To the Graduate Council:

I am submitting herewith a dissertation written by Gary E. Weir entitled "The Origins of German Seapower: Military-Industrial Relationships in the Development of the High Seas Fleet, 1897-1912." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in History.

John H. Morrow, Jr., Major Professor

We have read this dissertation
and recommend its acceptance:

Accepted for the Council:

Vice Chancellor
Graduate Studies and Research

# THE ORIGINS OF GERMAN SEAPOWER: MILITARY-INDUSTRIAL RELATIONSHIPS IN THE DEVELOPMENT OF THE HIGH SEAS FLEET, 1897-1912

A Dissertation

Presented for the

Doctor of Philosophy

Degree

The University of Tennessee, Knoxville

Gary E. Weir

June 1982

DEDICATION

for my wife, Catherine,

with love

ABSTRACT

The subject of this study is the construction of the German High Seas Fleet at the turn of the century from 1897 to 1912. Specifically, it focuses on the efforts of the Imperial Naval Office (RMA) under the direction of Admiral Tirpitz as State Secretary to coordinate and control fleet construction and the many firms caught up in that program. From the Admiral's appointment to the RMA in 1897 until the Reichstag's budget priorities shifted back to the army in 1912, the fleet was one of the outstanding sources of debate in Germany and among the western powers. Previous historical research has concentrated on political and social ramifications, but has ignored the naval-industrial relationship that was fundamental to the development of the fleet.

My research has shown that in spite of a powerful and well established community of armaments firms, the RMA usually enforced its will on industry through a complex system of checks and restraints. Even in its relationship with the navy's strongest suppliers, among them the Krupp-Dillinger armor plate monopoly, the RMA was able to make headway in quality and price controls to the German navy's long-term advantage.

The dissertation also assesses Admiral Tirpitz's influence on the creation and use of the fleet. His considerable political talent was essential for the passage of the Naval Laws of 1898 and 1900 as well as the supplemental laws of 1906, 1908 and 1912. Yet his

devotion to battleship strategy both played into the strength of his main adversary, Great Britain, and restricted his appreciation of new weapons systems like the U-boat. As the director of the RMA, Tirpitz's strategic dogma resulted in a fleet ill-suited for an actual confrontation with Britain. Thus he was, simultaneously the political architect of the navy's success in the Reichstag, as well as a major reason for its failure in World War One.

TABLE OF CONTENTS

CHAPTER PAGE

# LIST OF TABLES

## ABBREVIATIONS USED IN THE FOOTNOTES

| | |
|---|---|
| BA/MA | Federal German Military Archive, Freiburg. |
| HA Krupp FAH | Central Archive of the Krupp Firm, Family Archive |
| HA Krupp WA | Central Archive of the Krupp Firm, Works Archive |
| ABB | Allgemeine Baubestimmungen (General Construction Guidelines) |
| LV | Lieferantenverzeichnis (Suppliers' List) |
| BBS | Baubeaufsichtigung (Constr. Inspectorate) |
| SPK | Schiffsprüfungskommission (Ship Testing Commission) |
| ABA | Abnahmeamt (Purchasing Office) |
| KWs | Imperial Naval Yards |
| PWs | Private Naval Yards |
| SSW | Siemens-Schuckertwerke |
| R&D | Research and Development |
| RSA | Imperial Treasury Office |
| HK(s) | Chamber(s) of Commerce |
| RMA | Imperial Naval Office |
| FV | Naval League |
| AHR | American Historical Review |
| CEH | Journal of Central European History |
| MGM | Militärgeschichtliche Mitteilungen |
| MR | Marine Rundschau |
| EHR | Economic History Review |
| HJ | Historical Journal |
| HZ | Historische Zeitschrift |

# INTRODUCTION

At the turn of the Twentieth Century it was a sign of national greatness and power to possess a navy. The strengthening of a nation's naval forces was virtually required to compete for economic and political influence around the world. In the 1890's, Germany, under the direction of Kaiser Wilhelm II, sought to enter this international contest by developing a navy on par with that of Great Britain or France. This study focuses on the creation of the new German navy from the perspective of the naval-industrial relationship between the Imperial Naval Office (RMA) and the various shipyards and industrial concerns actually responsible for fleet construction from 1897 to 1912.

During these years Admiral Alfred Tirpitz conceived and directed an ambitious naval expansion program from his position as State Secretary of the Imperial Naval Office. The program grew rapidly as a result of his success in the Reichstag and reached its zenith with the Supplementary Naval Law of 1912.

The major questions posed here are related exclusively to the purchase of naval weaponry according to Tirpitz's design. The Imperial Naval Office or Reichsmarineamt (RMA) was the organization through which Tirpitz directed his program. How was it organized and which people within this structure were most influential in the navy's relations with the arms industry? On these individuals and their professional resourcefulness depended the leverage the RMA might exert upon scores of diverse business interests. How did the navy propose to

cope with the diverse industrial groups needed to fulfill its construction goals? New business arrangements with hundreds of companies were sought by an RMA inexperienced in this sort of quick, massive expansion. Quality, price, prompt delivery, all of these and more depended on the RMA's ability to turn potential confusion into advantage.

In many instances industrial competition for the navy's favors was fierce. However, this was not always the case. Other situations brought Tirpitz and his associates face to face with cartels and monopolies nearly impossible to break. In which cases was the RMA successful in its efforts to encourage competition to its advantage? Was this utterly impossible in other situations? The awesome international power of some German firms and the ambition of minor businesses to profit from the fleet forced the RMA to exhibit considerable flexibility and agility in its various relationships with industry. Contrasting its successes and failures in this area reveals the many facets of the naval-industrial complex.

Naval-industrial relations also expressed themselves in a series of rituals, formalities and procedures. For example, how did a firm qualify as a naval supplier? There were terms, requirements, tests and specifications imposed on every company contracting with the RMA. Where did these standards come from and how did they evolve? What were the procedures for contracting, sub-contracting, delivery and acceptance of a product by the navy? Indeed, procedures themselves are often used to the advantage of official organizations. Was this true of the German Navy between 1897 and 1912? A major consideration here

must also be the role given to the Imperial Naval Yards. What part did they play, for example, in establishing construction standards or lowering prices? The Imperial Yards were important as a possible tool for creating standards for and forcing lower prices from private industry.

Lastly, how did the introduction of new weapons and technological innovation affect the relationships between the navy and its industry? The most obvious case here is the advent of the U-boat. Where did German U-boat technology originate, with the navy or in the private sector? The response of the RMA to U-boat development revealed early its policy regarding research and development and the restrictions placed upon this activity by Tirpitz himself. This policy determined whether the navy purchased innovations like the U-boat, turbine or wireless telegraphy, at a very high price from a small group of highly developed private firms or possessed viable, cheaper alternatives.

The answers to these questions are valuable in understanding the growth of a navy at the turn of the century. The power of German industry made the High Seas Fleet possible. Tirpitz's parliamentary ability and ambition made it a force that disrupted international relations in western Europe and abroad. The fleet definitely contributed to the mounting tensions that later allowed an assassination to blossom into world war.

Yet there is still a great mystery lurking in the background. If one reads the printed minutes of the Reichstag sessions there is repeated one theme. The politicians could be convinced of the

necessity of building arms, and they could discuss these matters in terms of large sums and percentages of the annual budget. Very rarely, however, did any of these men truly understand the particulars of how and why the money was spent. They did not understand the mechanism that turned appropriations into naval hardware. This lack of understanding is not unique to the leaders of Germany earlier in this century. What has come to be called the military-industrial complex confused world leaders at the turn of the century and is very much a problem for present governing institutions. Thus a comparison between the case examined here and, for example, the modern American military-industrial complex, would not be entirely without its advantages. At the very least, the present study should provide the reader with a greater insight into the modern military-industrial complex in its infancy, eighty years ago.

This investigation also provides a profile of previously ignored historical characters and a new perspective on one of the most controversial figures in modern German history. Here the frequently discussed figure of Alfred Tirpitz appears in his role as director of an expanding naval construction program. His actions in this capacity were determined by the Risk Theory, an interesting strategic concept defensive in appearance, but offensive in reality. Tirpitz built the High Seas Fleet to give Germany enough seapower to discourage an attack by any potential adversary. The latter would be taking a "risk" not worth the cost in men and machinery. At the same time, however, the plans Tirpitz had for the future of the fleet seemed to go far beyond the goal of creating this "risk." Thus the suspicion

that Tirpitz actually intended to catch and surpass the primary naval power of his time arose in the minds of British leaders over eighty years ago as it does with modern historians today.

His dogged attachment to this theory takes on an interesting new dimension when one correctly perceives the Admiral's position. Tirpitz never had tactical command of the fleet he built between 1897 and World War One. Indeed, he came close to this opportunity only once and even then his candidacy displeased too many to be taken seriously. Thus, he became an administrator and shipbuilder following a concept which those in command of the fleet did not unequivocally accept. To what extent could this basic strategic antagonism weaken Germany as a naval power? Can one argue that this was one of the fatal flaws in German naval development, viz. the discrepancy between strategy and the choice of weaponry? These questions are central to this study.

Another part of this study is an attempt to reevaluate Tirpitz's puzzling and prolonged adherence to the Risk Theory. The appraisal of this issue is to a large extent a test of an analytical framework provided by Carl-Axel Gemzell in his study of the links between strategy formation and career ambitions in the German armed forces (Organization, Conflict and Innovation: A Study of German Naval Strategic Planning, 1888-1940). While acknowledging his debt to sociologist Ralf Dahrendorf's work, Class and Class Conflict in Industrial Society, Gemzell asserts that conflict over the selection of strategic theories frequently established an adversary relationship between officers leading to group formation. In turn, the antagonism between these groups was resolved by strategic innovation. The

innovation was sometimes a synthesis of both points of view or a victory for one strategy or another. Gemzell also insists that this model can work in reverse, from innovation to group formation, leading to conflict.

The question here is whether Tirpitz's devotion to the Risk Theory and the battleship was a result of a successfully fought conflict of this sort with his colleagues. Was he subsequently so identified with these points of view that he dared not deny them lest he damage his career and popular image? Another question along these same lines pertains to Tirpitz's position on the U-boat. Did this innovation produce antagonistic groups within the navy resulting in severe internal conflict? If this was indeed the case, then Gemzell's thesis is affirmed. The Risk Theory and Tirpitz's devotion to the battleship are essential themes to the topic of this work. These elements determined the number and type of ships that the RMA, under the direction of Admiral Tirpitz, built during the 1897-1912 period.

Other naval figures appear either for the first time or in a new light. Captain Persius and Admiral Galster loom large as two of Tirpitz's strongest public critics. The obvious direction here is to test the extent to which their criticisms were true. Another prime figure in these matters was Admiral Capelle, Tirpitz's successor in 1916, an administrator of the highest calibre, and far more adaptable in his strategic ideas than his superior. His first experience with the RMA came as head of the Administrative Department during the early years of Tirpitz's naval expansion. There are key characters among other RMA departments as well. Both Admiral von Eickstedt and his

successor Admiral Rollmann were vital to the progress of the building program, directing the Construction Department of the RMA from 1899 to 1914. In addition, Admiral Dahnhardt's role in determining the feasibility of many projects and in naval relations with the Reichstag were crucial to fleet development. As Director of the RMA Budget Department, his views on the constantly rising price of armor plate on the domestic and international market were particularly valuable to the navy.

Although the creation of the High Seas Fleet often seems the product of Tirpitz's energy and imagination alone, these "minor" characters hold the key to actually understanding relations between the navy and industry. Tirpitz set the policy, but these men turned the fleet into reality and tried, on a daily basis, to exert RMA control over naval-industrial relations.

Previous literature on the German Navy during this period focuses on the navy's role in domestic politics and international relations.[1] Walther Hubatsch has spent many years studying the navy, particularly its command structure. He is the present champion of traditional German naval historiography. His evaluation of Tirpitz is

---

[1]W. Hubatsch, Die Ära Tirpitz: Studien zur deutschen Marinepolitik 1890-1918 (Berlin, 1955); W. Hubatsch, Der Admiralstab und die obersten Marinebehörden in Deutschland 1848-1945 (Frankfurt a.M., 1958); E. Kehr, Schlachtflottenbau und Parteipolitik, 1894-1901 (Berlin, 1930); J. Steinberg, Yesterday's Deterrent (New York, 1965); H. Herwig, The German Naval Officer Corps, A Political and Social History (Oxford, 1973); V. Berghahn, Der Tirpitz Plan: Genesis und Verfall einer innenpolitischen Krisenstrategie unter Wilhelm II (Düsseldorf, 1971).

very supportive and he accepts the Admiral's contention that the fleet was built for defensive purposes.

Eckart Kehr's Battleship Building and Party Politics 1894-1901 pioneered new perspectives in German historical literature. Kehr's work integrated interest group politics, domestic economic issues and the international implications of fleet construction. He challenged the German historical preoccupation with foreign policy and focused on the primacy of domestic issues in German history. Kehr's evaluation of the naval issue in Germany concluded that internal financial and political interests spawned the fleet, not the necessity of responding to foreign pressures.

In the last twenty years historians have rediscovered the social, political and economic themes stressed by Kehr. Paul Kennedy is but one illustration. His recently published Rise of Anglo-German Antagonism, 1860-1914 has superceded earlier efforts by including many more social and economic factors in his analysis. Kennedy shows how Germany's unification and subsequent emergence as a world-rank military and economic power created the conflict with Great Britain that later contributed to the outbreak of World War One. In this study the naval issue is placed in the wider national context of political, social and economic elements.

Other historians have followed Kehr in a similar way. Jonathan Steinberg restated Kehr's thesis in his work Yesterday's Deterrent which focused on the passage of the 1898 and 1900 Naval Laws through the Reichstag. Holger Herwig has broadened German naval historiography by studying the social background of the officer corps.

More important for the issues essential to this work is Volker Berghahn's Der Tirpitz Plan. Berghahn devotes more time to an evaluation of Admiral Tirpitz, his aggressive motives and the importance of the Risk Theory. His thesis shows that the Admiral was building the fleet for the expressed purpose of challenging Britain for mastery of the seas. However, Berghahn does not dwell on the links between Tirpitz and the Risk Theory on the one hand and the types of ships built for the fleet on the other.

The works of Walther Hubatsch offered adept exposition and analysis of the naval command. Kehr, Kennedy, Steinberg and Herwig contributed their evaluation of the navy's position in the politics, society and economy in Germany at the turn of the century. Yet all of this literature on the German Navy ignores one vital element--the difficulties involved in actually building ships, i.e., the RMA's attempt to cope with the puzzle presented by daily business with civilian contractors. This work not only fills this void, but also adds to our knowledge of the nature and potential of German industry at the turn of the century.

Other valuable sources used in this work include the memoirs of various naval figures and politicians. The most important of these works describe the careers of Tirpitz, Hohenlohe, von Bülow and Riezler. The nature of memoirs, however, makes it important for a historian to use them with care.

In the case of the Tirpitz memoirs, the Admiral's obvious purpose was to defend his political policies and naval construction program. The success of the U-boat and the unfulfilled expectations

regarding the fleet during the First World War forced him out of the RMA in 1916 under a barrage of criticism. Thus, his statements, published ten years later, must be carefully evaluated. In too many instances he admits few errors and always defends his position uncritically as the logical and correct one. His decisions regarding the U-boat are a case in point. Tirpitz's evaluation of his own actions was widely criticized by his contemporaries and later by historians. Similar works present the same difficulties, but the role of Tirpitz in this study makes his memoirs at once very important, but equally suspect.

Most of the primary sources used in this work came from the naval holdings of the Bundesarchiv-Militärarchiv in Freiburg, West Germany. Of these the majority of the documents used can be found in the files classified RM3, the signature for the RMA or Imperial Naval Office. These documents include material from all departments of the RMA, including correspondence from all the private firms employed by the navy in ship construction. Other sources made available in Freiburg covered the old Imperial Admiralty (RM1), the Naval High Command (RM4), the Admiral Staff (RM5) and the Naval Cabinet (RM2). Also valuable were the personal papers of the Admirals Tirpitz, Capelle, von Senden-Bibran and Behncke.

It was fortunate that the bulk of the military documentation was preserved at various locations throughout the Second World War. Most of the archives of the pertinent private firms and shipyards were destroyed between 1940 and 1945. This includes the university libraries and private records centers in cities like Hamburg, Bremen,

Kiel, and Wilhelmshaven. For example, all that remains of the pre-1945 company records at the Howaldtswerke shipyard in Kiel, a single contract for the battleship S.M.S. Bayern, was sent to the author in response to a written inquiry for available source material.

There are very few major firms in Germany that still possess records covering the activities of their company earlier this century. Among the few naval related firms that do are Krupp, Mannesmann and Maschinenfabrik Augsburg-Nüremburg (M.A.N.). Unfortunately, neither Mannesmann nor M.A.N.'s archive was open to me during my working visit to Germany in 1981. However, the most important of the three, Krupp, allowed more than enough time to do the research required for this work, especially in the area of armor production and U-boat development. Therefore, in spite of war damage and archive scheduling problems, the Militärarchiv and the Archives of the Krupp Firm at the Villa Hügel in Essen supplied abundant source material. This evidence was more than adequate for a thorough investigation of both the naval and industrial perspectives on the problems of naval expansion.

Some of the primary and secondary sources used here might imply a wider scope for this study than is intended. Although the German Navy was a contributing factor to the First World War, this is not an issue for discussion here. Neither are the banks which were an important facet of the German industrial system. The activities of the Reichstag and political parties are treated only as they relate directly to the naval building program, the Naval Laws and their supplements. The author has relied on secondary sources merely to set

the proper political background, thereafter dwelling exclusively on the relationship between the navy and the industry that supplied it. The central focus of the dissertation is supported almost entirely by unpublished primary sources.

Each chapter of this work represents a chronological slice of the 1897-1912 period. Within the chapters five themes are frequently repeated alongside material pertaining to the political influences affecting the construction program. These five themes are: armor plate and the Krupp-Dillinger monopoly; the iron and steel industry; electrical firms; cost and weight problems; research and development. The first two chapters (1897-1898; 1899-1901) revolve around the problem of getting the construction program underway, initial contacts with industry and the passage of the 1898 and 1900 Naval Laws. The third chapter (1902-1904) deals with the acceleration of the naval program within the accepted boundaries of a system established by the RMA. The last two chapters (1905-1908; 1909-1912) concentrate on the passage of the Supplementary Naval Bills of 1906 and 1908 as well as the change of naval fortunes in 1912. These last chapters also highlight the efforts of the RMA to place controls on the formidable armor monopoly.

## BACKGROUND TO 1897

Germany was not an established naval power when Tirpitz arrived at the RMA in 1897. The fledgling shipbuilding industry needed naval expansion. Many shipyards were forced to do alternative work to remain solvent during dry spells between contracts. The organization of the labor force in the shipbuilding industry was also rudimentary. The numbers of skilled workers increased during the period in question here, but employers still controlled wages, hours and working conditions.

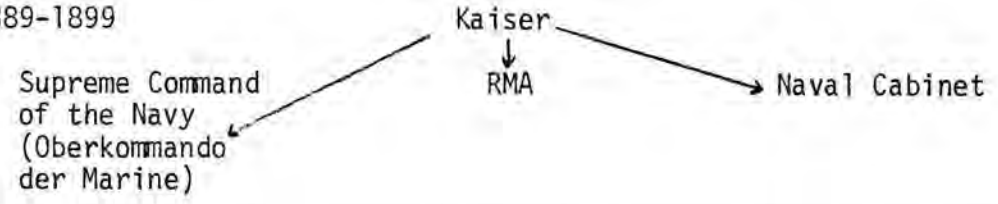
The key theme in this background chapter is the embryonic state of the navy, the shipbuilding industry and the organization of the workers hired by shipyards and firms. It was uncertain in 1897 how these vital factors would adapt and adjust when they were called upon to expand Germany's naval power.

### The Navy: Structure and Responsibility

Shortly after the young Kaiser Wilhelm II ascended the thrones of Prussia and the Empire in 1888, he requested that a commission review suggestions for reorganizing the naval hierarchy. This commission proposed a new structure which the Reichstag and then the Kaiser himself approved in 1889. The Admiralty split into three parts (Fig. 1), the Supreme Command (Oberkommando der Marine), the Naval Cabinet (Marinekabinette), and the Imperial Naval Office

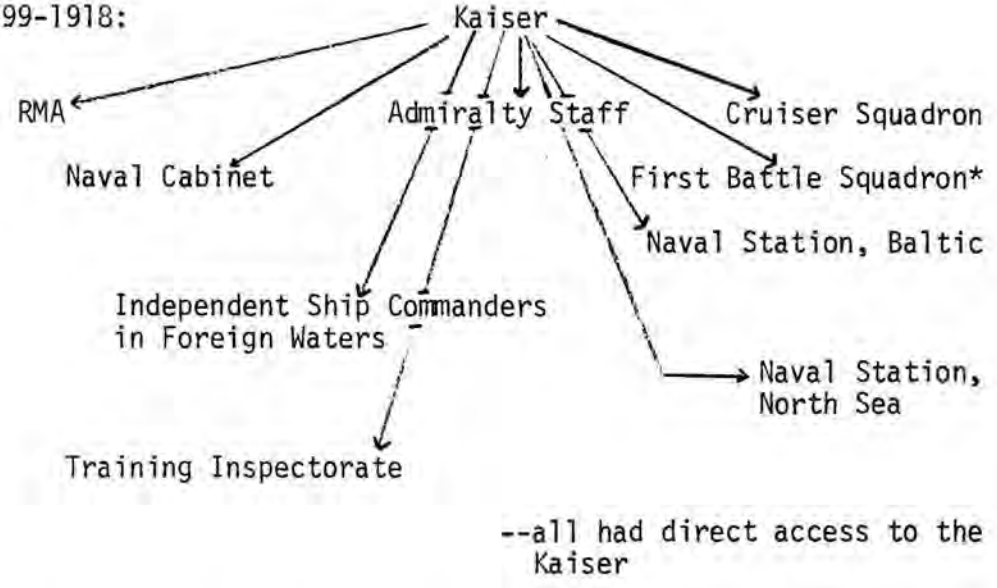
1871-1889:


1889-1899




(closely akin to the army's structure: General Staff, War Ministry and Military Cabinet)

1899-1918:




*Later becomes Fleet Command, when the Second Battle Squadron is added in 1903. Chief of the High Seas Fleet was the commanding officer.

Figure 1. Organization of the German Naval Hierarchy.
Source: Gemzell, Organization and Conflict . . ., p. 39.

(Reichsmarineamt or RMA).[1] The Supreme Command determined strategy and was the branch through which the Kaiser carried out his function as commander-in-chief. Its first leader was Vice-Admiral von der Goltz. The Naval Cabinet followed the pattern established by the Army's Military Cabinet and was responsible for matters of personnel and all of the secretarial aspects of the Kaiser's command role. Under its first head, Rear Admiral Heusner, the RMA received ministerial responsibilities with all of the obligations involved in presenting naval matters before the Reichstag.[2]

The Supreme Command determined ship types and advanced design, but the RMA was responsible for projecting naval needs into the future in terms of budget allocations. Yet in 1889 the RMA did not even have a full time chief of naval construction, and it was easily the least important of the three naval branches with direct access to the Kaiser.

Under Heusner (1889-91) and then Hollmann (1891-97) the policy of the RMA lacked direction (Table 1). Previously the navy had performed only a coastal defense function. Now Heusner and Hollmann, particularly the latter, found themselves caught in a period of re-definition. Wilhelm was clearly bent on a program of naval expansion. Furthermore, within the navy a diversity of strategic theories

---

[1]V. Berghahn, Tirpitz Plan, 23 24. See also W. Hubatsch, Der Admiralstab und die obersten Marinebehörden in Deutschland, 1848-1945 (Frankfurt am M., 1958).

[2]J. Steinberg, "Germany and the Russo-Japanese War," AHR, 75 (#7, 1970), 1968.

TABLE 1

NAVAL OFFICIALS IN CHARGE OF
CONSTRUCTION MATTERS

| RMA Construction Chiefs | State Secretaries, Imperial Naval Office (RMA) |
|---|---|
| Dietrich 1881-1898<br>Construction Office/Division | Heusner 1889-1891 |
| | Hollmann 1891-1897 |
| von Eickstedt 1899-1907<br>Construction Division/Dept. | Tirpitz 1897-1916<br>(Tirpitz was knighted in 1901 and thereafter carried the "von" before his name.) |
| Rollmann 1907-1914<br>Construction Dept. | |

clouded the nature of this expansion while in the political arena the growing strength of the Reichstag complicated the budgetary process. To evolve a logical expansion plan, formulate a proper budget, and defend it successfully before the Reichstag would take considerable political talent. Heusner and Hollmann were not suited for this position, as both were career officers with little or no political background.[3]

Thus during the 1890's everything was a bit chaotic. The fleet was actually a hodgepodge of different types of ships without a strategic coherence. In turn the flow of orders to the primitive naval armaments industry was perpetually erratic, and the industrialists were never sure that the Reichstag would vote appropriations enough to justify further capital investment.

The historian Volker Berghahn suggests at this point that Wilhelm's absolutist tendencies prompted him to envision a supra-ministry which would gather together the diverse elements of his disparate naval policy under his power. Whether one accepts this analysis or not, the Kaiser was certainly eager for increased continuity between his political plans and naval expansion. The RMA was commissioned to fulfill this purpose,[4] and Tirpitz was selected to fulfill the Kaiser's wishes.

---

[3]See Appendix: Heusner, Hollmann.

[4]The Kaiser was thinking about Tirpitz for this position as early as 1896. BA/MA N160/5 Nachlass von Senden-Bibran, von Senden, on board the S.M.S. Hohenzollern, to Tirpitz, Berlin, 3.3.1896.

In 1897, when Tirpitz was in command of the Far East Cruiser Squadron, the Kaiser's impatience over the Reichstag's hesitation to accept increased naval appropriations spilled over to include Hollmann's inability to alter that situation. The State Secretary had to pilot a 1.56 billion mark naval budget through the Reichstag in the spring of that same year, even as Tirpitz returned to take his place. Hollmann was less than eager to assume this task, especially given the fact that he had to present concrete spending proposals before the Reichstag. He rarely made a concerted effort to support his budget requests with studies or plans showing present and future needs for increased appropriations. The parliamentary deputies found his tendency to base his requests on unclear general principles rather than calculated plans and considerations too vague.[5] As one wartime political analysis put it:

> . . . one of his (Hollmann's) main difficulties with the Reichstag was his inability to justify his estimates by numerical demonstrations. . . . On the other hand, Admiral von Tirpitz's strength always lay chiefly in this, that he knew exactly what he wanted and why he wanted it.[6]

The concerted opposition of the Center and Progressive Parties in the Reichstag led by Eugen Richter regarded the Kaiser's proposed

---

[5]A. Hurd and H. Castle, German Seapower: Its Rise, Progress and Economic Basis (New York, 1914), 195. Hollmann did not like Tirpitz at all and frequently wrote about the new SS/RMA in later letters to his close friend Fritz Krupp. See: HA Krupp, FAH III C233 Hollmann to Krupp (on Capri) Berlin, 4.18.1899 and 4.26.1899. See also: Richard Owen, "Military Industrial Relation: Krupp and the Imperial Naval Office," Society and Politics in Wilhelmine Germany, ed. by R. J. Evans (London, 1978).

[6]Hurd & Castle, op. cit., 195.

1897 naval budget as "limitless." This left wing liberal tried to challenge the position of Hollmann as a minister of the crown, stressing his responsibility to the Reichstag as a Cabinet minister. The Kaiser denied that Hollmann was ultimately responsible to the Reichstag, which was technically true. But when Hollmann resurrected an 1873 memorandum on fleet composition and strategy as the basis of his Reichstag budget defense, the deputies cut 12 million marks off the naval appropriations for that year.[7]

In 1897 both the Supreme Command and the RMA received new directors in the persons of Admiral von Knorr and Rear Admiral Tirpitz. Knorr became one of Tirpitz's strongest opponents, not because he opposed an increase in naval spending, but because Tirpitz was from the outset clearly intent on making the RMA the preeminent branch of the Imperial Navy. Under von Knorr the Supreme Command could not preserve its influence in matters of construction and fleet composition because Wilhelm clearly supported Tirpitz. With his All-Highest Cabinet Order of February 1898 the Kaiser gave the RMA chief a free hand in these matters.[8] Tirpitz's enviable position in 1897 rested on his ability to guarantee a continuous flow of credits from the Reichstag in order to build Germany a first-rate navy.

---

[7]BA/MA RM3/2487 Reichstagsverhandlung, 9. Legislatur Periode, IV Session 1895/97 Kommission für den Reichshaushalts Etat 27. Sitzung 3.8.1897. For the 1873 Plan; BA/MA Library, "Denkschrift betreffend die Ausführung des Flottengründungsplans von 1873" (Berlin, 1873).

[8]J. Steinberg, Yesterday's Deterrent (New York, 1965), 136-140.

Tirpitz: The Driving Force

Alfred Tirpitz must dominate any discussion of the growth of the German navy during these years. The State Secretary is one of the most popular figures of modern German naval history. Evaluations of his ability and his effect on Germany's navy, domestic policy, and foreign affairs have received exhaustive study. On the one hand, the conservatives Walther Hubatsch and Gerhard Ritter have portrayed him as a man whose policy was essentially defensive, protecting Germany's security and vulnerable international trade.[9] On the other hand, to Volker Berghahn, John Rohl and many of the new social-economic historians influenced by Kehr, Tirpitz was the advocate of a High Seas Fleet designed to challenge Britain and neutralize the Reichstag's control over naval expenditure by means of a longterm shipbuilding commitment.[10] His naval laws severely curbed the financial authority of the Reichstag regarding further military spending by legally requiring a pre-determined budget minimum for each year. Afterwards, a series of supplements ensured that the minimum figure kept growing. It is essential here to review the development of Tirpitz's career and of his theories on the purpose and future composition of the fleet. The consistency of these views, and Tirpitz's persistence in following

---

[9]W. Hubatsch, Kaiserliche Marine (Augsburg, 1975); G. Ritter, Staatskunst und Kriegsnanswerk, Vol. 2 (Munich, 1965).

[10]V. Berghahn, Der Tirpitz Plan (Düsseldorf, 1971); J. Rohl, Deutschland ohne Bismarck (Tübingen, 1969); "Admiral v. Müller and the Approach of War, 1911 bis 1914," HJ, 12 (No. 4, 1969), 651-673.

them, determined the types of ships added to the German navy in the years between 1898 and 1912, thus limiting the strategic options of the Supreme Command in case of war.

Alfred Tirpitz was born in 1849, entered the navy as a cadet sixteen years later and passed through the naval academy between 1874 and 1876. He was trained as a torpedo specialist and thus his first commands were Chief of the Torpedo Inspectorate and then Chief of the Torpedo Flottillas. He also served as Chief of Staff, first to the Commander of the Baltic Naval Station and then to the Supreme Command.[11]

It was in 1894, when he held the latter position, that Captain Tirpitz first circulated the essentials of his strategy for the future of the fleet in his Service Memo IX. It proposed a direct challenge to Great Britain and a vast increase in German naval power emphasizing the battleship. The core of Tirpitz's ideas lay with the Risk Theory. It suggested that the seemingly absurd challenge to Great Britain was indeed possible if Germany possessed a large naval force capable of inflicting severe damage on its enemies. Then any naval power would shrink from engaging in a surface battle because a victory would be too costly to contemplate. As far as Tirpitz was concerned, increased offensive potential was the key to securing Germany's international ambitions without war.

---

[11]Hurd & Castle, 110. See also Kaiserliche Marine Rangliste, 1890-1895. (Hereafter cited as Rangliste.)

The vogue in naval strategy during these years was the Jeune Ecolé. This strategy was based on the commercial war theories of the French Admiral Theophile Aube.[12] Here, British naval supremacy, which was the one obvious "given" in all naval theories of the period, was countered by a naval force composed of quick, powerful cruisers aimed directly at her shipping lanes. This force would avoid the decisive battle, or Entscheidungsschlacht, with the Grand Fleet and attempt to strangle British supply lines. The interdependence of nations created by large scale industry, food scarcity and rising populations lay at the foundation of this strategy. It was popular in Germany and appeared in the writings of Freiherr von Maltzahn and Vice-Admiral Galster.[13] The Kaiser toyed with it for a short time. Later, it also formed the basis of many critiques of Tirpitz. The antithesis to the Jeune Ecolé would advocate the challenge to Britain and the possibility of the Entscheidungsschlacht. This was the central idea of Tirpitz's Service Memo IX (Dienstschrift IX).

Tirpitz embraced this idea in order to appear the German foil to the French Jeune Ecolé. In this he reflected sentiments within

---

[12]E. Böhm, Überseehandel und Flottenbau: Hanseatische Kaufmannschaft und deutsche Seerustung 1879-1902 (Hamburg, 1972), 87-88. For further information on the Jeune Ecolé see: V. Bueb, Die "Junge Schule" der franzasischen Marine: Strategie und Politik, Wehrwissenschaftliche Forschungen. Militärgeschichtliche Studien 12 (Boppard a. Rh., 1971).

[13]See Appendix: Galster, von Maltzan.

naval circles more eloquently stated by Alfred T. Mahan.[14] The appearance of a dynamic German naval leader with an appealing strategy also proved a welcome change from the aimlessness of Heusner and Hollmann.[15] Their ideas had perpetuated the navy's coastal defense role, a position which seemed outworn as German Weltpolitik developed during the reign of Wilhelm II. These factors worked to Tirpitz's career advantage when he returned to Berlin in 1897 as State Secretary of the RMA after a year abroad commanding the Far East Cruiser Squadron. To choose Tirpitz as State Secretary was to install Service Memo IX as the bible of the new navy. Tirpitz's energetic drive to publicize, argue, organize, and otherwise impress his High Seas Fleet concept on Germany's leaders enabled the passage of his naval construction bills of 1898 and 1900.[16] His reputation and credibility rested on his theory, and the entire construction program from 1898 to the war was based on his thought. As the program succeeded his faith in these ideas deepened. Industrial and public support gave naval expansion a momentum that constantly reenforced his attachment to the Risk Theory in spite of significant changes on the international scene.

For Tirpitz, the 1897-1898 period was a part of the strategic "danger zone," in which Britain might launch a preventive attack

---

[14]Alfred T. Mahan, The Influence of Seapower upon History (Boston, 1890). The original title of Dienstschrift IX: "Allgemeine Erfährung aus den Manövern der Herbstubungsflotte."

[15]Rangliste, 1889-1897.

[16]The supplements to the 1900 Naval Law came in 1906, 1908 and 1912, but under slightly different conditions. The Bülow Block was rocked in 1908 by a proposed increase in taxes.

before Germany's fleet development was complete.[17] Throughout this time he closely adhered to his policy, both to see Germany out of the "danger zone" and to preserve the credibility gained earlier for himself and his ideas. He did not want a war with Great Britain until Germany was ready. If it came earlier, however, he was fully prepared to urge the use of Germany's new naval strength to inflict quickly as much damage upon the British as possible. He believed that a protracted war would be disastrous.

Tirpitz was a strategist, but his most important role as Walther Hubatsch reminds us, was that of shipbuilder. Indeed, strategy was the province of the Supreme Command, whose job it was to use the fleet in wartime.[18] While Tirpitz may have consistently employed Service Memo IX as the bible of the construction program, the Supreme Command did not adhere to it in matters of strategy. The two agencies did not agree on fleet composition, location of the major naval bases, the use of the fleet, and the definition of exactly what "favorable conditions" were in a possible battle with the British. There was no unity of purpose between these two vital branches of the Imperial Navy. One finds only constant competition before the Kaiser for the upper hand, resulting in a confusion and indecision which greatly contributed to the sterility of the surface fleet during the war. Tirpitz never fulfilled his own plans, and, by 1914, a

---

[17]K. Riezler, Tagebücher, Aufsätze, Dokumente, K. D. Erdmann, ed. (Gottingen, 1972), 299.

[18]Bernard, Fürst von Bülow, Denkwurdigkeiten, vol. 1 (Berlin, 1930), 413. Berghahn, op. cit., 380-82.

discontented Admiralty was left with a fleet which was very often unsuited to the wartime strategic alternatives posed to it.

The Shipbuilding Industry

Before Tirpitz's arrival at the RMA, the German shipbuilding industry was still fairly embryonic as compared to Great Britain, the world's naval power. Contracts from the navy were infrequent and industry was obliged to diversify in order to survive. The private shipyards were also faced with the RMA's option to employ the Imperial Yards rather than awarding certain contracts to private concerns. This would keep prices down to a certain extent and perhaps enable only the larger yards and cartels to compete. From this situation, German shipbuilding firms had to weld themselves into an efficient, productive, mature industry if they hoped to respond to the urgently needed naval expansion. In 1852 the first seagoing steamer of German construction came off the slipway at Furchtenicht and Brock Co., later the Vulcan Firm of Hamburg and Stettin. It was, of course, not an ironclad, nor was there a Germany to speak of at the time. The only domestic source of ironclad ship construction technology was a small school at Grabow (Stettin) opened in 1831. For the most part, German shipbuilders learned their trade abroad, in England or at the naval construction school at Copenhagen.[19] After unification in 1871, most of Germany's ships were still built in Great Britain.

---

[19]Hurd and Castle, op. cit., 307-309.

The first concerted effort to force the expansion and development of the German shipbuilding industry came from the head of the Imperial Admiralty from 1871 to 1882, General Albrecht von Stosch. He combined in his person the functions which Wilhelm II would later distribute between the Reichsmarineamt, the Admiralty Staff and the Naval Cabinet.[20] His post as Chairman of the Committee on Naval Affairs enabled him to exert considerable political power and industrial influence.[21] Stosch was the first to insist that a greater percentage of German naval construction take place within Germany.[22] He ordered that the purchase of warships be limited exclusively to domestic shipyards (Table 2).[23] Thus the Admiralty policy under Stosch encouraged the development of a shipbuilding industry at home.[24]

By 1899 Germany had twenty-three private shipyards of various capacities (Tables 2, 3), eleven firms on the Baltic and twelve on the

---

[20]F.B.M. Hollyday, Bismarck's Rival: A Political Biography of General and Admiral von Stosch (Durham, 1960), 101-102.

[21]F.B.M. Hollyday, op. cit., 112-13.

[22]Hurd & Castle, op. cit., 311.

[23]Ibid., 199. Stosch was succeeded by: Caprivi, 1883-88 and Graf Monts, 1888-89. Afterward a drastic reorganization of the naval hierarchy took place. See Figure 1, page 14.

[24]Ibid., passim. During this period Germany's arms industry experienced increased competition. In 1885 the French Chamber of Deputies lifted its arms export prohibition against Germany. Richard Owen, "Military Industrial Relations: Krupp and the Imperial Naval Office," Society and Politics in Wilhelmine Germany, op. cit.

TABLE 2

GERMAN SHIPBUILDING FIRMS, 1899

| Baltic Sea | North Sea |
|---|---|
| Schichau, Elbing | Blohm and Voss, Hamburg |
| Schichau, Danzig | Reiherstieg, Hamburg |
| Klawitter, Danzig | Brandenburg, Hamburg |
| Vulcan, Stettin | Janssen and Schmilinski, Hamburg |
| Oderwerke, Stettin | Holtz, Harburg |
| Nüscke, Stettin | Weser, Bremen |
| Neptun, Rostock | Vulcan, Vegesack (Bremen) |
| Koch, Lubeck | Tecklenborg, Geestemünde |
| Howaldtswerke, Kiel | Wencke, Bremerhaven |
| Germania, Kiel and Tegel | Seebeck, Geestemünde |
| Flensburger Gesellschaft, Flensburg | Rickmers, Bremerhaven |
| | Meyer, Papenburg |

TABLE 3

VITAL STATISTICS ON THE SIX MAJOR PRIVATE SHIPYARDS

| Shipyards |
|---|

Germania (Krupp), Kiel
- 75,000 sq. meters: 10 docks for construction, workers' bath house, breakfast hall, beer storage facilities, railroad spurs
- 145,280 sq. meters: copper, brass and iron foundries, Schultz-System Boiler Factory, electrical workshop (some of this property was acquired in 1896 to fulfill expansion plans formulated during acquisition)
- Work force: 1890 - 1,409; 1899 - 2,564; 1914 - over 5,000

Howaldtswerke, Kiel
- 770 meters of waterfront, 155,000 sq. meters total territory
- 12 docks for construction (50 m. to 230 m. long)
- Work force: 1890 - 1,304; 1899 - 2,370

Schichau, Elbing and Danzig
- 12,450 sq. meters: 18 docks for construction
- 352,000 sq. meters: factories, mills, workshops
- Work force: 1880 (Elbing only) - 1,200; 1899 (Elbing and Danzig) - 5,820

A. G. Weser, Bremen
- 252 meters of waterfront
- 38,290 sq. meters of territory: shops, factories, storage
- 14,030 sq. meters of construction docks included above
- Work force: 1890 - 1,178; 1900 - 1,350

Blohm und Voss, Hamburg
- 1,195 meters of waterfront
- 141,750 sq. meters of territory: Of this, 32,650 sq. meters - 10 construction docks; 82,100 sq. meters - factories, workshops, storage
- Work force: 1880 - 450; 1890 - 2,051; 1899 - 2,598
- Extensive living facilities for workers built in the suburb of Wilhelmsburg, just outside the yard itself.

Vulcan, Stettin-Bredow
- 182,650 sq. meters of territory in total
- 518 meters of waterfront at Stettin
- 71,220 sq. meters - 9 construction docks (100-200 meters long)
- Work force: 1899 - 6,628
- A facility in Hamburg was acquired in 1906.

Source: T. Schwarz and E. von Halle, Die Schiffbauindustrie in Deutschland und im Auslande, 2 vols. (Berlin, 1902).

North Sea and three Imperial Shipyards.[25] The six most important private yards were Krupp Germaniawerft and Howaldtswerke in Kiel, Schichau in Elbing and Danzig, A. G. Weser in Bremen, Blohm und Voss in Hamburg and Vulkan in Stettin and Hamburg.

