just turned the tide of the war and the maintenance of security was still a major issue to the Air Force, hence the use of veiled referencing. By November 1944, however, Hollywood feature films such as *Thirty Seconds Over Tokyo* included explicit conversations involving the NBS. *Thirty Seconds Over Tokyo* was a re-enactment of the highly publicized Doolittle raid of April 1942 in which sixteen B-25 bombers had bombed five Japanese cities. During the initial publicity surrounding the raid, the media, and newspapers in particular, stressed that the NBS’s had been removed from the planes and replaced with a “20-cent sight.”<sup>278</sup> According to the *New York Times* the low-altitude of the attacks meant that the “extreme accuracy of the Norden Bombsight” was not required; besides, the chances of a bombsight falling into enemy hands “seemed inevitable.”<sup>279</sup> However in the 1944 film, the NBS’s removal from the aircraft became solely a means of evaluating the distinctive nature of the attack. Doolittle, played by Spencer Tracy, informs the airmen that their mission is so secret that their planes will be stripped of their NBS’s. The men are left wondering what their mission is, some arguing that it will be in non-combat zones due to the absence of the sight, while others presume correctly that

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<sup>276</sup> ‘Bombardier Movie Poster,’ Archives Center, Smithsonian National Museum of American History, <http://americanhistory.si.edu/militaryhistory/collection/object.asp?ID=444>

<sup>277</sup> ‘Bombardier Movie Poster,’ Archives Center.

<sup>278</sup> See: C. Brooks Peters, ‘Japan Bombed With 20-Cent Sight; Arnold Gives D.F.C. to 23 Raiders,’ By Special to The New York Times. *New York Times (1857-Current file)*; Jun 28, 1942; ProQuest Historical Newspapers, *The New York Times*, (1851 - 2005), pg. 1.

<sup>279</sup> Peters, ‘Japan Bombed With 20-Cent Sight.’

they will be attacking Japan itself. For the audiences of 1944 this candid discussion about the NBS would not have been a surprise because the NBS had just had an official public unveiling a month earlier. However, the references made to the device in the film reveal the entrenched perceptions of the NBS held by both Hollywood and their military advisors.

The Doolittle mission was extraordinary *due* to the absence of the NBS; by implication the NBS is thus recognized as the key element to standard missions undertaken by the AAF. *Thirty Seconds Over Tokyo* reinforces the perceptions of high altitude precision bombing by emphasizing the one-time-only nature of the raid undertaken by Doolittle and his men. The attention to detail regarding the “20-cent sight,” and its use by the bombardiers in the film certainly reflects the amount of attention paid to the issue shortly after the actual raid. Hence, even the absence of the device earned the NBS significant publicity.

In conclusion, almost as soon as motion pictures became a public form of entertainment, the efficacy of film to facilitate the dissemination of information was exploited. The use of propaganda by European fascists prompted an anti-fascist movement within the largely European émigré of Hollywood. Thus, both the Government and Hollywood used the same medium that promulgated fascist ideals in Europe against those same ideals in the United States. The NBS—and its central role in the doctrine of daylight precision bombing—became the focus of many films, both Hollywood feature films and public information films. These productions used language indicative of the type that the Air Corps and civilian media organizations used to create a particular image

of the NBS. The medium of motion pictures, however, was so effective in propagating information that military personnel, in this case bombardiers, were trained by film. Thus, through the medium of film, the myth of the NBS was introduced to a broad cross-section of American society. And while the plausible impact of film—in its various genres—remains at this stage unquantifiable, there can be no doubt that the promulgation of the NBS myth was facilitated by the mechanism's appearance in film.

## Conclusion

### Post War Reality and the Norden's Legacy

*Why can't we all pray for something good, like a tighter bomb pattern, for example?  
Couldn't we pray for a tighter bomb pattern?*

—Colonel Cathcart to the chaplain, *Catch-22*<sup>280</sup>

Events near the end of the Second World War, specifically the dropping of atomic bombs on Hiroshima and Nagasaki, have overshadowed the American use of the Norden Bombsight (NBS). As it turned out, the NBS was not actually America's most tightly guarded secret after all. More importantly, the highly touted virtues of precision bombing by American forces for humanitarian reasons were vaporized along with thousands of Japanese civilians. The kind of precision bombing that had initially been the hallmark of the fledgling American Army Air Corps had been swept away by another far less humanitarian technology, even if, as argued by many historians, the lives lost in both atomic blasts were fewer than would have been lost in an invasion of Japan. The purpose of this work has been to investigate how a technological artifact such as the NBS achieved and maintained legendary status in lieu of its unsatisfactory record.