Germania, owned by the Essen firm of Friedrich Krupp, eventually became the largest shipbuilding company in Germany. Located at the south end of the Kiel docks, this concern, established in 1822, was a foundry for boilers and the manufacture of naval engines until it acquired the Norddeutsch Werft also in Kiel. The company, which was called the Schiff-und Maschinenbau A. G. Germania by 1881, built the S.M.S. Kaiserin Augusta, the first German warship with triple screws capable of 22 knots, and the first armored German cruiser, S.M.S. Fürst Bismarck. Krupp gradually acquired the company between 1896 and 1902. The process was completed only seven months before Fritz Krupp's suicide in November, 1902 and supervised by Krupp director Hanns Jencke, a long standing member of Germania's Board of Governors.[26] The yard's income from warship contracts rose from 40.5 million marks between 1871 and 1896 to 51.5 million between 1897 and 1904. In the latter period, only Schichau had greater revenue.[27]

---

[25]See Figure 1, page 14.

[26]Hurd & Castle, op. cit., 369-371. HA Krupp, WA IV 952. See: Germania, Berlin/Tegel to Jencke, Essen 12.24.1896. The Krupp Firm was also busy trying to enter into a close association with Vulcan which the latter rejected. Then the firm began secretly to purchase large blocks of Vulcan stock. HA Krupp, FAH III B179, passim. See also: Chapter III on the 1902-04 period.

[27]E. Bohm, Überseehandel und Flottenbau. Hanseatische Kaufmannschaft und Deutsche Seerüstung 1879-1902 (Hamburg, 1971), 147.

Germania's work in the early 1880's for the navy was small scale: it built scout ships, a small armored cruiser, and a torpedo boat prototype. Under the direction of Krupp, this yard became an early center of research and development and later took the lead in German U-boat technology. It supplemented its domestic naval work by completing projects for foreign navies and fulfilling six commercial ship contracts between 1881 and 1900.[28]

As a member of the Association of Shipyards founded in 1885, Germania became one of fourteen yards to respond collectively to Stosch's plan to rely more on both German materials and production in domestic yards.[29] Yet Stosch's initial efforts to bring shipbuilding home could not suddenly bring stability to a firm. Germania experienced difficulties between 1889 and 1895 that no doubt reflected the unpredictable frequency of naval contracts and British domination of the commercial ship market. The yard's dividends bounced erratically between 0% and 6-1/2% during this period. With the arrival of Krupp capital in 1896 the dividends levelled off at a steady 4-1/2%.[30] The Essen concern eventually developed the yard from a 5.5 million mark investment in 1889 into a 200 million mark investment by 1914, with half of the financial interest in the hands of the family and the rest managed by a limited liability company.[31]

---

[28]T. Schwarz and E. von Halle, eds., Die Schiffbauindustrie in Deutschland und im Ausland, vol. 2 (Berlin, 1902), 53.

[29]Ibid. Others among the six leading yards in the Shipbuilding Association include: Schichau, Blohm und Voss, and Vulcan.

[30]Ibid., 58-59.

[31]Hurd & Castle, op. cit., 314.

In its relations with the RMA Germania and the Krupp Firm in general, found Tirpitz less than cordial. Very early in his term as State Secretary, Tirpitz correctly surmised that the firm would just as soon profit from Germany's enemies as supply the German navy. But as Willi Boelcke has pointed out, Tirpitz and the navy were hopelessly dependent on the firm.

> Although Admiral Tirpitz was truly a strong person of responsible position in Wilhelmian Germany, a man of unusual talents, hard and ruthless ambitions, and an initiator of modern warship construction, he was definitely not a friend of the house of Krupp. But the Reichsmarineamt could and would never be without the services of Krupp.[32]

The other major private shipyard in Kiel was the Howaldtswerke. Established in 1876 by Georg Howaldt it was one of the smallest of the six major private yards. Like Germania, it depended a great deal upon both military and commercial contracts, foreign and domestic, to remain financially solvent in the years before the military expansion of the Tirpitz era. In 1878-1879 it built the twin screw steamers Socrates and Diogenes for the Peruvian navy, and two corvettes for the Chinese government in 1883.[33] Its size forced it to specialize in the intermediate versions of the great commercial trans-Atlantic steamers. Howaldt also effectively diversified with various types of postal and passenger vessels and ships for colonial service.[34]

---

[32]W. Boelcke, ed., Krupp und die Hohenzollern in Dokumenten. Krupp Korrespondenz mit Kaisern, Kabinettschefs und Ministern 1850-1918 (Frankfurt, 1970), 236.

[33]Schwarz and Halle, op. cit., 314.

[34]Ibid., 22. The smaller "tramp" steamers were the specialty of Klawitter, Nüscke, Neptun and Henry Koch.

The Howaldtswerke only managed one commercial contract for over 2000 tons in the 1880's, but as the firm moved into the nineties this number grew, reaching ten by 1900.[35] However, work was never steady for any firm during this period. Howaldt produced 9,907 tons of commercial ships and that figure rose to 17,081 in 1899, but then an almost 2,000 ton decline occurred in 1900.[36]

The firm's dividends showed a constant slow upward progress in spite of the irregular nature of the market. Between 1899 and 1892, capitalized at 2 million marks, its returns increased a point annually from 4% to 7%, and then remained a steady 8% in 1893-94. When Howaldt was turned into a joint stock company in 1895 and recapitalized at 2.5 million, returns remained at 8%.[37]

Along the southern rim of the Danzig Bight in the eastern Baltic, the city of Elbing provided the site for one of Germany's largest and most diversified private shipyards. The shipbuilding work begun there by Ferdinand Schichau in 1852 was based on a successful machine works established in 1837. While it was acquiring a reputation as a first class locomotive and machine company, Schichau built Germany's first steam dredger (1841) and Prussia's first propeller driven ship (1855). By 1902 the firm's own factory was producing better cast steel forms than some of Germany's best mills.[38]

---

[35] Ibid., 53.

[36] Ibid., 50.

[37] Ibid., 58-59.

[38] Ibid., 11-12; 191.

Schichau's first contracts for the navy resulted in the production of three cannonboats. Although the RMA frequently balked at its high prices, it was the navy's primary supplier of small surface craft such as torpedo boats. This type of craft did not, however, represent the firm's limits. In 1891 it formally applied to the RMA for consideration in capital ship contracts[39] and less than a year later acquired a shipyard in Danzig with sufficient depth to accommodate ships with a much greater displacement.[40] The depth of the Elbing dock facilities was 2.8 meters normally and 4 meters at high tide. The new Danzig facility put Schichau in the battleship business with a depth of 8.5 meters at the construction sites and a minimum depth of 7.3 meters on the way out to sea.[41] Schichau eventually built six battleships for the RMA before the opening of World War One.

In spite of its potential, Schichau's purely commercial work was modest. It was one of the three or four German companies capable of handling the large trans-Atlantic liners, but it received no contracts between 1881 and 1890 and only six between 1891 and 1900. In this area the old Hanseatic cities kept the business to themselves. Between 1881 and 1890 Blohm und Voss and Reiherstiegwerft in Hamburg accounted for fourteen each out of fifty-five ships. Vulcan, Stettin (10) and Flensburger of Schleswig-Holstein (8) were a close third and

---

[39]BA/MA RM3/347 Schichau, Elbing to SS/RMA Konstruktions Dept., Berlin, 9.9.1891.

[40]Schwarz and Halle, op. cit., 12.

[41]Ibid., 85.

fourth. In the 1890's the same four firms won 121 out of 162 commercial contracts over 2,000 tons displacement.[42] Breaking into this market was difficult, even for a firm of Schichau's size.

Schichau remained somewhat unique in the German shipbuilding industry for the firm's success in its diverse interests. It was a family concern that not only involved itself in shipbuilding and manufacturing but also created its own shipping business as well. It provided regularly scheduled freight service, mostly for grain and wood, between east Prussia and the manufacturing centers of the west.[43]

Of Germany's major shipyards, only Weser was a former wooden ship company specializing almost exclusively in military vessels. In the 1880's Weser took only two commercial contracts over 2,000 tons and no others until after 1900.[44] Founded in 1843 as the Bremer Wätjenschen Werft, it became the A. G. Weser in 1872. It was the third German shipyard to form a joint-stock company (Aktiengesellschaft) after Vulcan (1857) and the Oderwerke (1871). Eighteen years passed before any other companies followed suit.[45]

In the 1870's Weser began the transition from wooden shipbuilding to metal.[46] As long as the ships were of a modest size the

---

[42] Ibid., 53.

[43] Ibid., 82.

[44] Ibid., 53.

[45] Ibid., 57.

[46] Ibid., 12.

shipyard diversified its military contracts in the 1880's and 1890's with torpedo boats, light cruisers and battleships. As the size and sophistication of the battleships desired by the RMA increased, Weser was forced into a pattern of torpedo boat and light cruiser contracts. Before 1900 the only battleships Weser built were the S.M.S. Beowulf and Frithjof (1890-93). It received no other contracts for this type of vessel until it began S.M.S. Westfalen fourteen years after the Frithjof was completed.[47] Weser's first contracts for the navy in the 1870's included thirteen armored gunboats and eight torpedo boats.[48] The firm followed that pattern through 1918, building only six battleships. During the same period it produced eighteen light cruisers and a number of torpedo boats and U-boats.[49]

Weser was always responsive to new naval construction plans. It was one of the first firms to begin converting to German materials for its vessels as a response to the wishes of Stosch.[50] However, its attempt to expand between 1900 and 1907 in order to accommodate RMA battleship contracts nearly resulted in disaster. Excessively rapid growth resulted in management miscalculations, strikes, and near bankruptcy. The price of Weser shares dropped during this period from

---

[47]Erich Gröner, Die deutsche Kriegsschiffe 1815-1945, vol. 1 (Munich, 1966), 19-49 passim. Weser did not feel able to fulfill battleship contracts in 1891.

[48]Schwarz and Halle, 16.

[49]E. Gröner, op. cit., 19-49 passim.

[50]Schwarz and Halle, op. cit., 26.

130 to 45 marks and financial ruin was averted only by raising 3.75 million marks among faithful stockholders.[51]

In the wake of Germany's unification and the incentive given shipbuilding by Stosch's policies, Blohm und Voss was established in Hamburg in 1872. It immediately won a contract to build a small ocean going vessel for the Hamburg-American Line in 1873.[52] This firm's primary strength lay in the commercial area throughout the 1890-1914 period. It built 42,337 tons of ships in 1898 and exceeded that figure by 6,127 tons in 1898.[53] The Hamburg firm raised the number of contracts it signed for vessels over 2,000 tons from fourteen between 1881 and 1890 to fifty for the next decade or almost one third of total German commercial production.

One of the reasons for Blohm und Voss's success was its willingness to adopt new technology and its ability to expand as the market demanded. In the 1890's the firm rebuilt part of its dock facilities to accommodate not only the increasing need for ocean going liners and freighters, but also the RMA's demand for battleships.[54] The result was the capability to repair and service the huge, commercial Vulcan built steamers, Preussen, Bayern, and Sachsen, as well as construction facilities large enough for the navy's capital ships.

---

[51]Hurd & Castle, op. cit., 316.

[52]Ibid., 12; 17. See also Hurd & Castle, op. cit., 366-67.

[53]Ibid., 50.

[54]BA/MA RM3/354 Blohm u. Voss, Hamburg an SS/RMA, Berlin 6.4.1892.

In 1892 Blohm und Voss finished their first military vessel, the S.M.S. Condor, while the expansion of their construction facilities was underway and the firm was ready for increased naval orders by 1897.[55]

Blohm und Voss built one battleship for the RMA, three light cruisers, and discovered its real military specialty: heavy cruisers. Beginning with the S.M.S. Friedrich Karl in 1903, Blohm und Voss provided the navy with eleven heavy battle cruisers including the S.M.S. von der Tann, Seydlitz, Moltke, Goeben and Derfflinger. In 1916 these ships gave remarkable performances against the British at Jutland.[56]

The last of the six major private shipyards, and, at the turn of the century, the largest, was the Maschinenbau Aktiengesellschaft "Vulcan" of Stettin-Bredow. Like many German shipbuilding firms, this joint-stock company was strong in the area of engineering and machine construction. Vulcan began in 1857 as the firm of Fruchtenicht and Brock, established in Stettin only six years before.[57] The new firm's capital grew from 3.9 million in 1880 to 10 million marks in 1900, and shareholders received a handsome return of from 6% to 14% during the 1890's.[58]

---

[55]E. Groner, op. cit., 19-49 passim.

[56]Schwarz and Halle, op. cit., 21.

[57]Hurd & Castle, op. cit., 362-364.

[58]Schwarz and Halle, op. cit., 58-59.

In the commercial market Vulcan produced only 15,249 tons of ships in 1898, but by 1900 this figure had risen to 55,023 tons.[59] Between 1881 and 1890 Vulcan completed ten ships for Germany's merchant marine, including six large government subsidized steamers for the North German Lloyd.[60] The following decade brought eighteen more contracts.

Vulcan's relations with the Imperial Navy began with the construction, in Stettin, of the first armored German ship ever produced, the corvette S.M.S. Preussen. It was laid down in 1869 and completed well after Bismarck was finished unifying Germany.[61] This was only the beginning of a very profitable association for both Vulcan and the navy. The Stettin firm eventually built nine battleships for the RMA, more than any other company. In addition, other contracts resulted in three heavy cruisers, eleven light cruisers, numerous torpedo boats and later, U-boats. Vulcan's work for foreign navies began in 1881, when it built several torpedo boats for the Chinese. In the next ten years this work expanded, with Stosch's approval, to two battleships, a light cruiser and two heavy armored cruisers.[62]

---

[59] Ibid., 50.

[60] Ibid., 19. The six were the Preussen, Bayern, Sachsen, Danzig, Stettin and Lubeck.

[61] Ibid., 15.

[62] Ibid., 16-17.

The typical shipyard performed actually a number of independent functions united by a single project. It employed painters, skilled mechanics, boilermakers and metalsmiths of all kinds. It made fittings, valves and different qualities of iron and steel. One yard engaged in repair work, others manufactured replacement parts, and all preserved the old carpenter's skills still very much in demand. This diversification enabled some of the larger firms to produce other products or do piece work which would keep them financially secure if contracts were few. Blohm und Voss's repair capability, Schichau's locomotive works and Vulcan's machinery are all examples of this capability. For the smaller firms the erratic rhythm of commercial and naval contracts through 1898 proved quite a trial.

The Imperial Yards, although physically similar to the private yards, served a variety of other functions for the RMA. Established in 1869 as centers for Prussian coastal defense in cooperation with Bismarck's North German Confederation, these yards were located at Danzig and Kiel on the Baltic, and at Wilhelmshaven on the North Sea.[63] They were as large as some of the private shipyards. In Danzig, the smallest of the Imperial Yards, the navy had three slipways, two stationary docks and a number of floating docks.[64] Danzig and the Germaniawerft were the only shipyards in Germany engaged in U-boat research and development. Danzig produced 27 of the 62 boats laid

---

[63]Schwarz and Halle, op. cit., 15.

[64]Ibid., plan 1 (Appendix).

down before 1914, leaving twenty-eight to Krupp, six to Weser and one to an Italian firm.[65]

The Wilhelmshaven yard was the second largest among the three. Wilhelmshaven specialized more in battleship construction than the other two and possessed extensive repair facilities as it was RMA policy to execute repairs exclusively at the Imperial Yards. Wilhelmshaven had three large docks, two smaller ones and a minimum of the required auxiliary facilities.[66]

The largest of the three Imperial Yards was at Kiel. Here construction capabilities certainly equalled some of the better independent firms. The centers in Kiel for testing artillery and torpedoes were larger and more sophisticated than either of the other Imperial Yards. Its plant space included machine shops, materials testing laboratories and considerable storage facilities. Besides nine slips for working on torpedo boats and three small construction docks, Kiel had six full size docks for battleship and cruiser work.[67]

In the 1870's the Imperial Yards were used to spearhead official programs, to perform administrative functions, and to provide

---

[65]E. Gröner, op. cit., 40-41. The U-42 was awarded to the Societa Fiat "San Giorgio," La Spezia-Muggiano. But all of these boats were very primitive. They were either 450 ton petrol driven models or 800 ton MS-boats. See RM3/11692, "Inbaugabe der U-boote," Berlin 5.3.17.

[66]Schwarz and Halle, op. cit., plan 3 (Appendix).

[67]Ibid., plan 2 (Appendix). At the turn of the century the KWs had a modest workforce of 15,781. See: Ibid., 204-05; 244-45.

the RMA with greater freedom of decision. For example, Stosch would only encourage the private shipyards to employ domestic materials and sub-contractors, but Imperial Yards had to follow these naval directives as much as possible. Nearly two decades later, when Tirpitz's ambitions for the fleet strained the entire industry to its limits, the Imperial Yards became one of his more effective tools in dealing with the private sector.

The RMA employed the Imperial Yards to whittle down ship prices. When Schichau and Germaniawerft proposed what the RMA considered excessively high bids for the Torpedo boats 90-101, it used the Imperial Yards to reduce the total contract price. Schichau bid 930,000 marks and Germania 1,075,000 marks for a project the RMA placed in the 770,000 marks range. The RMA gave projects worth 560,000 marks to the Imperial Yards and awarded the rest to Schichau at the reduced price of 874,000 marks.[68] According to two British journalists evaluating the Imperial Yards on the eve of World War One, the Imperial Yards were:

> . . . designed on the principle that they shall possess a sufficient power of output so as to prevent private yards from being in a position to fix the prices at which warships should be built, and they have shown themselves equal to the occasion, and are by no means behind private establishments.[69]

This role was not their original function, but it certainly became one of the major duties of the Imperial Yards after 1897.

---

[68]BA/MA RM3/3699, "Protokoll über die Sitzung am 16. Juni 1900." See also BA/MA RM3/3697-98 passim, for similar examples.

[69]Hurd & Castle, op. cit., 361.

Before Tirpitz, the Imperial Yards fulfilled a financial and accounting role that the admiral greatly expanded at the turn of the century. The administrative departments of all three Imperial Shipyards were used to account for the expenditure, not only of their own funds,[70] but also of those periodically released to the private yards to fulfill ship contracts. They were also responsible for funds allotted for research and testing at all the yards.[71] The RMA Budget Department often authorized the yards to issue vouchers which smaller contractors could present for payment at the Reichsbank.[72] The diverse skills required of every shipyard were considerably broadened in the case of the Imperial Yards.

By 1899, German materials still only amounted to 2.7% of any given ship built at home. More than half of the materials used and, in a good many cases, entire ships were still procured abroad, mainly in Britain. Only 120,000 tons, or 1.9% of total German steel production, was used in shipbuilding. By mid-1900 the percentage of German steel made for ships was only 4.5%.

---

[70]BA/MA RM3/6071 KWK an SS/RMA, Berlin 10.2.1896: "Beantragung von Mitteln aus den lfd. No. 11 und 12 des Rechnungssolls von den einmaligen Ausgaben." BA/MA RM3/7312-13 (1895-1909), passim. (Budget control.)

[71]BA/MA RM3/6072, passim (1896-1900).

[72]BA/MA RM3/6061. Payment of 661.80 marks made to the Norddeutschen Gewerbe Ausstellung, Königsburg 10.16.1895. The American system was similar. See BA/MA RM3/1073 "Marine der Vereinigten Staaten," Construction Dept., RMA, Berlin, 1896.

In 1900 prices for shipbuilding materials were 25 to 30 marks higher than in Britain or France because of the lack of naval experience and difficulties within industry. Germany's coal and iron ore prices, set largely by the Rhineland industrialists, were among the highest in Europe. Long distances between the major shipyards on the Baltic and North Seas and Germany's mines and inland industries created huge transport costs. From the Krupp works in Essen to Elbing was 984 km. From Essen to Wilhelmshaven, one of the shortest distance, was 299 km. Many small specialized firms could not pay these prices and still show a profit. Often their large capital expenditures were hardly worth the effort.[73]

Various industries suffered from low product standards, poor designs, and mismanagement. In the machine and tool industry, the U.S. surpassed Germany in mass production methods, and the British were more original in design.

In the iron and steel industry innovation and combination presented yet another problem. The Thomas-Gilchrist and Siemens-Martin processes for high quality steel production were still undergoing tests for naval use in the 1890's, and only a limited number of German firms were capable of producing by these methods. Armor plate production techniques changed every five years or so in a regular rhythm, from the Ellis System developed in Britain in the 1880's, through the Wilson System which first introduced steel into armor for

---

[73]Pollard and Robinson, British Shipbuilding Industry, 1870-1914 (Cambridge, Mass., 1979), 29.

resilience. Finally, by 1890, the Harvey Company of New Jersey devised a nickel-steel armor which Krupp almost immediately improved. Krupp had a virtual monopoly on armor in Germany by the early 1890's and a voracious appetite for consuming competitors like Gruson and the Bochumer Gussstahlfabrik, or outcompeting others like the Hörder Verein.[74]

Most of these iron, steel or mineral firms in the Ruhr formed cartels with which the navy had to deal. The coal and coke suppliers of western Germany were united in the Rhine-Westfalian Coal Syndicate and the Westfalian Coke Syndicate. Their east German counterparts later established two cartels centered in Berlin.[75] There were iron pipe, scrap iron and conventional iron syndicates like the Grobblechverband, which was managed by Krupp's Board of Directors and united twenty firms producing steel plate from five to forty millimeters thick. The powerful iron and steel firms were able to force the suspension of many provincial tolls, but the savings were hardly passed on to any consumer, let alone the navy. They also had close ties with other cartels such as the Association of Ship Steel Producers and the Association of Cast Steel Producers.

---

[74]G. Leckebusch, "Der Beginn des deutschen Eisenschifbaues, 1850-1890," Moderne deutsche Wirtschaftsgeschichte, Karl E. Born, ed. (Cologne, 1966), 191-99. Many firms also watched carefully any tendency by their workers to lean toward the unions or political left; e.g., Krupp's Direktorium claimed only 40 left-affiliated workers in 1896 at the Gussstahlfabrik and only 78 one year later. HA Krupp FAH III B39 Direktorium to F. A. Krupp, Essen 4.26.1897.

[75]BA/MA RM3/3681.

In 1895, according to the naval yearbook Nauticus, there were 1130 ship construction or supply companies in Germany employing about 35,000 workers. There were only forty-six firms with more than fifty workers making up 28,600 of the total employed. This was a modest increase from a workforce of 23,000 employed by the industry in 1882, the last full year Stosch spent at the Admiralty. By 1898, however, eleven of the largest shipyards were employing 24,220 people out of a total related workforce of 62,400 at a salary of approximately 67 million marks.[76] The expansion of the naval armaments industry to meet the RMA's demands was already under way.

The Labor Force

The success of individual construction projects and the entire program of naval expansion largely depended upon the labor situation at the shipyards. A primary consideration in any study of naval expansion must be the sufficiency of skilled labor and the state of its organization. The twenty-two private yards and three Imperial Yards employed 50,451 people by 1900. The six major private yards employed 23,381 administrators, technical personnel and workers; the Imperial Yards 15,781.[77] The skilled workers of the industry split into thirty-one different categories, and worked with metal, wood, canvas, and paint among other specialties. The average workday at a shipyard was ten hours, beginning at six in the morning with a break

---

[76]Nauticus, 1899, 282-83.

[77]Schwarz and Halle, vol. 2, op. cit., 124-25.

for breakfast and a sixty or ninety minute mid-day rest period.[78] The longer overtime days occurred most frequently in the summer, when the RMA and many private shipping firms brought their vessels in for standard repairs. During the winter the days were sometimes shortened to 7-1/2 hours, but this became more infrequent as the electrical industry provided night-lighting at the shipyards.[79]

Most workers were hired independently or in groups according to trade. Each person or homogeneous group had its own contract with his employer stipulating type of work, the pay scale, and schedule. Many were paid by the job, not by the hour, day or week, and this type of employment contract called for the completion of an entire project before the workers were paid a bulk, prearranged wage. The multiplicity of arrangements in this system made it extremely difficult to control wages easily or estimate accurately future spending. There was only one exception to this rule: the women in the industry. Since there were only fifteen of them in 1900, their wages posed no problem for the time being.[80]

The levels of pay given to German shipyard workers depended on two variables. The place an individual chose to work was as important as the skill he possessed. A riveter, included in the class "shipbuilder," working in Stettin would earn from 26 to 32 pfennig (pf) per hour. The same worker in Danzig was paid 25 to 28 pf. The higher wages

---

[78] Ibid., 105.

[79] Ibid., 105.

[80] Ibid., 124-25. Thirteen women were employed by Schichau and two by Neptun (Rostock).

were found at the five Hamburg yards. A riveter's wage there went from a low of 26 pf to 39/40 pf per hour. The wages paid by the navy were average for the industry in this case. At the Imperial Yard in Kiel a riveter earned from 26 to 36 pf.[81]

In another line of shipyard work, a machine builder earned wages similar to the various metalsmiths. The rates ranged from 30 to 40 pf in Danzig to a possible high of 43 pf in Hamburg. Some of the older traditional skills were practiced by fewer men and drew the highest salaries in the business. A sailmaker and rigger earned 55 pf per hour, but they were in demand only at the smaller firms in Stettin, Rostock, Lübeck, Hamburg and Harburg.[82]

Most firms had a number of apprenticeship programs that catered to two groups of trainees or Lehrlinge. These were young men grouped above and below sixteen years of age engaged in learning shipbuilding skills. There were also laborers sixteen and under, but the industry only employed 596 of these in 1900 and the Imperial Yards had only 111. The wages for the 3,252 trainees peaked at 15 pf per hour in Danzig, Lübeck and Papenburg and sank to 3-1/2 pf in Harburg. Those under sixteen were paid from two-thirds the rate for the older ones to full parity depending on location. The laborers under sixteen received about half of the amount given regular full-time skilled workers.[83]

---

[81] Ibid., 114-115.

[82] Ibid., 114-115.

[83] Ibid., 114-115.

For the workers, one means to better their wages and hours before 1914 was the pressure applied by unions. Yet by 1900 the development of the labor movement among the shipyard workers was still primitive, if growing. The earliest of these organizations traced its roots back to the mid-nineteenth century. This was the Carpenters Association formed from the guilds of Hamburg and environs in 1849 because of widespread unemployment and the hiring of foreign workers by the yards. By 1873 the German Carpenters Association unified the regional and city associations in Hamburg, Cuxhaven, Weserplätze, Apenrade, Kiel and LUbeck. Of about 6,000 carpenters in the trade in 1875 the Association represented 3,300.[84]

Not all of the workers associations were so homogeneous in their origins. In 1888, the Central Association of Shipyard Workers was formed from the German Shipbuilders Association founded among the Baltic workers six years before. This group was a coalition of wood and metal tradesmen as opposed to the single trade carpenters association. Many carpenters scorned the multi-trade organizations and chose to cling to the German Carpenters Association or local, smaller carpenters' groups. The craft guild traditions were still strong and not quickly submerged within the newer, more diversified organizations.

As was the case with the carpenters, the metal workers first began their associations among single specialized trades. The Mechanics' and Machine Builders' Association dated from 1883, the

---

[84]Schwarz and Halle, op. cit., vol. 1, 170-71.

Metal Smiths' Association from 1885. Perhaps because these men and their skill were products of modern industry, they were less concerned about losing their technical identity in a large heterogeneous organization. The German Metal Workers' Association of 1891, based in Hamburg, brought many different skills together in a common cause.

By the turn of the century most of the shipyard workers who were united were loosely committed to either the German Carpenters Association or the Central Association of German Shipyard Workers. But these two groups and smaller independents rarely cooperated with each other. The Carpenters called strikes in 1888 and 1889 over wages without the cooperation of the Shipyard Workers. Both strikes failed.[85]

In 1890, the Central Association of German Shipyard Workers with S.P.D. support attempted their own walkout in which 4,000 participated. It failed and nearly destroyed the Shipyard Workers organization, as they lost a great deal of money and many members. In order to survive, the Association briefly entered into a union with the dockyard workers until 1892. In 1896 its combination with the German Metal Workers' Association restabilized the situation with fresh money and supporters.[86]

Out of the more than 50,000 employed by the industry in 1900, only a few thousand were organized. The Carpenters and Shipyard Workers' Associations accounted for merely 4,000 members among fifteen

---

[85] Ibid., vol. 2, 127-29.

[86] Ibid., 128-29.

affiliated associations. The only other union making pretensions toward unifying the shipyard labor was the Hirsch-Dunckerscher Gewerkverein.[87] At this point the workers were far from being a truly effective political and economic force. There were no strikes at the shipyards between 1890 and 1899.

As the RMA also discovered, both it and the shipyards were particularly vulnerable to the sheer scarcity of skilled workers. In a discussion with the Kaiser at the time of the S.M.S. Kaiser Wilhelm der Grosse launching, Tirpitz complained about the way some private yards used skilled labor. He seemed particularly annoyed by Krupp's use of skilled workmen on the Russian Cruiser Askold, while some RMA projects were neglected.[88] The possibility of labor shortages, strikes, and slowdowns were perpetual sources of anxiety for the RMA. Tirpitz cited the latter two as the reason for up to six months of delays in finishing some of the battleships of the Kaiser Friedrich III Class laid down between 1895 and 1898.[89] The German navy was not alone in this sort of problem. In 1901, Mr. J. T. Bowles, the construction chief of the U. S. Navy, blamed steel-workers' strikes for delays of up to two years in the Virginia Class battleships and Pennsylvania Class armored cruisers.[90] No matter the country, the early growing pains were similar.

---

[87] Ibid., 129.

[88] Ibid., 130.

[89] BA/MA RM3/2 Tirpitz, Berlin to Wilhelm II 10.17.00.

[90] BA/MA RM2/163 Press clipping from the Daily Graphic, 10.22.01, New York City.

Summary

A number of important points should be distilled from this survey of conditions in the navy and industry as Tirpitz came upon the scene. The naval structure was fairly new, and each of the men in charge of the three part naval organization was testing the boundaries of his authority. Tirpitz proved the most aggressive of all. In choosing Tirpitz as State Secretary of the RMA, Kaiser Wilhelm selected a new set of ideas as well. Tirpitz religiously followed his strategic dogma despite the objections of his colleagues. He was clearly determined to fulfill Germany's ambitions as well as his own.

In 1897, the shipbuilding industry in Germany was still relatively primitive but two things offset a good measure of this disadvantage: The German economy in general was experiencing a period of rapid growth; and the prospect of huge naval profits was definitely attractive. The firms already involved in naval related fields increased their efforts, while new companies turned their attention to the navy's needs. The labor movement, lacking effective unions, posed no real threat of slowdowns to the RMA's expansion program. If Tirpitz could guarantee continuous government appropriations after 1897, the German shipbuilding industry appeared most capable of discarding the primitive qualities of the 1880's and 1890's.

# CHAPTER I

## NEW DIRECTIONS: 1897-1898

Upon assuming the post of State Secretary of the RMA, Tirpitz immediately began to execute his plans for expansion. On the political front he initiated preparations for the debate over the 1898 Naval Bill in the Reichstag. In the naval sphere he began to reorganize the RMA. The Admiral also set out to construct a system of relations with industry that would afford him the upper hand in all of his business dealings. His efforts resulted in victory in the Reichstag and a formidable system of controls which Tirpitz imposed on the firms wishing to produce for the fleet. They also led to his confrontation with the armor monopoly, a questionable RMA policy regarding research and development, and the first encounters with substantial cost and weight overruns. This stormy two year period witnessed the official birth of the modern Germany Navy.

### Tirpitz and the Naval Law of 1898

In a memorandum of June 1897, Tirpitz laid down his fleet proposals which called for a program of 408 million marks spread over the 1898-1905 period. His goal for the German fleet at home and abroad was as follows:

19 Battleships (+2 in reserve)
8 armored coastal vessels
12 heavy cruisers (+3 reserves for overseas duty)

30 light cruisers (+3 reserves for overseas duty)
12 Torpedo Boat divisions[1]

Tirpitz's memorandum of June 1897 was a truly revolutionary document in German naval history. In a single stroke he gave direction and consistency to naval policy and in the process managed to lower the projected construction costs by 15%. Although the goals set were not as extensive as Wilhelm wished, Tirpitz managed to put together an acceptable package. But more importantly, these naval goals were not proposed as part of the 1898 budget. The strength of the fleet in ships and men, the regular replacement of obsolete ships and the completion date for the program were all proposed as a new law. The Reichstag would approve not one year's spending, but rather a long term commitment to naval development.

In support of this effort the RMA News Bureau led by Corvette Captain August von Heeringen mustered its formidable power in the propaganda sphere.[2] During the Reichstag Christmas recess, beginning in December 1897, the business community joined the RMA in its propaganda campaign. On 13 January 1898, at the Kaiserhof in Berlin, the Central Association of German Industrialists and Hamburg's leading fleet proponent, Adolf Woermann, sponsored a meeting of the interested business community. Two hundred and fifty-one pro-naval individuals and groups, including seventy-eight Chamber of Commerce presidents,

---

[1]J. Steinberg, Yesterday's Deterrent (New York, 1965).

[2]von Heeringen: See Appendix.

attended and agreed to coordinate their efforts to see the 1898 Naval Law through the Reichstag.

Particularly important for parliamentary success was Tirpitz's relationship with the Catholic Center Party and its leader Ernst Lieber.[3] The Naval Law appealed to Lieber because of its potential for extracting political benefits for the Center. Lieber looked beyond the religious and regional character of his party and fancied that the naval issue could make the Center the national party in Germany. In exchange for aiding Tirpitz he hoped to broaden the freedom and influence of the Catholic Church and establish the Center as the arbiter in Reichstag disputes. But Tirpitz, the prototype of the soldier-politician, successfully sidestepped Lieber's efforts to place clearly defined limits on naval expenditure over the 1898-1905 period without losing the essential support of the Center Party leader.

Only the financial figures endangered the Tirpitz-Lieber agreement on Center Party support for the Naval Law. Could the Reichstag afford this law without a new source of revenue? Proposed progressive income tax laws, designed to arrest the Reich's declining revenues, remained a spectra that haunted the Reichstag, and both the Hohenlohe and von Bülow governments.[4]

The struggle over the Naval Law reflected the blurred distinction between outward appearance and political reality in a Reich

---

[3]See: E. Kehr, Schlachtflottenbau und Parteipolitik, 1894-1901 (Berlin, 1930); J. Steinberg, Deterrent, passim.

[4]J. Steinberg, Deterrent, 186.

bound by Bismarck's constitution. In spite of the obstacles he confronted in the Reichstag it ". . . was precisely because Tirpitz behaved as if Germany had a parliamentary regime that he was so successful."[5] He took the politicians seriously, talked, negotiated and argued with them, and thus seemed to become one of them. This often seemed true to his naval colleagues as well for, as Samuel Huntington has pointed out, ". . . he was generally viewed by the other admirals as an essentially political figure."[6]

The Admiral could adjust his relations with people according to the demands of the moment. He was ruthless at eliminating rivals in the navy. He pushed both von Knorr and Buchsel into the background and with them relegated the Supreme Command to a secondary position in naval affairs. He had Galster censured for advocating quicker development of the U-boat because Tirpitz felt it would challenge the primacy of the battleship.[7] But he handled contacts in the Reichstag with seasoned grace. He sent the Reichstag leaders thorough memoranda to keep them well informed on naval affairs. He frequently engaged them in personal conversations or encouraged his associates Dahnhardt and Capelle to do so.[8] The RMA responded to all of their questions

---

[5]Ibid., 191.

[6]S. P. Huntington, The Soldier and the State (New York, 1957), 102.

[7]H. Herwig, The German Naval Officer Corps, A Political and Social History (Oxford, 1973), 27.

[8]Both of these men were frequently at Tirpitz's side during Reichstag debates: See biographical appendix.

and even arranged for tours of the Imperial Naval Yards for some Reichstag deputies.[9]

If Tirpitz obtained what he wanted from the Reichstag in 1898 it would truly indicate a great deal of political skill. Costs rose constantly, and politicians like Lieber sought spending limits and sharp definitions in every spending category. The S.M.S. Brandenburg (1890) had cost 9.3 million marks and the S.M.S. Kurfurst Freidrich Wilhelm (1890) eventually went as high as 11.23 million marks.[10] No price was stable in the shipbuilding industry, especially now that the government was contemplating new spending in the billions. The possibility of a new tax to cover the commitments of the Naval Law seemed to loom larger than ever.[11]

One of the most understandable fears in the Reichstag concerned obsolescence. How could one determine appropriations for materials for repair and replacement? The navy was projecting only a twenty-five year service life for the new ships, and parts for repair work were constantly spiraling upwards in price. One deputy, Dr. Hammacher, lamented that: "In ordering artillery we can only deal with the Krupp Firm. But we should not have to fear constantly that the prices will

---

[9]P. Kennedy, "Fischer and Tirpitz: Political Admirals in the Age of Imperialism," Naval Warfare in the Twentieth Century 1900-1945, Gerald Jordan, ed. (London, 1977), 52.

[10]BA/MA RM3/347 "Zusammenstellungen von Schiffsneubauten bei 1897/98 und Neubauten Schiffe Sachsen Klasse" (quotes figures from 1889 to 1898).

[11]BA/MA RM3/11636 Handakten Dahnhardt, Reichstag Budget Commission Hearings 3.3.1898.

suddenly change. They are already high enough."[12] The presence of State Secretary von Posadowsky-Wehner from the Reich Treasury Office as a Tirpitz supporter during the budget debates was only mildly reassuring to the legislators.

The 1898 Naval Law passed the Reichstag on 26 March and was signed by the Kaiser fifteen days later. Just before the law was voted upon, August Bebel gave the final plea of the SPD against the true nature and purpose of the legislation. In his analysis of that speech and the Reichstag's reaction to it, Jonathan Steinberg wondered whether Tirpitz's cautious parliamentary tactics were actually necessary. The house responded with "prolonged laughter" to Bebel's warning that Germany would be crushed by Britain in a direct confrontation ". . . even if (our fleet) is finished to the very last ship demanded in this law." Only one thing was sure:

> What had been the closely guarded plan of an inner cabal in January of 1896 had become the wish of a substantial majority of the Reichstag by March 1898.[13]

## Coping with Rapid Expansion

In his memoirs, Tirpitz complained that he never had enough money to draw the best possible personnel to the weak spots in the naval administration. He rhetorically asked what the "democrats" would do if, following the British example, he appointed a chief

---

[12] Ibid., Hearings 3.2.1898.

[13] For Bebel's speech and the Reichstag reaction: Stenographischer Bericht, der Reichstag, 9. Legisl. Periode, V. Session, 68. Sitzung Wed. 3.23.1898, 1746. For Steinberg's analysis see Deterrent, 193-195.

engineer at an annual salary of 100,000 marks.[14] He felt the RMA was limited to small, quietly awarded bonuses to those who showed technical and administrative originality and devotion to duty.[15] The Naval Law only exacerbated this problem. The call for new personnel rose with its passage, reflecting the demands placed upon both the military and industry. The Chief of the RMA's construction division (Konstruktionsabteilung) asked for three dozen new inspectors and master shipbuilders less than one month after the Naval Law passed the Reichstag. The expansion of the fleet would draw skilled and unskilled people to every phase of naval affairs especially at the Imperial Naval Yards in Kiel, Wilhelmshaven and Danzig. There the need would be most immediate.[16]

The salaries the Reichstag was asked to appropriate for individual officers and expert advisors give some idea of the huge cost involved. Perels, a high ranking civilian naval adviser (Geheime Admiralitätsrath) earned 15,000 marks in 1896 at the top rung of his pay scale and a junior man of the same rank earned 8,000 marks. Naval designers took home between 1,800 and 3,800 marks, averaging about 2,100 annually.[17] Among the officers, the admirals usually

---

[14]1£ = 20 marks = $5.00. Paul Kennedy, The Rise of Anglo-German Antagonism, 1860-1914 (London, 1980), X.

[15]A. Tirpitz, My Memoirs, vol. I (London, 1919), 130.

[16]BA/MA RM3/2489 "Bei MI vorzulegen," signed, Dietrich, Berlin 4.22.1898.

[17]BA/MA RM3/2487 "Speziall Nachweisung 1896." Prepared as background for the formulation of the 1897/98 fiscal year budget proposals.

started at about 12,000 marks and the lowest grades were budgeted at 6,000 marks. The major differences in personnel spending here came with older, more experienced admirals. In 1896, for example, the State Secretary was paid 24,000 marks and the highest ranking officers were in the 30,000 marks range. The proposed salary for Tirpitz in 1898 was 30,000 marks, a 6,000 marks raise. This was only the tip of the iceberg.[18]

The size and scope of RMA authority reflected the responsibilities and challenges of rapid growth. In 1897 it was a small organization by Supreme Command standards. By 1914 however it had grown into a huge bureaucracy for supervising every facet of naval affairs and parliamentary relations with headquarters on the Königin Augusta Strasse in Berlin.[19] The section of it most directly related to problems of shipbuilding, the Construction Department, did not become an independent RMA division until 1904. The development of the construction department reflected the demand for a domestic shipbuilding industry and the necessity for expert naval construction supervision. In 1880 the navy possessed only a Technical Section (Abteilung) for shipbuilding, most of which was done abroad. The first Construction Chief of the Imperial Navy, Dietrich, was then only an engineer under the section's second in command, Admiralty Advisor Bauck. With the coming of von Stosch in 1881, an independent

---

[18]BA/MA RM3/2487 Reichsschatzamt an den Herrn Reichskanzler zu Hohenlohe, Berlin 7.4.1896. Figures on Tirpitz: BA/MA RM3/2488 Naval Budget 1897/1898, Kap. 46 (RMA).

[19]See Rangliste, 1897-1914. The development of the RMA can be progressively examined as it grew from year to year. (See Table 4.)

TABLE 4

EVENTUAL ORGANIZATION OF THE MATURE REICHSMARINEAMT, 1914

RMA State Secretary

The following departments and sections under his direct authority:

(M) Central Section

(A) General Naval Department

(B) Dockyard Department (formerly Technical Department, changed in 1905)

(K) Construction Department

(E) Budget Department

(W) Weapons Department

(H) Nautical Department

(G) Medical Section

(J) Legal Division

(N) News Bureau

(C) Administrative Department

All Naval Attachés

Construction Bureau was created under Dietrich in Rear Admiral Batsch's Naval Department. This structure remained the same until 1896, with Dietrich's official appointment as Construction Chief in 1894 the only alteration. In 1896 the Bureau was raised to the level of a section in the Naval Department now under Captain Buchsel and Dietrich was appointed Section Chief. Reflecting the plans of the new State Secretary in the 1897 to 1900 period, the Construction Section had its position redefined. In 1898 it was placed under the authority of the Administrative Department, and after one year returned to the Naval Department before finding a permanent place in the Technical Department in 1900.[20] On 10 November 1899 Captain von Eickstedt[21] was appointed its director and under his guidance the Construction Section was elevated to the level of a department in 1904.[22]

As State Secretary, Tirpitz controlled directly every department and section of the RMA. But, as the complexity of naval affairs intensified after 1898, he relied heavily on a group of very competent officers and civilian advisors to keep the RMA system running effectively. Communication between departments on matters of construction, budget, prices, research and so forth, were discussed in

---

[20] Rangliste, vols. 1880-1914.

[21] von Eickstedt: promoted to Rear Admiral 3.11.02, Vice Admiral 1.27.06, held the position of Chief of the Construction Department until his retirement in 1906.

[22] The first Construction Department independent budget = 1905, BA/MA RM3/2494-95. For purposes of clarity and consistency the term "Construction Department" will be used throughout this work, regardless of date.

Sitzungen or administrative session attended by representatives of all RMA departments.[23] Depending on the subject of the session, particular divisions of any given department or section would attend according to their specialty. For the Construction Department von Eickstedt was a regular at these sessions. His department had four divisions through which the various stages of construction were supervised. KI was in charge of general ship construction matters and KII conducted all relations with machine and motor firms. KIII division supervised the shake-down cruises of capital ships, smaller vessels, and all related work; and KIV regulated the correct methods of ship construction according to strict RMA guidelines.[24] Tirpitz kept himself abreast of the progress of the construction program in this way, involving himself deeply while avoiding the headache of personally assuming every responsibility.

Research and Development: The U-Boat and the Turbine Engine

RMA policy regarding research and development did not strengthen its position with industry. The vacillation of the Heusner and Hollmann years at the RMA had retarded technical development for a number of reasons. The RMA's demands for types of vessels and materials were not consistent, so it could never convince the Reichstag to appropriate

---

[23]For an example of a typical Sitzung: BA/MA RM3/3691 Berlin 1.13.04. The subject was the quality of boilers for capital ships.

[24]Rangliste, 1908.

adequate funding for any of its schemes.[25] The directors of Vulcan actually wrote to Hollmann in 1891 asking for a clearer idea of future naval plans, as the firm wanted to profit from naval expansion but had little idea of how it could adapt to the navy's needs.[26]

Tirpitz provided industry with the definition and direction it lacked before 1897, but his attitude toward new technical breakthroughs confounded industry in another way. In his memoirs, Tirpitz revealed his attitude toward research and development. He believed that no innovation should be adopted too quickly, i.e., before he thought it was perfected. Thus he delayed naval involvement in U-boat research and complained that wireless telegraphy was installed in warships too soon. What he sought to avoid was the avalanche of technical problems that usually accompanied hasty change.[27] What he actually accomplished was quite different. Tirpitz's faith in the battleship and slow, deliberate technological development led him to avoid any basic changes in naval hardware.

The RMA encouraged some research and development but left almost all of the work to the private sector of the shipbuilding industry. The navy's effort in this area was limited to testing materials and to a very restricted U-boat program. Materials testing was done at the Imperial Shipyards, the Royal Prussian Testing Office and the

---

[25]Hurd & Castle, op. cit., 112.

[26]BA/MA RM3/347 Vulcan, Stettin-Bredow an SS/RMA, Berlin 10.14.1891.

[27]A. Tirpitz, My Memoirs, vol. 1 (London, 1919), 36-37.

Technische Hochschule in Berlin-Charlottenberg. Among imperial yards the U-boats were the exclusive province of Danzig. The U-boat work at Danzig, however, was in no way as intense or advanced as that of Krupp at the Germaniawerft.[28] The goal of the various departments under Tirpitz's control was merely to keep themselves abreast of all current innovations in naval related fields.

Tirpitz was well informed of French and American progress in U-boat development. Early German efforts between 1867 and 1870 by Friedrich Otto Vogel failed. In the 1890's, however, the American John P. Holland had a great deal of success with his Plunger, and the RMA records contain many of the press reviews provided by the German Foreign Office.[29] He knew of these developments and of the presence of the French U-boat experts d'Equevilley and Laubeauf at the Germaniawerft.[30] Yet naval policy did not allow the emergence of the U-boat from the shadow of the capital ship until 1914. In spite of this situation the relationship between the RMA and industry relating to Research and Development was a good one, even if the former's lack of official involvement and monetary support slowed the process.[31]

---

[28]BA/MA RM3/2249-52 passim ("Versuche mit Materialien").

[29]BA/MA RM3/1074 For example see clippings from Le Matin 4.22.1898.

[30]E. Rössler, Geschichte des deutschen U-Bootbaus (Munich, 1975), 22-23.

[31]BA/MA RM3/2240-50 passim.

The importance of the RMA research and development policy under Tirpitz is twofold. His technical personnel found themselves without experience in many areas of high technology and thus were often incapable of exercising effective control over what the RMA was purchasing from private industry. In most instances they knew the theory behind certain innovations because the international flow of naval research information was still very free.[32] However, there was a considerable gap between theoretical knowledge and practical experience. More importantly, Tirpitz's policy tended to shift the sponsibility of research and development to those firms whose financial stability and technical expertise could support such programs. Too often this resulted in a monopoly by a single firm or a select group of dominant firms expert in an area where RMA was at its weakest. This is not to say that Tirpitz should have possessed a clairvoyance that would have made him aware of the later importance of inventions like the U-boat, but a deeper interest, greater official involvement, and a measure of financial support could have substantially improved the RMA's position. The expertise thus obtained would have resulted in more informed judgments regarding new developments and a greater control over their possible production by private industry.

A prime example of this problem is the length of time it took to place steam-turbine engines in German warships. The German naval

---

[32]BA/MA RM2 (Marinekabinette)/34 Senden-Bibran, aboard the Imperial Yacht Hohenzollern to Capt. Barber, U.S. Naval Attaché, Berlin 7.14.1898. RM3/1072 See Technical information sent by German Legation in Washington, D.C., 1895-97.

authorities carefully traced the development of the Parsons Turbine in Britain. The experiments with the Parsons prototype, the H.M.S. Turbina, were a constant topic in reports from the German Naval Attaché in London.[33] Clearly, the RMA had no wish to depend upon a foreign firm to supply this remarkably better form of naval propulsion. Unfortunately German private enterprise was at a loss. The RMA first saw possibilities in a turbine developed by the engineer Adolf Müller, but he was judged in violation of Parsons' patents.[34] The other options open to the RMA were not exclusively German. There was a system created by the American Curtiss Company in association with Allgemeine Electrizitäts Gesellschaft (AEG), and another of Swiss origin called the Zoelly System. Left with no option, the RMA later contracted with the Parsons Marine Steam Turbine Co., founded in Britain in 1897. It was not until 1903 that it built the navy's first turbine powered capital ship, the light cruiser S.M.S. Lübeck, in cooperation with Vulcan-Stettin.[35]

Without a private German firm involved deeply enough in turbine research to supply the navy with a Parsons quality engine, the RMA found itself without recourse. It was dangerous to rely so completely upon a foreign contractor for such an important breakthrough. There was no guarantee that the flow of parts and technical assistance would continue during wartime. Navy cfficials felt obliged to approach Krupp

---

[33]BA/MA RM3/2106 (1897-98) passim.

[34]BA/MA RM3/2106 passim.

[35]Ibid.

through the Kaiser in 1906, hoping that the Essen firm's substantial resources could successfully solve the problem. The effort was a failure. By 1911-12 the Parsons Co. still controlled the market. It powered two of the four König Class dreadnaughts with turbines manufactured by its subsidiary in Germany.[36]

The Armor Monopoly

Contrary to some historical interpretations, the naval authorities did direct efforts against signs of monopoly and price fixing.[37] However, the RMA met with mixed results in this area. In 1897, for example, the Construction Department was worried about the growing dominance of the Rheinische Metallwarrenfabrik of Düsseldorf in the production of boiler pipes. Concerted efforts in this area brought about successful competition from Mannesmann and Phoenix. Thus the RMA found itself with a group of very capable firms, excellent products and lower, more stable prices.[38]

It was not as easy to restrain Fried. Krupp of Essen, the best known land and sea arms manufacturer in the world. Anything related to high grade iron and steel was within the firm's area of

---

[36]BA/MA RM3/2298 "Lieferantenliste der deutschen Kriegsmarine" (Berlin, 1907), 66 (Section No. 46); S. Breyer, Battleships and Battlecruisers, 1905-1970 (Garden City, NY, 1973), 276.

[37]Here I take issue with P. C. Witt's assertion that the naval authorities were less than energetic in this regard. See P. C. Witt, Die Finanzpolitik des Deutschen Reiches von 1903 bis 1913 (Lübeck and Hamburg, 1970), 140 (Historische Studien, Heft 415).

[38]BA/MA RM3/2193 Bericht: KWK to SS/RMA, Berlin 5.5.1897.

expertise. Between 1890 and 1897 the RMA was fairly successful in finding a reasonable amount of competition for Krupp. Among others, Fritz Thyssen, the Bismarkhütte, Borsig and the Pilsen firm of Skoda competed to some degree in all areas of naval steel save one.[39] In alliance with Dillinger Hüttenwerke in the Saar, which began in 1893, Krupp completely dominated the armor plate industry.[40] Both of these firms were masters of armor technology, but Krupp alone was capable of producing the quantity the navy required. Here was the one alliance the RMA found nearly impossible to manage.

Dillinger was the major supplier of the navy's armor plate between 1876 and 1890. Before 1876 the modest amounts of armor Germany needed for naval use were made in Great Britain. Dillinger produced Wilson Process compound armor for the German Admiralty during the 1880's.

The RMA invited Krupp to participate in armor production in 1890. Three years later, almost simultaneously, the firm purchased the company of Gruson-Magdeburg and entered into its alliance with Dillinger.[41] Their perfection of the 420 nickel-steel armor process in 1894 gave the alliance, now dominated by Krupp, a monopoly in the

---

[39]BA/MA RM3/2190 "Zu BII 6466 von BII 6065" 11.24.1891 (RMA inter-office correspondence). RM3/2192 "Bismarckhütte to SS/RMA, Berlin 10.19.1895. RM3/2298 "Lieferantenliste," Berlin, 1907, Sections 1,2,3.

[40]BA/MA RM3/2193 Report: KWK to SS/RMA, Berlin 9.1.1897.

[41]HA Krupp, Krupp, 1812-1912 (Jena, 1912), 365. Krupp acquired Grusson-Magdeburg on 1 May 1893.

production of top grade armor.[42] By 1898, when Krupp's German patent on the nickel-steel armor process expired, the firm made sure its patent was extended to restrict the possibility of new firms entering the market.[43]

Early in Tirpitz's term at the RMA, he encouraged firms like Skoda, Thyssen and Rother Metallwerk in Düsseldorf to compete with Krupp and achieved some success in orders of small armor plate, rivets, container coverings and fasteners. Yet as naval expansion and more effective artillery required larger quantities of high grade steel armor, the Krupp-Dillinger alliance became unequaled.[44] They constantly drove ship prices up and shared responsibility for contracts signed by one or the other with the RMA.[45]

---

[42]HA Krupp WA IV 753 The History of Armor Plate Manufacturing by Fried. Krupp, 17. 420 Nickel-Steel Armor = 150 mm. thick, 3 layers, .34% carbon, .3% nickel, 2% chrome. (Process perfected: 7.14.1894. First sales: 1895. First ships: S.M.S. Freya, Hertha and Kaiser Class Battleships.) The use of nickel-steel armor reduced by almost 50% the amount needed to render a ship "safe." It was also over 2300 marks/ton as opposed to about 1500 marks for the old compound plate. Some historians see this as a true saving for the RMA and a value worth the price. The latter was definitely true, but given Krupp's high prices during this period, the former was hardly the case. For the opposing view, see Richard Owen, op. cit. Armor and its foreign and domestic price will be further explored in later chapters.

[43]HA Krupp, FAH III B39 "Gesichtspunkte, die für die Frage der Behandlung unseres neuen Panzerplatten-Fabrikations . . ." 1898.

[44]BA/MA RM3/327 Fried. Krupp, Gusstahlfabrik, Essen to SS/RMA, Berlin 2.26.1897. RM3/327 Dillinger Huttenwerke, Dillingen, Saar to SS/RMA, Berlin 2.19.97. RM3/327 RMA-Construction Division to Dillinger 1.12.97.

[45]Armor prices sometimes forced budget amendments in the midst of construction: e.g., Light Cruiser "K": (11.16.1896) original

A report by the Weapons Division of the RMA in 1899 blamed the rapid price changes and the monopoly of the Krupp-Dillinger alliance on advanced technology.[46] Only a few firms successfully employed the new Harvey Process of manufacturing nickel-steel armor: Krupp and Dillinger in Germany; Vickers and Armstrong in Britain; and Schneider in France. In the United States the armor powers were Carnegie, Bethlehem, and later Midvale. However, the anti-trust groups in the U.S. made it difficult for American firms to appear close to an alliance or combination. There were no such legal or popular limitations in Germany.

The 1899 report gave much attention to the United States where the Congress and Secretary of the Navy Herbert were monitoring the drastic rise in armor prices. Herbert was a Democrat, an anti-trust advocate, and he did not hide his suspicions regarding collusion in the steel industry.[47] The Congress was even investigating the possibility of a government-owned factory, and there were efforts to legislate the lower price of 1200 marks ($300) per ton.

---

estimate for armor = 500,000 marks: (1.18.1897); portion paid for = 193,004.82 marks; difference = 306,995.18 marks; payment necessitated by price increases = 470,000 marks; total budget increase needed for 1898 = 163,000 marks. See: BA/MA RM3/6071 KWK to SS/RMA, Berlin 1.18.1897.

[46]BA/MA RM3/6650 "Denkschrift über die Entwicklung des Panzerplattenmaterials in den letzten 10 Kahren unter besonderer Berücksichtigung der Preissteigerung" Berlin 11.29.1899. Weapons Division (W), RMA.

[47]B. F. Cooling, Grey Steel and Blue Water Navy. The Formative Years of America's Military Industrial Complex 1881-1917 (Hamden, Conn., 1979), 120.

The latest figures for American naval armor purchased raised a few eyebrows at the RMA. Bethlehem and Carnegie wanted 2180 marks per ton for first quality 4% nickel steel (1899). Krupp, which sold its superior steel for 2320 marks per ton in Germany, offered it to the U.S. Navy for 2192 marks. The reduction of 128 marks only served to underscore the difficulty the RMA was having with the armor alliance.[48]

The RMA attacked Krupp's position whenever it felt there was a chance for success. But in this case, the odds were overwhelming against the RMA. Krupp produced not only most of the navy's best armor, but also naval steel for every other use and all of the heavy guns for Tirpitz's battleships. Its shipyard facilities at Kiel were vital to the navy's growth. Tirpitz and his construction people consequently found themselves in a dilemma. They had to make sure the firm received every bit of help the navy's resources could muster, while they sought to draw new competitors into the armor field.[49]

Such was not the case in areas where the RMA committed itself to research, such as the exploration of ways to insulate battleship bulkheads. The navy needed a non-flammable, light-weight material for this purpose. The problem here was not a lack of subcontractors, but

---

[48]BA/MA RM3/6650 op. cit., fn. 125.

[49]BA/MA RM3/1072 For example, in the 1890's Freiherr Speck von Sternberg (the Army's Attaché in Washington, D.C.) sent a great deal of U.S. armor and artillery trial results to Krupp. The Naval Attaché did the same on a regular basis, e.g., Krupp, Essen to SS/RMA 3.27.1893--acknowledging the receipt of such information. Other firms did not receive similar treatment.

one of discovering a specialized material. The RMA worked with many firms supplying asbestos, rubber, wood, cork, and various synthetics. Afterwards it decided to employ a number of different materials according to the changing requirements in various sections of the ship. In this area the RMA directed research and relegated the firms to a secondary role.[50]

Involvement in materials research was a natural thing for any enterprise obliged to keep pace with engineering techniques. So it is no surprise that the RMA was advanced in this respect. Something like the turbine engine, however, was a dramatic innovation in engine design requiring extensive amounts of time, capital, and testing. Here it was always Tirpitz's policy to wait and to allow private business to perfect these systems before the navy judged them fit or unfit for military use.

Overruns in Time, Weight and Cost: The Formation of the Protocol System

Building capital ships required such a diversity of materials and skills that it resulted in many problems. In the early 1890's the German shipbuilding industry was still growing. It was backward and often lacked the skills or tools to keep up with the work schedules adopted by the RMA. In 1894 and 1895 the S.M.S. Kaiser Friedrich III, Victoria Louise, and Hertha were all finished behind schedule. The

---

[50]BA/MA RM3/2552 "Versuche mit Materialien" (See also: BA/MA RM3/2249-51 passim, on the insulation question).

subcontractors were often at fault. Flue pipes, boiler steel, armor and other parts and tools were frequently slow in arriving at the construction site.[51] This was understandable then, but many manufacturers, especially Krupp and Dillinger, kept up this annoying habit well into the 1900's.

Overruns in cost and weight were chronic problems. The Construction Inspectorate had to report every variation in cost or weight which deviated from those specified in the contract. Thus the construction documents of all German ships were cluttered with cost and weight reports on everything from locks and hatches to armor plate.[52] The overruns ranged from insignificant sums to difficulties costing thousands of marks and kilos. One inspection report from the Imperial Yard in Kiel informed the RMA that the parts inventories for two light cruisers averaged 3,300 marks above specified contract cost.[53] Many other cost problems were attributable to inflation and overpricing by firms. Three armored capital ships purchased by the RMA over a five year period rose dramatically in price from 4.5 million to 9.6 million marks.[54]

---

[51]BA/MA RM3/6650 "Die Frage: 'Weshalb hat sich die Fertigstellung der Armierung bisher verspätet und Weshalb wird das Kommende schneller Fertig werden.'" RMA Memo "An N('dept')" 11.27. 1899.

[52]BA/MA RM3/443 Construction Records: S.M.S. Wittelsbach 1898-1902.

[53]BA/MA RM3/6071 BBS, KWK 12.24.1896 to SS/RMA, Berlin. Re: Light Cruisers "K" and "N."

[54]BA/MA RM3/347 "Zusammenstellung von Schiffsneubauten bei 1897/98 und Neubauten den Schiffe Sachsen Klasse."

The RMA responded to such problems with a very effective system of regulations and protocol. It began during the Hollmann period and was refined and perfected during the Tirpitz years. The accounting functions of the Imperial Shipyards, the role of the Purchasing Office, and the resident instructor at every yard represented only a small part of the entire picture. This RMA Protocol System involved the firms in a labyrinth of requirements, tests, and screening that became the single most important lever the RMA possessed in its relationship with industry.

The roots of the RMA protocol lay in its first efforts to reach the level of technical expertise shared by the world's naval leaders. Under Dietrich's direction, construction experts attended most of the major international conferences dealing with topics essential to naval development. Most important among these were the international congresses on testing methods held in Zurich in 1895 and Stockholm in 1897. Here RMA officials accumulated valuable information regarding new construction methods, all manner of tests for materials, and procedures for shakedown cruises.[55] This free exchange of technical information enabled the RMA to take advantage of sophisticated procedures, like the Zerissenprobe, or breaking test, which strained such substances as Siemens-Martin cast iron and Schneider-Creuzot steel to their limits. The new techniques and information allowed Dietrich's people to judge the quality of the supplies it purchased

---

[55]BA/MA RM3/2098 "Bericht über die Verhandlungen der internationalen Konferenz zür Vereinfachung einheitlicher Prüfungsmethoden . . ." 9.9-11.1895.

more accurately and to formulate a strict set of quality codes governing all naval purchases.

German naval attaches gathered further information on foreign firms. Besides developments in Britain, the RMA was particularly interested in the United States because the theory of battleship superiority reigned supreme in the U.S. That placed the Americans in a situation closely akin to the Germans both in strategic theory and in their stage of naval growth. The RMA closely followed the U.S. Navy Department's relations with Carnegie and Bethlehem Steel on the armor issue.[56] It also kept close tabs on publications in American technical journals and shake-down cruises. One example was the first trip of the light cruiser U.S.S. Cincinnati. The information in this report to the State Secretary included data on boilers, steering mechanisms and propulsion.[57] In the case of the battleships Alabama and Kearsarge the naval office scrutinized American purchasing procedures as well as the engine systems.[58]

The RMA built a foundation of regulations to govern its work with industry. By 1894 the General Guidelines for naval projects appeared. These regulations stipulated routine construction site inspections and strict adherence to technical specifications. Every yard that contracted with the RMA received these specifications, called

---

[56]BA/MA RM3/1073 N.Y. Times article 2.26.1895.

[57]BA/MA RM3/1073 Trials of the U.S.S. Cincinnati.

[58]BA/MA RM3/1074 Report on the Probefahrten of the U.S.S. Alabama and Kearsarge. German Naval Attaché, Washington, D.C. to the SS/RMA, Berlin 9.7.1899.

the General Construction Guidelines, which varied according to the ship being built. The General Guidelines required a weekly accounting of man hours, work accomplished, and the amount and type of materials used. Safe working conditions and the purchase of construction tools and materials were entirely the responsibility of the yard or subcontractor. The Construction Department received quarterly financial reports, and any requests for RMA assistance became part of the monthly reports submitted by the project directors. Certain projects required workmanship guarantees from three months to one year.[59]

All shipyards in Germany were subject to the same forms of supervision and review regarding work for the RMA. The RMA Technical Department always had experts at the various naval yards whose duties included further inspection of sophisticated system components. In this function they were, in many instances, double checking the tests performed by the Purchasing Office of the RMA, which restricted its work to the production sites of the various subcontractors. If material was acceptable, then the Technical Department people supervised and often assisted in its installation at the yard.

The ultimate authority regarding all phases of ship construction at the individual yards was the Construction Inspectorate. Usually one naval official functioned as inspector for every project in every yard and reported directly to the Construction Department. This was a very common method of supervision. Even foreign countries with projects underway at German shipyards attached an official to that yard as

---

[59]BA/MA RM3/115664 Allgemeine Bestimmungen, 1894.

inspector. There were Russian, Greek and Dutch naval personnel at Schichau, Vulcan and Blohm und Voss, while Germania often played host to Austrians, Chinese and Norwegians.[60] Both the Foreign Office and the RMA had to be informed of their presence, but the latter had no control over relations between the private yards and foreign nations until the War. The only dividend the RMA received was the designs and specifications of all foreign ships built in domestic yards.

The Construction Inspector was the ultimate interpreter of the maximum amount of hours and output the RMA could expect from any yards' workforce. It was also his duty to pinpoint and remedy any technical snags in construction in order to avoid falling behind schedule. Dietrich and his successors at the RMA Construction Department found it profitable to allow the inspectors as much independence and responsibility as possible. In that way the officials were able to adapt more quickly to any problem confronting them without constantly contacting Berlin. The Private Shipyards sent all correspondence with the RMA via the resident inspector. In this way the latter could comment on the contents of any communication and the RMA would immediately see both sides of an issue.[61] This procedure also confirmed the authority of the Inspectorate and strengthened the RMA in its relationship with the Private Yards. (See Appendix B)

---

[60]BA/MA RM3/1063; see also volumes 1098; 913-15, passim.

[61]BA/MA RM3/421 See, for example, KI, KII and KIV inter-office correspondence.

The most important element of the valuable RMA protocol system was the Lieferantenverzeichnis or Suppliers List. This directory was a list of all firms, great and small, which were permitted to work on naval projects. Without a listing here a company could not act as a subcontractor to a shipyard working for the Imperial Navy. The complicated qualification procedure required a formal petition.[62] A company could apply for a listing for one or more of its products in a specific category or categories. Very often smaller firms would have themselves introduced by their Chambers of Commerce. Then a Construction Department official would go to the firm to inspect its plant facilities, labor force, and its capital and financial stability.

If the RMA expressed no reservations a company had to supply samples of its material or product at its own expense for tests at some official navy testing center according to established RMA standards. Provided the tests were acceptable, the firm was then added to the Suppliers List, but only in the specific category for which it applied. Very often a firm could fail to qualify one of its products but have no difficulty with another. The Suppliers List was the ultimate screening procedure used by the RMA. If a firm once qualified and the Purchasing Office or Construction Inspectorate felt its products were falling below standard, it was removed. Unless it requalified there was no hope of further contracts with the RMA.

When Tirpitz arrived at the RMA in 1897 a good deal of the protocol system was already in existence. It was left to him to

---

[62]BA/MA RM3/2210 Consideration of a firm for the Lieferantenverzeichnis (1910).

expand it as the needs of the fleet required and make it work effectively in a wide variety of situations. Because he was able to provide the navy with ample parliamentary funding, the navy's expansion was a potential source of huge profits for German industry. If businesses wanted to work on naval projects they had to follow the RMA's regulations. With the exception of areas of high technology this procedure assured the RMA of a strong position in its relations with industry.

Summary

In the early years of Tirpitz's naval program, he often felt obliged to make industry more secure and responsive by favorable treatment. The State Secretary needed to develop a core of firms willing to extend themselves enough to prepare the navy for the eventuality of mobilization. In his memoirs the Admiral gave this as one guiding precept of his contract policy:

> At the time I gave out contracts, including victualling, clothing, coal, etc. on the condition that the contracting private firm made arrangements to proceed forthwith to an increased output in the event of mobilization.[63]

The preferential distribution of contracts was an important informal tool to force the armaments industry to conform to naval requirements. They supplemented the Protocol System which served as the primary tool Tirpitz used to deal with industry. The effectiveness of the system was vital because of the accelerated pace of production after the navy's success in the Reichstag. Industry no

---

[63]Tirpitz, op. cit., vol. 1, 38.

longer had to question RMA promises of possible profits. The Naval Law of 1898 made Tirpitz's promises good. Now that his program was underway, his most immediate task was to impose his system of controls on industry.

During this period the naval authorities rapidly discovered certain areas which would present the greatest difficulties. The first was in the production of armor plate. Krupp and Dillinger possessed the strongest armor monopoly in the world. They were charging the navy higher prices than their foreign customers paid and openly resisting any controls imposed by the RMA. Secondly, the Construction Department was hard pressed to curb massive cost and weight overruns on projects large and small. Tirpitz and his associates were discovering early the problems involved in large scale expansion.

Other areas of difficulty originated with the RMA. Tirpitz's cautious policy regarding research and development was intensified by his determination to populate the fleet exclusively with battleships and cruisers. This combination restricted the activities of the Technical and Construction Departments of the RMA. They had to play the role of observers while the Parsons company extended its lead in turbine development far beyond the scattered and primitive efforts of German firms. The same was true of experimentation with the U-boat. The RMA was well aware of French, American and German research efforts with submersible vessels. According to official RMA policy, however, official involvement was both too expensive and a wasted effort in terms of accepted strategy.

## CHAPTER II

## FURTHER EXPANSION AND THE SECOND STAGE: 1899-1901

Between 1899 and 1901, Tirpitz maintained the momentum gained by the fleet expansion plan. As he began to push the second stage of his program through the Reichstag in the form of the 1900 Naval Law, the world situation seemed to bear out the State Secretary's political argument for increased naval expenditure. Germany's relations with Britain, France and the United States deteriorated markedly, and Tirpitz sought to convince the public that the lack of naval clout was responsible for Germany's poor performance in various international crises.

There was no need to court industrial support for further expansion. German and foreign firms were anxious to benefit from Tirpitz's substantial budget. The major difficulties Tirpitz and his associates had encountered in their early relations with industry continued. The options open to the RMA in some of these matters were few. Although the Protocol System seemed well conceived to address overruns in cost and weight, the RMA seemed doomed to only limited success in arresting the overruns: a permanent solution was unlikely. The RMA could only impose the strictest sanctions possible against these particular violations, which were not likely to disappear unless the building program ended.

In the case of the armor monopoly, Tirpitz tried to press Fritz Krupp officially and publicly, only to discover that the head of

the House of Hohenzollern was the industrialist's trump card. The State Secretary's policy of limited research and development heightened the RMA's difficulties. His technical personnel found themselves at an increasing disadvantage as recent products of high technology proved useful for naval purposes. Tirpitz's policies also increased the confusion in efforts to develop a continental turbine to rival the Parsons machine. Only in the area of U-boat technology did the Admiral's policy change. Submarines were already a proven part of the French navy and the Americans were interested in the Holland vessel. Both public opinion and Reichstag pressure forced a reluctant Tirpitz to obtain a number of U-boats from the Germaniawerft and to extend the development efforts of the Imperial Shipyard in Danzig.

## Political Background

In 1897, Bernhard von Bülow became Foreign Minister and, in 1900, Chancellor.[1] His rise, along with Tirpitz's appointment as State Secretary, clearly signalled the adoption of the so-called "new course" toward a Weltpolitik for the Reich. Bülow shared the Kaiser's ambitions for world power. A naval force was the tool essential for establishing and protecting Germany's position as a world, rather than merely continental, power. Therefore, Bülow never sought an alliance with Great Britain because he knew Tirpitz's naval plans and the Kaiser's attitudes. As Paul Kennedy pointed out, the new foreign

---

[1]Bernhard Furst v. Bülow: 1888 - Legate in Bucharest; 1893 - Ambassador in Rome; 1897 - Foreign Minister; 1900-1909 - Reichschancellor and Prussian Minister President.

minister saw the need to preserve good formal relations with Britain for a period of time:

> . . . he himself told the Kaiser and Tirpitz in 1897 that "a really honest and trustworthy Anglo-German alliance" was irreconcilable with the intended naval expansion and "more or less means the renunciation of it."[2]

This was the source of lasting antagonism over which the Haldane negotiations faltered in 1912.

Bülow and the Kaiser interpreted every crisis in terms of how Germany would appear in contrast to other powers. Moreover, every tense situation seemed to echo the Kaiser's request for a vastly increased navy. The growing power of the United States in South America, the Far East, and the South Pacific made it seem a direct threat to Germany's emergence upon the world scene. Bülow and the Kaiser insisted upon some share in the carving up of Spain's Pacific Empire and overreacted to American successes in the Spanish-American War. This attitude nearly led to a shooting confrontation between Commodore Dewey and Vice Admiral von Diedrichs' superior cruiser force off Manila Bay in June of 1898.[3]

Immediately afterward, in 1899, Bismarck's old settlement of the Samoan problem broke down. Faced with a full-scale island civil war, Germany, Britain and the U.S. had to repair or replace the tripartite supervision of Samoa outlined in the Berlin Act of 1889. In return for securing her reputation, prestige and, possibly, a few

---

[2]P. Kennedy, Anglo-German Antagonism, 226.

[3]H. Herwig and D. Trask, Politics of Frustration (Boston, 1976), 28-29.

coaling stations, Germany exacerbated its relations with the U.S. only one year after the Dewey-Dietrichs confrontation. The friendly attitude of the British toward the Americans during the war with Spain pulled the English-speaking powers together. The Germans became all the more isolated.[4]

These setbacks served to reinforce sentiments among Germany's citizenry that she was the victim of superior power. Would the U.S. or Britain have dared act as they did if Germany's fleet was up to standard? They interpreted the rise of American power as an open political and military challenge and regarded Britain's performance in Samoa in the same light. The English search of a German commercial ship in Delago Bay in 1899 set off sparks in the German press to the glee of naval expansionists. The seizure of the Bundesrath and other steamers on the suspicion of supplying contraband to the Boers was only one more in a succession of outrages. The Kaiser and Tirpitz returned to these themes repeatedly and, bolstered by economic and political pressure groups, argued for more fleet money. Ships were the key to Germany's relief and Wilhelm characteristically blustered to Bülow in 1899 that the fleet would change things: "After twenty years, when it is ready, I will adopt a different tone."[5] With Tirpitz in charge of naval development, these words took on a more concrete significance.

---

[4]See: P. Kennedy, The Samoan Tangle (Dublin, 1974), passim.

[5]H. Herwig, et al., Politics of Frustration, 34.

The last step in the creation of the modern naval command structure came on 14 March 1899. The Supreme Command was replaced by the Admiralty Staff. In peacetime this new organization was in charge of strategic planning, training officers in staff duties, and naval intelligence. During war it directed all naval operations with the Kaiser's approval.[6]

In the year 1899, the Construction Department also experienced a change. Dr. Dietrich had retired the year before after seventeen years as the director of naval construction. His post was left vacant for a few months while Tirpitz searched for someone to pilot the new construction program authorized by the Reichstag. On 10 November 1899 Captain von Eickstedt was appointed head of naval construction and held the post until his retirement as a Vice-Admiral in 1906.[7]

## The Progress of Construction

In the first naval law the Reichstag recognized an existing German fleet of twelve battleships, ten heavy cruisers and twenty-three light cruisers in service or under construction by April 1, 1898. Therefore, the limits set by the law for construction through 1903 included seven battleships, two heavy cruisers and seven light cruisers in order to bring the total in service and reserve,

---

[6]H. Herwig, The German Naval Officer Corps (Oxford, 1973), 26.

[7]von Eickstedt: Rear Admiral - 3.11.02; Vice Admiral - 1.27.06; Vice Admiral (ret.)- 1906. The discussion about a man for this post also involved some industrial leaders, like Hanns Jencke, Director of the Krupp Firm. HA Krupp, FAH III B127. Jencke to Krupp 3.24.1899.

to a legal limit of nineteen battleships, twelve heavy and thirty light cruisers.[8]

The first class of battleships laid down according to these regulations was the five-ship Wittelsbach Class (Wittelsbach, Wettin, Zähringen, Mecklenburg and Schwaben). Built between 1899 and 1903 these ships cost an average of 22.3 million marks each, with a displacement of 11,774 tons normal.[9] The main armament consisted of four guns of 25 cm., eighteen of 15 cm. and twelve of 8.8 cm. This class brandished one submerged torpedo tube more than the five which the Kaiser Friedrich III Class possessed. The Torpedoes used were of the 45 cm. variety.[10] During this period advances in propulsion and gyroscopic guidance extended torpedo range to at least 1600 meters.[11] Armor specialists and gun designers consequently had to strengthen waterline belt armor and extend the range of heavy guns.

The ships of the Wittelsbach Class were capable of a maximum steaming range of 5,850 sea miles (at 10 knots) and a minimum of 3,150 sea miles (at 16 knots).[12] The power-plant consisted of three

---

[8]Hurd & Castle, op. cit., 328-29. (Text of the 1898 Naval Law.)

[9]The term normal is employed to designate weight at the time of shakedown cruise, with partial complement and less than half of normal fuel load.

[10]E. Gröner, op. cit., 20.

[11]H. Herwig, The Luxury Fleet (London, 1980), Table 6. Also: 1 knot/hr = 1.15 mph or 1.85 km/hr; 1 sea mile = 1 nautical mile = 1.85 km or 1.15 miles.

[12]E. Gröner, op. cit., 20.

triple expansion engines powered by six Schulz-Thornycroft and six cylindrical boilers.[13]

The bids entered for the Wittelsbach Class prompted the RMA to award two to an Imperial Shipyard and three to private firms. The S.M.S. Wittelsbach and Schwaben were given to Wilhelmshaven while Schichau received the Wettin; Germaniawerft, the Zähringen; and Vulcan, the Mecklenburg. While the cost of the ships at the private yards varied very little, the same was not the case for the Wilhelmshaven contracts. The 22.7 million marks paid for the Wittelsbach (1899-1902) was the highest amount of the five, by a slim 100,000 marks. However, the Schwaben (1900-1904) was markedly cheaper, costing 21.7 million, i.e., between 600 and 900 thousand marks less than any private firm.[14] Once the Wilhelmshaven Yard was properly tooled and prepared for a particular ship design, it was fully capable of saving the RMA a great deal of money.

In the later Deutschland Class the 24.25 million marks it cost to build the S.M.S. Hannover at Wilhelmshaven was the lowest as compared with Germania, Vulcan and Schichau. The Imperial Yard's first experience with a dreadnought, the S.M.S. Nassau (1907-1909), resulted in an expenditure of 37.39 million marks. This represented the most expensive ship in the class after the S.M.S. Westfalen (A. G. Weser, 1907-1909). However, in the next dreadnought class, the price the RMA

---

[13]A. Preston, Warships of World War I (Harrisburg, Pa., 1972), see: Wittelsbach Class.

[14]E. Gröner, op. cit., 20.

paid at Wilhelmshaven for the Ostfriesland (1908-1911) was 43.5 million marks. This ship was the cheapest of the four in the Helgoland Class by 2.3 million marks.

The comparison between the Wittelsbach-Schwaben example and the Nassau-Ostfriesland case illustrates well the capability of the Imperial Shipyards to enforce sorely needed economies to the benefit of Tirpitz's strained finances. As well, the Wilhelmshaven Yard was mark for mark, as good or better than the private shipyards in battleship building, and a valuable alternative for the RMA when bids seemed a bit too high. Doubtless, Tirpitz often wished that Wilhelmshaven could build more ships than its limited capacity allowed.

The Schwaben project saved enough for the entire Wittelsbach Class to remain within the appropriation.[15] Based on the 1899 budget, for example, the Wilhelmshaven Imperial Shipyard saved the RMA 662,000 marks which, along with Germaniawerft's 214,000 marks saving more than balanced out the cost overruns experienced by Vulcan, Schichau and Wilhelmshaven's S.M.S. Wittelsbach project.[16]

Both of the heavy cruisers budgeted during this period were given to the Imperial Yard at Kiel. The S.M.S. Prince Heinrich ultimately cost 16.6 million marks and weighed 8,887 tons, normal. At a speed of 18 knots it had a range of 2,290 sea miles which could be extended to 4,580 at 10 knots. This cruiser carried two 24 cm guns, ten of 15 cm, ten of 8.8 cm and four 45 cm torpedo tubes.

---

[15] V. Berghahn, Der Tirpitz Plan, 618 (Table 34).

[16] Ibid.

The S.M.S. Adalbert, laid down in 1900, had similar dimensions and the same armament as the Prince Heinrich. For that matter, all German heavy cruisers finished before 1905 had a similar offensive power. However, the Prince Adalbert exhibited a marked increase in speed and range over the Prince Heinrich. The former held greater amounts of coal and oil, and at a speed of 18 knots exceeded the Prince Heinrich's range by 690 sea miles. At 12 knots the Prince Adalbert was capable of 4,970 sea miles, an expanse the earlier cruiser could match only at 10 knots. The Friedrich Carl, Roon and Yorck later continued this trend of ever greater speed and steaming range for the heavy cruisers through 1905.[17]

Only one of these two heavy cruisers exceeded the budgets appropriated for it. In 1898, the Prince Heinrich went 1,329,000 marks over its yearly budget, but in 1900 the Prince Adalbert came in 1,258,000 marks under its projected cost. This deficit of 71,000 marks for Tirpitz's first two cruisers in their initial budget years marked a beginning almost as favorable as that in the battleship program.[18]

Construction of the smaller vessels was also accelerated. Six small cruisers were laid down between 1898 and 1900: three at A. G. Weser (Niobe, Ariadne, Medusa); two at the Germaniawerft (Nymphe, Amazone); and one at the Imperial Yard at Danzig (Thetis). All but the Niobe and Nymphe, both begun in 1898, were built within appropriation, and the cheapest of the six was the Danzig's Thetis at 4.5

---

[17]E. Gröner, op. cit., 23.

[18]V. Berghahn, Der Tirpitz Plan, 618 (Table 34).

million marks.[19] The larger high seas torpedo boats were produced at approximately one million marks each. Schichau had been the exclusive producer of these boats since 1886,[20] and that only changed slightly in 1900. The Elbing firm started eighteen new boats between 1898 and 1900, and the RMA awarded Germaniawerft six.[21]

The Protocol System: Cost and Weight Overruns

Along with its inspection system, the Suppliers List remained the strong point of RMA protocol policy vis-á-vis industry. The latter was always in flux and never final, because the RMA deleted or added firms as it saw fit. In 1900 the RMA circulated versions of the Suppliers List among all the firms dealing with the navy. It recorded companies removed for financial instability, legal and military code violations[22] or those deemed unreliable because of certain business practices.[23] Other firms listed were those being readmitted to the List after their products passed standards set by the RMA.[24] Beyond

---

[19]E. Gröner, op. cit., 27.

[20]The one exception to the virtual Schichau monopoly of torpedo boats between 1886 and 1900 was the D-10. It was a product of Thornycroft, London.

[21]E. Gröner, op. cit., 34.

[22]The "military code" violations in the area of supply were determined by the Prussian War Ministry. See: BA/MA RM3/2304 "Mittellungen uber Ausschliessungen und Wiederzulassen von Lieferern und Unternehemern," Berlin 7.3.14.

[23]BA/MA RM3/2294: regarding controls developed during the formation of the L.V.

[24]For example: BA/MA RM3/2307 Torpedo Inspectorate, Kiel to SS/RMA, Berlin 9.16.16.

these controls, the officials of the Purchasing Office[25] and the Construction Department both cleared naval purchases and conducted on-site plant inspections of naval contractors.[26] The system was strict and effective, limited only by its designers' abilities and the political and economic power of heavy industry.

Private industry often encouraged the RMA to expand the number of firms on the Suppliers List in order to keep the prices charged by subcontractors down to a minimum.[27] However, if the RMA included many privately favored firms, the coercive power of that instrument would decline. On the other hand, many industrialists regarded any efforts to use the List strictly as too restrictive, and they occasionally accused the RMA of interfering with free competition. That accusation did not overly impress Eickstedt or Tirpitz in their struggle to get the best deal for the navy.