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<sup>280</sup> Joseph Heller, *Catch-22*, (New York: Simon and Shuster paperbacks, 1994), 192.

The atomic bombs and the Manhattan Project have become synonymous with wartime secrecy and technological supremacy, yet, as this work has demonstrated, these descriptors had been used to portray the NBS during the war. While the atomic bombs and subsequent Atomic Age robbed the NBS of its earlier fame, a far more damning event forever placed the NBS in the category of failed technology in the minds of military strategists. As the Allies began to liberate Europe and gain access to targeted areas, the United States Secretary of War initiated a survey to assess the successfulness of the strategic bombing campaign.<sup>281</sup> The United States Strategic Bombing Survey (USSBS) revealed that some of the fundamental principles of the pre-war American doctrine of daylight precision bombing had been among the main factors that actually decreased accuracy. The final USSBS report indicated: “Increase in altitude, increase in the size of the attacking force, and increase in the size of a [defensive] box decreased bomb accuracy.”<sup>282</sup> The idea that large defensive formations of heavily fortified bombers could enter enemy airspace—above the range of ground fire—and target specific buildings without sustaining great losses in men and machines was ultimately unrealistic. Yet this is exactly what daylight precision bombing pundits had proposed before the war. More importantly, however, was that the supposed dogmatic adherence to the idea of precision targeting was sold to the American public right up until the destruction of Hiroshima, regardless of actual events and modified tactics.

Interestingly, the USSBS also concluded that, once air superiority had been established in Europe during the early months of 1944, the result was an overall increase

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<sup>281</sup> The survey was established under the directive of the Secretary of War on 3 November 1944 as ordered by President Roosevelt. The United States Strategic Bombing Survey, ‘Bombing Accuracy, USAAF Heavy and Medium Bombers in the ETO,’ 2<sup>nd</sup> Ed., *Military Analysis Division*, 1 January 1947. 1.

<sup>282</sup> The United States Strategic Bombing Survey, ‘Bombing Accuracy, USAAF Heavy and Medium Bombers in the ETO,’ 2<sup>nd</sup> Ed., *Military Analysis Division*, 1 January 1947. 1.

in visual bombing accuracy.<sup>283</sup> This despite the fact that by early 1943 dismal targeting results and considerable losses had forced the AAF to shift its original precision tactics, with each plane equipped with an NBS, to pursuing area bombardment using only a lead plane equipped with a bombsight, with the lead plane signalling the rest of the group when to drop its payload. Essentially most of the bombardiers in the latter situation became toggle men as opposed to the fabled sharp-shooting NBS professional.<sup>284</sup> Furthermore, even though the USSBS indicated there was an overall increase in accuracy during the early months of 1944, even one of the dogmatic adherents of precision bombing, General Carl Spaatz, was forced to admit the ineffectiveness of the American effort. Spaatz, who was now the over-all commander of the Army Strategic Air Forces, stated in late 1944, “we are becoming increasingly aware of our inability to achieve accurate bombing on some of our top priority targets.”<sup>285</sup> In the Pacific theatre, low altitude night time attacks using incendiary weapons were initiated by Curtis LeMay on 9 March 1945, resulting in the destruction of several Japanese cities and the deaths of hundreds of thousands of Japanese civilians.<sup>286</sup> That 96 percent of all the bombs dropped on Japan during the war occurred after 9 March 1945—and after LeMay decided to

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<sup>283</sup> The survey actually indicates that visual bombing improved from January 1943 until the end of the war but it was not until the Allies won air superiority that a significant surge in the amount of tonnage dropped in Europe increased. See: Factors in Accuracy Analysis in: USSBS, ‘Bombing Accuracy, USAAF Heavy and Medium Bombers in the ETO,’ 4. And also: Phillip S. Meilinger, Air Power: Myths and Facts, (Air Force University Press: Maxwell Air Force Base, 2003) 33.

<sup>284</sup> The toggle bombardier were actually referred to as “toggliers,” see: Ross, Strategic Bombing by the United States, 135.