In awarding contracts to shipyards the RMA's system was somewhat similar to other world naval powers. Much of the fine print in German naval contracts was taken from the standard British forms. For example, the RMA replaced the "controller" of British contract language with the Inspector who was directly responsible to Tirpitz, via the Construction Department, for his project. These parallels with

---

[25]Kaiserliches Marine Abnahmeamt (ABA), Graf Adolfstrasse 53, Düsseldorf.

[26]BA/MA RM3/2066, passim. Max Krause (Director of Borsig Berg- und Huttenverwaltung) to Herrn Langner, Geheime Admiralitätsrat, RMA, Berlin 10.1.01.

[27]BA/MA RM3/458 Vulcan, Hamburg to SS/RMA, Berlin 4.25.00.

British policies applied also to product guarantees, pay schedules, work stoppages or slowdowns, patent matters and cost and weight changes among others.[28]

There were occasional exceptions to RMA contract provisions. In one instance, Schichau successfully approached the Danzig Construction Inspectorate for permission to raise the price of a ship's coal bunker. As a result, the spending ceiling, spelled out in the contract, required adjustment.[29] Contract specifications formed a structure within which the RMA and its primary suppliers operated. It was up to Tirpitz, in close cooperation with von Eickstedt,[30] to keep exceptions to a minimum and firms within contract restraints as well as they could.

Like the naval authorities of other nations, the RMA imposed financial penalties if the construction schedule outlined in the contract was not met. In one such instance, the RMA informed Germaniawerft that a 3.5% penalty would be imposed if the proper schedule was not maintained. The percentage pertained to the ship as a whole or any material Germania had agreed to supply within a specified time. The total price of the object multiplied by 3.5% and

---

[28]BA/MA RM3/6007 British Admiralty Contract Forms; Correspondence between KII and KIV, April 1901.

[29]BA/MA RM3/452 Correspondence between Schichau and BBS Danzig, August 26-29, 1901.

[30]Tirpitz - Construction department cooperation was the basis for contract awards. E.g.: BA/MA RM3/471 Construction Department Memo to SS/RMA, May 1901.

the length of the delay, was deducted from the total price paid to the yard.[31] This financial penalty system was similar, but not identical to that of other navies. The United States, for example, used a flat rate by the day for ships that were behind schedule. There was a $300 penalty per day for the first month and $600 every day thereafter.[32]

Construction schedules proposed by the shipyards were an important consideration in the awarding of RMA contracts. The navy did not expect capital ship bids to vary greatly. In the Braunschweig Class, the ultimate prices paid for the five ships varied only between 23.8 and 24.3 million marks. However, the suggested pace of construction and the schedule of installment payments varied greatly. Every battleship was financed in four installments.[33] Blohm und Voss suggested that the second payment, bringing the S.M.S. Braunschweig to half completion, would come after sixteen months and the final or fourth payment should come due in the twenty-third month.[34] Germania offered a somewhat tighter schedule. Payment two would come at month twenty-one and the final installment in the twenty-fifth month.[35]

---

[31]BA/MA RM3/471 SS/RMA, Berlin to Germania-Tegel, Berlin, 5.24.01.

[32]BA/MA RM3/1077 Naval Attache U.S. Embassy, Berlin 7.6.03 to SS/RMA, Berlin.

[33]BA/MA RM3/6026-27-28 passim. Final ship prices were usually higher than original bids. However, neither figure varied dramatically from PW to PW on any given project.

[34]BA/MA RM3/471 Blohm und Voss, Hamburg 5.8.01 to SS/RMA, Berlin.

[35]BA/MA RM3/471 Germania, Tegel-Berlin 5.11.01 to SS/RMA, Berlin.

Vulcan's schedule called for payment two at the twentieth and the final payment at the twenty-seventh month.[36] Germaniawerft received the contract for the S.M.S. Braunschweig, the first of its class, mostly because of the RMA's preference for Krupp's proposed payment scheme and its efficient construction schedule.

The navy paid any monies owed to a subcontractor for armor, guns, electrical parts and the like through the shipyards.[37] The only major concern here was to keep the project on schedule and material quality up to par. If the Construction Inspector did not consider the subcontractor's obligation fulfilled, for any reason, the firm's money would not appear in the installment paid to the shipyard.[38]

In response to questions from the new State Secretary of the Imperial Treasury Office von Thielmann,[39] Tirpitz defended his disbursement of shipbuilding funds. Whether small contracts handled by the Imperial Yards or huge payments via installments to shipyards, he asserted that the "current form of disbursement of shipbuilding funds is not only the cheapest but also politically the best." However, he did not take all the credit for himself, noting that the system's

---

[36]Ibid., Vulcan-Stettin, 5.10.01 to SS/RMA, Berlin.

[37]For example, see: BA/MA RM3/6029 "Rathenwertheilungsplan, 1901."

[38]One such case developed with Krupp armor in 1901: BA/MA RM3/6073 Krupp, Essen 3.14.01 to SS/RMA, Berlin.

[39]von Thielmann - SS/RSA 1897-1903.

history recommended it: "As proof I declare that it had functioned faultlessly from 1887 to 1897."[40]

One of von Eickstedt's first efforts to address the more difficult problems of construction pertained to cost and weight control. Together, the contract and the General Guidelines dictated RMA expectations of time, weight and cost for every stage of a project.[41] Unfortunately these standards were not easily enforced. The puzzle was not how to set weight standards for an entire ship or class, although the RMA found some of the yards less than cooperative on that count.[42] The major difficulty was the increase in a ship's construction time, weight and cost from small overruns on individual projects adding up over the long run. The proper procedure in these smaller cases was to clear any cost, time or weight overrun with the Construction Inspector at the yard and then report it to the RMA for final approval. The General Guidelines stipulated that the RMA would pay for additional materials, labor, and supervision. In these cases, the RMA placed a 15% ceiling on the amount the yard could take as profit.[43]

---

[40]BA/MA RM3/6029 Tirpitz to SS/RSA, Berlin 12.22.01.

[41]BA/MA RM3/458 Construction Department, Berlin to KWW 3.16.00. RM3/277 Allgemeine Bedingungen, 1900.

[42]BA/MA For example: RM3/360 Schichau, Elbing to SS/RMA 9.29.1899. Schichau complained that light cruisers could not be built at less than 3100 tons, let alone the 3000 tons the RMA wanted. RM3/360 "Bericht des Marineattachés des Kaiserlichen Botschaft zu Washington #77. Die neue Kreuzer von Denver Klasse." Washington, D.C. 7.19.1899. American light cruiser tonnage averaged between 2500 to 3400 tons for the Denver Class.

[43]BA/MA RM3/277 (see fn. 44).

Many cost, weight and time overruns resulted from the failure of various industries and businesses to solve the problems posed by increasing demand. Sometimes a lack of cooperation between yards in sharing designs and technical information created expensive slowdowns.[44] Changes in designs frequently revealed just how little communication there often was between the yards and subcontractors. This, in turn, caused delays in the final designs and increases in weight and consequently costs increased.[45] An RMA memo of 1899 also blamed slow and expensive plant expansion on the suddenness of naval needs[46] and the problems of adaptation.

Growing pains were not entirely to blame. Schichau's work on the S.M.S. Wettin of the Wittelsbach Class, plagued by cost and weight overruns, seemed to run consistently in the red. Difficulties arose with everything from turrets much heavier than anticipated, to a more expensive ventilation system to technical problems with watertight doors.[47] The S.M.S. Wettin was not the exception; it was the rule.

---

[44]BA/MA RM3/452 Construction Dept., Berlin to Schichau, Danzig 12.28.01.

[45]For example: BA/MA RM3/458 Vulcan, Hamburg to SS/RMA 6.29.00. See also RM3/449 and 285 passim.

[46]BA/MA RM3/6650 Die Frage: "Weshalb hat sich die Fertigstellung der Armierung bisher verspätet und weshalb wird das Kommende schneller Fertig werden?" RMA Memoranda "An News Bureau" 11.27.1899.

[47]BA/MA RM3/452 Correspondence between Schichau, Eickstedt and Boekholt (BBS, Danzig) August to December 1901, re: Wittelsbach Class.

The RMA tightened its system of accounting and supervision and eliminated incompetent subcontractors through the constant revisions of the Suppliers List. Yet this problem was never really resolved, not even at the Imperial Yards, because a combination of swift technical advance, profiteering by certain firms, and the necessity of treating these cases one by one rendered a satisfactory solution impossible.[48] The RMA could only seek to minimize the problem in the long run.

Industry and Monopoly: Armor and the Electrical Firms

In 1900 the German iron and steel industry produced 6.65 million tons. This represented 23.8% of the world's output as compared with Britain's 17.6% and the 38.5% effort of the U.S. and Canada. The 101 independent firms that supplied materials for shipbuilding assured the RMA of sufficient competition in most areas. Twenty-one firms dealt in fine finished steel plate and machine parts, and twenty-two supplied lesser grades of steel.[49] Only in the specialized areas were the firms fewer in number. Eight companies were responsible for special steel and parts for boilers, five for zinc treated material, and only two for armor plate.[50]

The most outstanding impression one gets from the construction of the Wittelsbach and later the Braunschweig Classes is the dominant

---

[48]For a few illustrations see: BA/MA RM3/441 KWW an SS/RMA 12.7.00.

[49]Schwarz and Halle, vol. 2, op. cit., 208-209.

[50]Ibid., 208-209.

position the Krupp Firm held in all phases of steel production, including research and development. In the field of naval artillery the Chief of the Admiralty Staff spoke only of Krupp products.[51] For both of these battleship classes Krupp also supplied more than its share of conventional steel products such as steel plate and all manner of the fasteners' including some made of nickel steel to fasten the armor.[52] Krupp's monopoly in supplying armor was another accepted fact. Dillinger's armor was just as good as that of the Essen firm, but Krupp jealously guarded its design specifications[53] and relegated Dillinger to piece work when possible.[54] This partnership with the Dillinger firm sometimes created snags in cooperation that delayed projects for months.[55]

In 1901, the armor requirements for the Wittelsbach Class were estimated at 7,353 tons. The contracts for the five battleships and one additional heavy cruiser split the task of production between

---

[51]BA/MA RM3/3701 Report: The Chief of the Admiral Staff to SS/RMA, Berlin 10.24.01. BA/MA RM3/327 Construction Dept. to every yard, Berlin 4.5.97. RM3/458 Vulcan, Stettin-Bredow to SS/RMA, Berlin 7.5.00.

[52]BA/MA RM/470 Construction Dept. to Germania, Schichau, Vulcan and Blohm und Voss, Berlin 4.3.01. RM3/458 Construction Dept., Berlin to Vulcan, Stettin-Bredow 10.5.00.

[53]BA/MA RM3/439 Dillinger to SS/RMA Dillingen-Saar 3.28.99.

[54]BA/MA RM3/440 Dillinger to SS/RMA, Dillingen-Saar 1.25.00.

[55]BA/MA For example: RM3/440 Vulcan, Stettin-Bredow to SS/RMA, Berlin 12.21.99.

Krupp and Dillinger, 3,907 tons to 3,446 tons, respectively. Half of the six ships were split between the two firms, showing the RMA's faith in their smooth interchange of materials and technique. Eickstedt obviously expected nearly equal quality and workmanship. Dillinger was to outfit the S.M.S. Schwaben completely and Krupp was to do the same with the S.M.S. Zahringen and heavy cruiser "B."[56]

If the navy and the Reichstag had one thing in common, it was the desire to lower armor prices without destroying quality. In Germany the Krupp-Dillinger alliance presented no opportunity to accomplish these ends. There was no third competitor that could provide the RMA with an alternative,[57] nor did the Reichstag Budget Commission have any practical suggestions to offer. The RMA needed to curb high prices, overruns and waste, while encouraging industry to keep pace with the quality of foreign armor.[58] In 1901, Krupp nickel-steel armor was the best in the world, and the firm was glad to sell its product but never its techniques.[59] It was hard to see any hope for RMA success.

The Wilson Process had first introduced nickel into armor for strength and resilience. Krupp and Dillinger employed the superior

---

[56]BA/MA RM3/6029 Notes on armor contracts for Wittelsbach Class - 1901.

[57]B. F. Cooling, op. cit., 154.

[58]BA/MA RM3/2 Werftdepartment an Zentralabteilung 3.31.00.

[59]Clive Trebelcock, "British Armaments and European Industrialization, 1890-1914," EHR Series XXVI No. 2 (May 2, 1973), 256.

Tresidder-Harvey Process in successfully establishing their monopoly in Germany. This technical advance, according to the RMA, was surely a response to the ever growing power of naval artillery between 1890 and 1901. In Germany, Krupp's influence with the Kaiser and the firm's advance research and development facilities gave it the edge.[60]

Efforts in the early 1900's to reduce armor contracts to Krupp had obviously failed.[61] The navy suggested that it was primarily responsible for Krupp's success in armor and demanded some consideration,[62] but Fritz Krupp answered by hinting that he would close his armor plant if any further action was taken. This was obviously a bluff, but he had the RMA right where he wanted them. They could not rely solely on Dillinger for the quantities needed, so Krupp demanded a steady stream of lucrative contracts to keep this dimension of his business profitable.[63]

The Imperial Treasury was equally annoyed with the Krupp firm. Its representative, Johann Jencke, argued that the Essen firm was fortunate to benefit from the 1898 Fleet Law with the prospect of another law in 1900. Given these benefits, Krupp should seriously

---

[60]BA/MA RM3/6650 "Denkschrift uber die Entwicklung des Panzerplattenmaterials in den letzten 10 Jahren unter besonderer Berucksichtigung der Preissteigerung." Berlin, 11.29.99 -- signed "Sack" for the Weapons Division.

[61]P. C. Witt, op. cit., 140.

[62]BA/MA RM3/2 SS/RMA, Berlin to Krupp Essen, 4.4.00.

[63]Ibid. Jencke, Essen to Tirpitz Berlin 3.30.00. Krupp, Capri to Tirpitz 4.6.00.

consider a downward revision in the price for armor.[64] The result of this plea, so similar to that of the RMA, was Fritz Krupp's assertion that the firm was his and he felt free to charge any price he wished.[65] This curt reply exposed tensions that were privately and publicly building over ever increasing armor prices.

Only two months earlier in February of 1900 the German press accused Krupp and Dillinger of rampant profiteering. The liberal Frankfurter Zeitung, Eugen Richter's Freisinnige Zeitung, and many other publications printed a basically similar story, accusing these two firms of collecting an unheard of 176 million marks in armor profits from state contracts.[66]

In appearances before the Reichstag Budget Commission Tirpitz was confronted with demands to explain the assertions in the press. Reichstag representatives Richter and Paasche argued that the armor manufacturing process that Krupp used was widely known. Why could competition not be found? To a certain extent Tirpitz presented the Budget Commission with the reasons given by Krupp director Hanns Jencke to similar questions asked by the RMA, viz. costly technology, higher wages, and increased general overhead.[67] However, the State Secretary alarmed Krupp by openly supporting suggestions that new competition in this area was necessary and overdue. He told Richter

---

[64] Ibid. April (no day), 1900.

[65] Ibid. Krupp, Capri to Tirpitz, Berlin 4.6.00.

[66] HA Krupp, FAH III B36, passim.

[67] Ibid. Jencke, Essen, to Tirpitz, Berlin, March, 1900.

and his colleagues that the navy was equally bewildered at the willingness of foreign powers to buy Krupp armor, in spite of high prices, and, in some cases, viable competition.[68]

During February, March and April of 1900, the press deliberately deemphasized the name of the Stumm-owned Dillinger Hüttenwerke in its accounts, most of which surely originated with the RMA News Bureau.[69] Clearly, Dillinger was not the threat to the RMA that Krupp was, so Tirpitz directed his efforts at the Krupp side of the armor alliance. If he made headway against the Essen firm's high prices, then Dillinger would surely follow Fritz Krupp's lead.[70]

It was at this point that Fritz Krupp, on holiday on Capri, told his director Hanns Jencke to arrange a meeting with the Kaiser for early May through the latter's close friend, Graf Eulenburg.[71] The meeting did not materialize until later in May, in Wiesbaden. There, Krupp spoke to Wilhelm and insisted that the pressure from the RMA would only drive him to turn the portion of his firm concerned with armor into a joint stock company. This suggestion, and Krupp's agitation, clearly disturbed the Kaiser, prompting him to urge Tirpitz to calm the situation.[72] In a later discussion with Krupp,

---

[68] Ibid. Weckruf Nr. 77, 4.1.00.

[69] Ibid., 74-75.

[70] Ibid. Press clippings from Feb., Mar. and April, 1900.

[71] Ibid. Krupp, Capri to Jencke Essen 4.17.00.

[72] Ibid., Fritz Krupp's account of the meeting with the Kaiser and von Senden. The Krupp firm did become a joint stock company. However, this took place in 1903, many months after Fritz's death.

the Chief of the Naval Cabinet von Senden expressed the feeling that Tirpitz would not want the Essen firm's armor production independently incorporated. It probably never occurred to Senden that the State Secretary also preferred the existing composition of the Krupp Firm because it remained vulnerable to future pressures in the person of Krupp himself. Tirpitz was hardly defeated, only put off.[73]

The State Secretary, however, was not deprived of a parting salvo. He advised Krupp to restrict his questions on naval matters to RMA headquarters on the Konigin Augusta Strasse in Berlin before going to higher authorities.[74] In Tirpitz's price policy,[75] the public pressure fomented by the press was another tool to strike a blow at a situation unfavorable to the navy, as were the priority of awarding contracts, the composition of the Suppliers List and Tirpitz's political skill in the Reichstag. These factors were, at least partially, responsible for a reduction in Krupp armor prices in 1901 from 2300 to 1900 marks per ton.[76]

Besides the eagerness of Krupp to increase his profits, there were other, more fundamental reasons for the level of armor prices in Germany. Both rising raw material costs and advanced production

---

[73]W. Manchester, The Arms of Krupp (Boston, 1968), 217.

[74]BA/MA Nachlass Tirpitz N253/4 Tirpitz, Berlin to Krupp, Essen 1.23.99.

[75]G. Leckebusch, Die Beziehungen der Deutschen Seeschiffswerften zur Eisenindustrie an der Ruhr in der Zeit 1830 bis 1930 (Cologne, 1913), 64.

[76]HA Krupp, FAH III B36, 74-75 BA/MA RM3/11634 Handakten Dahnhardt: "Panzer: Übersicht über die Panzerpreise in verschiedenen Ländern," 3.3.15.

techniques caused increased prices. The RMA and the Imperial Treasury both recognized the increased metal ore costs,[77] but still jealously eyed the efforts of U.S. Congressmen to limit 4% nickel-steel armor to $300 (1200 marks) per ton.[78]

Cheaper Krupp armor prices in the U.S. further aggravated German naval officials. In the Reichstag and press the liberals called it outright robbery. In March of 1901 the Freisinnige Zeitung said that if Krupp continued to sell in Germany at about 400 marks more than its current price in the U.S., it would cost the German taxpayer sixty million marks over the duration of the 1900 construction program. They suggested the alternatives of securing armor abroad or building a government owned foundry. Other publications like the Tagliche Rundschau agreed heartily.[79]

The Krupp Firm responded that the figures in the newspapers were overestimates. The price for armor at the factory was 28 marks cheaper than the press insisted and the material delivered to Kiel and Wilhelmshaven was barely over 2300 marks per ton. None of the firm's domestic prices exceeded 2300 marks. Indeed, they asserted that the difference in Krupp prices for armor in the U.S. and Germany was actually only 222 marks per ton rather than the widely quoted 400 marks

---

[77]BA/MA RM3/6648 Jencke, Essen to Tirpitz, Berlin 2.27.00. Jencke, Essen to Tirpitz, Berlin, Telegram 2.27.00.

[78]BA/MA RM3/3699 Tirpitz to RMA Budget Dept., Berlin 11.18.99.

[79]HA Krupp FAH III B40 Press clippings, 1901.

figure.[80] The firm's directors cited the RMA's "extraordinarily strict" inspection practices and the complicated technical and design problems in the production of modern warship armor as the reasons for high domestic prices. As for the lower U.S. prices, the Essen firm claimed that the American Navy gave it bulk orders for an entire class of ships in contrast to the RMA's ship by ship contracts.[81] Tirpitz presented this information to the Reichstag Budget Commission as the Krupp Firm requested.[82] However, nobody in the navy or the Reichstag was any less outraged by a difference of 222 marks than they were by 400 marks save possibly a few defenders of industry. With no alternative domestic source of armor available, the RMA paid dearly. In April of 1901, Krupp's portion of the payment for the S.M.S. Mecklenburg's armor was 2.3 million marks. Along with its part of the S.M.S. Wettin and the armor for heavy cruiser "B" Krupp's receipt for that month alone was 3.6 million marks.[83]

The RMA could have driven a wedge between Krupp and Dillinger, but this idea was counterproductive. The volume of business offered

---

[80] Ibid., Krupp Direktorium to SS/RMA 3.5.01.

[81] Ibid., Krupp Direktorium to SS/RMA 3.5.01. Rebates, for example, were often considered in RMA-Krupp business relations, but did not seem popular with Krupp. See also: FAH III B127 H. Jencke to Krupp, Essen 4.10.00.

[82] Ibid. Report by the Norddeutsche Allgemeine Zeitung (3.8.01) on the Reichstag meeting of 3.7.01, 1 P.M. (63rd Session).

[83] BA/MA RM3/6042 KWK to SS/RMA (Construction Dept.) Berlin 5.11.01.

to each by the RMA offered a good starting point. Tirpitz was also in an ideal position for playing one side against another; a powerful, self justified Krupp[84] versus an outraged press and Reichstag. This would have been the perfect situation for a man of Tirpitz's political talents. However, while it produced armor of equal quality, Dillinger could never have supplied all of the navy's needs if Krupp retaliated with a production slowdown. Furthermore, Tirpitz and von Eickstedt risked alienating the firm responsible for all naval artillery, and the owner of the Germaniawerft. These considerations, much more than Krupp's political friends and royal connections, kept the RMA tied to a policy that rebounded to Essen's benefit nearly every time.

However, RMA measures against emerging monopolies were occasionally successful. In one instance the Imperial Shipyard at Kiel informed the Technical Department that the firm of Schulz-Knaudt was rapidly increasing its control over the supply of steel ships' flues. According to Kiel: "If this independence from a single supplier has, up to now, not led to major error, it appears still to lie in the interest of the navy to break the monopoly of Schulz-Knaudt and likewise to approach the productive competing firms about supplying flues."[85] The officials at Kiel suggested that the RMA might switch frequently from Firma Schulz-Knaudt to Duisberger Eisen- und Stahlwerke. Not only did this advice dilute the possible monopoly

---

[84]HA Krupp, FAH III B40. A study of these papers shows just how self-justified Krupp felt. This was not merely a facade.

[85]BA/MA RM3/2196 KWK to SS/RMA Technical Dept. 6.17.01.

situation, but Duisbergers' product quality guarantee turned out to be longer and more appealing to the RMA.

The situation in the electrical industry was more favorable to the navy than that in armor. Here the RMA had to deal with many companies including the two giants, German General Electric (A.E.G.) and the Siemens companies. However, the diversity of smaller firms created adequate competition in this field.[86]

In 1847 Werner von Siemens and J. G. Halske formed the firm of Siemens and Halske. With the growing diversity of uses for electricity the company prospered and, by 1897, became a joint stock company with branches in England and Russia. Eleven years after the death of their father, Wilhelm von Siemens supported his brother Carl in establishing the Siemens-Schuckertwerke in 1903. Although united by family ties Siemens and Halske remained separate from Siemens-Schuckert until 1970.[87]

The Siemens family were the premier German electrical contractors of their day. They were involved in many phases of warship construction for the RMA, including wireless-telegraphy, cables, wires, switches and dynamos. Unlike the situation in the steel industry, this family had stiff competition that placed the RMA in a far better bargaining position. Emil Rathenau's A.E.G. competed with both Siemens companies in nearly every field. In addition, there was

---

[86]BA/MA RM3/1231 KWW to SS/RMA (Construction Dept.) Berlin 5.11.01.

[87]Brockhaus Enzyklopädie, vol. 17 (Wiesbaden, 1973), 404.

Brown and Boveri, which was the first German company to produce turbines along the Parsons model as well as dynamos in competition with both S.S.W. and A.E.G. Felton-Guilleaume competed in wire and cable and Voigt and Hoffner switching systems were considered as good as or better than those of the Siemens Firms.[88] The greater competition within the electrical industry caused a phenomenon that never occurred in the armor and artillery area: In 1900 Siemens and Halske guaranteed a 10% rebate on electrical systems and parts for the navy in return for increased contracts.[89]

The contrast between the Krupp-Dillinger situation and that of the electrical firms is instructive. The latter had to respond to an ever growing public market in electrical tools, appliances, streetcars, and gadgets of all kinds. There was a widespread demand that allowed room for a number of large companies and a host of small ones. Siemens and Halske's pioneering efforts in warship electrical systems just opened up new possibilities.[90] In addition, the widespread commercial market drew a large number of firms into research and development with the hope of ever increasing profits. The size of the market did not attract many to the armor and artillery industry. It was small and risky and required a great expansion of plant facilities and a long term commitment to research and development.

---

[88]BA/MA RM3/1229-1233 passim. RM3/1229 For example: KWW to SS/RMA (Technical Dept.) 6.26.01.

[89]BA/MA RM3/1230 KWW to SS/RMA, Berlin 10.5.00.

[90]Schwarz and Halle, op. cit., 253.

Besides, in the late nineteenth and early twentieth centuries the reputation and capabilities of German firms like Krupp and Dillinger and Schneider-Crusot in France would have presented a nearly impossible hurdle. The electrical industry possessed no such long standing giants, and at the turn of the century showed considerable promise for the newcomer.

Research and Development: The Turbine and U-Boat

All during this early period of naval growth the RMA was involved in broadening its technical expertise. There was a constant correspondence between the Construction Department and inventors of all kinds, from quacks to innovators of genius.[91] The RMA was of necessity supportive, or directly responsible for the creation, of several research institutes devoted to naval related fields. Of course, it had its own research center at Kiel. This was closely linked with another naval research institute at Marienfelde near Berlin. Private centers that worked with the navy included the Royal Research Institute for Shipbuilding and Hydraulics in a northwest suburb of Berlin[92] and the facilities of the North German Lloyd in Bremerhaven. The latter was particularly helpful in developing towing tests, to determine the stability and durability of new ship designs.[93] Close cooperation between the navy and private shipping

---

[91]BA/MA RM3/2248 (1900-1901), passim.

[92]BA/MA RM3/1002-1015 (1900-1910), passim.

[93]BA/MA RM3/272 North German Lloyd, Bremerhaven to SS/RMA 7.16.00, 1.14.01, 4.15.01, 6.18.01.

firms also facilitated the process of establishing standards of quality. The construction experience and testing laboratories of Albert Ballin's Hamburg-America Line (HAPAG) and those of the North German Lloyd frequently benefitted the navy in problems requiring expertise in physics, naval architecture, and engineering. In other cases Tirpitz and Eickstedt supported new research associations and explored those of other countries. In 1899 Eickstedt played a personal role in the founding of the Society for Shipbuilding Technology. Along with other naval officers, he became one of the first members. By 1902 the Society facilities were providing the navy with research.[94] The Construction Department also sent its people abroad to examine the latest in research techniques at foreign institutes. One such trip produced suggestions on structural testing from the British Naval Research Centers in Dumbarton and Haslar.[95]

The shortage of personnel in the Construction Department prevented a significant broadening of the RMA's research efforts. von Eickstedt constantly reminded the RMA's Central Section of this shortage as the latter formulated the budget for the RMA. Cuts in the proposed budget frequently affected the numbers of qualified ship and machine building inspectors, whose expertise or lack of it would

---

[94]BA/MA RM3/90 Schiffbautechnischen Gesellschaft, 1899.

[95]BA/MA RM3/272 Fact Finding Trip Report by Construction Inspectors Edgar and Schumann to SS/RMA Berlin 7.8.01.

reflect the RMA's commitment to research and education.[96] von Eickstedt realized that high technology was one of his department's weakest points vis-á-vis certain segments of industry and that cuts in the budget at just his point would exacerbate present shortcomings.

The education of RMA inspectors and the efforts of the navy to keep abreast of modern ship technology did nothing to dislodge Tirpitz's axiom that advanced research and development was part of the private sphere. Perhaps the best illustration of this was the way the RMA left the entire turbine question in the hands of private industry. Before the formation of the Turbina A. G., which was the official Parsons' Steam Turbine company in Germany, Brown, Boveri and Co. managed to obtain exclusive rights to the production of the new engine system in Germany.[97] This was a period, however, when Parsons' patent rights were not yet fully recognized on the continent. Other firms in France and Germany had similar engines under development. The French systems Laval and Rateau were not ready for service when three private German yards undertook to produce acceptable turbine powered ships. Germaniawerft decided to build a torpedo boat (S-35) with its own turbine and a schulz boiler system and poured more than 194,000 marks into this prototype.[98] Schichau followed along the

---

[96]BA/MA RM3/2492 K(Construction Department) to M(Central Section), Berlin 3.27.01.

[97]BA/MA RM3/2107 Brown and Boveri, Mannheim to RMA 8.23.00.

[98]BA/MA RM3/2107 Schiff- und Maschinenbau Germania, Kiel to Imperial Torpedo Inspectorate, Kiel 11.23.00.

same lines while the RMA urged Vulcan to cooperate with Brown and Boveri in producing a Parsons' boat.[99]

Save for the Parsons' system, all these turbines were still very much in the development stage. RMA involvement in the situation might have provided some early uniformity and a later advantage for German industry but the RMA completely rejected any notion of an Imperial Yard entering into this process.[100] By insisting that naval ships employ the already tested Parsons' system, the RMA could have brought turbine power to the navy earlier, and forced all of the yards to learn the same basic technology. Firms with research funds to spend, like Krupp could have mastered and improved the system, later providing the RMA with a domestic, perhaps better variation of the original. The brief dependence on a foreign propulsion system could have given the Imperial Navy long range dividends.

Instead, the situation degenerated into patent fights and ended with the complete dominance of the Parsons Co. The firm of John J. Thornycroft brought suit against the Schulz Co. for violation of their boiler system patents, which retarded the efforts of Vulcan.[101] Germaniawerft just barely managed to avoid this problem by earlier signing an agreement with Thornycroft for exclusive use of its newest

---

[99] Ibid. See also citation in footnote 100.

[100] BA/MA RM3/2107 Torpedo Inspectorate, Kiel to SS/RMA, Berlin 10.13.00. "Verhandlung mit der Firma Brown and Boveri uber Parsons Turbinen."

[101] BA/MA RM3/1244 John J. Thornycroft and Co., London to Vulcan, Stettin 9.27.99.

boilers in turbine research.[102] Domestic setbacks in development became the rule in the application of turbine technology in the Imperial Navy.

It was also during this period that Tirpitz first grudgingly acknowledged the possibilities presented by the U-boat. His attention was not drawn by any sudden revelation that the U-boat might one day challenge the battleship, but by the obvious interest of the other major naval powers in this invention. As early as 1899, the French were having a good deal of success with the Gustave Zede,[103] and by 1900 the U-boat was becoming an integral part of the French navy. Late in 1899, the French authorities ordered twenty-six of the vessels, and twelve were nearly finished by February 1900.[104] The British were experimenting with two-man submarine prototypes late in the same year,[105] and the American boats built by Holland in Baltimore were testing very well.[106] The RMA was engaged only in a small scale development effort at Danzig.[107] Krupp alone,

---

[102] Ibid., Vulcan, Stettin to SS/RMA, Berlin 2.12.00.

[103] BA/MA RM3/3685 Daily Graphic clipping from 2.3.99.

[104] BA/MA RM3/1049 Naval Attaché, Paris to SS/RMA 2.13.00.

[105] BA/MA RM3/3876 Naval Attaché, London to SS/RMA, Berlin 11.9.00.

[106] Ibid. Naval Attaché, Paris to SS/RMA, Berlin 1.10.01.

[107] BA/MA RM3/6062 passim.

in Germany, was proceeding with U-boat development[108] at the Germaniawerft.[109]

Tirpitz thus paid attention to the U-boat only because he had little choice. When Eugen Richter confronted him in the Reichstag with the RMA's lack of interest in U-boats, in spite of the French advances, the RMA chief responded: "The U-boat is, at present, of no great value in war at sea."[110] He made similar statements before a Reichstag Budget Committee session in March 1901. In his marginalia to a report by the Naval Attache in Paris one finds comments on every imperfection the French U-boats had. Here again was his old axiom that the navy should not become involved with new weapons or other hardware while they were still under development.[111] He noted for example that the French were yet to perfect a practical periscope for their boats. How could they attack submerged? Tirpitz never posed the possibility that German firms, with the RMA's assistance, might succeed where the French had not. The RMA never played the role of catalyst among its firms and businesses, especially in the case of the U-boats. Tirpitz was also hesitant, no doubt, because the U-boat

---

[108]HA Krupp, WAXa 4,160. This is a published account of U-boat development at the Germaniawerft.

[109]Ibid., WA IV 714. Barandon was the chairman of the two sections of Germania, Tegel-Berlin and Kiel. Each section had its own director.

[110]BA/MA RM3/11603 Handakten von Gohren. "U-bootsdebatten im der Budgetkommission von 1900-1903."

[111]BA/MA RM3/3876 1) Daily Mail 3.2.01, 2) Naval Attaché, Paris to SS/RMA, Berlin 1.10.01.

had no part to play in his beloved Risk Theory at this stage in its development.

The Naval Law of 1900 and Further Progress in Construction

On 12 June 1900 the Second Naval Law was passed in the Reichstag by a vote of 201 to 103.[112] As was the case two years earlier, a barrage of RMA propaganda preceded this legislation. Only nine months before, Tirpitz proposed to the Kaiser his plan to increase the navy to forty-five battleships and auxiliary vessels[113] at a cost of 2,759.5 million marks.[114] This scheme projected RMA plans through 1917, if one believed that Tirpitz intended to stop at these stated goals. Few observers did.

In his "Bitter Need Speech" of 18 October 1899, Wilhelm struck the first note for the State Secretary's new proposals.[115] His main theme--the protection of the Empire against the British navy--became the basis of the RMA News Bureau's propaganda efforts. The British seizure of the mail steamer Bundesrath[116] during the Boer War, the Boxer Rebellion in China, the embarrassing situation in Samoa and the "lessons" learned from the Spanish-American War were cited in support

---

[112]P. Kennedy, "Tirpitz, England and the Second Navy Law of 1900: A Strategical Critique," MGM 1970 (part 2), 35.

[113]Ibid., 34.

[114]P. C. Witt, op. cit., 142.

[115]P. Kennedy, "Tirpitz, England and the Second Navy Law," 34.

[116]Hurd & Castle, op. cit., 119. P. Kennedy, Anglo-German Antagonism, 417.

of the idea that Germany had to have a larger fleet to prosper in a world of far flung empires.

During the propaganda campaign for the 1900 Naval Law the RMA became increasingly aware of the power held by private pronaval groups. The German Naval League, the Pan-German League, the Colonial League and the Liberal Association for Fleet Expansion all became involved in supporting the Naval Law, but were not under the control of the RMA.[117] The Naval League alone had grown to enormous proportions by 1900. In its drive for the passage of this Naval Law the Association increased its private membership by more than 155,000. It also added 176,881 organizations to its roster and the circulation of its periodical, Die Flotte, by 175,000 copies in the fall of 1900.[118] While the RMA invested 222,035 marks in the propaganda campaign, the Naval League alone expended 760,000 marks. With the aid of other groups the total outlay easily exceeded one million marks.[119]

Most of these efforts aimed at Germans who were middle class and politically centrist or slightly right of center. Although the large industrialists had everything to gain, the conservatives whose privilege and economic security lay in agriculture were not sure that this campaign was in their best interest. Many feared that the

---

[117] W. Deist, Flottenpolitik, 140-42.

[118] W. Marienfeld, op. cit., 83. Membership statistics from 1.1.00 to 12.31.00: Single = 93,991 to 269,370; Organizations = 152,890 to 329,771. Die Flotte circulation: Jan. 1900 = 125,000; Dec. 1900 = 300,000.

[119] W. Deist, op. cit., 81-82.

mobilization of the middle and lower classes would upset their place in society as their economic security was subordinated to the interests of the industrial Free-Conservatives. It is in this atmosphere that the compromise proposed by the State Secretary of the Prussian Finance Ministry, Johannes Miquel, christened Sammlungspolitik by Eckart Kehr, must be appreciated. Within this compromise the agrarian Prussians received tariff protection for their foodstuffs and heavy industry won its fight to broaden an already profitable naval construction plan. Above all, the existing German social order was strengthened by the successful cooperation between these two factions. The existing monarchical order in Germany had purchased a new lease on life.[120]

It was an indication of Tirpitz's determination and industrial support that the Reichstag passed the 1900 Naval Law in the face of huge budget deficits.[121] Tirpitz was willing to throw the Reich even further into debt for the fleet, but his padding of naval appropriations and careful spending always managed to create a surplus large enough to ensure continual construction over leaner times to come.[122]

The passage of the Second Naval Law allowed the Construction Department to continue its building plans. In 1901 and 1902 the RMA began construction on Braunschweig Class battleships at an average cost of 24 million marks per ship. Germaniawerft received both the

---

[120] V. Berghahn, Der Tirpitz Plan, passim.

[121] P. C. Witt, op. cit., 139-41.

[122] V. Berghahn, Der Tirpitz Plan, 285-286.

Braunschweig and the Hessen. Schichau in Danzig contracted for the Elsass and the Lothringen, Vulcan for the Preussen.[123] The normal displacement of these ships was about 13,200 tons, powered by triple expansion engines and boilers on the Thornycroft system. The main armament consisted of two double 28 cm turrets, with a strong secondary battery of fourteen 17 cm, and fourteen 8.65 cm guns.[124] They had a maximum range of 6,500 km when steaming at ten knots and could do 3,470 km at a top speed of sixteen knots. When they were ready for service between 1904 and 1906, these ships finally gave the Imperial Navy a class that compared favorably with the ships of the Royal Navy.

Five other vessels made possible by this law were the heavy cruisers Friedrich Karl, Yorck, Scharnhorst, Gheisenau and Roon. Blohm und Voss of Hamburg built the first three at prices between 15.6 and 20.3 million marks. A. G. Weser won the Gneisenau and the Imperial Yard at Kiel built the Roon for the lowest price of the five, 15.3 million. They could steam at fourteen knots with a range of between 4,800 and 5,100 km.[125]

The most ambitious expansion took place in the area of light cruisers. Tirpitz authorized twelve in all between 1901 and 1905. As was the case after the passage of the first Naval Law, Weser received most of the light cruiser contracts from the RMA. The Imperial Yard at

---

[123]E. Gröner, op. cit., 20.

[124]A. Preston, op. cit., see closeup on Braunschweig Class.

[125]E. Gröner, op. cit., 23.

Danzig qualified for two, Kiel one, Howaldswerke one, Vulcan two and Weser the remaining six.[126] The most expensive of these ships was Vulcan's Lübeck, which was the first German warship powered by a turbine.

Schichau and Vulcan shared the three cannon boat contracts awarded by the RMA. Vulcan built the Eber and Schichau both the Tsingtau and Vaterland. The Eber was similar to earlier models, like Panther and Luchs, while the two ships awarded to Schichau were much smaller.[127]

Turbine experimentation also took place with these smaller ships. In Schichau's S-125 (T-125),[128] the Parsons System appeared for the first time in high seas torpedo boats. Schichau was responsible for all the boats in the 114-131 series, which cost approximately one million marks. The S-125 was the exception at 1.27 million. Germaniawerft won a contract for five other torpedo boats at an average price of 1.18 to 1.20 million marks each.

Summary

The 1899-1901 period represents the beginning of the RMA's routine relationship with industry. The actual construction of the

---

[126] Ibid., 27.

[127] Ibid., 31. Eber - 1,193 tons - 1,632,000 marks; Tsingtau - 280 tons - 497,000 marks; Vaterland - 280 tons - 492,000 marks.

[128] While a torpedo boat was still under construction, its designation revealed the yard responsible for it. Thus the S (Schichau) - 114 through 131 or the G (Germania)-132 through 136. Upon commissioning the prefix "T" replaced the first initial of the yard. Ibid., 34.

first ships made possible by the Naval Law of 1898 revealed the strains placed upon industry by sudden naval expansion. These strains manifested themselves in intra-industry relationships as well as the difficulties arising between industry and the RMA.

In 1900, an RMA commission studying the shipbuilding industry made suggestions, all of which the navy pursued. They discouraged specialization in a single product or system, because the business investment was too great and the promise of profits too small. The navy needed a core group of reliable competing firms to find better products at the lowest possible prices, and the stability resulting from a measure of diversification in a number of good firms would be its best possible asset.

Where the navy might have only a few firms at its disposal, the commission suggested using the Imperial Yards and, when possible, the Private Yards to organize a front against any excessive prices proposed by subcontractors. In dealing with the Private Yards, secret sealed bids for whole ships would provide the navy with the best prices when awarding contracts. The shipyards could make bulk purchases to keep their costs low, and the navy could try to apply pressure on them or their subcontractors as it saw fit. This could be important in matters of price, building time, and prompt material delivery.[129] Above all, the Commission encouraged consistency in all the RMA's relationships with industry. The problems the RMA faced during these years were of a diverse nature, and many could not be

---

[129]BA/MA RM3/2 Tirpitz to Wilhelm II, Berlin 10.17.00.

completely resolved. The RMA protocol system reduced cost and weight overruns and construction delays. The real puzzles were posed by firms like Krupp, which appeared to survive and prosper in its monopoly in spite of concerted attacks by the RMA. Tirpitz, Capelle, von Eickstedt and many other naval leaders never completely resigned themselves to this phenomenon, and a good deal of their efforts against other, would-be monopolists succeeded.

Their real failure came in the decision to leave major research and development efforts to the private sector. On the one hand, greater involvement in research and development would have absorbed a large percentage of the RMA's annual budget. On the other hand, this involvement would have placed the RMA in a better position vis-a-vis possible monopoly, made possible by the high technology involved in some areas of research.

In the case of the turbine and perhaps even armor plate, deeper RMA involvement in research and development might have made a dent in Krupp's monopoly or paved the way for an even better engine than the Parsons. The least that could come from these measures was a higher degree of technical expertise among the naval inspectors and an ability to disseminate an understanding of naval related technology to new or already established, interested firms.

Between 1899 and 1901, the U-boat became a reality for Tirpitz. Whether he liked it or not, he could no longer ignore the vessel. Advances in submarine technology, actual sales by Krupp, and Reichstag pressures forced the State Secretary to divert part of the

funds won in 1900 to acquiring weapons of this sort. The extent of the navy's commitment was, however, still in doubt.

## CHAPTER III

## BUSINESS AS USUAL: 1902-1904

It is ironic that just as naval-industrial relations settled down to "business as usual," the Risk Theory was called into question by the changing international situation. Tirpitz chose to ignore the determination of the British to maintain their naval supremacy. He relied on public and industrial support to maintain the momentum of his fleet program, despite opposition from the treasury. At the same time it was quite evident that he was completely preoccupied by the construction of the fleet.

By 1902 the Protocol System was an accepted part of life in naval-industrial relations. The RMA felt secure enough to involve itself in every transaction affecting the navy. von Eickstedt presumed that every business deal pertaining to the fleet was within RMA jurisdiction.

The theme of "business as usual" also characterized U-boat and turbine development. Tirpitz's reluctance to become directly involved in these areas rebounded in ways his administrators regretted. Krupp continued to dominate the U-boat industry and many shipyards and electrical firms frantically tried to provide the Parsons company with competition.

An interesting twist during this period was Krupp's determined but futile effort to annex the giant Vulcan Shipyard of Stettin. This tendency to consume as much of its competition as possible also

extended itself to Essen's American U-boat rivals. However, Krupp was even less successful in coaxing the American Laker Company into collusion than it was in annexing Vulcan.

Political Background

Between 1902 and 1904, Tirpitz's building program hit full stride, with two classes of battleships under construction and the Deutschland Class up for bids in 1904. It is sobering, however, to consider these events in the political context of the period. These three years witnessed the emergence of Great Britain from "splendid isolation" and the revelation of the fatal flaws in the Risk Theory.

During this period Great Britain's position and world fortunes improved markedly. The naval treaty with the Japanese in 1902 stabilized the British position in the Far East and gave London greater freedom to become more involved in the European political situation. France was suggesting closer cooperation regarding matters of continental and colonial policy since the successful stand made by Britain at Fashoda. A conflict with the United States seemed less likely than ever with the signing of the Hay-Pauncefote Treaty in 1901 and the Alaskan Boundary Settlement of 1903. The British government also discarded the burden of protecting the Ottoman Empire in the East. By 1902-03 the "status quo" in the Dardnelles region no longer represented a vital portion of British foreign policy. Internally Great Britain engaged in extensive army reforms and drastically increased the naval budgets of 1900 and 1903. The latter

eventually took concrete form as ten new battleships and eighteen armored cruisers.[1]

The German service attachés in London were sending back ominous reports of the treatment of German naval expansion in the British press. An article in Vanity Fair recalled the 1807 "Copenhagening" of the Danish Fleet and suggested the same technique be used against the Germans. The author promised that the destruction of emerging German naval power would guarantee world peace for two generations.[2] This would hardly prompt the naval or military attachés in London to suggest scrapping Tirpitz's plans.[3] However, Chancellor Bülow's effort to calm the British press in a 1904 interview with Brashford of the Nineteenth Century failed completely. The British mood was clearly changing, and the Chancellor's claim of a defensive fleet fell on deaf ears.[4] As Paul Kennedy observed, Britain was ". . . clearly looking very carefully at the expansion of the German fleet, which, due to the agitation of the National Review, Spectator, the Times and other journals,

---

[1]P. Kennedy, Anglo-German Antagonism, 265.

[2]Die Grosse Politik der Europaischen Kabinette, ed. by J. Lipsius and A. Mendelssohn-Bartholdy, vol. 19/2 No. 6149: Coerper, Naval Attaché in London, to Kaiser Wilhelm II, 18 Nov. 1904.

[3]Ibid., 360-65. Maj. Graf von der Schulenberg, Military Attaché in London, to Chancellor von Bülow, Berlin 13 Dec. 1904.

[4]Ibid., 372-73. Chancellor von Bülow to Kaiser Wilhelm II, 26 Dec. 1904.

had entered the "danger zone" much earlier than Tirpitz suggested was likely."[5]

By the end of this period the political fortunes of Germany had taken a turn for the worse. Relations between Germany and the United States had not improved since the confrontation over the Philippines and Samoa. Indeed, the navy was actually exploring alternative strategies should war with the U.S. break out.[6] In April of 1904 the British and French eliminated one of the old fundamental presumptions of German foreign policy by concluding the Entente.[7] With the appointment of Sir John Fisher as First Sea Lord (1904-10), the British also adopted a strategy greatly strengthening the Home Fleet at the expense of the Mediterranean forces. The Entente with France made this possible, and the entire change of strategy was clearly aimed at countering the new German threat. This more aggressive policy by the British was rapidly rendering Tirpitz's "danger zone" a permanent rather than transitory situation.[8]

In these circumstances it is not surprising that Tirpitz wanted to avoid a confrontation with Britain. Many took this as a

---

[5]P. Kennedy, Anglo-German Antagonism, 265.

[6]BA/MA N253/21 Nachlass von Tirpitz, "Politische und Militarische Beatractungen uber einen english-deutschen Krieg," Berlin 11.27.04.

[7]P. Kennedy, Anglo-German Antagonism, 268-273. The traditional continental and later colonial antagonisms between England and France were a basic assumption of German foreign policy since 1871.

[8]Ibid., 272.

lack of nerve or fighting spirit. At the German Foreign Office, Friedrich von Holstein concluded that Tirpitz's lack of inclination to fight over Kiaochow in China or during the crisis surrounding the Boer War revealed an absence of "kampfnerven."[9] However, given the primitive stage of the fleet construction program, Tirpitz's lack of nerve seems sensible rather than spineless. He was too busy trying to create a tool Germany could use effectively against Britain to allow any premature confrontation with the Royal Navy to destroy everything.

The Admiral's attentions were riveted on construction, extending the power and prestige of the RMA, and staying out of war. To these ends he strengthened the RMA by making it the compulsory channel through which all matters related to naval politics, finance, and construction found their way to the Kaiser.[10] He raised von Eickstedt's Construction Division to the status of a full RMA department,[11] while the building program was so successful that a Second Battle Squadron was well on its way to completion by 1904.[12] The last thing Tirpitz lacked was "kampfnerven." He knew better than Holstein when Germany might be prepared to confront the British. The period between 1902 and 1904 was definitely not the appropriate time.

---

[9]F. von Holstein, Die Geheimen Papiere Friedrich von Holsteins, ed. by N. Rich and M. H. Fisher, vol. 4 (Göttingen, 1962), 221: Diary excerpt 1.11.02; 496: Holstein to Bülow 8.21.08; 510: Holstein to Bülow, Dammhaus, 9.13.08.

[10]BA/MA RM3/108 Wilhelm II to Tirpitz, aboard the S.M.S. Hohenzollern (Kaiser's yacht), Kiel 6.28.02.

[11]BA/MA RM3/2493 Tirpitz to von Eickstedt, Berlin 6.20.02.

[12]C. A. Gemzell, op. cit., 103.

Whatever the project or expense, the RMA was increasingly at odds with the Imperial Treasury Office over expenditures and the budget. In the preparation of the 1904 budget there are some revealing illustrations of this relationship. The sources of contention here were the very headaches the RMA was trying to control: costly design changes, material and labor costs, expensive testing and research, and shipyard overhead. Pertinent discussions revealed a serious lack of communication between the Imperial Treasury and the navy. The Treasury, for example, insisted that the RMA budget estimates for battleship construction were too high given the fact that only two private yards were able to build this type of ship. This claim was, of course, entirely false and was a cause of considerable bewilderment at the Königin Augusta Strasse.

Stengel, State Secretary of the Imperial Treasury from 1903 to 1908, furthermore insisted that the Imperial Yards would have to build battleships to keep RMA expenses down. Tirpitz had adopted this policy long ago and the Imperial Yards were already doing this sort of construction. The recent decision to renovate them would increase this capability. Stengel also challenged the RMA installment system of payment, as every RSA secretary seemed obliged to do. Repeatedly having to defend this system did not endear the Treasury to Admiral Tirpitz.[13] Stengel then suggested that no payment should be made until nine-tenths of the work specified in a contract was complete.

---

[13]BA/MA RM3/6008 For example: "Neubau 107, Turretdampfer für die Erzfahrt an die Herrn L. Posschl and Co., Lübeck" 3.17.04.

Given the number of ships taken on by the six major private yards at any given time, this was absurd. With the possible exception of the Germaniawerft, none of them could muster enough capital to absorb all costs until the job was only 10% short of completion.[14]

Stengel's attitude reveals a lack of understanding at the Imperial Treasury regarding the shipbuilding industry and its relationship with the RMA. It also betrays Tirpitz's propensity for isolating the RMA from interaction with the rest of the Imperial government. All he desired was that the Treasury find a source for the appropriations he squeezed out of the Reichstag. The Treasury never felt that the State Secretary of the RMA was genuinely trying to get the best value for each mark spent. They understood the Admiral's flaw as one of opulence and mismanagement when it was nothing of the sort. Tirpitz's hunger for ever increasing funds was a result of his self-imposed imperative to give Germany a tool that could truly challenge England. In the process he alienated some colleagues in the navy, and left Stengel with the problem of finding new sources of income for the Reich. This repeatedly raised the unsavory political issue of tax reform before the Reichstag and a harried Chancellor von Bülow.[15]

In spite of an appropriation of ten million marks less than requested, the RMA budget rose in the financial year 1904-05 for the fifth consecutive time since 1899-1900. The Reichstag granted the

---

[14] Ibid., RSA to SS/RMA, Berlin 4.7.04.

[15] P. C. Witt, op. cit., 112-113.

99.3 million marks requested for projects already under way, but shaved 5.5 million from the categories covering new construction and armaments and another 4.5 million from "special projects."[16]

Among Britain, the U.S., France, Russia and Germany, the last was one of three countries which did not reduce their naval appropriations between 1903 and 1905. In France the naval budget fell from a high of 265.4 million marks in 1901-02 to 250.3 million in 1904-05.[17] The Russian budget fell a relatively modest five million marks between 1903 and 1905.[18] The 109.7 million spent on shipbuilding, however, remained constant in order to support the construction program begun in 1903.[19]

In the United States, primarily because of the efforts of President Theodore Roosevelt (1901-09), the naval expenditure by the turn of the century was second only to that of Great Britain's.[20] The American naval budget rose consistently between 1899 and 1902 to 351.1 million marks. After dipping slightly in 1902/03 it rose again

---

[16] Nauticus (Berlin, 1904), 18.

| 1904 Budget: | Proposed | Granted |
|---|---|---|
| Continued Projects | 99.3 mil. marks | 99.3 mil. marks |
| Shipbuilding and arming | 100.4 mil. marks | 94.9 mil. marks |
| Special projects | 25.7 mil. marks | 21.2 mil. marks |
| | 225.4 mil. marks | 215.4 mil. marks |

[17] Nauticus, 1904, 439.

[18] Ibid.

[19] J. Rohwer, op. cit., 215-227.

[20] Ibid.

to 404.6 million marks in 1905.[21] Congressional appropriations for shipbuilding 122.6 million per year between 1899 and 1905, but expenditure on new ships fluctuated constantly. It was not until the threat of war confronted the Wilson Administration that the building program of the U.S. Navy genuinely got under way.[22]

The German naval budget climbed 81.6 million marks between 1899 and 1905 averaged 185.5 million per year, and totaled 1,113.1 million marks for the whole period. But by comparison with other major powers it was still small. In 1902/03 the British naval budget was 637.6 million marks, 432.6 million more than the German allocation for that year. In the 1903/04 naval appropriations the British made a quantum leap for the reform and expansion of their navy of 91.2 million above the previous year. The German increase was a mere 6 million.[23]

The Protocol System: Cost and Weight Problems and the Koch Case

In the struggle to make every mark count, the RMA pressed the Construction Department and inspectors to complete and publish the first full edition of the Suppliers List. This took place in 1902 and this handbook of all naval vendors was far clearer and easier to use and revise. There were four editions of it between 1902 and the war,[24] and the pre-war system of supplements, called Deckblätter,

---

[21] Nauticus, 1904, 439.

[22] J. Rohwer, op. cit., 215-227.

[23] Nauticus, 1904, 439.

[24] BA/MA RM3/2296 1902 edition of the Lieferantenverzeichnis. Other pre-war editions: 1905 (RM3/2297-98) and 1907 (RM3/2298).

appeared periodically to list deletions and additions. The Deck-blatter included everything from a correction on the quoted diameter of some pipe supplied by Mannesmann to a baking machinery manufacturer complaining about not finding his firm listed.[25]

It was a measure of the list's importance that participation in its compilation and accuracy rarely had to be solicited by the RMA. Many suggestions on format, and possible use were forthcoming from RMA inspectors whose reputations often depended upon the reliability of the firms admitted to the Suppliers List.[26] If their judgment failed one time too many, Tirpitz would strongly complain to von Eickstedt as he did in 1903 regarding boilers, coal chutes and ventilation systems.[27] Vendors also notified the RMA very quickly if they were omitted from the list or listed inaccurately. Carl Flohr reminded the RMA in April of 1903 that his firm manufactured cranes, munition conveyors and small elevators. He wondered why the RMA failed to list it in these machinery categories.[28]

The smaller firms, which were more dependent on RMA contracts, were just as responsive. In most cases they took care to protect their position on the Suppliers List by following the requirements and

---

[25]BA/MA RM3/2294 Revisions for the 1902 L.V. RMA Construction Dept., Berlin 4.28.03. Richard Lehman, Dresden to RMA, Berlin 6.5.03.

[26]BA/MA RM3/2295 passim (1904).

[27]BA/MA RM3/328 Tirpitz to von Eickstedt, Berlin 4.3.03.

[28]BA/MA RM3/2294 Carl Flohr Maschinenfabrik to SS/RMA, Berlin 4.4.03.

specifications laid down in all RMA quality control publications.[29] In 1904, when the Rheinisch-Westfälischen Copper Works failed to deliver sheet metal to the Imperial Yard at Kiel in time or with the expected quality, the firm was put on probation and investigated at the suggestion of the Construction Inspectorate.[30]

Of course, the RMA was fallible. In one case von Eickstedt went against the advice of his inspectors and approved the admission of the Richard Gradenwitz Co. to the Suppliers List for manometers. Later evaluations of this firm's work prompted comments like "terrible" from the Kiel Torpedo Inspectorate and the Imperial Yard in Kiel. Other firms, like Schaffer and Budenberg, were already prepared to solve this problem with a better product.[31] The offending firm disappeared from the Suppliers List until it showed a marked improvement.

Sometimes the formal and organization of the Suppliers List subtly created problems that the RMA did not foresee. Of the five approved vendors in competition for contracts in the List's category number 52, electrical gauges, three were small privately owned companies in Frankfurt, Berlin, and Hannover. The other two firms were Siemens-Schuckert and A.E.G., the two biggest electrical firms in Germany. This was certainly unfair competition, and if the product in question had not been highly specialized the three smaller firms

---

[29]BA/MA RM3/301 1904 edition of the Vorschriften für die Lieferung und Abnahmeprüfung von Materialen und Apparaten.

[30]BA/MA RM3/2295 KWK to SS/RMA, Berlin 7.28.04.

[31]Ibid. Richard Gradenwitz Co. to RMA, Berlin 9.2.03.

would have had an even harder time surviving.[32] In other cases a parent firm was listed in a single category along with two or three of its subsidiary companies. Among eight companies supplying parts for heavy marine machinery, for example, Krupp and three of its subsidiaries controlled half of the competition.[33] A closer examination of the firms in each category of the Suppliers List and more care in contract distribution could have increased the RMA's chances for an even better price in most product categories.

In many instances, other regulations took the variations of size and capability more closely into account. The Construction Department always required a list of ship parts inventories accumulated at each yard. This regulation appeared in the General Construction Guidelines[34] so that the RMA would have a better idea of each yard's ability to manufacture, store, or otherwise stockpile goods related to ship construction. The private yards less able to gather very large inventories before construction needed more RMA funds earlier than other yards. Thus contract rate payments for the smaller private yards were scheduled to help the company progress in construction without encountering an acute capital shortage.[35] The

---

[32]BA/MA RM3/2298 L.V. (1907 edition), 72.

[33]BA/MA RM3/2294 L.V. (1902 edition).

[34]A.B.B. = General construction regulations. See list of abbreviations.

[35]BA/MA RM3/6008 SS/RMA, Berlin: "Auf die Schrieben vom 7 April 1904 und vom 10 September 1904," to Budget Dept., and KWK to Vulcan, Stettin 6.8.04.

RMA arranged other pay schedules without special consideration and, when possible, to their own convenience.

Besides the Suppliers List and the General Construction Guidelines the Construction Department published many technical handbooks for maritime firms to ensure that they met naval standards. One such publication was the "Basic Guidelines for Electrical Systems" issued to Siemens-Schuckert, A.E.G. and any other firms involved in warship electrical work.[36] These pamphlets compiled RMA technical expertise and contained rules which were effective if properly enforced. The Construction Department used constant testing to approve a company's admission to the Suppliers List, determine the quality of products purchased for naval use, and ascertain the performance of these products while in naval service.

The problems the RMA encountered here, again, stemmed from the rapid pace of expansion. Its various testing agencies were spread so thinly that it was difficult to accommodate each firm as it produced needed materials. The RMA broadened its capability and employed resources of private testing agencies with greater frequency. As was the case with the North German Lloyd, some private companies were in the RMA's service for many years as research centers. The Lloyd's facilities were important to the RMA for testing new ship prototypes.[37]

---

[36]BA/MA RM3/1170 "Grundzuge für elektrischen Anlagen."

[37]BA/MA RM3/328 RMA, Berlin to North German Lloyd, Bremen 6.21.02. RM3/502 RMA, Berlin to Germaniawerft, Kiel-Gaarden 1.8.03.

The RMA employed other independent firms, or gave its permission to use certain firms to augment the services of the Purchasing Office. Schichau employed the Cassirer firm to test cables delivered to the yard in 1902.[38] In addition, the Construction Inspectorate more often supervised the shipyards' tests of their own materials.[39] Regardless of the method, the guarantees of product quality demanded by the RMA regulations remained in force. If a private firm substituted for the Purchasing Office as in the Cassirer case, the testing firm assumed the responsibility of guaranteeing the product. If the Inspectorate supervised, the guarantee obligations rested with the producing firm.

The Purchasing Office was an RMA agency composed of a combination of naval inspectors and approved independent engineers under contract to the navy. The importance of this agency grew with the navy. On-site inspections by the Purchasing Office were becoming increasingly important. Catching defects in naval supplies at the factory reduced expensive delivery and return costs, as well as lost time.[40] By 1903 the RMA required many of the Private Yards to share the cost of the tests at their yards.[41]

---

[38]BA/MA RM3/1238 RMA, Construction Dept., Berlin to Schichau, Elbing 2.22.02.

[39]BA/MA RM3/2040 "Materialabnahme für die kleine Kreuzer 'G' und 'H,'" Berlin 1.11.02.

[40]Ibid. KWK to RMA, Technical Dept., Berlin 8.4.02. Correspondence between Technical Dept. and the six major shipyards Oct., 1901-June, 1902. Handelskammer für den Kreis Essen to SS/RMA, Berlin 1902.

[41]Ibid. RMA Construction Dept., Berlin to KWK 11.7.03.

The RMA testing and approval system was usually adequate to meet the navy's needs. The admission of a weak firm to the Suppliers List would occasionally reveal its limitations. However, the Technical Department assured Tirpitz in 1904 that the testing methods and rigorous inspections were permitted in far fewer flaws in naval building materials.[42] More importantly, the technical and administrative expertise of the RMA was proving itself equal to the task Tirpitz had asked it to assume.

The RMA effectively evaluated materials, determined their relative suitability and then demanded that industry abide by that decision. Boiler construction presents a case in point. Up to 1902 the most common form of steel used in the construction of ship's boilers was crucible steel. This form of tool steel had a high chromium and low silicon content and was first produced in 1740. A century later crucible steel was the standard material used by Krupp on many navy and army contracts although it often required re-smelting to obtain the desired quality.[43] In 1902, the RMA decided that Siemens-Martin steel was a far better material for boilers because the finer quality control afforded by that company provided a far more reliable product. In spite of Krupp's argument that insufficient quantities of the new product would make construction more difficult, the RMA ordered a changeover and Krupp abided by its decision.

---

[42]BA/MA RM3/2100 KWK to SS/RMA, Berlin 2.3.04.

[43]Der Grosse Brockhaus, 16th edition, vol. 3 (Wiesbaden, 1953).

Krupp's facilities were already producing large quantities of crucible steel, and the RMA's request obliged it to change to the Siemens-Martin process for boiler material. The quantities of crucible steel Krupp already had were thus unsuitable for future RMA boiler projects.[44] In this case, the RMA had a sufficient number of firms willing to supply the type of steel desired if Krupp refused, so even the most powerful of Germany's steel firms had to bow to its decision.

The RMA continued to test its vessels after they entered service. The Königin Augusta Strasse received a constant flow of reports on every aspect of a vessel's routine performance.[45] In this way the RMA ironed out every flaw, from faulty boat cranes to the rudder problems that briefly plagued the ships of the Braunschweig Class.[46]

By 1902, the RMA was discovering the true complexity of having ten new battleships under construction. Those of the Wittelsbach Class were nearing completion, and the Braunschweig Class were all in the early stages of construction. In addition, heavy cruisers and a multiplicity of smaller vessels were being built. As many more companies flocked to obtain their share of lucrative navy contracts, the administrative problems involved strained the RMA's abilities to the limit.

---

[44] Ibid.

[45] BA/MA RM3/3701 Commander of the 1st Squadron, North Sea to SS/RMA, Berlin 9.5.02.

[46] BA/MA RM3/483 RMA Construction Dept., Berlin to Vulcan, Stettin 1.31.02. BA/MA RM3/480 Germaniawerft, Kiel-Gaarden to SS/RMA, Berlin 11.4.04, RM3/446 RMA Berlin to KWW 4.27.04.

The virtual avalanche of cost and weight excesses that dropped into the Construction Department offices in Berlin pinpointed the most vulnerable point in the entire building program, with the possible exception of the armor monopoly. von Eickstedt's staff had to verify and evaluate each and every additional cost report.[47]

Most of the problems causing cost and weight overruns also wasted valuable time. Since these construction obstacles were interlaced, it was not possible to solve one separately from the others. Their origins lay mostly in the private sector, as Krupp's periodic inability to meet delivery deadlines exemplified. Tirpitz had previously approached Wilhelm II about Krupp's late deliveries during the construction of the S.M.S. Kaiser Friedrich III and inquiries by the Kaiser obtained almost immediate results on that project.[48] Then the Krupp directors blamed RMA design changes, production errors, and early RMA delivery deadlines for the problem.[49] Their suggestions for improvement involved greater competence of the firm's technical personnel and closer cooperation between the shipyard, the RMA and the subcontractors.[50]

---

[47]For example, see: BA/MA RM3/500-11, passim.

[48]HA Krupp, FAH III C181, F. A. Krupp, Villa HUgel to Direktorium, Essen 11.2.1898.

[49]Ibid., Direktorium to F. A. Krupp, Essen 12.7.1898.

[50]Ibid., "Bericht betreffend die verspätenten Lieferungen des Artillerie-Materials für S.M.S. Kaiser Friedrich III" (Direktorium to Krupp, Essen 12.7.1898).

The evaluation of every overrun was the worst part of the RMA's task. The very nature of this process, including the large number of firms involved and the variety of reasons proposed for the increases and excesses, diffused the RMA's power to act effectively. This inescapable consequence of a very ambitious building program represented a vulnerable point which a single complaint to the Kaiser could not possibly solve.

One typical case involved the manufacture of drinking water containers for the Braunschweig Class. In each case these seemingly insignificant items increased the ship's weight over 100 kg. and cost between 330 and 449 marks more than the contract allowed. Thus in this one minor instance the RMA had to approve an additional 2000 marks for these battleships.[51] It would not take long for an accumulation of small cases like this to create a financial crisis for the RMA, retarding the success of the entire program.

The major causes of these headaches were diverse. In some instances various contractors or yards would overextend themselves by accepting too many projects. Usually the RMA was able to avoid this situation. However, when it happened, the burden would often cause production flaws, a decline in quality, and disrupted schedules. Problems of this sort arose between the RMA and Krupp over the

---

[51]BA/MA RM3/488 Vulcan, Stettin to SS/RMA, Berlin 6.24.04.

latter's diverse contract commitments to the Deutschland Class.[52]

Late delivery, damage to important ship parts, the failure of designs to arrive at the factory on time, all of these general reasons resulted in extra spending, lost time and often increased weight. Siemens-Schuckert's late installation of the radio telegraphy system delayed the construction of the cruisers Prinz Adalbert and Hamburg.[53] Vulcan complained that Krupp took far too long in making the cannon mountings for the S.M.S. Mecklenburg,[54] and Schichau appealed to the RMA for greater pressure on the S.M.S. Wettin subcontractors to keep them on schedule.[55]

Krupp's efforts to economize damaged the foundations of the 15 cm. turrets on the cruiser S.M.S. Prinz Heinrich. The bolts used to anchor the turret housing at various deck levels were spaced further apart so fewer would be required. The resulting lack of stability caused damage to the turrets. When the builders of the S.M.S. Wilhelm der Grosse employed the same design, the RMA had a terrible

---

[52]BA/MA RM3/502 Krupp to SS/RMA, Berlin 11.4.02. "Notizen zum Immediatverträge über der Inbaugabe von Kriegschiffen, die 1903 neu gefordert werden," Berlin 10.30.02.

[53]BA/MA RM3/1100 KWK to RMA Construction Department, Berlin 14.5.04.

[54]BA/MA RM3/462 Vulcan, Stettin to Kaiserliche. Marinebaurath Flach, Berlin 9.10.02.

[55]BA/MA RM3/453 "Ruckstandige Angaben für den Bau S.M.S. Wettin," Danzig 3.29.02.

time trying to get Krupp to admit the error and change the plans.[56] The Imperial Yard at Kiel was left to repair the damage to the Prinz Heinrich.[57]

Most design difficulties, however, were smaller, and their number made them expensive. A change in specifications for the stern galley in the S.M.S. Wettin eventually cost 1655 marks extra and added another 436 kg to the ship.[58] Extra work needed to strengthen the cannon mountings on board the S.M.S. Wettin and Zähringen cost 8,172 marks and 2,787 marks, respectively.[59] Both the Braunschweig and Deutschland Classes had problems with excessive vibrations in the steering system and rudder. The firm of Haniel and Lueg in Düsseldorf installed systems with similar defects in both the S.M.S. Hannover and Pommern.[60] Schichau received similarly flawed designs for the S.M.S. Lothringen, and rudder alterations made on the S.M.S. Braunschweig at the Imperial Yard at Kiel cost an extra 6,850 marks.[61] Eight new

---

[56]BA/MA RM3/286 Krupp, Essen to SS/RMA, Berlin 4.8.02. KWK to SS/RMA, Berlin 4.3.02.

[57]Ibid., KWK to SS/RMA, Berlin 7.19.02.

[58]BA/MA RM3/453 Schichau, Danzig to SS/RMA, Berlin 2.17.02.

[59]BA/MA RM3/455 KWK to SS/RMA, Berlin 5.15.03.

[60]BA/MA RM3/517 KWK to RMA Construction Dept. 12.20.04 (Telegram). RM3/527 Haniel and Lueg, Düsseldorf to SS/RMA, Berlin 12.16.04, and RMA Construction Dept., Berlin to KWW 12.23.04.

[61]BA/MA RM3/495 Schichau, Danzig to SS/RMA, Berlin 10.7.03. RM3/481 KWK to RMA Construction Division, Berlin 2.25.04.

watertight doors for the S.M.S. Wittelsbach came in 400 kg and 1600 marks over projections,[62] and the chains for the S.M.S. Braunschweig added 1,612 kg and 7,104 marks to that ship's contract weight and cost.[63] These examples only begin to show the extent of the problem.

For the RMA, the cost of alterations or repairs to Krupp projects was the most trouble. The extra expense of reinforcing the S.M.S. Preussen's 15 cm turrets was 41,282 marks.[64] Similar alterations to the 15 cm turrets of the S.M.S. Zahringen, Wettin and Mecklenburg involved a total of 43,885 marks.[65] Krupp absorbed none of these costs and the RMA had to pay the firm or have the work done at one of the Imperial Yards. As a result substantial amounts of money and time were lost. Krupp completed most of the heavy guns on time, but delays were usually considerable. In one case the delivery of 10.5 cm cannon for the light cruiser S.M.S. Merkur was delayed six months by a minor design change that Krupp deemed necessary. In these cases, the RMA could not turn to a competitor, so it had to absorb the losses.[66]

Eickstedt used the RMA cost accounting system to inject order into the process of coping with these overruns. In every case the

---

[62]BA/MA RM3/444 KWW to SS/RMA, Berlin 3.20.02.

[63]BA/MA RM3/478 Germaniawerft, Kiel to SS/RMA, Berlin 2.4.04.

[64]BA/MA RM3/463 Vulcan, Stettin to RMA, Berlin 10.31.03.

[65]BA/MA RM3/462 Vulcan, Stettin to RMA, Berlin 7.20.03.

[66]BA/MA RM3/360 RMA, Berlin to Krupp, Essen 2.16.04.

firm or yard claiming the overrun had to submit a strict spending breakdown. Using quarterly spending control reports compiled by the Imperial Shipyards for all projects, the RMA was able to evaluate the various cost changes for each ship, determine their overall effect, and plan official action.[67] Tirpitz also increased the control of the Construction Inspectorate over releasing funds for work they felt met RMA standards. Krupp protested this action as unwarranted interference by the RMA in business affairs, especially between the private yards and subcontractors.[68] Nevertheless, Tirpitz and von Eickstedt insisted on the measure, and closer cooperation between yard, subcontractor and RMA, in order to strengthen the position of the latter.[69]

The shipyards were also feeling the impact of steady expansion. The RMA evidently expected some yards and subcontractors to feel the strain and ordered the Imperial Yards to extend credit or determine some disbursement schedules according to the financial need of the more reliable naval vendores.[70] Wilhelmshaven and Kiel were

---

[67]BA/MA RM3/460-61 passim. RM3/6112 "Vierteljahrliche Ausgabekontrolle uber den Fonds fur den Neubau des Linienschiffs "Mecklenburg" für das 3. vierteljahr 1903," (KWW). RM3/489 Vulcan, Stettin to SS/RMA, Berlin 12.17.04. RM3/504 RMA, Berlin to Germaniawerft, Kiel 2.11.04.

[68]BA/MA RM3/6007 KWD to SS/RMA, Berlin 4.7.04. KWK-BBS to SS/RMA, Berlin 4.6.04. Krupp, Essen to SS/RMA, Berlin 4.16.04. Vulcan-BBS, Stettin to SS/RMA, Berlin 4.22.04.

[69]BA/MA RM3/462 Tirpitz to Construction Dept., RMA (handscript notations), Berlin 2.16.03. RM3/455 Tirpitz to Kaiserliche Kommando des I. Geschwader, Berlin 5.23.03.

[70]BA/MA RM3/6008 Abschrift zu KIV 3457, zu EI 1625/03, Berlin 9.26.03.

responsible for most payments on capital ship projects, while Danzig dealt mostly in smaller craft and U-boats.[71]

An interesting clash over contract payments took place between an Imperial Yard and a private subcontractor in 1904. The case of the Imperial Shipyard at Danzig versus the Stettin firm of Bruno Koch was actually atypical of shipyard-subcontractor relationships. It was, however, illustrative of the power of an Imperial Shipyard in its function as RMA bursar and the ability of the naval authorities to support their subordinates in some situations. In September of 1904 the Koch Firm extended the shipyard facilities at Danzig for the RMA to include a large breakwater, a new 67,000 cubic meter dock and quite a few pilings to stabilize the dock's shoreline foundation. Koch's engineers determined that even more pilings were needed than originally estimated.[72] The Imperial Yard decided that since the additional work and departure from the contract was not cleared first with Berlin, the 3,300 marks cost overrun was not a legitimate expenditure. Therefore, that part of the bill was not paid.

In the prolonged legal battle that followed, Koch brought suit against the RMA for its contract restrictions. He contended in court that the work at Danzig was well done, only 5% over contract

---

[71]BA/MA RM3/6078 KWK to SS/RMA. Construction Dept., Berlin 11.14.04.

[72]BA/MA RMA/10857 Firma B. Koch, Stettin to RMA, Berlin 2.27.05, "Beschwerde gegen die Handlungsweise der Kaiserlichen Werft, Danzig." KWD to SS/RMA Technical Dept., Berlin 3.27.05; and Mitteilungen des Verbandes des deutschen Tiefbauunternehmer, No. 3, March 1905.

cost, and justified according to conditions at the construction site. He was battling "not against a person, but against a system" that in his opinion was far too restraining.[73] In this instance, the RMA was able to focus all of its authority and influence on a breach of naval-industrial protocol, something difficult to do when the subject was a ship on a tight schedule. It supported Danzig's arguments against Koch completely. The case dragged on until 1921 when the navy handed it over to the civilian government and washed its hands of the affair.[74] By that time his claim against the Danzig Yard was all he had left, for the Firm of Bruno Koch went bankrupt before 1914.

The Koch case inadvertently resulted from an RMA plan to renovate the Imperial Yards. The private shipyards were expanding their facilities with their own resources, but the Imperial Yards were degenerating out of sheet neglect as the head of the RMA Shipyard Department, von Ahlefeld, openly complained.[75] It was becoming more difficult to keep official prices below private shipyard levels.[76]

---

[73]BA/MA RM3/10857 Firma B. Koch, Stettin to RMA, Berlin 4.17.05.

[74]Ibid., Reichswerft, Danzig to Reichswehrministerium, Berlin 3.3.21.

[75]BA/MA RM3/6033 "Vergebung der grossen Kreuzer 'C' und 'D' an Privatwerften," Berlin 6.2.04 (Shipyard Dept. to SS/RMA).

[76]BA/MA RM3/6030 "Vergleich der Neubaukosten auf Kaiserlichen und Privatwerften," Berlin 9.24.02. This was a constant concern for the RMA. Tirpitz sent a Professor Bernhardt to Britain to evaluate the Royal Navy's State Shipyards in 1904. Bernhardt felt their machinery was a bit out of date but concluded that they bore a heavier burden for the British than the KWs did for the RMA. BA/MA N253/7 Nachlass Tirpitz, Prof. Bernhardt to SS/RMA, Essen: Report on his fact-finding trip of June 1904.

The only way to remedy the situation was to spend a great deal on expanding the facilities at each Imperial Yard according to the RMA expectations of that yard. The work given the Koch Firm was a partial response to this problem.

Krupp: The Vulcan Scheme and the Armor Monopoly

A firm the RMA could never conquer the way it did Koch was secretly trying to broaden its shipyard holdings. In 1903 the Krupp Firm directors approved a plan to begin a takeover of the Vulcan shipyard at Stettin. The initial plan was to negotiate a gentleman's agreement with the Stettin firm for close cooperation, something like the alliance with Dillinger. However, when Vulcan rejected these initial approaches the Director of Krupp, Max Rotger,[77] ordered the slow but steady purchasing of the shipyard's stock.[78] Vulcan's stockholders received a two part appeal to help quicken the pace of the annexation. Essen guaranteed a consistent 4% dividend on Vulcan shares and a thirty year period of minimum changes and experimentation, which was to assure Vulcan's stability after the takeover.[79]

---

[77]Max Rötger: b. 8.27.1860 Wittenberg, d. 4.7.1923 Berlin-Grünewald. Successor to Hanns Jencke as chairman of the Krupp Direktorium 6.1.01-10.1.09. See: HA Krupp FAH III B261.

[78]HA Krupp FAH IV C16 Gustav Hartmann, Dresden to Rötger, Essen 11.5.03. Rötger, Merau, Habsburger Hof to Hartmann, Essen 11.9.03. WA Xa 3,7 and FAH IV C276 Gustav Hartmann, generalia. See also: FAH IV C13 and WA IV 1264. Hartmann was a member of the Krupp Board of Governors from 1903 to 1909.

[79]HA Krupp FAH IV C16 Rötger to Hartmann, Baden-Baden 4.30.04.

Vulcan was particularly vulnerable to this type of attack. Its contracts with the RMA were not coming rapidly enough to keep its entire workforce employed on a continuous basis. In 1902 it received contracts for a light cruiser and a cannon boat, with another cruiser following in 1903 and a battleship in 1904. It finished the lighter vessels in less than twenty-four months and released many highly specialized workers at various stages of construction without alternative work. Before the acquisition of its larger Hamburg facility in 1906, Vulcan was limited in the number of capital ships it could simultaneously accommodate. The Hamburg site would enable a vastly increased capacity later, but the firm's employees needed the additional work immediately.[80]

To make it more difficult for Vulcan's directors to oppose the Krupp move, the latter endangered Vulcan's position with the RMA by slowing down on armor and cannon deliveries. This could affect both Vulcan's reputation with the navy and the status of Vulcan stock on the exchange.[81]

---

[80]BA/MA RM3/514 von Maltzahn, Oberprasident of Pommern to Chancellor von Bülow, Berlin 1903. By way of comparison, Germaniawerft's contracts between 1900 and 1905 were as follows:

1900 - 6 torpedoboats (TB)
1901 - 1 battleship (BB)
1902 - 1 BB
1903 - 1 BB
1904 - 1 U-boat
1905 - 1 BB

The greater frequency of contracts and the overlapping of projects made it less likely that Germania would have difficulty keeping its workers on the job. E. Gröner, op. cit., passim.

[81]BA/MA RM3/460 Vulcan, Stettin to SS/RMA, Berlin 1.4.02. RM3/461 Vulcan, Stettin to Krupp, Essen 6.26.02.

Krupp's aim, of course, was to possess shipyards on both the North Sea and the Baltic, effectively doubling its value to the RMA if not its output and profits as well.[82] This effort continued throughout the period before 1914, as the Vulcan directorate under Herrn Flohr and Stahl barely kept Krupp at bay.

During the 1902-1904 period the Krupp Firm continued to dominate German armor plate production. It managed to keep this and its lucrative business in high percent nickel steel products beyond the reach of the Association of Steel Works.[83] Otherwise Krupp, as one of the association's larger companies, observed the Association's quotas governing steel production and profits in the Ruhr.[84] Essen benefitted both in and out of cartel organizations.

Although it often seemed so, Krupp was not the only steel producer employed by the navy. Many firms produced a variety of special steel products, and not all were as well known or powerful as Krupp, Dillinger, Thyssen or Stinnes. Furthermore, many of the shipyards deliberately varied the steel firms they used in an effort to reduce overhead, among other reasons. Schichau, for example, frequently used Borsig, Hörder, or the Bismarckhütte rather than Krupp for nickel steel.[85] Vulcan also approached Hörder in Westphalia

---

[82]HA Krupp FAH IV C16 Rötger to Hartmann, Baden-Baden 4.30.04.

[83]BA/MA RM3/2290 KWK to RMA Construction Dept., Berlin 5.9.04.

[84]G. Leckebusch, op. cit., passim.

[85]BA/MA RM3/494 Schichau, Danzig to SS/RMA, Berlin 2.28.03.

on the S.M.S. Preussen contract and preferred Dillinger to Krupp for armor when possible.[86] Given Krupp efforts to take over this company, it was no surprise that Vulcan was not anxious to rely too heavily on Essen for anything.[87] Vulcan also contracted with the Panzer firm in Wolgast for small quantities of armor plate.[88] These other companies did not present much of a threat to Krupp. Nonetheless, these cases clearly illustrate that neither the shipyards nor the RMA were ready to surrender to Krupp's position in the steel industry.

The RMA had to endure Krupp prices for armor and artillery. In a discussion of this matter during October of 1902, Geheimrat Rudloff of the Construction Department felt that Krupp did not seize all of its opportunities to cut costs. He referred Capelle of the Administrative Department to one case where a 80,000 marks saving on armor costs might have been possible. Capelle replied that if he pressed the issue with Krupp, ". . . the entire armor plate question would again unravel." Capelle was only too aware of Tirpitz's failure in his efforts against Fritz Krupp, and he did not want to return to that state of affairs.[89] Between Fritz Krupp's death

---

[86]BA/MA RM3/485 Hoerder Bergwerks- und Hütten Verein, Hoerde to RMA, Berlin 3.4.03.

[87]BA/MA RM3/484 Vulcan, Stettin to SS/RMA, Berlin 6.28.02. Vulcan, Stettin to SS/RMA, Berlin 7.31.02. Vulcan, Stettin to SS/RMA, Berlin 12.10.02. Vulcan, Stettin to SS/RMA, Berlin 5.6.02.

[88]BA/MA RM3/2040 BBS, Stettin to RMA Construction Dept., Berlin 9.16.04.

[89]BA/MA RM3/2527 "Protokoll über die Sitzung am 27. Oktober 1902," RMA, Berlin.

in Italy on 22 November 1902 and the subsequent marriage of his daughter, Bertha, to Gustav von Bohlen und Halbach in 1906,[90] the situation began to change. The firm's grant of a 2.5% rebate on all naval orders in April of 1903 was interpreted as a hopeful sign. However, nobody at the RMA was rejoicing too loudly,[91] as the rebate would not alter the prices dramatically.[92]

Research and Development: The Turbine Engine and U-Boat

The few areas of research and development in which the RMA participated indicated its priorities for the future of naval technology. By 1902, for example, the consensus among RMA leaders was to steer artillery research toward larger weapons with a much greater muzzle velocity.[93] The 28 cm. (11 inch) guns which would arm Germany's first dreadnoughts were already perfected, along with a new ship design capable of 19.5 knots.[94]

---

[90]BA/MA RM3/479 Germaniawerft, Kiel-Gaarden to SS/RMA. Berlin 4.30.04. RM3/6076 KWK to SS/RMA Construction Dept., Berlin 1.2.03. Information on F. A. Krupp; Georg von Alten, Handbuch für Heer und Flotte, vol. 5 (Berlin, 1913).