<sup>285</sup> Carl Spaatz to Lt. Gen. Barney Giles, Chief of Air Staff, 15 December 1944, Box 16, Spatz papers, Library of Congress. As cited in: Paul G. Gillespie, Weapons of Choice: The Development of Precision Guided Munitions, (Tuscaloosa: University of Alabama Press, 2006) 29.

<sup>286</sup> MaxBoot, War Made New: Weapons, Warriors, and the Making of the Modern World, (New York: Gotham Books, 2007) 268-169.

abandon daylight precision bombing—leads one to wonder how the Norden myth outlived the war at all.<sup>287</sup>

The release of the USSBS results forced proponents of air power to shift their publicity campaign away from the now famous NBS. The new publicity campaign still focused on technology, but no more did it feature the melodramatic and fantastical language used to promote the NBS during the war. An article that appeared in the 31 October 1945 *Washington Post* attempted to diminish the obvious failings of the wartime strategic campaign—and the NBS—by describing a *new* new age of high-tech air war. “The air power employed against Germany has already been largely outmoded by new developments—jet propulsion, rockets and, of course, the incalculable potency of Atomic energy.”<sup>288</sup> This article used the statistics found in the USSBS to portray the strategic campaign as a relative success but one that could be outdone in the future with newer and greater technological devices. No mention was made of the fabled NBS.

The *Post*'s article mirrored the new rhetoric that air-war advocates were now employing. An article by Carl Spaatz that appeared in the national weekly, *Collier's*, was introduced with the type of fear-mongering that would become typical of the coming Cold War: “[The] Atomic bomb and superplane have made it a suicidal fallacy to think of preparedness in terms of defence.”<sup>289</sup> This quick introduction set the tone for Spaatz's article, which stressed the notion that the increased range of modern aircraft coupled with the development of atomic weapons had placed every civilian center in the Northern hemisphere within range of each other. What is interesting about this article is how

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<sup>287</sup> For the statistics regarding the quantity of bombs dropped on Japan see: Meilinger, *Air Power*, 32.

<sup>288</sup> Strategic Bombing, *The Washington Post (1877-1954)*; Oct 31, 1945; ProQuest Historical Newspapers (1877 - 1992), pg. 6.

<sup>289</sup> Introduction to Carl A. Spaatz, ‘Air Power in the Atomic Age,’ *Collier's*, 8 December 1945, 11.

Spaatz describes the impact of atomic weapons upon AAF doctrinal thinking. Spaatz indicated: “Just as the atomic bomb rendered obsolete the bomb-carrying capacity of the mass formation of bombers, so this picture of air war with conventional airplanes is being made to seem antiquated by current experiments.”<sup>290</sup> The new modern war, according to Spaatz “must be total in every way, designed to destroy an enemy’s home base and spare him nothing.”<sup>291</sup> Always the pragmatist, Spaatz reveals how far AAF doctrinal thinking had come after just four years of war. He spends no time whatsoever discussing either the AAF mantra of daylight precision bombing or the actual physical results of the American experiment during the war. Instead, Spaatz presents the reality of modern war with what he calls the “perfect explosive.” The age of the highly sophisticated and accurate NBS had been replaced by the age of city-destroying weapons of mass destruction. Yet, despite Spaatz’s revelations regarding AAF thinking, there is evidence that the “Great air power controversy” and the argument for daylight precision bombing actually outlived the war.

An article written by Stuart B. Barber that appeared in the 17 August 1947 *Washington Post*, cynically titled, ‘Pinpoint Bombing’ was a scathing critique of an earlier article titled ‘Amazing Accuracy.’<sup>292</sup> According to Barber, the earlier article described the “amazing accuracy” achieved by B-29’s dropping single 25,000lbs bombs on a Bremen U-boat pen. The hype surrounding the drop was due to the fact that none of the bombs fell beyond 200 yards of the intended target. Barber then explains how the intended target area was given as 350 by 1350 feet, or one city block by three and-a-half,

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<sup>290</sup> Introduction to Carl A. Spaatz, ‘Air Power in the Atomic Age,’ *Collier’s*, 8 December 1945, 11.

<sup>291</sup> Spaatz, ‘Air Power in the Atomic Age,’ 12.

<sup>292</sup> Stuart B. Barber, ‘Pinpoint Bombing,’ *The Washington Post (1877-1954)*; Aug 17, 1947; ProQuest Historical Newspapers (1877 - 1992), pg. B4.

and that the 200 yard outer limit would have meant that the bombs would have all landed in an area the size of four city blocks by six and-a-half. Holding nothing back Barber then states: “That it should be amazing for all bombs to hit in an area this large will no doubt come as a shock to a public accustomed to hearing of ‘pin point precision’ bombing by the Air Force heavy bombers.”<sup>293</sup> He then reminded his audience not only that the bombardiers were specifically chosen because of their proficiency and that the single bombs were heavier than standard ordinance, and thus more accurate, but also that this test was done in near laboratory conditions. He points out that wartime conditions were far less likely to produce results as “amazing” as these. This leads Barber to ask the ultimate question:

If the results obtained in the test were amazing even under peacetime conditions—and it must be admitted they were superior in light of previous experience in bombing from altitude—what then was the normal range of accuracy in the wartime missions so often described to the public as involving “pinpoint precision?”<sup>294</sup>

Barber goes on to describe the reality of what the USSBS numbers mean in laymen’s terms. The picture that he painted was far from what the public had been told during the war. Barber, however, was not just an ordinary citizen who had the public interest in mind. He was in fact a Lieutenant Commander in the USNR who had worked in the Air Branch of the Office of Naval Intelligence during and after the war.<sup>295</sup> He was also personally responsible for producing a complete analysis of Pacific air operations for the Commander Air Force, Pacific Fleet (COMAIRPAC). Near the end of the war, he wrote a series of Ordinance and Target Selection Bulletins in order to highlight many of his

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<sup>293</sup> Barber, ‘Pinpoint Bombing,’ pg. B4.

<sup>294</sup> Barber, ‘Pinpoint Bombing,’ pg. B4.

<sup>295</sup> Jeffrey G. Barlow, ‘Background on the Monograph *Naval Aviation Combat Statistics—World War II*,’ 1. [www.history.navy.mil/download/nasc.pdf](http://www.history.navy.mil/download/nasc.pdf)

findings in the overall analysis.<sup>296</sup> Far from hiding his bias in the article however, Barber points out that Navy carrier bombers had “demonstrated a combat accuracy about 40 times as great as the planned accuracy of the B-29’s.”<sup>297</sup> He also reminds his audience that the one time during the war that Navy bombers undertook a strategic mission they successfully destroyed a Japanese aircraft plant with only 50 tons of bombs. Despite Barber’s evident pro-Navy stance he presented his case well, and he used the USSBS statistics to demonstrate not how ineffective the air campaign was, but instead how inaccurate wartime perceptions of Air Force “pinpoint precision” had been. Barber blamed the Air Force for misleading the public, but he does so in order to argue for the inclusion of the Navy in future strategic campaigns. Those seeking to revise historical perceptions of the Second World War and its consequences would later mirror Barber’s argument.

Like the 1945 article in the *Post* and Spaatz’s editorial in *Collier’s*, Barber’s piece does not even make mention of the NBS in his *Post* retort. This is most likely due to the fact that it was the Navy that actually developed the NBS, so Barber may well have preferred to leave it out of his attack on Air Force doctrine for fear of implicating the US Navy. While there is no way to be sure of the reasons behind Barber’s oversight, it is interesting that there is simply no more public discussion about the NBS and its famed characteristics. The atomic bombs and the USSBS together simply shattered whatever misconceptions the public held about the device. For their part, air war proponents such as Hap Arnold and Carl Spaatz continued to advocate for an independent Air Force but now attention had focused on the global capabilities or threats inherent in the latest

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<sup>296</sup> Barlow, ‘Background on the Monograph,’ 1.

<sup>297</sup> Barber, ‘Pinpoint Bombing,’ pg. B4.

technological developments. What the NBS and the experience of the strategic campaigns of the Second World War did was to broaden the scope of support for a strong independent national air force. Before the war was even finished Assistant Secretary of War, Robert Lovett, wrote to Spaatz demonstrating just how far up the federal chain pro-Air Force thought had moved.