[91]BA/MA RM3/2527 Weapons Dept. to Central Division RMA, Berlin 4.2.03.

[92]BA/MA N253/7 Nachlass Tirpitz. "Zusammenstellung des Gesamtverbrauchs an Krupp'schem Vertikalpanzermaterial" (survey of cost between 1894 and 1906).

[93]BA/MA RM3/329 RMA memo regarding 24 cm. guns for battleships, Berlin 9.26.04. "Aufstellung der Artillerie in Kasematten, Einzelturmen und Zwillingsturmen," Berlin 11.3.04. RMA memo: Construction Dept. on 21 cm. guns for new battleship contracts, Berlin 12.13.04. RM3/3701 "Protokoll über die Sitzung am Montag den 24. November 1902."

[94]W. Hubatsch, Der Admiralstab (Frankfurt a.m., 1958), 115-16.

Events abroad heavily influenced the decisions of the RMA Sitzungen or planning sessions. The RMA received a constant flow of technical information from its naval attachés which it shared with the private shipyards and private firms.[95] Another important foreign source was Oberleutnant von Lowenfeld, who observed the Battle of Tsushima between the Russians and the Japanese in late 1904 from the battleship Tsarevitch. His report emphasized Japan's effective use of torpedoes against the Russian battleships. Torpedoes became a topic of intense debate within the RMA,[96] as the German navy was well equipped with these weapons. But any hope of using the torpedo in conjunction with the U-boat perished in tactical discussions and evaluations of battleship performance. In a fourteen page memo entitled "Reflections on the Tsarevitch," Vice-Admiral von Prittwitz, Chief of the Cruiser Squadron, concluded that torpedo nets had justified themselves by keeping damage to Russian ships to a minimum.[97] Twelve years later the navy discarded these defensive nets after evaluating the Battle of Jutland (Skaggarak). Nonetheless, the lessons gleaned from an actual war were considered invaluable opportunities to improve the quality of decisions mapping the future of a navy. With few exceptions, however, the lessons learned from the

---

[95]BA/MA RM3/1077 Blohm u. Voss, Hamburg to SS/RMA, Berlin 5.4.03.

[96]BA/MA RM3/1002 Report by Oberleutnant z. S. von Lowenfeld regarding his experiences on board the battleship Tsarevitch at Tsingtau (Kiaochow) 8.20.04.

[97]Ibid. "Beobachtung auf Cesarewitsch," Tsingtau (Kiaochow) 9.1.04. (Author: v. Admiral v. Prittwitz.)

Russo-Japanese War reinforced already predominant points of view, rather than provoking experimentation.

In all areas of research and development, the RMA depended upon the private sector. Tirpitz had a very modern facility in the Research Center for Shipbuilding and Hydraulics in Berlin, but it required extensive technical cooperation from Siemens-Schuckert, the Germaniawerft, and other firms.[98] Thus research and development remained what it had been since 1897, an effort to augment Tirpitz's naval plans conducted mostly in the private sector.

One result of research and development, the Parsons Turbine, monopolized the attention of the electrical industry. In the spring of 1902, Tirpitz sent a naval commission to Great Britain to examine first hand the performance of the Parsons' engine, and advise the Construction Department on the system's suitability for use in the Imperial Navy. The group returned enthusiastic about the engine's possibilities, with only one reservation. They were not sure how this high powered system would work as part of an on board electrical dynamo.[99]

As far as industry was concerned, the generally favorable evaluation was the go-ahead signal. Up to 1902, only Brown and Boveri was licensed to manufacture the Parsons' engine in Germany. In that

---

[98]BA/MA RM3/1003 Memo regarding the versuchsanstalt für Wasserbau und Schiffbau, Berlin 7.9.04. SS/RMA to Finance Minister, Berlin 10.21.03.

[99]BA/MA RM3/2108 "Bericht der nach Schottland und England zum Studium der Parsonsturbinen entsandten Kommission" to SS/RMA, Berlin 5.16.02.

year, however, the British Parsons Co. opened its own German branch. The "Turbina," Deutsche Parsons Marine A.G. was named after the first successful British turbine ship prototype.[100] Brown and Boveri was reduced to a "Turbina" affiliate where the Parsons' System was concerned.

The rest of the German electrical industry was not standing still while these developments took place. The North German Lloyd, Krupp, Siemens-Schuckert and M.A.N. were all exploring the Swiss Zoelly Turbine system. Indeed, the Berliner Tageblatt reported that the formation of a huge combine among these firms was imminent.[101] This was not yet the case, however, for Krupp was investigating propulsion systems of its own and was tied to no single engine design. A.E.G. and Vulcan began joint research, while Siemens and Halske continued to deal with Parsons through Brown and Boveri.[102]

In spite of any potential continental breakthrough, the Parsons system remained the only engine already designed and proven effective tests. It soon became recognized around the world as the most advanced form of reliable marine propulsion. Jay Gould and J. P. Morgan jointly paid £ 100,000 in 1902 for the American rights to the Parsons patent

---

[100] Ibid. Promotional brochure for "Turbina," Deutsche Parsons Marine A.G., 1902.

[101] BA/MA RM3/2109 Clipping from the Berliner Tageblatt of 2.15.04.

[102] Ibid.

in order to power five quick trans-Atlantic steamers with 50,000 h.p. Parsons' turbines.[103]

In Germany, the Parsons case seemed the one exception in a naval expansion otherwise dominated by German domestic industry. Although the turbine situation presented a problem for Tirpitz, it also indicated something even more important. Germany had finally reached the stage of self-sufficiency that Stosch had hoped for thirty years earlier. For all intents and purposes the navy needed only home-based firms and yards to fulfill Tirpitz's naval ambitions. Even in the case of the turbine, the position of the RMA did not seem nearly as tenuous after 1902. Nearly every German electrical firm and even a few shipyards were in some way involved in research to upset the dominance of Parsons.[104] With the foundation of an affiliate of the Parsons Co. in Germany, it was unlikely that the RMA would find itself cut off from vital technical information in case of war. Domestic engineering expertise, coupled with the facilities of "Turbina" and Brown and Boveri, would ensure independence in cases of extreme necessity.

Other problems confronting the electrical firms and the RMA were relatively minor. The RMA was upset by frequent minor design modifications required by some electrical hardware. Often these were lamps, lanterns and lighting fixtures found ineffective in their

---

[103] BA/MA RM3/2108 See fn. 113.

[104] W. Hubatsch, Kaiserliche Marine (Augsburg, 1975), 375-84.

originally intended position.[105] On-board electric dynamos, powered by small turbines presented problems of space and stability.[106] The Construction Department feared that the Siemens companies were approaching a monopoly of the installation of wireless telegraphy, but the RMA still considered the amount of competition in the industry sufficient.[107] Between 1902 and 1904, the RMA outfitted some forty-one new and old ships with the latest forms of wireless telegraphy for about 1,500 to 2,000 marks per ship.[108] All the navy wanted was strict adherence to the Suppliers List and the official guidelines for wireless apparatus installation.[109]

The Germaniawerft began construction on the first RMA approved U-boat in 1904. By that time, three of Germany's top naval rivals were far ahead in this area. In 1903, the French boat "Forelle" successfully completed a three nautical mile test cruise, during which the sixteen ton vessel simulated a submerged attack and returned to base. About three months later the German Kaiser saw the boat in

---

[105]BA/MA RM3/1172 See 1171-72 passim, 1903-04.

[106]BA/MA RM3/1173 KWK to RMA Technical Dept., Berlin 10.3.02.

[107]BA/MA RM3/1232 RMA Construction Dept., Berlin to Siemens and Halske, Berlin 4.30.02. Construction Dept. to Weapons Division, RMA (eight page memo), Berlin 1902.

[108]BA/MA RM3/1100 Dockyard Dept., section VII to section V, RMA Berlin 1.3.04.

[109]Ibid. "Generalle Vorschriften über Einrichtung von Funkentelegraphenkammern," Berlin 11.8.02.

action and later his brother, Prince Heinrich, became the first German officer to ride in a U-boat.[110]

In the first few years of the new century the French led in submarine development and offensive use. France had forty-six U-boats in service or under construction by 1904, manned by fifty-four officers and 531 men and financed by a budget of 1,337,858 francs.[111] The Americans were not far behind in research and development, but the U.S. Navy was a bit slower than France to find a strategic place for the new vessels on the high seas. The design perfected by Holland was under production by 1897 and nine successful boats were manufactured before the end of 1901, at an average cost of $700,000 per boat. The British approached the American inventor in 1902 with an eye toward producing the new American boat in England under license. The Admiralty had already completed four submarines at state shipyards and five others at Vickers' Sons and Maxim.[112]

In Germany only Krupp's work at Kiel made any genuine progress with U-boats. By 1904 an RMA memorandum testified to the lack of official naval commitment in these matters and the secretive nature of the work at the Germaniawerft.[113] Both of these were natural, for the

---

[110]H. Techel, Der Bau von Unterseebooten auf der Germaniawerft (Munich, 1969), 5.

[111]Nauticus, 1904, 103-108.

[112]Ibid., 109-110. BA/MA RM3/3877 British Submarine Boat Co., Ltd., London to SS/RMA, Berlin 10.6.02. RM5/1947, passim; Comparative notes on U-boat development in: France, Britain, U.S.A., Japan and Germany.

[113]BA/MA RM5/1947 "Fortschritte im Bau der Unterseeboote," 1904.

RMA was following Tirpitz's dictum about minimal involvement in U-boat work, and the Krupp Firm was always secretive about its research. Between 1902 and 1904, however, the RMA's U-boat policy began to crumble under domestic and international pressure.

Krupp built the first German U-boat prototype at Kiel under the supervision of the French expert d'Equevilley in 1902.[114] The Krupp firm sought to rely on a bare minimum of subcontractors in production in order to maximize profits, but it still had to procure a light, reliable diesel engine for surface running from M.A.N., Fiat (Turin), or Körting. Krupp spent the better part of the next decade trying to surpass the designs these firms had to offer.[115]

Essen first entered the U-boat market by applying for a German patent to construct diesel-electric boats in 1904.[116] The firm immediately encountered international competition at home and abroad. The American based Lake Company was peddling the Holland "Protector" class submarines in St. Petersburg, London, and Berlin.[117] Initially, the Krupp Firm approached this challenge the same way it dealt with Dillinger and Vulcan. Max Rötger and other directors suggested negotiations with the Lake Co. with an eye toward cooperation in U-boat sales to the Tsar's navy. They were resigned to a head-to-head

---

[114] H. Techel, op. cit., 5.

[115] Ibid., 21-22.

[116] Ibid., 5.

[117] BA/MA RM3/3877 See fn. 125.

competition if Lake did not respond favorably.[118] Krupp was well aware of the potential of the American vessel, having purchased a Holland boat of a similar type for research purposes.[119] The appeal to Lake, however, was no more successful than their recent approach to Vulcan. Germaniawerft foreign sales were a minimal success, but they were guaranteed a near monopoly at home now that Tirpitz was, however reluctantly, realizing the need for this new type of weapon. Between 1902 and the end of World War One, the Germaniawerft built 101 U-boats,[120] of which the RMA bought eighty-six.[121]

With the beginning of construction on the U-1, the RMA Chief quickly saw the need to educate his engineers and inspectors for work with this new vessel. In 1904 Tirpitz ordered the Technical Department to recruit engineers and to take some of its younger personnel, on a volunteer basis, and subject them to an intensive course in the niceties of U-boat construction.

Progress in Construction

The last pre-Dreadnought class of German battleships was also laid down between 1903 and 1905. The Deutschland Class included the Hannover, Pommern, Schlesien, Deutschland and Schleswig-Holsten.[122]

---

[118]HA Krupp FAH IV C13 Rötger and Eccius, Essen to Hartmann, Dresden 12.20.04.

[119]BA/MA RM5/1947 See fn. 126.

[120]H. Techel, op. cit., 101.

[121]E. Gröner, op. cit., 40-45.

[122]All technical information on these vessels came from: E. Gröner, op. cit., 20-40; S. Breyer, op. cit., 262-263.

Germaniawerft received the first and last ships while Vulcan and Schichau would build the third and fourth, respectively. The Imperial Yard at Wilhelmshaven contracted for the S.M.S. Hannover for 24.2 million marks, the lowest price of the class by 130,000 marks. The five ships averaged about 14,000 tons and had a top speed of between eighteen and nineteen knots. Their main armament consisted of two double 28 cm. turrets and fourteen 17 cm. guns along with a number of smaller quick-firing cannon. The final type of vessel built under the financial auspices of the 1900 Naval Law was the U-1. This boat cost the RMA about 1.9 million marks and was ready by 1906. It was capable of 1,400 sea miles submerged at five knots.

By the time the U-1 was half-complete, the RMA was already gearing up to supplement the old 1900 Naval Law. The 1906 Supplementary Naval Law was the first of three pre-war bills of its kind successfully presented to the Reichstag. Tirpitz's continued good fortune with the legislature gave him both the means to respond to the H.M.S. Dreadnought and the money to perpetuate the new U-boat program.

Summary

Between 1902 and 1904 a far more active and aggressive British response to RMA ambitions destroyed the foundations of the Risk Theory. Tirpitz's position, however, remained strong because the battleship retained its position as the master of the seas and analyses of the Russo-Japanese War confirmed this turn of the century dictum. Outside the military establishment, the public still

believed that an imperial policy and a strong navy went hand in hand as part of the image of a great power.

It is difficult to determine Tirpitz's state of mind during this period. Politically astute and realistic, he certainly detected the British change of policy. His decision to explore the possibilities of the U-boat represented less an admission of a strategic flaw than a stopgap measure to ensure German technological parity. Rather, a combination of lasting capital ship predominance, an inner imperative to challenge Britain, and the dependence of his position and reputation on the Risk Theory allowed the true nature of events to change with little noticeable reaction from the State Secretary.

In relations between industry and the RMA these three years were characterized by an increasingly accepted routine. The navy was still expanding at a rapid pace, but the protocol system and testing procedures were firmly established. Industry was well aware of the standards it had to meet and the extent to which the RMA would go to insure compliance. In some instances, the RMA even sought to regulate not only its contractors, but also relationships between the latter and their subcontractors as well. On the one hand it became clear that the RMA regarded any industrial contact involving naval construction as its province.

On the other hand, Tirpitz's refusal to commit the RMA to research and development led to problems with the turbine and to Krupp's prominence in the U-boat industry. Despite these flaws, the German naval-industrial relationship was rapidly producing a

formidable high seas fleet, and the potential of domestic industry to meet naval needs by 1904 far surpassed even Stosch's expectations.

# CHAPTER IV

## CRITICISM, CONTINUITY AND LEGISLATIVE SUCCESS: 1905-1908

From 1905 to 1908 Tirpitz began to confront an unusual degree of opposition which openly criticized him for both his relentless loyalty to the Risk Theory and his battleship strategy. In spite of scathing criticisms by Captain Persius, Admiral Galster and others, Tirpitz kept to his course and struck back at his detractors. He successfully pushed two new supplements to the 1900 Naval Law through the Reichstag in 1906 and 1908. His aversion to the U-boat prevailed, contrary to the growing popularity of the weapon in naval circles, so there was no increased RMA commitment to U-boat development. Thus, continuity prevailed as Rollmann replaced the retiring Eickstedt as chief of the Construction Department in 1907.

The problems facing Rollmann were basically the same as those which plagued his predecessor. The armor monopoly was costing the RMA more money and contributing to overruns beyond contract cost and weight limits. The Parsons "Turbina" Company still completely controlled the turbine industry in spite of efforts by Siemens, A.E.G., Krupp and others. Furthermore, the cost of building the fleet was now rising more drastically. Tirpitz became more conscious of a need to give every advantage possible to the Imperial Shipyards as the navy's only alternative to private industry. In the face of a 20% to 25% rise in the Wholesale Price Index after 1905, and the

usual degree of industrial price gouging, the RMA needed every advantage it could muster.

Political Background

By 1906, the British had resolved to adjust themselves as the naval scene required. The Director of British Naval Intelligence commented that Germany would soon surpass Russia as the principal Baltic naval power. He was certain that the Admiralty would shift the focus of the two-power standard to France and Germany, rather than France and Russia, as the next most powerful fleets.[1] Thus Ambassador Metternich's 1905 comment that "No reasonable man here (i.e., Great Britain) thinks of war against Germany" soon required amendment.[2] The Royal Navy was planning to match and perhaps surpass any further German naval expansion. The British did not want war any more than Tirpitz did, but they were not willing to play blind man while the State Secretary guided his fleet program through the "danger zone." The change in the British political climate between 1902 and 1904 destroyed the international foundations of the Risk Theory.

Why then did Tirpitz continue as planned? That his reputation and position rested on the Risk Theory was surely the strongest motive. Other ingredients reinforced his continued course of action. Tirpitz was a die-hard proponent of a strategic offensive school of naval thought that found commerce war repulsive. He felt that

---

[1]P. Kennedy, Anglo-German Antagonism, 251-52.

[2]Die Grosse Politik., op. cit., volume 19/2, No. 6159. Metternich, London to Chancellor Bülow, Berlin 1.11.05, 375-77.

Germany would have to hold the field against Britain sooner or later in the imperial and economic arena. The only way to force the British to respect Germany's right to compete was to bloody the Royal Navy in battle. A commerce war was only a last resort, after the deciding battle was already lost. The best this strategy could accomplish in a contest against Britain was to extract "a favorable peace," and, as far as Tirpitz was concerned, Germany required more than that.[3]

In 1907, the commercial-war theories of the newly retired, U-boat advocate Vice-Admiral Galster were achieving a larger following among many high-ranking officers in the German navy.[4] Others were arguing that a battleship strategy could only succeed against Britain in the restricted waters in the Belts north of Kiel and east of Denmark. Both of these points of view had flaws which Tirpitz considered fatal. He never regarded the U-boat as an important primary weapon, and hence dismissed Galster. The "belts" strategy depended on the occupation of Denmark to secure the fleet's western flank for offensive operations. In the event of war, the Army General Staff refused to detach troops vital to the northern wing of the Schlieffen Plan offensive against France for action in Denmark. Beyond this problem, it was doubtful just how the British could be drawn out of the North Sea and into the Belts region.[5]

---

[3]BA/MA RM3/11710 Tirpitz to Bethmann-Hollweg, Berlin 4.20.07.

[4]G. Ritter, Staatskunst, 192-93. See below, pp. 178-183.

[5]P. Kennedy, "German Naval Operations against England, 1896-1914," English Historical Review, 89 (No. 550, 1974), 71.

Furthermore, the British introduction of the dreadnought served Tirpitz as both an open challenge and a reaffirmation of the battleship's future dominance in warfare. The RMA did not occupy itself with Galster's theories, but rather with new, all big-gun, ship designs. Between 1904 and 1906 the RMA produced three designs for a ship of the dreadnought type. Project 10A (1904) was a 14,000 ton ship with all heavy guns, but of two calibers. In 1905, Project C weighed 17,000 tons with eight heavy guns of a single caliber. The true forerunner of the Nassau Class dreadnoughts was Project G76, an 18,000 ton vessel with twelve heavy guns, drawn up in 1906.[6]

Other pressures to continue the fleet program unchanged existed besides technical and strategic considerations. In spite of doubts, public and private, voiced by people like Albert Ballin and Friedrich von Holstein, support for fleet expansion was still growing.[7] The membership of the German Fleet League rose to 330,044 by 1906 with the participation of 621,778 organizations.[8] The RMA News Bureau was producing more fleet propaganda than ever in preparation for the presentation of the 1906 Novelle to the Reichstag.[9]

---

[6]S. Breyer, op. cit., 263.

[7]F. von Holstein, Geheimen Papiere . . ., vol. 4, 439-440. Holstein to Bulow, Berlin 8.29.07. L. Cecil, Albert Ballin (Princeton, 1967), 350-51. Ballin was the Director of the Hamburg-America Line (HAPAG).

[8]W. Marienfeld, op. cit., 83.

[9]For example, see: BA/MA RM3/10148 News Bureau (Boy-Ed) to SS/RMA, Berlin 12.2.07.

For the shipbuilding industry it was just as important that the Tirpitz construction plan continue. The expansion of the shipyards and new capital investments made by firms interested in considerable profits were a direct result of Tirpitz's projections of naval needs. The entire industry would experience a setback if these estimates were sharply reduced. The RMA's relationship with industry had developed an identity and momentum of its own that encouraged Tirpitz to continue his past policies and played a role in limiting the scope of German diplomacy during these years as well.[10]

Without increased funds, Tirpitz's future plans as well as needed technological and design developments would come to nothing. Before the launching of the Dreadnought he had already determined to present two revisions of the 1900 Naval Law to the Reichstag. The first of these was scheduled for 1906, the second for 1908. Together their purpose was to tie the Reichstag to a much accelerated naval construction program in spite of the immense increase in the cost of naval hardware. In this effort, Tirpitz received the wholehearted support of the Kaiser. While the State Secretary focused on getting the fleet through the "danger zone," the Kaiser was pleased with the support Tirpitz's frequent political successes gave the aristocratic political and social order in Imperial Germany. It was therefore just as important to him that each Law arouse public support and hamstring

---

[10]V. Berghahn, Germany and the Coming of War in 1914 (New York, 1973), 92.

the Reichstag, as well as provide money for a more formidable fleet.[11]

In both 1906 and 1908 Tirpitz rode into the Reichstag on a wave of RMA inspired Fleet League propaganda and his own detailed projections of naval needs. The navy was better able to impress the Reichstag with its budget defense than was the army, with its piecemeal fashion of presenting its financial needs.[12] However, in his desire for these 1906 and 1908 Naval Supplements, Tirpitz rarely showed any willingness to understand the financial pressures bearing down on the Reichstag and the Treasury Office. He always felt, to the regret of Chancellor von Bülow and Treasury Secretaries von Stengel and von Sydow,[13] that the government's job was to find enough money to support naval needs approved by the Reichstag.[14] Perhaps closer cooperation with the Imperial Treasury would have given him a better picture of the government's future ability to finance naval ambitions. Tirpitz relied neither on other government agencies nor on any single administration to perpetuate the construction program. He adjusted his techniques to circumstances and increased RMA power vis-á-vis other divisions of government whenever possible.

---

[11]V. Berghahn, Der Tirpitz Plan, 474.

[12]P. C. Witt, op. cit., 204.

[13]Secretaries of the Imperial Treasury Office: Freiherr von Stengel (1903-1908) and Freiherr von Sydow (1908-1909).

[14]P. C. Witt, op. cit., 141.

The Naval Laws of 1898 and 1900 did not stipulate a standard rate of naval growth to Tirpitz's satisfaction. Thus the Supplementary Laws of 1906 and 1908 were designed to do just that. These laws changed the rate of replacement of battleships from twenty-five to twenty years and accelerated the proposed construction schedule far beyond this replacement rate.[15] As usual, Tirpitz employed the personal touch in Reichstag relations in order to support and promote the image of naval power as a vital element in Germany's political and economic growth. In 1902 he had a large Reichstag contingent brought to England to witness, with Germany's military representatives, the naval review for the coronation of King Edward VII. He continued to keep many of the Reichstag people in touch with impressive signs of naval power at home and abroad. During the debate over the 1908 Supplementary Law, he provided tours for some of the wavering deputies to naval bases, shipyards and even some of the newer capital ships.[16]

In one case, the RMA took the Reichstag Budget Committee on a tour of the Schichauwerft in Danzig to evaluate plant facilities, materials, labor and working conditions. This trip was not one of the usual jaunts designed to impress possible political supporters. The Budget Committee was out to get a first-hand estimate of increasing costs at one of the larger private shipyards.[17] Prices were rising very quickly,

---

[15]A. Tirpitz, My Memoirs, vol. 1, 203. BA/MA RM3/6674 "Begrundung zur Novelle 1908."

[16]W. Deist, Flottenpolitik, 99.

[17]G.W.F. Hallgarten, Imperialismus, vol. 2 (Munich, 1963), 544.

and the further increase in size, artillery and the amount of armor for dreadnought types was the major issue in the 1908 debate.

Between 1905 and 1909 the price of a battleship rose nearly 96%; the price of heavy cruisers, 107%. Part of this can be accounted for by a 20% to 25% rise in the German wholesale price index. However, responsibility for this drastic price increase rests with a number of factors, among them increased production costs and profit taking. A battleship that cost 24 million marks in 1905 was 47 million by the time the 1908 Supplementary Law was under debate.[18] A look at the RMA's first installment payment on the Nassau (1907) and the Helgoland (1908) Classes gives a good indication of the rapidity of rising costs. A. G. Weser received an opening payment of 12.02 million marks for the S.M.S. Westfalen in 1907. One year later the S.M.S. Thuringen's first installment topped that figure by 2,681,000 marks.[19] Both of these vessels were built at the same shipyard. The artillery and armor costs determined by the Krupp-Dillinger alliance accounted for a substantial portion of these increases. In 1905 armor and artillery alone were between 30% and 40% of the entire cost of a capital ship.[20]

---

[18]P. C. Witt, op. cit., 142.

[19]BA/MA RM3/3609 RMA Inter-office correspondence: Budget Dept. to Dockyard Dept., Berlin 2.20.05.

[20]BA/MA RM3/2528 "Notiz zum Immediatbericht, betreffend Vergebung der Linienschiffe 1907." RM3/578 Construction Dept. to Central Division, RMA, Berlin 6.25.08.

The costs of running the RMA were rising as well. In 1908 the budget for 340 top administrative personnel amounted to over 1.2 million marks.[21] No section of the RMA was content with the size of its staff as compared with the job they were expected to do.[22] Besides the numbers, wages were rising across the board. Within the RMA it was fairly easy to impose controls, but private individuals under contract to the navy and workers throughout the shipbuilding industry were demanding more pay. Foundry workers at Krupp were awarded an eight pfennig per hour raise in 1908.[23]

The other RMA budget priority, besides shipbuilding, was the expansion and modernization of the Imperial Naval Yards. By 1905 their facilities were broadened and future plans emphasized the further specialization of each yard. Every Imperial Shipyard had its coal and oil storage capacity increased as well as its facilities for stockpiling explosives, supplies, and ship parts.

Danzig was slated as a U-boat yard and a repair base for light cruisers. Kiel would be the central base for all torpedo work, and its ability to handle capital ships was substantially augmented by 1908. The property owned by the navy at Brunsbüttel, adjacent to the Kiel yard, was developed into part of the yard. Wilhelmshaven was

---

[21]BA/MA RM3/2499 RMA Budget for 1909 (Chapter 45 of the prepared budget presented in 1908).

[22]Ibid. For example, see: RMA Inter-office correspondence: Construction Dept. to Budget Dept., Berlin 6.5.08.

[23]HA Krupp WA VII f1104 "Arbeiter-Lohnstatistik vom 1. Januar 1911-31. Dezember 1917." Raises, per person, per day: 1908/09 = .08 marks; 1909/10 = .08 marks; 1910/11 = .13 marks.

largely left as it was, the primary place for battleship construction among the three. Like the others, its capacity for fuel and explosives was also increased.[24] These improvements required large yearly appropriations over the entire period before the war.[25]

Tirpitz exploited every possible theme in his efforts to secure the passage of both fleet law supplements. England was publically pinpointed as the main adversary abroad. Tirpitz argued that the "danger zone" and the fear of "copenhagening" would disappear only if the navy adopted a three-ship-per-year building tempo. Tirpitz targeted the opposition of the Progressives and the SPD for propaganda attacks in the press,[26] and he was once again convincing in political debate. The Reichstag passed the Supplementary Naval Laws on 5 June 1906 and 6 April 1908.[27]

The 1906 Law increased the Foreign Service Fleet by five heavy cruisers and the Reserve Fleet by one.[28] The more important of the two laws, however, was the 1908 supplement. This Law established both the three ship construction tempo and a twenty year service life for every ship. For all intents and purposes this created a construction

---

[24]BA/MA RM3/3610 "Denkschrift betreffend den Ausbau der Werften. Stand im Mai 1908 und nachstliegende Zukunftsbedurfnisse," Berlin 5.16.08.

[25]BA/MA RM3/3608, 3609, 3610 passim.

[26]V. Berghahn, Tirpitz Plan, 485 ff.

[27]For the debates on the passage of the 1906 and 1908 supplements, see the Reichstagsverhandlungen for both 6.25.06 and 4.6.08 and the session just before these dates.

[28]Hurd & Castle, op. cit., 335.

rate of four ships per year between new projects and replacements.[29] This was the peak of Tirpitz's building program. Between 1906 and 1912 the bulk of Germany's most effective capital ships joined the fleet.

Research and Development: Dreadnoughts and U-Boats

The revolution in ship design caused by the appearance of the H.M.S. Dreadnought in 1906 caused the RMA to reevaluate naval architecture, gunnery, and propulsion.[30] von Eickstedt shared the determination of his chief that the navy should have practical and effective weapons at a minimum cost. They accelerated research on new vessel designs at the Kiel Technical Institute, where the navy made stress tests on hull designs and cooperated with firms like Zeiss Optical and Siemens on special instruments and gauges.

The RMA also planned to locate a new research institute at Berlin Marienfelde[31] and another for materials testing in Stuttgart. The latter would complement those at Charlottenberg, the Berlin Technische Hochscule, and the Purchasing Department offices in Düsseldorf, Essen and Berlin.[32] RMA technical personnel made mandatory trips to these centers and the facilities of private companies to

---

[29] Ibid., 336.

[30] BA/MA RM3/1002-1015 passim.

[31] BA/MA RM3/1006 "Denkschrift über die Notwendigkeit einer Marine-Versuchsanstalt," Berlin 10.11.07. RM3/1008 passim.

[32] BA/MA RM3/2204 KWK to Construction Dept., RMA, Berlin 7.21.07.

improve their skills in the increasingly complex fields related to ship construction.[33] At the Imperial Yards the RMA kept lists of independent commercial and private research projects of possible interest to the navy.[34]

In their joint research and experimentation, industry and the RMA encountered few of the difficulties plaguing them during standard construction projects. The results of the research at Kiel, Berlin and Danzig not only benefitted the navy, but also meant new business for the firms involved. Here the navy found less of the tension usually found in government, military and business circles. There was a wide variety of specialized products competing for navy approval. These research efforts were also of interest to other divisions of the German government.[35] The Ministry of Public Works, for example, was a major source of funds for the work at the Research Center for Shipbuilding and Hydraulics in Berlin.[36] This relative harmony served the navy well in the years before the S.M.S. Nassau, Germany's first dreadnought style battleship, was laid down.

The RMA was aware that it was difficult to keep new ship designs secret. It was obvious that every naval power would now seek

---

[33]BA/MA RM3/2067 passim. RM3/2066 passim. For example: KWW to Dockyard Dept., RMA, Berlin 6.20.06.

[34]For example, see the case of the Firm Posnansky and Strelitz doing work on insulation materials: BA/MA RM3/2249 KWD to RMA, Berlin 1.14.03.

[35]BA/MA RM3/1003 passim.

[36]Ibid.

to copy the design of the British all big-gun ship. However, the RMA intended not to copy the British, but rather to create a ship that would best fit German needs vis-a-vis the Royal Navy in the North Sea and the Baltic. Thus the designs that ultimately resulted in the Nassau and Helgoland Classes and the battlecruiser von der Tann were different enough to require a greater amount of secrecy than ever before. Designs were solicited from private firms and developed by the navy.[37] In a note to Germaniawerft and Vulcan on this matter, the RMA reminded firms who might become involved in the construction of new designs "to maintain the greatest discretion regarding everything pertaining to our ships of the line."[38] As the development of new designs progressed the same secrecy reigned in the preparation of the publications that revealed all design specifications and RMA construction requirements to each shipyard and vendor.[39]

One of the areas in which the RMA initially departed from British design was in the choice of heavy guns for the Nassau Class. The H.M.S. Dreadnought carried 30.5 cm guns but the German navy initially favored a gun of a smaller caliber. In 1905 and 1906, the RMA did a good deal of research into the potential of the 21, 24 and the bigger 28 cm. guns.[40] The result was a move away from the old

---

[37]BA/MA RM3/329 RMA Construction Dept. to Weapons Division, August 1905.

[38]BA/MA RM3/2528 RMA, Berlin to Vulcan, Stettin, Germaniawerft, Kiel 12.4.06.

[39]BA/MA RM3/2531 SS/RMA to Construction Dept., Berlin 10.2.06.

[40]BA/MA RM3/348 Marine Oberbaurat Prof. Otto Kretschner, Baden-Baden to RMA, Berlin, August 1905.

mid-range 21 and 24 cm. weapons in favor of a uniform big-gun design.[41] However, the RMA rejected at first the 30.5 as its main weapon. The new Krupp 28 cm., 45 caliber model was not only as effective as the 30.5, but also lighter and cheaper to produce.[42]

This weapon was designed by the Krupp Firm in 1907 as an improvement on the 40 caliber 1901 type. Although the 30.5 was selected for the 1908 Helgoland Class and von der Tann, the choice of the smaller gun for the first German dreadnoughts was revealing. Tirpitz was not simply out to copy the British. Rather, decisions of this sort took into account the needs of a German fleet with substantial budget restrictions that nonetheless required a ship to match the H.M.S. Dreadnought. Speed, armor protection and firepower were needed in harmonious balance. Thus the 28 cm. gun was only one factor in designing a ship like the S.M.S. Nassau. The British presented the challenge. The form of the response was entirely an RMA creation.

A wide variety of improvements went into the new capital ship designs. Max Krause, the Director of the Borsig Mining and Foundry Company, presented a new design for the mounting of torpedo nets on the sides of the ship that reduced the possibility of tangles, slack, rust, and other problems occurring during deployment.[43] The RMA also

---

[41]BA/MA RM3/357 Construction Dept. to SS/RMA, Berlin 6.10.05.

[42]BA/MA RM3/577 RMA, Berlin 4.18.07. "Armierung der 1908 Linienschiffe an Seiner Excellenz dem Herrn Staatsekretar vorzulegen."

[43]BA/MA RM3/302 Max Krause to RMA, Berlin 3.1.05.

received a favorable consensus from the private shipyards on a new method of hull construction which combined an oblique alignment of steel plate on the surface with double wall construction. Both of these measures provided a better defense against torpedoes.[44] Every aspect of naval architecture and every sort of ship system was under review.

One badly needed improvement had to wait for further exploration. The increasing weight of capital ships required a better form of propulsion. The obvious answer--the turbine engine--was not yet ready for use in the larger ships. The engine was first successfully adapted to a German battleship in the 1909 Kaiser Class. Meanwhile, the conventional engines required to power the new dreadnoughts used an extraordinary amount of room.[45]

For the shipyards, this was also a time of increased activity. In 1905, many of them could not build the new battleships because their slips were not wide enough. All six of the major private yards began a crash program of alterations to their facilities. In spite of some efforts to claim certain wide berth construction techniques as private property,[46] all of the firms adjusted well. By early 1906

---

[44]BA/MA RM3/279 Correspondence between RMA and Vulcan, Howaldtswerke, Blohm und Voss, Schichau, Germaniawerft, and Weser Nov.-Dec., 1907.

[45]BA/MA RM3/361 "Denkschrift betreffend Erhohung der Geschwindigkeit der kleinen Kreuzer," Berlin 12.16.05.

[46]BA/MA RM3/331 Schiffsform Guljaeff, Kiel to SS/RMA, Berlin 10.2.06.

Vulcan was already using its new Hamburg facility, and the other five private yards were ready to construct ships with berths from 20 to 41 meters. Weser was the smallest of the six with a 20 to 30 meter capacity and Vulcan the largest, covering up to 41 meters.[47] Among the Imperial Yards, only Wilhelmshaven could accommodate the larger ships. The increased specialization of the Imperial Yards evolved as a result of their varying abilities to build certain types of vessels well. Thus Wilhelmshaven built every battleship assigned to an Imperial Yard through 1914 save for the S.M.S. Kaiser. The RMA then limited both Danzig and Kiel to U-boats and mid-sized vessels.

Thanks to the 1906 and 1908 Supplementary Naval Laws, the pace of the U-boat program quickened. Eleven boats were laid down during this period. Naval money for research and development was less scarce. In 1905 and 1906 the latter amounted to 1.5 million marks per year. For the next two years the figure rose at one million per year, finally leaping to five million marks in 1909.[48] By his statements at the time, and the array of technical faults he later attributed to the first U-boats in his memoirs, Tirpitz showed

---

[47]BA/MA RM3/330 Correspondence between RMA and the major private yards, Dec. 1905-Jan. 1906. Hurd & Castle, op. cit., 322.

[48]E. Rössler, Die Deutsche U-Bootbau bis Ende des 1. Weltkriege (Munich, 1979), 35. BA/MA RM3/4915 "Denkschrift zum Immediatvortrag betreffend Entwicklung des U-Boots-wesens" Berlin 9.10.09. BA/MA RM5/1947 "Fortschritte im Bau der Unterseeboote," 1905. C.-A. Gemzell, op. cit., 62.

consistency in his negative attitude.[49] In spite of the considerable level of performance achieved by the U-1 and foreign boats he kept the RMA's investment in the weapon restricted:

> I refused to throw away money on submarines so long as they could only cruise in home waters, and therefore would be of no use to us; as soon as seagoing boats were built, however, I was the first to encourage them on a large scale, and, in spite of the financial restrictions imposed upon me, I went as far as the limits of our technical production would permit.[50]

The needs of Tirpitz's battleships defined the limits of the RMA commitment to the U-boat. During his tenure as State Secretary, Tirpitz made no secret that his interest in the U-boat was merely as a possible auxiliary to the battleship. In a Reichstag session in January of 1908, Tirpitz listened to Progressive representative Lionhart's favorable evaluation of a pamphlet on the U-boat and commerce war by Vice Admiral (ret.) Galster. The State Secretary responded that he was not going to suddenly convert to the gospel according to Galster: "If the honorable representative believes that, then he is badly misled."[51]

Indeed, Tirpitz treated the opponents of his strategic ideas ruthlessly. He classified officers like Galster, Franz Rust, Kurt von Maltzahn and Lothar Persius as enemies of the navy and had their

---

[49] A. Tirpitz, My Memoirs, vol. 2, 572.

[50] Ibid., vol. 1, 138.

[51] BA/MA RM3/11603 Handakten von Gohren, "U-Bootsdebatten im Plenum und in der Budgetkommission von 1904-1914."

writings banned while they were still in the service.[52] After retirement, however, Lothar Persius was an ever present foe. His series of books and articles praising the possibilities of the U-boat in a commercial war was severely critical of Tirpitz. In the middle of the First World War, when Tirpitz's theories were finally discredited and he was forced into retirement, Persius administered a journalistic coup de grâce. He indicted Tirpitz's strategic dogma and blamed him for Germany's ill preparedness in 1914 to fight a U-boat war in a booklet entitled "The Tirpitz Legend."[53] When Persius began writing and the first U-boats were built, however, Tirpitz was still in the forefront among the world's naval leaders and the battleship was the acknowledged king.

Of the boats built before 1908, the Imperial Yard at Danzig received the U-2, 3, 4 and 9 through 12. The Germaniawerft and its U-boat chief, Techel, were given boats 5 through 8 after completing the U-1 in 1906.[54] Krupp charged 1.9 million marks for the U-1 and

---

[52]C.-A. Gemzell, op. cit., 60-61.

[53]BA/MA RM3/9754 See Persius' work: "Die Tirpitz Legende," 1918.

[54]All technical information taken from: E. Gröner, op. cit., 40. Oberingenieur Techel: in charge of U-boat construction at the Germaniawerft from 1907 to 1918. His work with the Krupp firm extended back to 1895. HA Krupp WAXa 4,187. Germaniawerft Direktorium 1909: Bauer, Hüber, Steinike, Toussaint and Richter. The last replaced Korvette Capt. Ritter von Mann, later head of the U-Booteamt and SS/RMA, who was the shipyard's liaison with the navy. See: F. Krupp A.G. ed., Handbuch (Essen, 1906 and 1909).

the more sophisticated 5-8 series cost an average of 2.57 million. As was usually the case, Danzig's boats were substantially cheaper. The U-2 was 1.5 million, the U-3 and 4 about 300,000 more and the later 9-12 series, 2.2 million. All of these boats displaced between 3.13 and 3.55 tons, and the cruising radius, even in the later models, varied very little. The U-1 was capable of 1400 sea miles at ten knots on the surface. Its successors were capable of 1600 to 1900 sea miles at between twelve and fourteen knots. The electric motors of the U-1 through 4 could propel these boats submerged for 50 to 55 sea miles at 4.5 or 5 knots. The better electrical systems on the U-5 through 12 increased the submerged radius to 80 sea miles at a standard 5 knot speed.

At the same time, the RMA initiated work on many U-boat related projects and facilities. In 1906, when the fortification of Helgoland began in earnest, the navy built dock facilities to accommodate ninety torpedo boats and eighteen U-boats along with considerable shore batteries to protect the installation.[55] The RMA also purchased more time for U-boat work at the Center for Shipbuilding and Hydraulics in Berlin.[56] One step that Tirpitz refused to take was the employment of an independent firm to increase the output of U-boat torpedoes. He found the quality and workmanship at the navy's torpedo work station in Friedricksort far superior to the best private manufacturer,

---

[55]W. Hubatsch, Der Admiralstab, 121.

[56]BA/MA RM3/1004 RMA to Ruchshauptkasse, Berlin 5.28.06.