The whole future security of this country depends, I believe, on a proper recognition of Air Power in our national defence setup and the acceptance of the demonstrated fact that its striking power is at least equal to that of land or sea forces and probably is greater than either since it is a prerequisite to successful offensive operations.<sup>298</sup>

What then happened to the NBS and its legendary capabilities? It is not that the NBS faded into obscurity as much as that the device simply became irrelevant. As jet propulsion pushed aircraft beyond the speed of sound, and ordinance became exponentially more destructive, the public demand for precision simply fell to the wayside. Essentially, aeronautic and munitions technology outpaced precision capabilities by so much that precision weapons would not come into their own again until *Desert Storm* in 1991. Missile guidance technology became the focus for precision specialists while global delivery systems like B52's became the means of strategic offensives that would mass conventional bombs over targets.<sup>299</sup> The shift in precision targeting went from delivery system—to precision ordinance. The shift in public attention went from humane daylight precision bombing—to Atomic destruction and the spread of global Communism. The NBS simply did not matter.

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<sup>298</sup> Lovett to Spaatz, 27 October 1944, Spaatz Papers, Box 16, LOC. As cited in: David R. Metz, Master of Airpower: General Carl A. Spaatz, (Novato: Presidio Press, 1988), 293.

<sup>299</sup> For a discussion surrounding this subject see: Richard P. Hallion, Storm Over Iraq: Air Power and the Gulf War, (Washington DC: Smithsonian Institution Press, 1992).

After the Second World War, the NBS appears in public more often than not as a sideshow, first as Victor Adding Machine Company's contribution to the Smithsonian, then as a comedic prop for both television and literature. Joseph Heller's best selling 1955 book *Catch-22* demonstrates the type of comic cynicism that the once lauded device became the target of. *Catch-22*'s main character, the tragic hero Yossarian, is caught in a world that makes his insanity seem quite sane. The often ridiculous goings on in the story create a sense of futility in regards to not just the Second World War, but war in general. The story line is replete with irony and contradictions that are successful in creating a sense of shared hopelessness in the reader while at the same time maintaining a comic theme. Yossarian is a bombardier who is so afraid of going into combat that he is constantly looking for excuses or reasons not to go on missions. His resolve to stay alive shifts between simply not going into battle to avoid death, and going into battle to insure that the targets are destroyed so he does not have to do the mission twice.

Yossarian took his flight of planes in over the target a second time. The group had missed the bridge at Ferrara again for the seventh straight day with the bombsight that could put bombs into a pickle barrel at forty thousand feet, and one whole week had already passed since Colonel Cathcart had volunteered to have his men destroy the bridge in twenty-four hours.<sup>300</sup>

Heller's portrayal of the NBS contains elements of the myth that go beyond the "pickle barrel" example. In one case he describes Yossarian looking through the sight glass to his target where the "cross hairs were glued magnetically over the target exactly where he placed them, intersecting perfectly deep inside the yard of his block of camouflaged warehouses before the base of the first building."<sup>301</sup> This scene is remarkably similar to the images that would appear on televisions during *Desert Storm* some thirty-six years

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<sup>300</sup> Heller, *Catch-22*, 54.

<sup>301</sup> Heller, *Catch-22*, 146.

after Heller wrote the book. It is interesting that Heller chose to go into such detail describing what the bombardier would actually be intending to hit. This idea that the bombardier could potentially choose the exact location his ordinance would hit would probably not have been accepted by the American public only a decade after the war and certainly was meant by Heller to be sarcastic.

The 1965 CBS sitcom *Hogan's Heroes* included the NBS as a prop for one of its first season episodes, 'Top Hat, White Tie and Bomb Sights.'<sup>302</sup> Hogan, played by Bob Crane, is the leader of a group of Allied POW's who constantly created problems for their German captors. The Norden episode is quite clever in its exploitation of the Norden myth. Hogan has to figure out a way to get out of the POW camp in order to meet an undercover agent at a local tavern. He convinces the hapless commander of the German Camp, Colonel Klink, and Klink's superior, General Burkhalter, that he knows the secrets of the famed Norden. Hogan lets it slip that before his entry into the war he was a captain at Mitchell Field where he had top security clearance and was "the man who helped them test the famous secret Norden."<sup>303</sup> In an effort to bribe the "top-secret" information out of Hogan, Klink and Burkhalter take Hogan to the tavern in the hopes that he will get drunk and tell them all he knows. In the meantime Hogan makes contact with the undercover agent and saves the Allied cause. Once Hogan has completed his mission he agrees to provide the Nazi's with the NBS plans. As he starts to draw the plans on a blackboard it becomes evident to the television audience that Hogan is actually drawing a stand-up vacuum cleaner. A German engineer who has been called in to assess the plans eventually figures this out and the scene erupts in the classic *Hogan's Heroes* melée with

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<sup>302</sup> 'Top Hat, White Tie and Bomb Sights,' *Hogan's Heroes*, Season 1, Paramount Pictures, 1965.

<sup>303</sup> *ibid*

Colonel Klink yelling “HOGAN!” Hogan, who of course is not fazed by the uproar, simply says. “What... Norden makes one of the greatest vacuum cleaners in the world.”<sup>304</sup>

Every aspect of the Norden myth is touched upon in this hilarious episode, not only the fabled characteristics, but also elements of the media frenzy that surrounded the device during the war. The Germans think that with the device in their hands they can turn the tide of the conflict, so they are willing to do anything, including getting someone drunk, in this case Hogan, in order to pull secrets from him. That a single piece of technology could be seen to have so much influence upon the outcome of a conflict so large, in hindsight seems absolutely absurd. But this was the very message that the proponents of an independent strategic Air Force wished to purvey to the American public. What is most striking is that the writers of the show could feature the NBS so prominently in a television program twenty years after the war, without burying the audience in background detail: this is an indication of how deep or widespread the myth actually was. The allusions to the NBS’s mythical capabilities, and the ridiculous behaviour of the Germans reflect a certain scepticism that at least some Americans held of the device in hindsight.

The moral question of the strategic air campaign and carpet-bombing was revisited during the Vietnam war, and the plethora of revisionist literature since the latter conflict subsequently led the American public to reconsider its role in the destruction of both Western Europe and Japan. Criticism regarding American bombing in Vietnam put

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<sup>304</sup> *ibid*

into question the idea that America, and its technology, was somehow morally superior. The mythical elements of the NBS held so little validity that the public debate—or more correctly moral dilemma—surrounding the strategic campaign now shifted to American intentions, as opposed to, results. America had to maintain the moral high ground, and in order to do so, the public needed to witness the struggle between good and evil, selective targeting versus carpet bombing.

The most public medium of American communications of course is Hollywood, and a prime example of the *new* public perception was Warner Brothers's 1990 feature film, *Memphis Belle*.<sup>305</sup> The hit film was a popular Hollywood version of William Wyler's 1945 propaganda film with the same title.<sup>306</sup> The final mission of the legendary B-17 provides a showcase of all the difficulties and dangers associated with flying combat missions, from flak and enemy fighters to friendly fire and freezing to death. Typical of any Hollywood historical feature film, *Memphis Belle* is replete with historical errors and misrepresentations. While the NBS is never mentioned by name in the film, the bombardiers' role becomes the moral crux of the final mission where he is seen using an NBS. The moral battle begins when the target area is blocked from the bombardier's view by cloud cover. When he tells the pilot he cannot see the target, the pilot indicates that he will be forced to turn the plane around and attempt to hit it again. The crew's navigator then attempts to convince the bombardier to drop the bombs anyways to avoid the chance of their being shot down. The bombardier refuses to drop the bombs, as the target is located beside a children school, so the crew must attempt a second bomb run.

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<sup>305</sup> *Memphis Belle*, Warner Home Video, (1990).

<sup>306</sup> Incidentally, the film was co-produced by Wyler's daughter Catherine Wyler. <http://movies.msn.com/movies/movie/memphis-belle/>

The next few minutes are filled with scenes of the bombardier looking through the sight at fleeting images of buildings below the clouds, the frightened navigator, and the bombardier's fingers on a toggle switch. Just in the nick of time the B-17 passes over a clear patch of sky, the bombardier sees his target, and he drops his bombs confident that he will hit only the military target.

In many ways the American public must have craved the moral victory so inaccurately portrayed in *Memphis Belle*, for as this work has demonstrated, the Second World War public was fed an unrelenting campaign that allowed them to believe they were just. For many people Vietnam shattered this perception. In looking back to the Second World War from the 1990's it was far too easy to discover the truth about the NBS, so the reality is hidden in the moral struggle undertaken by a lone bombardier. *Memphis Belle* makes it clear that many in the American public do not know the truth about the strategic bombing campaign. This is a testament to the depth of the Norden myth, and the pervasiveness of perceptions of the links between technology and progress still held within the American public consciousness. These facts lend credence to Stuart Hasley Ross's theory that the US government's "myth-building deceit" prayed upon the tendency of Americans to think of themselves as exceptionally humanitarian.<sup>307</sup> Ross aims to "expose the deceptions and cover-ups, purposeful as well as benign, that still crowd the realities of U.S. strategic bombing," and *Memphis Belle* certainly presented a fantastic story to the public, that was not the whole truth.<sup>308</sup>

Less than a year after the release of *Memphis Belle*, the United States became a belligerent in its biggest war since Vietnam. The Iraqi invasion of Kuwait on 2 August

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<sup>307</sup> Ross, *Strategic Bombing by the United States*, 2.