Schwartzkopf. Thus the RMA gave more money to Friedrichsort to increase its production, and the torpedo work station supplied all of the navy's torpedoes until the outbreak of the war.[57]

Germany was far behind its major naval rivals in the number of U-boats in service or on order. In 1904 the international U-boat situation was summed up by a British report in the following way:

| | Completed | Under Construction |
|---|---|---|
| Britain | 8 | 11 |
| France | 26 | 13 |
| Germany | 1* | 0 |
| Russia | 1 | 14 |
| Italy | 1 | 2 |
| U.S.A. | 8 | 0 |
| Japan | 0 | 0 |

* The U-1 was actually still under construction.[58]

All of the major naval powers were beginning to take notice of the U-boat in varying degrees, save Japan. However, only the French were casting the new underwater weapon in a major strategic role and adjusting the composition of their fleet accordingly. In 1906, French naval experts submitted the following projections of naval needs through 1919 to the Senate: 34 battleships and 36 cruisers; 109 torpedo boats for defense and 170 more for offensive operations; and 49 defensive and 82 offensive U-boats.[59]

---

[57]A. Tirpitz, My Memoirs, vol. 1, 38-39.

[58]BA/MA RM3/3686 "Fleets (Great Britain and Foreign Countries)," London 1904 (official publication).

[59]BA/MA RM3/1050 Marine Attaché, Paris to SS/RMA, Berlin 4.10.06.

The French obviously agreed with those in the German navy who saw value in the strategic doctrines of Galster and Persius. The commercial war strategy, for which the U-boat was so well suited, was an integral part of French naval thought. The same was not the case in Germany. Tirpitz's views were not free from attack, but they showed few signs of succumbing to those of the U-boat advocates.

Protocol System Revisions, Overruns in Time, Cost, and Weight

The substantial increases in construction between 1905 and 1908 necessitated revision of the Protocol System to streamline inspection procedures and supervisory methods. The revision of the publications governing construction and product quality often caused difficulties for the yards because some specifications changed while projects were under way. Although Weser, the Germaniawerft, and the Imperial Yard at Danzig voiced their dissatisfaction to the RMA,[60] the RMA required the continued excellence of materials that the revised booklet guaranteed. Thus the occasional delay they caused seemed worthwhile.

The General Construction Guidelines were also revised during these years for the first time since the First Naval Law was passed. The RMA solicited suggestions from the Imperial Yards, naval inspectors, and private firms.[61] According to the Construction Department, it was not changed merely for the sake of change but

---

[60]BA/MA RM3/278 Weser, Bremen to RMA, Berlin 1.23.05. RM3/280 passim.

[61]Ibid. KWW: Suggestions for revision of the ABB, 1908.

"The revisions of the construction manuals, weight specifications, etc., will strive for clarity, lucidity and an ability to exert control."[62]

New editions of the Suppliers List appeared in 1905 and 1907.[63] Some firms, like Postler Chemical of Dresden, did not appear thanks to information on illegal business practices supplied by the regional government.[64] In the case of the Firm of Wilhelm Meyerholz, false representation was the issue. It turned out to be an approved company actually acting as a clearing house for firms not listed in the Suppliers List.[65] This information came to the RMA courtesy of the Hannover Chamber of Commerce.

In many instances, a better product was achieved in each category of the List by strictly limiting many firms to the areas of their expertise.[66] Purging as many weak firms as possible from each category enabled contractors and the RMA to focus immediately on the best ones in any given field. Knowing their suppliers also enabled RMA officials to pick out new areas in which certain firms might be useful in the future. The editing process even addressed the problem

---

[62]BA/MA RM3/1182 BBS, Stettin-Bredow to RMA Construction Dept., Berlin 2.29.08. RM3/6009 "Return to KI," Berlin 4.28.06.

[63]BA/MA RM3/2296 1905 Edition of the Suppliers List.

[64]BA/MA RM3/2299 Postler and Co., Dresden to RMA, Berlin 11.0.08.

[65]Ibid. KWW to RMA, Berlin 6.16.08.

[66]Ibid. KWK to RMA, Berlin 7.19.09.

of unfair competition within the List's categories, but the RMA never found a completely satisfactory solution to that problem.[67]

The Imperial Yards frequently received a special advantage by the way the RMA employed the Supplier's List. Blohm und Voss once complained about having only one contractor at its disposal, Siemens-Schuckertwerke, to install the electrical system in the battlecruiser S.M.S. von der Tann. Angrily, the Hamburg shipyard observed that the Imperial Yards could choose from A.E.G., S.S.W., Felton and Guilleaueme or any other firm listed in the Suppliers List. The RMA replied that it restricted Blohm und Voss because with Siemens-Schuckert doing most of the ship's electrical work the yard could achieve a uniformity impossible with two or three contractors. Of course, the RMA also knew that the choice gave the Imperial Shipyards the opportunity to reduce their overhead. The latter always had priority in choosing the best vendor at the cheapest price.[68] They also received first notification of any new addition to the Suppliers List and early results of product tests.[69] As public institutions in an economic system that supplied every possible freedom to the private sector, the Imperial Yards needed artificially created advantages to keep pace. The RMA obliged, and, coupled with the ongoing expansion

---

[67]BA/MA RM3/2296 Construction Dept. report on financial difficulties confronting Becker and Ulmann, Berlin 8.31.05. RM3/2297 Carl Stoeckicht A.G., Frankfurt a. M. to RMA, Berlin 2.2.07.

[68]Ibid. Blohm und Voss, Hamburg to SS/RMA, Berlin 9.28.09.

[69]BA/MA RM3/2296 KWW to Construction Dept., RMA, Berlin 10.17.05.

of the facilities of the Imperial Yards, it preserved in these yards a safety valve against higher prices at the private yards.

Businesses often informed the RMA that its protocol controls and tests were too restrictive. Mix and Genest protested that suppliers to the Imperial Yards were getting preferential treatment,[70] and that the time required for the testing of finished products was too lengthy. The RMA insisted on the tests and urged the firms to notify the Purchasing Office earlier regarding a product's impending completion.[71] Given the fact that every product needed to undergo testing the RMA frequently asked firms to build an extra ten days to two weeks into their construction schedules to avoid delays and possible late delivery.[72] The larger firms, like Krupp, continued to complain loudly, but to no avail.[73] A memorandum from the Construction Inspectorate in Hamburg was a bit too effusive in its praise for the protocol system, but the officer's point was clear. In the majority of cases the system worked well for the RMA.[74]

One of the most difficult things for the RMA to accomplish was the precise definition of its role in business affairs. The leaders

---

[70]BA/MA RM3/2076 A. G. Mix und Genest, Berlin-Schönberg to SS/RMA, Berlin 10.28.16.

[71]Ibid.

[72]BA/MA RM3/7618 Kaiserliche Marine Deutsche Seewarts, Hamburg to Nautical Section, RMA, Berlin 11.8.06.

[73]BA/MA RM3/6009 Germaniawerft, Kiel-Gaarden to SS/RMA, Berlin 2.11.08.

[74]BA/MA RM3/348 BBS, Hamburg to Construction Dept., RMA, Berlin 2.11.08.

of industry involved in shipbuilding found the naval construction program's promise of substantial profits attractive, but they resisted any government interference in their affairs. Emil Kirdorf wrote a scathing letter to Chancellor von Bülow in 1905 during some labor trouble in the Ruhr accusing him of not only interference, but actions less than friendly to industry.[75] Most industrialists expected support and encouragement from the government and a minimum of actual involvement in private business affairs. In some instances, industry and the State were actually partners as both Prussian state and private coal mines belonged to the Rheinisch-Westfalischen Coal Syndicate.[76] However, the preservation of privacy and the independent nature of industry's affairs was part of the business leader's expectations of government.

Just before his retirement as head of the RMA Construction Department in 1907, Vice-Admiral von Eickstedt declared that the RMA could never take a neutral stand in business matters directly relating to naval projects.[77] Although the industry often complained bitterly, Tirpitz and Eickstedt placed the RMA in the role of partner in every business transaction resulting from contracts granted by the navy.

---

[75]D. Fricke, "Eine Denkschrift Krupps aus dem Jahre 1912 uber den Schutz der Arbeitswilligen." Zeitschrift fUr Geschichtswissenschaft, VI (1957), 1250-53.

[76]Ibid., 1253.

[77]BA/MA RM3/6009 Construction Dept. to Legal Section, RMA, Berlin 10.22.07.

Rear Admiral Rollmann,[78] Eickstedt's successor, also believed that it was naïve to think that industry would place the interests of the navy first. Rear Admiral von Usedom, the director of the Imperial Yard at Kiel, asserted in a memo to the Construction Department in 1906 that the force driving industry in naval construction was anything but patriotism. Its first concern was the possible profit in any project, not whether the best product was built for the RMA.[79] Thus, in spite of frequent complaints from the business community, the RMA's role was not that of ally or bystander. Tirpitz and his associates cast the RMA as an "interested party" in every business transaction with full authority to interfere if the navy was not properly served.

Ultimately, the RMA administration in Berlin was the arbiter between all of the scattered branches of the naval construction program, as it alone had the authority to step in and smooth over any sort of disagreement among its diverse officers and experts.[80]

The RMA's policies all indicated that time was of the essence. The longer it took to build each ship the greater the risk of confronting Britain before Tirpitz felt the fleet was ready. Both France and Germany trailed Britain in the amount of time used to construct a capital ship. What took the French between fifty and sixty months to

---

[78]See Appendix: Rollmann.

[79]von Usedom: Captain 9.18.1899 (Rangliste 1904-07); Rear Admiral 3.14.05, Director of KWK; BA/MA RM3/1176 KWK to Construction Dept., RMA, Berlin 2.19.06.

[80]BA/MA RM3/4851 Kommando der Marine Station der Ostee, Kiel to SS/RMA, Berlin 8.28.07 and 9.21.05.

accomplish took thirty-six months in Germany and only twenty-four months in Britain.[81] In his analysis of the French situation, Rollmann believed that their shipyards had too little money, too complex designs, and subcontractors who took their time with deliveries. The French also suffered from a problem the RMA frequently encountered--personnel shortages. Rollmann, the new head of the RMA Construction Department, knew all of these problems well. His response was to give the Construction Inspectorate and the various technical inspectors on each project greater freedom to deal with daily problems.[82]

The goal both Rollmann and Tirpitz had in mind was to draw Germany closer to the construction times of British yards. In 1906, the German shipyards were still in the thirty-three to forty-nine month range for battleships and heavy cruisers. The year before, the Devonport yard in Britain built the H.M.S. Montague in thirty-nine months and the Brown Company finished the H.M.S. Hindustan in thirty-two months. Both of these represented the maximum times usually invested in British ships.[83] Tirpitz judged that faster construction would offer economies as well as the obvious political advantage. Some of the private yards argued that a quicker pace could drive costs

---

[81]BA/MA RM3/1051 RMA Construction Dept. Report: "Lange Bauzeit der französischen Neubauten," Berlin 6.10.08.

[82]Ibid.

[83]BA/MA RM3/6672 RMA Construction Dept. Report: "Abkurzung der Schiffbauzeiten," Berlin 1.24.06.

up rather than down.[84] The RMA chief was convinced, however, that the advantage of speed was worth the risk.

Probably the most difficult area in which to conserve time was artillery and armor. In an optimistic note, the Weapons Division presented a 1905 memo on methods the RMA could use to reduce construction time. Minor efficiencies could shave off at least two months, while improvement in material and delivery times and shakedown procedures might save from thirty-six to twenty-four months and have a ship in service, complete with the shakedown, before the 33rd month.[85] The officials at the Weapons Division felt that these improvements were possible by 1907. However, Krupp was still projecting six to eight months for guns and armor installation during this period, pushing these optimistic estimates to at least twenty-seven months, sometimes thirty-two. Then the ship still faced a lengthy shakedown cruise.[86]

Krupp and Dillinger often slowed construction schedules by delivering their armor or guns late. Dillinger retarded the S.M.S. Pommern project at Vulcan to such an extent that the latter complained to the RMA, mentioning the incident in a report to the Kaiser.[87] The

---

[84]For example, see: BA/MA RM3/499 Shichau, Danzig to SS/RMA Berlin 12.14.05.

[85]BA/MA RM3/6672 Weapons Division to Budget Dept., Berlin 12.23.05.

[86]Ibid. Krupp, Essen to SS/RMA, Berlin 1.8.06. Regarding: "Termine für Lieferung von Schiffsarmierung."

[87]BA/MA RM3/523 Construction Dept.: "Denkschrift zum Immediatvortrag über die Fertigstellung des Linienschiffes Pommern," 5.26.04. RM3/522 Vulcan, Stettin to SS/RMA, Berlin 11.3.06.

Construction Department addressed itself to this problem by ordering that the yards alter their construction techniques to allow armor installation to begin earlier in the building process.[88] However, the success of any time saving measure relied on more punctual delivery by the firms and a greater amount of cooperation between them. In the case of the S.M.S. Schlesien, Dillinger managed to cooperate closely with Schichau.[89] The opposite was more usually the case, as with the Krupp portion of the S.M.S. Schlesien's armor. Schichau director Ziese told two Reichstag representatives on a fact-finding tour of the Elbing yard that he would need only twenty-two months to complete a capital ship if Krupp would meet its armor deadlines.[90] Here, the RMA could only apply the few pressures within its power and hope for a favorable result.

In other areas, the RMA was also hard pressed to keep projects on schedule. Firms often pointed to the time wasted while waiting for quality tests by the Purchasing Office, Construction Inspectorate or other naval inspectors. A shortage of Purchasing Office personnel was one major source of lost time. Rollmann was pleased with the

---

[88]BA/MA RM3/6009 Construction Dept., RMA, Berlin, to the Legal Section 10.22.07.

[89]BA/MA RM3/6673 "Denkschrift über Verkurzung der Bauzeiten und Verbilligung der Baukosten bei den Schiffsneubauten nach den Ausfuhrungen von Schichau," Berlin 12.2.08.

[90]Ibid. Geheime Kommerzienrat Ziese, Elbing to SS/RMA, Berlin 6.19.08.

performance of his men, but he badly needed more.[91] This problem reduced Purchasing Office promptness and flawed the Protocol System.[92] More frequently, slowdowns in inspection were the result of defective products which required a series of different probes to discover the exact nature of the problem and its solution.[93] The RMA had sought to remedy these problems by increasing its requests for technical personnel and using the Suppliers List to eliminate firms which proved a liability to the construction program.

Cost and weight overruns continued, but were greatly reduced in degree. The amounts of time, extra money, and weight involved were smaller because of RMA controls. However, the problem was a long way from solution.

The last of the Braunschweig and Deutschland Classes were still giving the RMA difficulty. In some instances the yard was forced to absorb extra costs, but this was rare. The Germaniawerft agreed to pay an extra 200 marks on a small overrun incurred on the S.M.S. Deutschland, but that was about as generous as Krupp ever was.[94] On the same ship, the RMA paid an extra 17,900 marks for alterations to the command

---

[91] Ibid. Rollmann to SS/RMA, Berlin 6.4.08.

[92] Ibid. Vulcan, Stettin to SS/RMA, Berlin 3.27.08.

[93] Ibid. Blohm und Voss, Hamburg to SS/RMA, Berlin 1.17.08. RM3/348 BBS, Blohm und Voss-Hamburg to Construction Dept., RMA, Berlin 2.11.08.

[94] BA/MA RM3/489 RMA, Berlin to Vulcan, Stettin 2.24.05. RM3/511 Construction Dept.: "Gutachten zum Sonderbericht des Schiffs-Prüffungs-Kommission betreffend Bekohlungseinrichtungen S.M.S. Deutschland," 1907.

bridge.[95] Yet the RMA was rejecting certain overrum claims with a slightly higher degree of regularity. In the case of the S.M.S. Preussen, it refused to allow an additional 3,972 marks and 1,400 kg in clothing, hammocks and living supplies for the crew.[96] However, the small amounts were still adding up to a disturbingly large total. The auxiliary boats placed aboard the S.M.S. Braunschweig, Elsass and Lothringen in 1905 added an average of 4,447 kg overweight, with 4,594 marks of excess cost per boat.[97]

The imperfections found in ships during actual trials at sea were almost as costly. Some of these were design problems, like the aforementioned steering system difficulties with the Braunschweig Class, which required costly repairs to the steering mechanism, bulkheads, deckplates and other parts damaged by excessive vibration.[98] Repairs or alterations after shakedown cruises were usually not as serious as this, but almost always expensive. Further work on the Deutschland's command bridge came to almost 27,000 marks.[99] The S.M.S. Preussen's torpedo tubes required alterations as did the

---

[95]BA/MA RM3/511 KWK to Construction Dept., RMA, Berlin 1.19.07.

[96]BA/MA RM3/489 KWK to Construction Dept., RMA, Berlin 1.10.05.

[97]BA/MA RM3/481 Germaniawerft, Kiel-Gaarden to SS/RMA, Berlin 2.1.05.

[98]Ibid. KWK to Construction Dept., RMA, Berlin 4.6.05.

[99]BA/MA RM3/510 Germaniawerft, Kiel-Gaarden to SS/RMA, Berlin 7.19.06.

ventilation system of the Braunschweig.[100] In some instances the problems were minor, like a repair job on the same ship's system of vocal communication pipes,[101] and to be expected in a rapidly expanding program. However, this did not make them less troublesome and expensive. Only the consistent high quality of the finished products partially balanced off the financial problems these overruns created for the RMA.

The Armor Monopoly

Krupp's monopoly in the area of armor and artillery made it difficult for Rollmann to save time, money, or weight.[102] Essen's hold on the armor industry was stronger than ever and rendered RMA protests sterile. One Krupp overrun on the small guns for the S.M.S. Pommern totaled 4,200 marks with an extra 2,960 kg over contract weight.[103]

In March of 1906 the Construction Department took exception to Krupp's 2,300 marks price to cover an artillery range finder with nickel steel armor. The alternative, a low nickel content, soft steel

---

[100]BA/MA RM3/480 Germaniawerft, Kiel-Gaarden to SS/RMA, Berlin 1.2.05. RM3/491 KWK to Construction Dept., RMA, Berlin 6.15.05.

[101]Ibid. S.P.K., Kiel to Construction Dept., RMA, Berlin 9.19.05.

[102]BA/MA RM3/524 Vulcan, Stettin to SS/RMA, Berlin 8.21.07. For international armor price comparisons, see: B. F. Cooling, Grey Steel . . ., Table 7.

[103]BA/MA RM3/522 Vulcan, Stettin to SS/RMA, Berlin 10.30.06.

totaling 1950 marks, was no bargain either.[104] Situations like this drove the RMA to a constant search for substitutions for Krupp.

As the building program progressed, the RMA persisted in challenging Krupp armor and artillery prices and continued to seek a way to lower them. The source of RMA frustration was the low price of Krupp products abroad and the ability of the Americans to produce cheaper steel of similar quality. Oddly enough it was the latter which finally forced Krupp to reduce his armor prices further. When the American Midvale Company lowered its price to 1,650 marks per ton in 1903 and the highest price paid in the U.S. was 1,900 marks, exactly Essen's rate, Krupp had to respond. Midvale was already breaking into the European market, in Italy. The growing, innovative American armor industry was no longer a distant competitor. In 1905 the Essen firm dropped its price from 1,900 marks to 1,780 marks per ton, roughly midway between the low Midvale rate and the higher American price charged by Bethlehem and Carnegie.[105] However, these events were hardly under the influence of the RMA. von Eickstedt gave voice to the Construction Department's helplessness when he commented that ". . . the Krupp Firm will do everything in its own interest."[106]

---

[104]BA/MA RM3/287 Krupp, Essen to SS/RMA, Berlin 3.28.06.

[105]BA/MA RM3/11634 Handakten Dahnhardt. "Panzer: Übersicht Über die Panzerpreise in verschiedenen Landern." Prepared 3.3.15.

[106]BA/MA RM3/2204 Construction Dept., RMA, Berlin to Weapons Division 3.9.07.

The financial and technical power available to Krupp was awesome. Besides its monopoly of armor and gun supply, the technicians of the Krupp firm were the only ones capable of properly assembling and installing heavy guns on naval vessels.[107] Its research facilities could produce breakthroughs in steel strength and resilience, as in the case of Siemens-Martin Special Steel.[108] The firm also expended a great deal of its financial strength by buying up raw materials deposits abroad, augmenting its domestic resources. In one case, the F. F. King Real Estate Co. of Denver, Colorado, offered to sell seven tracts of land rich in tungsten to the RMA for ten thousand dollars in gold. Mr. King informed Admiral Tirpitz that Krupp and an English syndicate already had extensive holdings in the area.[109] This tungsten was used to harden Krupp steel for the artillery and armor that represented nearly a third of the cost of every ship the RMA built.[110] The navy had neither the resources nor the authority to make such purchases. The best it could do in many instances was a personal appeal to the Krupp directors for more reasonable prices in view of

---

[107] BA/MA RM3/1176 Weapons Division: "Besprechung über den Anschluss der elektrischen Einrichtungen für schwere Artillerie der Neubauten 1906 an ihre Primarstationen," 4.28.06.

[108] BA/MA RM3/2204 Construction Dept. to Weapons Division, RMA, Berlin 3.9.07. Reply 3.12.07.

[109] BA/MA RM3/2206 F. F. King, Real Estate and Investments, Denver, Colorado to SS/RMA, Berlin 2.13.08.

[110] BA/MA RM3/3704 "Protokoll über die Sitzung von 22. September 1905 betreffend Neukonstruktionen von Linienschiffen und grossen Kreuzern."

current budget difficulties.[111] This technique rarely brought a response from Essen.

Krupp's towering position in the industry only prompted naval officials to join Tirpitz in his efforts to make some progress against the firm. Rear Admiral Goetz of the Weapons Division voiced an appeal very common among Tirpitz's subordinates when he insisted that competition for Krupp, in any form, was absolutely necessary.[112] Goetz dealt with Krupp in nearly every weapons contract and realized the firm's power better than most. There was no armor rivalry within Germany and only Heinrich Ehrhardt's Rheinische Metallwaren- und Maschinenfabriken in Düsseldorf manufactured gun barrels that came close to Essen standards.[113] In other areas, alternatives for Krupp were more available. In 1909 the Mulheim firm of Thyssen and Co. produced this type of steel, and by 1908 had entered the nickel-steel armor market in a small way.[114] Other firms were engaged in research on various new types of ship steel, including Phoenix, Duisberger Eisen und Stahlwerke, and the Friedrichshutte.[115]

---

[111]HA Krupp FAH IV C7 Admiral von Müller (RM2) Berlin to Krupp Director Max Rötger, Berlin 3.21.05.

[112]BA/MA RM3/1176 Weapons Division to Construction Dept., RMA, Berlin 1.3.06.

[113]BA/MA RM3/7763 "Kommission zur Prüfung von Verträgen über Kriegslieferung" 10th Session 11.15.17. Brockhaus Enzyklopäidie, vol. 5 (Wiesbaden, 1968), 267.

[114]BA/MA RM3/600 A. G. Weser, Bremen to SS/RMA, Berlin 8.20.08.

[115]BA/MA RM3/2207 KWK to Construction Dept., RMA, Berlin 3.27.09.

Inroads that were made against Krupp were due to the firm's few limitations. When new contracts kept the Krupp facilities occupied in the spring of 1908, the Thyssen firm took up the slack on some armor orders for the deck of the S.M.S. Westfalen. The facilities at the Germaniawerft were simultaneously building two battleships, one light cruiser, two torpedo boats and four U-boats.[116] More firms, such as the Bismarckhütte and Borsig, were periodically used to fill in for Krupp as they perfected the techniques required to produce nickel steel.[117] Some of the private yards were improving the quality of steel they could produce by 1908. Nevertheless, Krupp and Dillinger remained the primary contractors in deck and vertical-superstructure armor throughout these years.

Electrical Firms and the Turbine Engine

The RMA was having some difficulty monitoring developments and enforcing controls in the ever changing electrical industry. As with the General Construction Guidelines, the Basic Guidelines for Electrical Systems was, by 1908, already in revised editions.[118] Although these detailed standards provided a basis for RMA supervision, there were always the few disturbing surprises not covered in the

---

[116]BA/MA RM3/544 BBS, Bremen to SS/RMA, Berlin 3.9.08.

[117]BA/MA RM3/304 Bergische Stahl-Industrie, Remscheid to SS/RMA, Berlin 10.1.07. Ibid. Bismarckhütte to SS/RMA, Berlin 11.22.06. Ibid. RMA, Berlin to Bismarckhütte 12.11.06.

[118]BA/MA RM3/1184 Blohm und Voss, Hamburg to SS/RMA, Berlin 7.29.09.

Guidelines. In one instance a Krupp complaint to the RMA about two faulty A.E.G. 60 kw generators slated for use in a 28 cm. gun turret turned into a classic example of naval frustration with the Essen firm.[119] In the course of ironing out this difficulty, the RMA discovered that Krupp was nearly finished developing an economical 25 kw system for 28 and 30.5 cm. turrets.[120] The RMA first stumbled on the new breakthrough in an article in the Journal of the American Society of Naval Engineers. Krupp protested that the system was not yet completed and denied inspiring the publication.[121] This did not quell the justified outburst of anger from both the Construction Department and Weapon's Division. They found it hard to believe that Krupp had no knowledge of the 1906 article, especially when it discussed the possible use of the new system in the 30.5 cm. turrets of the U.S.S. Louisiana.[122] There was little that could be done to the Krupp Firm in retaliation, so the RMA officials issued their reprimand and the matter died.

Not all experiences among the electrical firms were as frustrating. The case of switches for the various ship control panels

---

[119]For example: BA/MA RM3/1174 "Allgemeine Beivertung und Prüfung," May 1905.

[120]BA/MA RM3/1180 Krupp, Essen to SS/RMA, Berlin 8.17.07. RMA Construction Dept. to A.E.G., Berlin 8.23.07.

[121]BA/MA RM3/1178 Telegram to RMA from Krupp, Essen 8.11.02. Krupp, Essen to SS/RMA, Berlin 8.16.06. SS/RMA, Berlin to Krupp, Essen 11.25.06. Weapons Division to Construction Dept., RMA, Berlin 11.13.06.

[122]BA/MA RM3/1177 Construction Dept., RMA, Berlin to Krupp, Essen 7.14.06. Weapons Division to Construction Dept., Berlin 6.29.06. Construction Dept. to Weapons Division, Berlin 7.12.06.

and back-up systems is an illustration. The RMA was not satisfied with the automatic switches Siemens-Schuckert produced; nor was the A.E.G. model entirely trustworthy.[123] The product of Voigt and Haeffner Firm was, however, exceptionally reliable. Thus, the RMA dealt extensively with this firm with the whole-hearted approval of the Imperial Yard at Wilhelmshaven and other shipyards.[124] Siemens-Schuckert and A.E.G. were not struck from the Suppliers List, only encouraged to bring their products up to standard. Hence, competition was maintained and quality assured.

In yet another instance, the RMA confronted a mixed situation. By 1904 it feared that Siemens and Halske would soon monopolize the manufacture and installation of wireless telegraphy systems. Soon thereafter the RMA asked Wireless Telegraphy Ltd. to provide Siemens and Halske with competition. Here they quickly discovered the limits of a company smaller and less diverse than Siemens. Whereas the latter was able to produce most of the required parts for a wireless, the newer and smaller company was plagued by a host of subcontractors and less than successful research and development efforts.

Wireless Telegraphy Ltd. tried to limit these headaches by abandoning the standard electrical transformers made by S.S.W. for a model of its own. This new transformer was riddled with technical

---

[123]BA/MA RM3/1180 A.E.G., Berlin to Construction Dept., Berlin 9.11.07. RM3/1178 KWW to Construction Dept., RMA, Berlin 8.4.06.

[124]BA/MA RM3/1184 KWW to Construction Dept., RMA, Berlin 7.28.09.

problems, forcing the company to relinquish the effort and return to an RMA approved vendor, Felton-Guilleaume.[125] Usedom of the Kiel Imperial Shipyard even welcomed the cost and weight overrun caused by the new Felton transformers when they enabled him to get his ships back on schedule.[126] The transformers were not an isolated case. Similar annoying technical difficulties beset the design and construction of the wireless rooms aboard many ships.[127]

The RMA, however, was not willing to suffer a Siemens and Halske monopoly, or even a hint of one, if there was an avenue of escape. As far as Tirpitz and the Construction Department were concerned, a duplicate of the armor-artillery stalemate was out of the question. In the electrical industry, there were many firms and plenty of competition. New organizations were always moving in to challenge the old. For the RMA, it was a case of the existing situation presenting a greater threat than the risk of going to someone new.

The RMA was also interested in further encouraging turbine development within Germany. For this reason, it turned down an offer from the "Turbina" to sell licenses to the Imperial Yards for turbine

---

[125]BA/MA RM3/1101 Letters to SS/RMA, Berlin from the major shipyards April, May, June 1905. Ibid. Gesellschaft für Drahtlose Telegraphie m.b.H., Berlin to Construction Dept., Berlin 4.4.05. Ibid. Berlin 10.26.05.

[126]Ibid. KWK to Construction Dept., RMA, Berlin 2.5.07.

[127]BA/MA RM3/1102 KWK to Construction Dept., Berlin 3.3.09.

construction.[128] The deal would have cost the RMA 300,000 marks for a fifteen year period. Eickstedt, like Tirpitz, preferred to keep turbine work in the private sphere to avoid tying the navy to one turbine, when some German companies were exploring other systems. Furthermore, von Eickstedt felt that the company's German branch was not giving the RMA its best effort, because the performance of German vessels powered by Parsons did not measure up to current British test results. When he said as much to the directors of "Turbina," they categorically denied national favoritism and the latter accused the RMA of suspicion, excessively rigid rules and denying the company access to information vital to its work. While the RMA's distrust was a bit too open and perhaps excessive, von Eickstedt had a reason for some of his doubts.[129] The tests on the light cruiser S.M.S. Lubeck were up to standard. However, why could the S.M.S. Hamburg, the former's sister ship, accelerate and stop faster with ordinary engines in identical trial runs? The Daily Telegraph captured the RMA's attitude exactly when it quoted Eickstedt's November 1906 speech before the Society for the Study of Shipbuilding: "The German Admiralty was not convinced that the Parson's system was the best, and they would be glad to consider any system which claimed to have eliminated the drawbacks at present apparent."[130]

---

[128]BA/MA RM3/2112,2113 passim 1906-1907.

[129]Ibid., 9.26.06.

[130]Ibid. Press clipping from the Daily Telegraph, 11.23.06, sent to the RMA by the Foreign Office.

The "drawbacks" were less the engines' imperfections as the possibility of never having a truly domestic alternative. The acceleration and stopping problems were worth solving, given the vast increase in speed and the reduced space required by the turbine. The RMA was clearly dissatisfied with Parsons, and Müller of the Naval Cabinet reported to the State Secretary that Kaiser Wilhelm had approached Krupp with this problem while visiting Villa Hügel. Gustav Krupp indicated that his firm was deeply involved with the development of the Zoelly System and might approach Emil Rathenau about A.E.G. aid.[131] In fact, Krupp belonged to a syndicate bent on using the Zoelly System to challenge Parsons. Other participants included Escher Wyss and Co., M.A.N. and the North German Machine and Armature Co. of Bremen.[132] This syndicate ended up competing rather than cooperating with A.E.G. Rathenau had already signed a contract with the Curtis Marine Turbine Co. of West Virginia and felt certain this system would outstrip the Zoelly.[133] Vulcan allied itself with A.E.G. to use their Curtis machine in capital ships.[134] Later, this combination led to an A.E.G.-Curtis engine for the Vulcan built

---

[131] Ibid. "Notiz zum Immediatvortrag" (signed by v. Eickstedt), Berlin 9.22.06. Admiral von Müller to Tirpitz, Berlin 10.16.06.

[132] Ibid. Germaniawerft, Kiel-Gaarden to SS/RMA, Berlin 10.20.06. RM3/1176 KWK to Construction Dept., RMA, Berlin 5.7.07. S.S.W., Berlin to SS/RMA, Berlin 4.4.06. Reply 4.10.06.

[133] BA/MA RM3/2112 A.E.G. Turbinenfabrik, Berlin to SS/RMA, Berlin 9.17.06.

[134] Ibid. Vulcan, Stettin-Bredow to SS/RMA, Berlin 5.29.06. Construction Dept., RMA, Berlin to Vulcan, Stettin 6.14.06.

battleship S.M.S. Friedrich der Grosse, a part of the Kaiser Class begun in 1910. Two other private yards committed themselves to turbine deals as well. A. G. Weser decided to pump research time and money into a system developed by retired propulsion engineer Schulz.[135] Both Schichau and the Bergmann Co., a division of Electrical Industries, Ltd., produced their own engines. A Schichau model was put in the dreadnought S.M.S. König Albert and a Bergmann system powered the S.M.S. Markgraf (1911) of the König Class.

Nevertheless, the ships mentioned here and other pre-war capital ships driven by German turbines were in the minority. Parsons supplied most of the engines that the RMA eventually purchased, including those in the battle cruiser von der Tann and in the Moltke and Sachsen Classes. German industry started late in this field and lacked an early focus on one or two alternatives to Parsons. Later attempts by Schichau to develop its own turbine were unsatisfactory.

In spite of technical problems, especially with the smaller turbines used in conjunction with on-board electrical generators,[136] the RMA kept encouraging the efforts of the electrical firms. The process of development was slow but successes with the Parsons' system in large German transatlantic commercial ships showed the great promise of this style of propulsion. The HAPAG liner "Kaiser" was tested at the Imperial Yard at Kiel as a favor to the navy from

---

[135] Ibid. A. G. Weser, Bremen to SS/RMA, Berlin 11.3.06.

[136] BA/MA RM3/1174 KWK to Construction Dept., RMA, Berlin 2.3.05. RM3/1173 KWK to Construction Dept., Berlin 1.14.05.

Director Ballin. These tests and the trial results of the 30,000 ton British liner "Carmania," built by John Brown and Co., showed that the turbine was perfect for capital ships.[137]

Summary

The 1905 to 1908 period was the most intensive of the entire building program to date. Both the Nassau and Helgoland Classes of battleships were laid down, shared by six different shipyards. The Imperial Yard in Wilhelmshaven, with the cheapest construction costs of any yard, was given the S.M.S. Nassau and Ostfriesland. A. G. Weser, in Bremen, received the S.M.S. Westfalen and Thuringen and the S.M.S. Rheinland went to Vulcan. The S.M.S. Posen and Oldenburg went to the Germaniawerft and Schichau, respectively. All of these ships were dreadnoughts, ranged in cost between 37 and 47 million marks and were in service by 1912. The Imperial Yard at Kiel and Blohm und Voss began building the heavy cruisers S.M.S. Blucher and von der Tann in 1907 and 1908. The Imperial Yard at Kiel produced the Blucher for 28.5 million marks, but the von der Tann cost somewhat more. The first of the larger ships to employ a Parsons turbine, the von der Tann, cost 36.5 million marks.

The pace of construction in the smaller classes was no less hectic than for the battleships and heavy cruisers. The Imperial Yard at Kiel was kept busy with the light cruisers S.M.S. Königsberg and

---

[137] BA/MA RM3/2533 Central Division, RMA, Berlin to S.P.K., Kiel 4.7.06. RM3/2111 KWK to Construction Dept., RMA, Berlin 4.25.06.

Nürnberg, and Danzig was given the Stuttgart and the Emden. The S.M.S. Nautilus, Albatross, Stettin, Dresden and Kolberg went to Weser, Vulcan, Blohm und Voss and Schichau, respectively. These ships varied in weight and cost between 3 and 8 million marks. The number of torpedo boats were sharply increased, and the RMA drew more yards into their construction. Out of thirty-four boats begun between 1905 and 1908, Schichau only received sixteen, whereas before the Elbing yard had dominated in this area, Vulcan and Germaniawerft shared the remaining contracts at prices ranging from 1.4 to 1.8 million marks per boat.[138]

The years between 1905 and 1908 were characterized by continuity rather than change. Tirpitz's basic faith in his theories regarding the composition and use of the fleet was reinforced by the sheer momentum of public and industrial support. Thus assured, the State Secretary stepped up his program. He increased construction and achieved a four ship building tempo by means of supplementary legislation in 1906 and 1908. This took immediate concrete form in eight new dreadnought battleships.

These most recent successes in the Reichstag also enabled the RMA to deepen its involvement with the U-boat despite Tirpitz's reluctance. He was a battleship advocate and the U-boat had no place in the age of Mahan. The RMA's escalation of the number of U-boats on order was intended to quell internal criticism and to keep

---

[138]For all technical information regarding these ships, see: E. Gröner, op. cit., 20-35.

pace with international naval technology. Before 1914, the U-boat was, for Tirpitz, only a small vessel with a role to perform secondary to that of the capital ship.

The State Secretary did not respond kindly to criticism of his policies. Vice-Admiral (ret.) Galster's 1907 pamphlet entitled "Which Type of Naval Armament Does Germany Need?" started a battle with the RMA that lasted for five years.[139] Galster's defense of the "klein-krieg" or commercial war strategy, with emphasis on the U-boat, brought RMA harrassment in many forms. Intense adverse publicity and investigations of the Admiral-turned publicist by the Berlin police are only two examples.[140]

Lothar Persius, far more relentless than Galster, added criticisms of Tirpitz's ever rising budget demands to the list of his objections to the Admiral's administration of naval construction. Persius was interested in slightly reducing Germany's naval budget to avoid a direct confrontation with Britain. As compensation he suggested encouraging a naval buildup by Austria-Hungary which would strengthen the alliance as a whole vis-á-vis the Triple Entente.[141] He received the same treatment Galster did, and was even threatened with arrest by the Berlin police on a few occasions.[142]

---

[139]BA/MA RM3/9757 Boy-Ed (News Bureau-RMA) to SS/RMA, Berlin 10.4.07. "Welche Seekriegsrustung braucht Deutschland" (Berlin, 1907).

[140]BA/MA RM3/9753 Berlin Police President to RMA News Bureau, Berlin 11.5.09.

[141]Ibid. Clipping from the Times 4.16.09 (RMA News Bureau).

[142]Ibid., passim.

Continuity extended itself also to the choice of a successor for Eickstedt as the retiring head of the Construction Department. Rear Admiral Rollmann was described by a colleague as a "distinguished, somewhat professorial, splendid character . . . ."[143] He was an excellent administrator, ran the Department according to Tirpitz's directives, and provided reliable leadership until the outbreak of the war in 1914.

The RMA's primary problems did not change. The Krupp-Dillinger alliance remained a frustration and both firms collected profits from artificially inflated domestic prices. The RMA handled cost and weight overruns, often a direct result of steel products, more effectively during this period. However, time and money were still being wasted, while ships carried additional weight that strained engines and burned extra fuel.

Tirpitz also found himself adjusting his policies toward the shipyards to the advantage of the Imperial Yards. In order to keep these open as an effective safety valve against high prices at the private yards, they received additional benefits to help them keep costs down. The German economy gave extraordinary freedom to the private business to expand, combine, monopolize and profit. The RMA needed the Imperial Yard strong to preserve both a financial advantage and a delicate balance with the private yards.

---

[143]BA/MA N316.61 Nachlass Weichold: "Aufzeichungen . . . Admiral (ret.) von Mantey (1938)."

Lastly, Tirpitz's policy regarding research and development rebounded to the benefit of the Parsons Company. While a handful of German companies scrambled to displace "Turbina's" edge in the turbine business, the RMA remained dependent on the British based firm as the only proven vendor in the market. The A.E.G.-Curtis, Schichau and Bergmann systems represented the earliest of the reliable German versions. If the RMA had involved itself in this matter sooner, by focusing industrial efforts and conducting research of its own, a domestic alternative would have appeared earlier.

# CHAPTER V

## THE MONEY RUNS OUT: 1909-1912

Never before in the short history of his construction program had Tirpitz experienced sharper contrasts in success and failure than he did now. In his eternal struggle with the Krupp-Dillinger armor monopoly he finally discovered a way to change Essen's price policies. By employing a triple threat Tirpitz drastically lowered the armor prices that plagued him since 1897. First, he used the European ambitions of the American Midvale Company to provide Krupp with a true competitor that Essen could not consume or lure into collusion. Tirpitz used RMA contracts and government supports to create in Fritz Thyssen the possibility of a homegrown alternative to Krupp and Dillinger. Finally, he orchestrated a fierce and well-timed attack on Krupp and Dillinger in the Reichstag by Graf von Oppersdorf. The result was a drastic drop in armor prices and more cooperation from Krupp than Tirpitz ever expected to receive.

However, Tirpitz's good fortune ended with the inroads made against the armor monopoly. The SPD election victory in 1912 gave hope to the trade unions in the shipbuilding industry and support to those who believed the navy was an expensive luxury. Chancellor von Bethmann-Hollweg was dismayed by the fleet's negative effect on Germany's international position. Then the Treasury Office told the Reichstag to choose between increased appropriations for either the army or the navy. The Reich's financial situation would not allow

additional spending in both areas. On top of this a scandal broke in the press in 1909 revealing that certain private vendors had defrauded the Imperial Shipyard at Kiel. The Protocol System failed to detect the crime and the RMA received a great deal of adverse publicity. The State Secretary could not overcome the growing feeling among the Reich leadership that the nation's financial resources were better spent on the army as a tested source of national security. Thus Tirpitz's building tempo was drastically reduced and the navy once again took a back seat to the army in budget appropriations.

Political Background

As 1912 approached, military and political thought regarding the fleet became more confused than ever. The only one who, as usual, seemed sure that there was value in continuing past policy was Tirpitz. The new naval attaché in London, Erich Müller, was urging some sort of naval holiday with Britain. He witnessed, at close range, the determination of the British government not to allow the German challenge to progress further. Dahnhardt, chief of Tirpitz's Budget Department, rejected the possibility of victory based on the Risk Theory. Rather, he felt Germany would find it difficult to wage an adequate defensive war against the Royal Navy.[1] Confusing the conflict further, Capelle of the Administrative Department tended to agree with Tirpitz. Naïvely, he believed that Britain would have to seek an

---

[1]BA/MA RM3/11639 Handakten Dahnhardt, passim. In particular, see: Memo on the Risk Theory, 1912.

agreement with Germany at the expense of France because of the threat presented by the High Seas Fleet. "We hold the trump cards," he asserted, "not England. All we need do is wait patiently until our present naval act (1912) has been fulfilled."[2]

The Kaiser was wavering between full-fledged support for Tirpitz and the fear of a confrontation with England. His Secretary of the Naval Cabinet, Admiral von Müller, cautiously argued against precipitating a war, but did not want to pay a price in terms of naval hardware for a stable agreement with the British. Neither did he fully agree with Tirpitz's building program.[3] Relying exclusively on capital ships seemed risky, but he did not come forth with any viable alternatives.[4] In all of this only two characters were consistent: Lothar Persius, in his scathing public critiques of Tirpitz,[5] and Tirpitz in his relentless efforts to fulfill his policies.