<sup>308</sup> Ross, *Strategic Bombing by the United States*, 1.

1990 predated the release of the movie by two months, but by the time the film was released America was well on its way to war. Only three months after the film's début, America's new high-tech war machine was reasserting American moral and technological hegemony, only this time it actually seemed to work. Television screens all over the world were privy to laser or televisually guided munitions actually striking specific windows of Iraqi buildings. While smart bombs were first used in Vietnam, it was not until the first Gulf War that the "Precision Revolution" came into its own.<sup>309</sup> The publicity and hype created by this "sci-fi turned real-life technology" spurred interest in the history of precision targeting.

The surge in interest regarding precision weapons is easily explained by the ubiquitous nature of modern televised media, as well as, by the increased tendency of the West to use these high-tech weapons as a means of intervention in international affairs.<sup>310</sup> The air war against Iraq in *Desert Storm* and the NATO intervention against Serbia in Kosovo in 1999 are just two examples of conflicts that paved the way for the type of combat employed in Afghanistan and Iraq since 2001 and 2003 respectively. All of the afore mentioned conflicts have taken on a "virtual" role: that is, television audiences back home watched these wars unfold from their living rooms, often through the images captured from the ordinance themselves.<sup>311</sup> There can be no doubt that *Desert Storm* marked a critical turning point in the production of material relating to precision weapons

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<sup>309</sup> For an in depth discussion of the so called "Precision Revolution" and the history of guided munitions, see: Michael Russell Rip and James M. Hasik, *The Precision Revolution: GPS and the Future of Aerial Warfare*, (Maryland: Naval Institute Press, 2002).

<sup>310</sup> For an in depth discussion involving the increased use of advanced weaponry in international affairs see: Michael Ignatief, *Virtual War: Kosovo and Beyond*, (Toronto: Penguin Books, 2000).

<sup>311</sup> See: Ignatief, *Virtual War*, 3 and 92., Douglas Kellner, *The Persian Gulf TV War*, (Boulder: Westview Press, 1992), 1-7, and John Taylor, *Body Horror: Photojournalism, Catastrophe and War*, (New York: New York University Press, 1998).

and/or high-tech war. This includes much of the secondary material used for the present thesis.<sup>312</sup> Returning to the beginning of this work, however, it is clear that a new generation of new high-tech weaponry was part of the motivation for PBS's documentary *Warplane*. What is not clear is why PBS chose to perpetuate the myth of the NBS so long after it had been so easily—and obviously—debunked.

The true vestige of the Norden myth, however, is the notion that precision weapons can somehow lessen the brutality of war. The popular view of precision technology today is that it enables humankind to wage high-tech, sanitized war—a kind of war that spares civilians and saves humanity from the tragedy of collateral damage or conventional battlefield loss. Michael Ignatieff describes this warfare as “virtual war” and warns us that having the ability to strike targets with impunity, and possibly winning wars without “friendly” casualties, might actually lead to the unrestrained use of violence with precision weapons.<sup>313</sup> John Taylor, writing about the First Gulf War, argues that the focus upon high-tech precision weapons dehumanized the conflict. Taylor insists that, “Sustaining the gap between what violence civilians guessed must be happening and what they wanted to believe about ‘surgical strikes’ made it easier to sustain the war.” The efficacy of the newest generation of precision weapons, especially after their successful application in the Gulf War and Kosovo, has served to re-enforce this idea that humane warfare is attainable.

For some commentators, such as Andrew Bachevich, precision-guided munitions represent the latest “revolution in military affairs.” Terms such as *precision bombing*, and

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<sup>312</sup> See the historiographical section in this work's introduction and consider how many of the works indicated were actually written after 1991.

<sup>313</sup> Ignatieff, *Virtual War*, 163.

*surgical strike* are widely used to describe this *new* form of warfare. While Bachevich attributes these phrases to a “new lexicon of military terms,” this thesis has demonstrated that such terminology has been used since the inter-war period to describe the fabled capabilities of the NBS.<sup>314</sup> My research makes it clear that the myth of the NBS was produced by differing groups of individuals for differing reasons. On the one hand, the fliers of the nascent United States Army Air Corps needed some way to justify their existence. These men not only exploited the media but also exploited American self-perceptions in order to achieve their aims. For them the NBS became the keystone to their quest for the autonomy of their branch of the military. The NBS allowed the airmen to develop a doctrine that ensured that their role in future wars would remain distinct enough from the other services to warrant independence. Fortunately for the proponents of an independent air force, the American public held a special place in their hearts for technology, so it was easy to confer value-laden traits upon technological artifacts such as the NBS.

Once the NBS became so highly regarded and accepted in mainstream thought, other groups—particularly those that could exploit the NBS’s fame for capital gain—latched onto the accepted characteristics of the device and used its familiarity to generate income. Any association with the device became a tool from which groups could profit: whether by selling newspapers, magazines, films, or adding machines, the NBS became an already popular means of generating income. It should be said, however, that all these groups, including the airmen, seem to have actually believed in the device. Curtis LeMay’s predecessor, General Haywood Hansell Jr. was sacked from his

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<sup>314</sup> Andrew Bachevich, *The New American Militarism: How Americans Are Seduced by War*. (Oxford: Oxford University Press, 2005), 20.

command of the 21<sup>st</sup> bomb group because of dismal bombing results, these results a reflection of his dogmatic adherence to daylight precision bombing using the NBS despite its failings.<sup>315</sup>

Strong evidence suggests that the development of the Norden myth did not occur spontaneously. The propaganda techniques used by all parties—military or otherwise—to sell their doctrine, their *raison d’etre*, or their product, were under intense scrutiny at the time. The growing presence of radio and motion pictures drove social scientists of the 1920’s and 1930’s to investigate emotions and how they could be influenced. Propaganda techniques were tested with “emotion-gauging technology” in an attempt to uncover the secrets that allowed for the fanaticism that the European fascists were so able to exploit.<sup>316</sup> A recent study by Brenton J. Malin shows, for instance, that American scientists tested individual responses to media exposure by “hooking up subjects to psycho-galvanometers and pneumo-cardiographs that monitored perspiration, respiration, and heart rate.”<sup>317</sup> Regardless of these “social science” experiments, the American public’s predisposition to accept technology as something good, the development of new forms of mass media coupled with propaganda technique, and the enormously emotional event that was the Second World War, came together to create the perfect scenario in which a myth such as the *Norden myth* could be born.

Unfortunately nearly 100,000 American airmen became casualties in the skies over Europe. Even though this number includes fighter escort pilots, the majority of the

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<sup>315</sup> Max Boot, War Made New: Weapons, warriors, and the Making of the Modern World, (New York: Gotham Books, 2006), 285-288.

<sup>316</sup> The term “emotion-gauging technology” was taken from: Brenton J. Malin, ‘Mediating Emotion: Technology, Social Science, and Emotion in the Payne Fund Motion-Picture Studies,’ *Technology and Culture: The International Quarterly of the Society for the History of Technology*, April 2009, Vol. 1, Number 2., 368.

<sup>317</sup> Malin, ‘Mediating Emotion,’ 368.

casualties were made up of those men flying the B-17's and B-24's. Air Force casualties represent a staggering twenty percent of the 405,000 Americans killed during the war.<sup>318</sup> American Strategic Bombing doctrine demanded accurate daytime attacks upon targets that were deemed vital to the enemy's war waging capabilities. The doctrine relied on precision, which relied on a stable aerial platform and an effective sighting mechanism, neither of which existed prior to the theory. Stephen McFarland points out that the American doctrine developed "in a technological vacuum."<sup>319</sup> That is, the theory existed before the capabilities of precision daylight bombing had been tested or proven. Despite the fact that the capabilities of the NBS were a myth, Americans went to war thinking that they could defeat evil without killing the good, they *believed* it, not because they had to, but because they *wanted* to.

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<sup>318</sup> Ross, Strategic Bombing by the United States, 9.

<sup>319</sup> McFarland, America's Pursuit of Precision Bombing, 82.

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