From the State Secretary's point of view, the fleet could easily destroy Britain's hope of maintaining a 2:1 battleship ratio during this period.[6] In order to keep a tenuous peace, he advised the Kaiser against any type of offensive that would oblige the British to

---

[2]G. Ritter, Staatskunst, vol. 2, 232-36.

[3]J. Rohl, "von Müller and the Approach of War, 1911-1914," HJ, 12 (1969), 670 and 688-89.

[4]Ibid., 654.

[5]BA/MA RM3/9753 RMA News Bureau, Berlin to the Jahrbuch fur deutsche Armee und Marine, Berlin 5.1.09.

[6]W. Hubatsch, "Der Kulminationspunkt der deutschen Marinepolitik im Jahre 1912," HZ, 172 (Oct. 1953), 296.

react.[7] These same goals prompted him to take a hard line in conversations with the Kaiser and Lord Haldane in February of 1912. The Kaiser was angered by Tirpitz's refusal to enter into some sort of rapprochement during the Haldane Mission, but the Admiral stood his ground. The price he refused to pay for an understanding with the British was a marked reduction in the construction plans outlined in the 1912 Supplementary Naval Law. Later he felt vindicated in his resistance, when a discussion between Albert Ballin and Churchill, as First Sea Lord, offered no hope of British neutrality in the event of German involvement in a war on the continent.[8] Tirpitz still believed that he could bring the fleet to a point where Germany could challenge Britain without precipitating war along the way. The political reality, since about 1904, was that Britain had discarded her splendid isolation and developed a new determination to counter Tirpitz's goals.

Indeed, by 1909 the British government appeared moderate in its response to the German fleet by comparison with the public and press. Naval Intelligence in Britain had carefully monitored German raw materials imports and the capability of the shipbuilding industry as a whole. The Admiralty felt that the German yards had reached a capacity equal to Britain's, erasing an advantage that had provided the Royal Navy with a one or two year lead in ship construction.

---

[7]P. Kennedy, "German Naval Operations Plans Against England, 1896-1914," English Historical Review, 89 (No. 550, 1974), 75.

[8]W. Hubatsch, "Der Kulminationspunkt," 312, 17.

According to historian Arthur Marder, the British drew the "most alarming conclusion" that the Germans would have seventeen dreadnoughts to their twenty-one by the spring of 1912.[9] London began to believe that it would be hard pressed to maintain a 5:4 ratio in dreadnoughts with Germany.

It was this situation and the reaction of the press that produced the British Naval Scare of 1909. At the height of this public outburst, the liberal Asquith government presented its 1909-1910 Naval Budget to the Commons. It proposed four new dreadnoughts immediately and four more the next year on proof of their necessity. Although the official naval sources in Britain felt a total of six ships would restore a favorable balance, Conservative MPs and their allies in the press demanded all eight immediately. Eventually the latter position passed the House.[10]

Actually neither nation fully appreciated the position of the other. The Germans wanted the assurance of British neutrality in a European war if Germany were attacked. In effect, this would damage the foundation of the Triple Entente system. In return the British were arguing for a real reduction, not a slowdown, in the German construction program for 1909-1912. "The British never appreciated that the French entente was for Germany a potential threat to their safety, but no more did the Germans ever realize that in a world of

---

[9]A. J. Marder, From the Dreadnought to Scapa Flow: The Royal Navy in the Fisher Era, 1904-1914, vol. 1 (London, 1961), 153.

[10]Ibid., 160-170 passim.

armament races, Realpolitik and imperialistic rivalries, naval supremacy was vital to Britain's safety."[11]

The 1909 scare obliged the British government and navy to respond over and above the pledge of eight new battleships. The Dominions were asked to help, and New Zealand and Australia both promised to contribute a battleship to the Royal Navy. The latter offered two if the need appeared great enough. Anti-German feeling reached a new high in Britain, and all MP's save a few radical Liberals saw limiting naval arms as politically suicidal. The British abandoned the 2:1 standard and began to solicit the support of growing American naval power. The political ramifications of the 1909 Scare also contributed to Admiral Fisher's retirement as First Sea Lord in January of 1910.

The British overestimated both the capability of the German shipyards and the time it would take to place new dreadnoughts in service. However, they did not exaggerate Tirpitz's determination. Haldane was confronted with that first hand in 1912, and it soured his originally optimistic assessment of a possible understanding with the Germans.[12]

The breakdown in Anglo-German relations dismayed the Kaiser. On 8 December 1912, he had a meeting with Tirpitz, von Müller and von Moltke in which he expressed his fears for the future and felt obliged to take some steps to prepare for war. Burdened by British

---

[11] Ibid., 177.

[12] Ibid., 179-205 passim.

loyalty to its Entente allies and the failure of the Haldane Mission, Wilhelm found himself bombarded by conflicting opinions from his military advisors. Moltke advised action as soon as possible, for this would give the army an advantage. Tirpitz argued for a delay of up to a year and a half to ready the fleet and continue construction. For the moment, Tirpitz seemed to have won, for Wilhelm was concerned that the U-boats and their base in Helgoland were not ready. He was still talking in terms of offensive naval operations rather than an immediate land war.[13]

It was characteristic of Wilhelm not to invite any civilian advisers to these discussions. Few of his political leaders agreed with Tirpitz or Moltke. In 1909 Bülow's government fell and Theobald von Bethmann-Hollweg became chancellor. He did not support further drastic increases for the navy and instantly clashed with Tirpitz. The new chancellor perceived the contradictions of government policy regarding the navy and had to endure endless infighting and differences of opinion. Both Prince Metternich and his successor as ambassador in London, Kühlmann, urged that an offensive role for the navy was counterproductive and risked destroying a potentially profitable friendship with Britain.[14] Bethmann agreed, adding that "the policy of working for English friendship while demanding new

---

[13]J. Rohl, "von Müller," 661.

[14]W. Hubatsch, "Der Kulminationspunkt," 319-22. BA/MA RM3/6674 von Kühlmann, London to Bethmann-Hollweg, Berlin 10.22.13.

ships from the Reichstag is a fiasco."[15] At one point he asserted that the heavily naval slant of Reich policy both made enemies needlessly and neglected the army, which was Germany's prime military force.[16] Tirpitz defended his position against the new chancellor so fiercely that at one point the latter's friend and advisor Kurt Riezler was convinced the Admiral wanted the chancellorship for himself: "However he can't do it, because no one will trust him."[17] Nevertheless, before the war Tirpitz's position was strong enough to force a stalemate with the chancellor.

In spite of questions raised by the effect of fleet expansion on relations with Great Britain, Tirpitz pushed continuation of the three battleship per year tempo in the Reichstag. His assurances of success were having less effect than before because of a number of new influences.[18] The increasing number of SPD representatives crested with their 1912 election victory, making them the largest party in the Reichstag. The left-wing of the SPD totally opposed Tirpitz. Moderates, like Vogtherr, pushed for the coexistence with Britain that the naval program, in its pure form, made impossible.[19]

---

[15]K. Jarausch, The Enigmatic Chancellor: Bethmann-Hollweg and the Hubris of Imperial Germany (New Haven, 1972), 94-95.

[16]Ibid., 96.

[17]K. Riezler, op. cit., 187-188.

[18]W. Hubatsch, "Der Kulminationspunkt," 301-303.

[19]BA/MA RM3/5997 pt. 1. Speech by SPD Reichstag Representative Vogtherr in the Naval Budget Debate, 123 session 3.1.13.

The SPD as a whole constantly attacked the arms manufacturers and the industrial combinations that were reaping huge profits from Reichstag appropriations.[20] Between 1898 and 1911, according to the RMA's publication Nauticus, the Reichstag pumped 1.31 billion marks into the naval shipbuilding industry. Over half of the figure went to ship construction and another third to the cost of armor and heavy guns.[21] Even the Kaiser Wilhelm Canal required alterations in order to accommodate the new, larger dreadnoughts.[22] These financial and political factors, combined with the opposition of Bethmann and many within the navy itself, placed the future of the building program in doubt two years before the First World War.

During November, 1909 a scandal broke in the German press that further endangered the plans of the RMA. The Firm of Frankenthal, among others, was discovered defrauding the Imperial Shipyard at Kiel. The directors of the Imperial Yard were paying transport costs that were never earned, accepting old steel sold for new and bronze in a case that called for brass. The final bill, spread over an indefinite period of time, totalled in the millions, and newspapers of every political persuasion aimed their editorial columns at Tirpitz and the RMA administration.[23] Der Tag predicted a severe

---

[20]Ibid. Speech by Noske (SPD) in the Reichstag Naval Budget Debate, 124, session 3.3.13.

[21]Nauticus, 1912, 297-98.

[22]C.-A. Gemzell, op. cit., 81.

[23]BA/MA RM3/4742 1909 press clippings, passim.

political backlash that Tirpitz would have to weather. Die Post reported that the Reichstag waited for an explanation while Tirpitz hid behind a wall of technological jargon, a smokescreen to reduce public perception of the navy's problems. Even though the courts convicted the businessmen involved of fraud and meted out stiff jail sentences, the public outcry refused to die down. The socialist Vossische Zeitung suggested that there was more to the problem than the conviction of felons: "Mr. Tirpitz must answer for faults and mistakes."[24]

The State Secretary was interpellated as a minister of the Bethmann-Hollweg government before the Reichstag in December. Tirpitz defended the RMA administration in the German parliament by saying that the matter was already resolved. While the civilian defendants were enduring their trial the navy was cleaning house at Kiel. Unfortunately, the Reichstag committee of inquiry was in no mood for what they perceived as a naval cover-up. After one session in the Reichstag the Vossische Zeitung reported that Tirpitz wanted to pass the affair off and accept it as experience, when it seemed evident that wholesale internal reform was in order.[25] The liberal Freisinnige Zeitung joined in the call for naval reform measures. It supported the suggestions made by the Reichstag progressive, Dr. Leonhart, that more civilian technical and business people

---

[24]BA/MA RM3/4743 Vossische Zeitung clipping 12.7.09.

[25]Ibid. Der Tag 12.7.09. Die Post and Vossische Zeitung 12.7.09.

belonged in the administration of the naval construction program. The State Secretary did not altogether oppose some reform measures. As the Vossische Zeitung of 7 December reported after Tirpitz's hour long defense of naval measures taken during the crisis: "Mr. von Tirpitz made assurances that he has swept with an iron broom: he has ordered all kinds of reforms and placed others within view."[26] He was not, however, willing to relinquish naval control over the Imperial Shipyards. This was what many of the Reichstag representatives had in mind. Civilian penetration of the construction program administration would greatly increase public influence in a heretofore purely military sphere. Indeed, on the seventh of December, Dr. Leonhart called for Tirpitz's removal and a complete reform of the naval hierarchy.[27]

The 1909 Kiel Scandal revealed much more than the need for reform within certain parts of the RMA administration and Protocol System. It showed just how precarious Tirpitz's political base in the Reichstag had become. The conservatives were curiously quiet in all of this, and the intensity of the barrage fired by the radical liberals and the socialists was unprecedented. Tirpitz, indeed, managed to weather the storm, but the odds seemed against him in the long run. His Reichstag opponents were seeking his recall and his naval associates were questioning his definition of the navy's needs. Even Bülow, whose imperial policies were partially based on German naval might, parted company with the State Secretary over the long range consequences of

---

[26]Ibid., Vossische Zeitung 12.7.09.

[27]Ibid.

German naval growth without some sort of understanding with Britain.[28] With Bülow's successor, Bethmann-Hollweg, these disagreements became permanent. The public and official reaction to the Kiel Scandal was symptomatic of a political climate increasingly unfavorable to Tirpitz's vision of the naval construction program.

Research and Development and the U-Boat

The RMA continued its research and development efforts, now only with a greater eye toward economy. The General Naval Department received a memo from the Naval Attaché on London who suggested that many existing ship designs were a waste of RMA funds. He expressed a sentiment which the RMA could readily appreciate. U-boats, torpedo boats and destroyers were easy and relatively cheap to build, but their capability was limited. All big-gun battleships were still the answer. However, now speed, reduced size and maximum fire power should be the goal of naval architecture. In the process, the RMA administrators could build ships better prepared for war, but at a lower cost.[29]

The modest RMA research and development effort still relied a great deal on the facilities of private companies. Discussions regarding turret designs always included Krupp, for the facilities at the Gussstahlfabrik were the only ones capable of executing any plans

---

[28]W. Hubatsch, Die Tirpitz Ära: Studien zür deutschen Marinepolitik, 1890-1918 (Berlin, 1955), Chapter 4.

[29]BA/MA RM3/3707 Marine Attache, London to SS/RMA, Berlin 10.30.13.

the firm and RMA decided upon.[30] Krupp's facilities included a metals research laboratory as early as 1863, and one for materials testing since 1895. Between 1907 and 1909 two million marks were invested in yet another, more comprehensive facility in Essen.[31] With these assets the company was able to do studies on ship design for the RMA, concentrating on battleships of reduced size and weight. One such research effort completed in 1911 lasted nearly four years and cost the RMA 33,075 marks.[32] The North German Lloyd and HAPAG continued to aid the RMA's efforts. HAPAG was engaged in work on an improved water cooling system for capital ship turbines in 1911. The North German Lloyd worked with the Deutsche Seewarte on highly sophisticated navigation techniques and compass testing.[33]

In 1910, the RMA expanded the Naval Research Center at Marienfelde, complete with an experimental "stream" to test new ship designs.[34] Such growth intensified the RMA search for technical personnel to staff the center. In one case the navy promised a

---

[30]BA/MA RM3/3694-95 passim.

[31]BA/MA RM3/2101 "Bericht über die 12. Hauptversammlung des Deutschen Verbandes für die Materialprufung der Technik," 1911.

[32]HA Krupp WA VII f 1479 "Kosten für Ausarbeitung des Projekts No. 283. Schnelle Linienschiffsstudie," 1911.

[33]BA/MA RM3/1482 Blohm und Voss, Hamburg to SS/RMA, Berlin 12.2.11. RM3/7619 passim.

[34]BA/MA RM3/1013 KWK to Construction Dept., RMA, Berlin 4.27.10. BA/MA RM3/1011 F. H. Schmidt, Altona to Rechnungsrat Dopking, Berlin 4.23.09 passim.

skilled mechanic and fitter a good salary with a yearly raise schedule, in addition to paying for his family's transport and his first month's rent.[35] The navy's modest research and development efforts were feeling the pressure of financial limits. Paying its employees was as hard as finding them, and the situation would worsen before long, because this area was not among Tirpitz's budgetary priorities.

One of the Admiral's priorities was discussed in a Reichstag session in early 1909. The legislators asked him to verify statements by the British press that German construction time was now shorter than that achieved by the Royal Navy. The press stories placed German construction time at between 26 and 30 months for capital ships. Although he probably would have enjoyed asserting that this was true, he could not. Without the time allotted for the shakedown cruise, private yards were taking 36 months and the Imperial Yards 40 on an average.[36] Reports on this same topic reached the Kaiser through the Naval Cabinet. His marginal notes to an article from the British publication Shipping World showed a great deal of frustration and impatience: ". . . 24 months against 34 months in Germany, sometimes 36-40!" After visiting Weser in March 1910 and seeing the same ship under construction that was there during a visit the year before, Wilhelm added to the above notes:

---

[35]BA/MA RM3/1013 KWK to SS/RMA, Berlin 4.30.10.

[36]BA/MA RM3/6674 Tirpitz's statements in the Reichstag 3.29.09.

"It should have been launched in 9 months!"[37] Tirpitz would have agreed with the Emperor's remarks on the Naval Cabinet's annual report on the international naval situation in 1909: "We build too slow! A light cruiser takes 39 months! No English ship of the line takes that long, and 20 months longer than an English heavy cruiser of the same type! Unheard of!"[38] Unfortunately, the Kaiser's outrage did Tirpitz little good at the shipyards. Late deliveries, defective parts, late inspections and other now well known causes kept these construction times at the existing levels until the demands of war forced a change.[39]

The submarine program was still just getting under way. The U-boat was accepted as a useful naval weapon but its exact strategic and tactical place was still very much under discussion. A memo from the Technical Department's Breusing in 1909 was very optimistic. He felt that the U-boat was ready for mine laying and harbor defense. Then he suggested that offensive operations were not far off. Experimentation along these lines was worth eliminating some battleships from the program to find more money. He believed that "we should build more U-boats and fewer capital ships."[40]

---

[37]BA/MA RM2/190 The Shipping World, no. 875, 3.9.10.

[38]BA/MA RM2/189 "Rundschau in allen Marinen: Jahresübersicht 1909," Marine Rundschau 1910.

[39]BA/MA RM3/280 Verein Deutscher Schiffswerften to SS/RMA, Berlin 7.28.09. RM3/582 Construction Dept., RMA, Berlin to KWW 3.16.11.

[40]BA/MA RM3/4915 "Vorgehen in Ubootsbau," Berlin 11.30.09.

Tirpitz did not agree, but he was interested in deploying the new boats to best advantage. Most of the boats were at the Imperial Yard at Wilhelmshaven, awaiting the completion of their pens on Helgoland.[41] Eventually, he envisioned three stations for a force of thirty-six boats. Twelve would operate within a thirty sea mile radius of Helgoland, with about five sea miles between each boat. Another dozen would soon go to the Kiel Bight. Of these, four were in the belts area, four in the harbor approaches and the rest in reserve. Tirpitz saved the last dozen for offensive action in the case of a North Sea blockade of Germany by the British.[42] Clearly, he was still wary of the U-boat's offensive capability. The entire force was slated for defense, or desperate action in the event the Imperial Navy lost the decisive battle which still lay at the core of naval strategy.

Although most submarine work met with considerable success, the RMA's U-boat work was not without tragedies. In 1911, the U-3 was unable to surface after submerged tests in Kiel. When a floating crane pulled the boat up by the bow, twenty-nine men escaped through the torpedo tubes, after twenty-five hours under water. The rest of the crew, including the captain, were later found asphyxiated in other compartments when the boat was completely raised. Tragic lessons like

---

[41]BA/MA RM5/1948 RMA to Chief of the Admiralty Staff, Berlin 1.5.10.

[42]E. Rössler, op. cit., 49.

this one prompted standardized safety measures, more salvaging equipment and further research into on-board ventilation systems.[43]

The RMA's U-boat testing and construction was not as insular as private efforts. Krupp did most of this work as Germaniawerft could build boats employing subcontractors only for propulsion systems and some electrical work. Other private firms such as Weser were working on new submarine designs by 1912.[44] Unlike Krupp, the RMA had extensive dealings with subcontractors in nearly every phase of U-boat construction. For instance, the firm of Julius Pintsch A.B. (Berlin-Furstenwalde) supplied most of the hull sections for the U-boats built at the Imperial Yard at Danzig.[45] Initial problems also plagued the diesel engines designed to propel the U-boats on the surface, much to the State Secretary's annoyance.[46] Nevertheless, three major firms quickly perfected machines that served Germany's U-boat arm through 1918, viz. Körting, Daimler and M.A.N. Later, Krupp frequently provided its own engine, and Fiat of Turin was used once and then abandoned.[47]

---

[43]Ibid., 40.

[44]A. Tirpitz, op. cit., vol. 2, 581-582. BA/MA RM3/4915 "Denkschrift zum Immediatvortrag, betreffend Entwicklung des U-Bootswesens," Berlin 9.10.09.

[45]BA/MA RM3/2209 KWD to Construction Department, RMA, Berlin 1.5.10.

[46]BA/MA RM5/1948 SS/RMA, Berlin to Commander of the Baltic Naval Station, Kiel 6.1.13.

[47]A. Tirpitz, op. cit., 571-72. E. Rössler, op. cit., 33.

By 1912, U-boat construction was settling into a routine similar to that of the capital ships by 1904-1905. Germaniawerft forecasted a construction time of at least eighteen months per boat, depending on the number of vessels in any given contract. It was capable of delivering up to four boats in twenty-four months, working on them simultaneously.[48] Two RMA departments governed similar work on location at the Imperial Shipyard in Danzig. Matters pertaining to electrical systems, propulsion and weaponry were left to the yard's Technical Bureau. The U-boat inspectorate directed the submarine service, the submarine school, and research.[49] By 1908 the RMA had published the guidelines for U-boat construction in a special edition of the General Construction Guidelines.[50] Though the operation at the Germaniawerft was more self-contained than that at Danzig, they were obliged to employ those vendors listed in the Suppliers List and abide by all the requirements of the protocol system.

U-boat construction was an expensive proposition. It increased the RMA's dependence on the Imperial Yard at Danzig because Krupp's boats were the only alternative. The Germaniawerft prices were already bringing complaints from the RMA by 1909.[51] However, it was less

---

[48]BA/MA RM5/1948 SS/RMA, Berlin to the Chief of the Admiralty Staff, Berlin 1.30.12.

[49]E. Rössler, op. cit., 51.

[50]BA/MA RM3/1183 KWD to Construction Dept., RMA, Berlin 3.17.09.

[51]E. Rössler, op. cit., 37.

Krupp's propensity to overcharge than the sheer high cost of modern technology that was contributing to rising prices. On Krupp's early models the Essen firm managed very small profits compared with its capital ship work. It also lost about four million marks in its protracted efforts to perfect a U-boat diesel engine to render the firm independent of M.A.N. or Korting.[52] The percentage of the total cost for vessels spent on new technical components and the salaries of special personnel was nearly as high for U-boats as for the Kaiser Class battleships. The S.M.S. Prinzregent Luitpold cost the RMA nearly thirteen million marks, 4.59% of which went for highly technical equipment and related personnel. The U-23 through 26 collectively ran up a bill for 5.95 million marks, and their 3.66% high technology expenditure was huge, relative to the size of the project.[53]

## The Armor Monopoly

By this time RMA relations with the Krupp Firm had assumed a character of coexistence based on profits and naval necessities. Krupp prices, occasional production errors, and frequent late deliveries were always frustrating to Tirpitz and his associates.[54] The

---

[52]HA Krupp WA VII f 1113 passim.

[53]HA Krupp WA VII f 1479 See: Bau No. 177/180 and Bau No. 167.

[54]BA/MA See, for example: RM3/1118 ABA, Düsseldorf to Construction Dept., RMA, Berlin 6.30.12. RM3/547 Weser, Bremen to SS/RMA, Berlin 7.9.09. RM3/550 Weser, Bremen to SS/RMA, Berlin 1.3.10. RM3/308 Germaniawerft, Kiel-Gaarden to SS/RMA, Berlin 4.18.11.

Krupp-Dillinger combine still dominated the armor plate industry,[55] although their prices on other steel products often differed. It was no consolation to the RMA when Essen and Dillingen occasionally parted company on rivet prices and their charges for particular parts custom built with nickel steel.[56] In addition, artillery was still the sole province of Krupp, and the bills increased as the caliber and number of guns required by the dreadnoughts grew. The first installment paid to Essen in 1911 for the S.M.S. Kaiserin's guns, for example, came to over 7.9 million marks, a full 17% of the total cost for the battleship.[57] The RMA did not have enough coercive power to force a reduction in Krupp's prices, primarily due to Essen's monopoly in the field of gun production.

By 1909, however, other new developments gave the RMA its best opportunity against the Krupp-Dillinger armor plate alliance. Earlier, international competition from the American Midvale Company had helped drive Krupp prices down to 1,780 marks per ton. In 1906 fierce competition with U.S. Steel and Bethlehem in the United States had produced a record low price of 1,450 marks for Midvale armor.[58]

---

[55]BA/MA RM3/3694 "Protokoll über die Sitzung am 30.3.11 Anwesend Vetreter von A, K, W and B. Betreffend: Grossen Kreuzer K," Berlin 5.5.11.

[56]BA/MA RM3/580 Krupp, Essen to SS/RMA, Berlin 9.25.09. Dillinger Huttenwerke, Dillingen/Saar to SS/RMA, Berlin 10.2.09.

[57]BA/MA RM3/289 "Zusammenstellung der im Rechnungsjahre 1911 entstanden Kosten der artelleristischen Armierung fur Schiffsneubauten," Weapons Division, RMA, Berlin.

[58]BA/MA RM3/11634 Handakten Dahnhardt "Übersicht über die Panzerpreisen in verschiedenen Landern," 3.3.15.

Taking advantage of the international pressure placed on Krupp by this new price, the RMA had asked Midvale, in November 1906, to provide the Imperial Navy with samples of its armor for tests. The same month the RMA offered its support to Fritz Thyssen if he would consider entering the armor market against Krupp-Dillinger.[59]

The momentary pressure provided by Midvale gave the RMA the opportunity to use Thyssen, the best of the smaller arms producing firms, to explore any vulnerable points in the armor monopoly. Tirpitz was anxious to cut into the monopoly's power, especially when Schichau asserted that the RMA could build 20% to 25% cheaper if British firms were supplying the armor and artillery.[60] Discussions with the Mulheim firm began in 1906 and continued well into the next year.

Although events in the U.S. allowed the price of armor to bounce back to 1,750 marks in late 1906, the RMA maintained its interest in the Midvale product.

Krupp complained that it was hard to equal the prices produced by intense American competition. By this time, however, the Krupp-Dillinger price was also down to 1,750 marks. As the talks with Thyssen continued, Krupp and Dillinger enacted two further

---

[59] Ibid., "Entwicklung der Panzerpreise," Budget Dept., RMA Berlin 1915.

[60] W. Boelcke, op. cit., 206.

reductions, to 1,680 marks in May of 1907 and then to 1,630 marks in June. Krupp and Dillinger offered to keep their armor at this low level only if the RMA agreed to a long term contract extending to 1915. By August of 1907 the price was down to 1,600 marks, and Krupp then agreed not to object to any competition the navy might promote. The two dominant firms were sure that they could produce armor at least 5% cheaper than any competitor.[61] At last the RMA was making progress.

The negotiations with Thyssen soured in June 1907 because the firm was unsure whether it should risk competing in the world of Midvale and Krupp. However, in 1909 it was drawn back into discussions with the RMA at the request of Reichstag member Graf von Oppersdorff. During the Budget Commission hearings over the Krupp-Dillinger armor contracts, Oppersdorff launched a political attack against the monopoly. He appealed to Thyssen and corresponded with the American Secretary of the Navy regarding Washington's policy toward armor producers. He then drew the Ehrhardt artillery firm into the talks with the navy as well.[62]

In a twenty page memorandum to Tirpitz, Oppersdorff criticized past RMA policies, the dangers of monopoly, and presented some

---

[61]BA/MA RM3/11634 Handakten Dahnhardt: see footnote 42. For Krupp's reaction to the Thyssen-Midvale threats, see: RM3/11712 Krupp, Essen to SS/RMA, Berlin 12.16.09. And RM3/11635 Handakten Dahnhardt pp. 26-39.

[62]BA/MA RM3/11638 Handakten Dahnhardt. See pp. 178-94 in this volume.

possible solutions to the problem. In his opinion there were a variety of possible alternatives to the difficulty posed by Krupp and Dillinger. The RMA could lengthen the duration of its contracts past the usual three years simply to coax new firms into the field. Otherwise it could actively provide competition either by supporting a state owned armor factory or giving every possible advantage to a third firm. He believed that it was vital to avoid leaving Krupp and Dillinger with full responsibility for Germany's armor, that the Reichstag coffers had limits and that, in case of war, both Essen and Dillingen were too close to the French border for comfort.[63]

In April of 1909, the RMA once again entered discussions with Wallmann, Thyssen's technical representative, but the negotiations faltered over the substantial guarantees demanded by Thyssen to make his risk worthwhile. By January 1910, Thyssen explained that it wanted at least one-third of all navy armor contracts for the next ten years. The firm would provide the RMA with a low price that could exert further pressure on the Krupp-Dillinger monopoly until 1915. Thereafter, Thyssen would feel free to charge the same price as the alliance did. If the navy decided to participate in the creation of a state armor factory, the provisions of this agreement would stand unchanged. Arguing that this risky venture could ruin the firm, Thyssen refused to assume any responsibility for changes in material

---

[63]Ibid., 16-26. BA/MA RM3/11635 "Verhandlung mit Thyssen über Aufnahme der Panzerplatten-Herstellung," Construction Department, RMA, Berlin 1913.

and labor costs that might eventually increase the price of the finished product.[64]

The circumstances created by possible American competition, debates in the Reichstag, and talks with Thyssen drove the Krupp-Dillinger price down to 1,550 marks per ton by early 1909.[65] Nonetheless, Tirpitz faced accusations in the Reichstag during February of 1910 that the navy was not doing enough to lower armor prices.[66] Indeed in June of 1911 the Center Party representative, Erzberger, joined Oppersdorff in encouraging Thyssen to enter the armor field against the monopoly.[67] The political pressure on the RMA to employ an alternative armor source was as great as ever. Ironically, Krupp's lower price and Thyssen's extensive guarantee demands made Tirpitz less willing to pursue an alternative than ever before.

During these proceedings, a number of RMA department chiefs expressed their views on the alternatives open to the navy. Rollmann (Construction Department) believed that since the Krupp-Dillinger prices were already down to a fairly low level, the navy should continue to deal with these two firms. A state factory would not produce better or cheaper armor and might take as much as ten

---

[64]BA/MA RM3/11635 Handakten Dahnhardt: see footnote 63.

[65]BA/MA RM3/11634 Handakten Dahnhardt: see footnote 58.

[66]BA/MA RM3/11635 Handakten Dahnhardt Reichstag Verhandlungen, 24, Sitzung, Kommission fur den Reichshaushalts-Etat, 12, Legislatur-Periode II, session 1909/1910.

[67]BA/MA RM3/11639 Handakten Dahnhardt, M. Erzberger, Berlin to Thyssen, Mulheim, June 1911.

years to reach a point where it could adequately compete with Krupp.[68] Rollmann had doubts about Thyssen's capacity to function as an alternative "third firm." These were shared by Capelle (Administrative Department). The current Krupp price was good, the alliance could deliver immediately, and Thyssen's contract demands far exceeded those ever suggested by Krupp or Dillinger. Capelle also agreed that a state factory was far too expensive to consider, and there was no guarantee that it could ever outproduce or undersell a private armor company. Besides Krupp had already agreed to keep his prices down even if a state-owned factory became a future reality. No such guarantee came from Mulheim. Capelle stressed that Essen and Dillinger were willing to come to terms early with the RMA on a long range contract under more favorable conditions than ever before. He advised the State Secretary to stay with the alliance.[69]

Dahnhardt (Budget Department) agreed completely with his two colleagues. He quickly discarded any suggestion from the political arena that the RMA did not truly desire competition for Krupp and Dillinger. Nonetheless, the RMA's current alternatives to the armor alliance did not impress him at all. A state armor factory was a risk that would not justify the navy's investment. Another Graf von Oppersdorff suggestion was the possibility of a compromise between a

---

[68]BA/MA RM3/11712 RMA Construction Dept.: a) "Konkurrenz gegen Krupp," 1909; b) "Panzerlieferungsfrage Krupp-Thyssen," Berlin 2.1.10 (Rollmann). See also: "Resumé."

[69]BA/MA RM3/11711 EI 182/10 1910. Capelle to SS/RMA, Berlin 1.26.10.

Staatswerke and a private effort. In effect, he proposed a partnership in which the state would partially finance a privately directed effort. Dahnhardt strongly advised against this as well because it would have all the disadvantages plaguing military-industrial relations with no guaranteed advantages. The military could never exert the control in a mixed enterprise that was the primary reason for wanting a public one. Besides, said Dahnhardt, "This theory has never been realized in practice, there are Staatswerke, but absolutely no mixed enterprises."[70] The new lower prices, the stability of the Krupp-Dillinger alliance, and the reliability of their products now appealed to him far more than any alternative.

That the RMA enjoyed lower armor prices during the 1908-1912 period was more a product of foreign competition than their own efforts. The price war in the United States and Midvale's penetration of the foreign market forced Krupp to respond. Tirpitz openly explored the possibility of using Midvale products to challenge Krupp's position at home. Although the State Secretary could never permanently depend upon foreign sources for armor, he kept up RMA contacts with U.S. Steel, Bethlehem and Midvale through 1913.[71] The long-term negotiations with Thyssen and the serious consideration given to Graf von Oppersdorff's suggestions showed that the RMA was never content to endure the armor monopoly if there was a viable alternative.

---

[70]BA/MA RM3/11635 EI 182/10 1910.

[71]BA/MA RM3/11634 See footnote 59.

The renewed negotiations with the RMA and the energetic support of Oppersdorff convinced Thyssen that it was in a strong bargaining position. Furthermore, Oppersdorff and his Reichstag associates probably felt vindicated in their antimonopoly efforts by the drastic reduction of Krupp-Dillinger prices between 1900 and 1909. If the alliance could reduce their price to 1,600 marks per ton and still turn a handsome profit, why was this not done long ago? Could prices not decline even further? The spectre of possible Thyssen success and continued Reichstag assaults on armor prices pushed a worried Krupp to stabilize the situation by suggesting a long-term contract with the RMA at 1,550 marks for battleship armor.

Unfortunately for Thyssen, the guarantees it demanded destroyed its chances of capturing a portion of Krupp's armor profits. While on the one hand, it was true that the venture under discussion was a great risk for Thyssen, on the other hand, the alliance's prices were down sharply and their contract proposals were far more appealing. The unanimous approval of these proposals by Rollmann, Capelle and Dahnhardt leaves little doubt that this was the predominant feeling within the RMA. The result was a long-term agreement with Krupp and Dillinger which lasted until the outbreak of war in 1914. In the final reckoning, it was effective handling of political and economic forces both inside and outside the navy that eventually produced lower armor prices.

## The Protocol System, Labor, and Overruns in Cost and Weight

Not every test and inspection in the protocol system went smoothly. By 1909, the RMA Purchasing Office was experiencing severe

personnel shortages. The existing Purchasing Office inspectors were too few and could not work quickly enough to keep construction on schedule. In one instance, the Bismarckhütte waited nearly three months for purchasing tests required for its steel by RMA protocol.[72] These cases prompted many naval officials to push for more personnel in spite of budget restrictions. von Goecke of the Imperial Yard at Wilhelmshaven argued that if the Prussian railroad alone could have ninety-six inspectors the navy could manage to increase its own.[73] Some naval suppliers resorted to independent engineers or testing firms to perform tests approved by the Purchasing Office. The Zeiss Co. did this in 1913 in order to have cables approved for a U-boat periscope system.[74] However, most firms were reluctant to employ this alternative. If the Purchasing Office did the job, the firm only paid for the tests and not the personal expenses of the naval officials. Hiring a private testing agency meant accepting all of the additional costs. Furthermore, this practice, although not forbidden, was not encouraged by the RMA.

In an effort to resolve these difficulties, the Construction Department proposed that independent suppliers should transport their products to the private and Imperial Yards part of the time, where

---

[72]BA/MA RM3/2043 Baumeister Grundt, Danzig to SS/RMA, Berlin 10.2.09. Correspondence between the BBA in Danzig and Wilhelmshaven and the Construction Dept., RMA, Berlin 5.11.09.

[73]Ibid. ABA, Düsseldorf to KWW 3.10.10.

[74]BA/MA RM3/2044 Firma Carl Zeiss, Jena to Kaiserliche Inspektion des Torpedowesens, Kiel 12.23.13.

shipyard personnel could assume some of the tasks usually reserved for the Purchasing Office. This idea was under debate at the RMA for at least two years, between 1910 and 1912. However, the Imperial Yards and some chief inspectors strongly opposed this solution as counter-productive. They argued that the additional transport costs involved in sending defective equipment back to the factories made this solution far more expensive than asking for increased personnel appropriations.[75] This remained a nagging problem well into the war years, primarily because Tirpitz would not reduce his construction spending to allow for an increased personnel budget.[76] By 1912 most purchase tests were still performed at the factory.[77]

This decision was common to other navies as well. The Austrians limited purchasing tests to the production site and then allowed delivery and installation under naval supervision at the shipyard. They demanded the very same type of guarantees required by the RMA and left their Construction Inspectorate in ultimate control of construction site decisions.[78] Vienna managed to avoid delays at the end of a ship's construction period by convincing its yards that

---

[75]Ibid. KWW to Construction Dept., RMA, Berlin 2.3.12. BBS, Hamburg (Blohm und Voss) to Construction Dept., RMA, Berlin 6.15.12. BA/MA RM3/2043 KWD to Construction Dept., RMA, Berlin 8.22.10.

[76]BA/MA RM3/2044 Telegrams: RMA to KWD, KWW, KWK 8.29-30.13.

[77]Ibid. Beaufsichtigung der Panzerplattenfabrikation, Essen to SS/RMA, Berlin 7.29.12.

[78]BA/MA RM3/1063 Präsidialkanzeli des K.u.K. Kriegsministeriums, Marinesektion, Vienna to German Naval Attaché, Vienna 10.3.13.

it was wise to increase the number of naval technical personnel on board at the time of launching and shakedown. This would guarantee quick acceptance of the product by the navy and a much shorter, more efficient trial period. While the RMA was having a great deal of trouble carrying out this same measure, the Austrians cut their shakedown time to less than three weeks.[79] The RMA constantly ran into debates with industry over who would pay the costs for the on-board personnel during these trial runs. The time period involved remained a month or more.[80] Then the vessel still had to face final approval by the Ship Testing Commission.[81]

The RMA frequently found itself once again defining the boundaries of responsibility and spending for industry. The private yards often argued that the navy should pay much of the cost for tests on machines, boilers and other apparati. The RMA retorted that the well of construction funds was not bottomless. It would bear the cost of docking and maintenance, some research projects, and a percentage of the work on the submerged parts of the ship, but not standard product testing.[82] As was the case with adhering to the Suppliers List and

---

[79]Ibid. Naval Attaché in Vienna to SS/RMA, Berlin: "Probefahrten in der Osterreichisch-ungarischen Marine," 9.22.11.

[80]BA/MA RM3/6013 Germaniawerft, Kiel-Gaarden to SS/RMA, Berlin 10.9.12. Schichau, Elbing to SS/RMA, Berlin 11.6.12. Vulcan, Hamburg to SS/RMA, Berlin 11.4.12.

[81]BA/MA RM3/6198-6202 passim, 1909-1918.

[82]BA/MA RM3/6011 KWW to Construction Dept., RMA, Berlin 1.24.11.

obtaining permission to employ some patents, the individual firms were completely responsible for providing the navy with well constructed and tested products.[83] If a firm encountered difficulties, as it might over a patent, it could count on RMA assistance.[84] However, the responsibilities here ultimately lay with industry.

In its search for suppliers or information about firms applying for a place on the Suppliers List, the RMA became closely associated with scores of local Handelskammern or Chambers of Commerce. It was standard procedure for the RMA to check out every firm that desired to work for the navy[85] and much of this information came from the Chambers. In 1910, the Hamburg Chamber of Commerce revealed that the Henry P. Newman Co. sold some corkboard ship insulation that was not produced in Germany. The RMA later assured itself that the material it bought from Newman was manufactured in Germany.[86] Nonetheless, information like this assured some Chambers of a great deal of influence at the Königin Augusta Strasse. Others would merely supply details on a firm's financial stability and fixed capital. The Frankfurt a. M. Chamber gave the RMA facts on the Gummiwerke Frankfurt A.G. that

---

[83]BA/MA RM3/363 Blohm und Voss, Hamburg to Geheim Oberbaurat Bürkner, Hamburg 9.13.13. RM3/381 Werkvertrag: Ersatz Kurfürst Friedrich Wilhelm (Grosser Kurfürst, König Class) 1911.

[84]BA/MA RM3/1119 KWK to Construction Dept., RMA, Berlin 5.31.13.

[85]BA/MA RM3/2208 "Besichtigung über die Firma 'Württembergische Eisenwerke GmbH', Feuerbach-Stuttgart," 1909. RM3/2300 KWW to Construction Dept., RMA, Berlin 9.9.09.

[86]BA/MA RM3/2256 Henry P. Newman, Hamburg to RMA, Berlin 8.20.10. HK, Hamburg to SS/RMA, Berlin 6.10.10.

revealed the firm's capital and distribution of shares, as well as information on its dividends and founders.[87]

It was the function of a Chamber of Commerce to promote the fortunes of business in its locality. By reporting accurately on the best and the very worst of firms,[88] many trusted Chambers were able to sponsor small firms in their ambitions to work for the navy. These Chambers of Commerce actually assumed the role of minor pressure or lobbying groups for companies which otherwise might have had a difficult time obtaining naval consideration. In January of 1910 the Düsseldorf Chamber appealed to the RMA to avoid going abroad for an insulation material called "polypyrit." The navy was investigating the product manufactured by the R. G. von Kokeritz Company in New York City, but the Chamber made an excellent argument for staying at home by proposing a capable Düsseldorf firm as a viable domestic alternative.[89]

In other circumstances, Chambers of Commerce acted on behalf of groups of small firms with as few as fifty workers each or often banded together with other chambers to introduce a single firm to navy work. In one instance the Plauen and Zittau Chambers joined to sponsor the bid of the Otto Büttner firm in Bautzen for a place on the

---

[87]Ibid. HK, Frankfurt a. M. to SS/RMA, Berlin 6.30.10. HK, Dresden to SS/RMA, Berlin 6.1.10.

[88]Ibid. HK, Hannover to SS/RMA, Berlin 3.23.10.

[89]BA/MA RM3/2255 HK, Düsseldorf to RMA, Berlin 1.3.10.

Suppliers List.[90] These small towns tried to command the attention of the RMA, but more characteristic of this facet of RMA relations with industry were letters from Berlin, Hannover, Dresden and Hamburg. This was a symbiotic relationship which provided influence for the smaller businesses in the highest circles and vastly expanded the number of firms from which the RMA could choose.

Tirpitz also had to enforce greater security measures, primarily due to complaints from some of the private yards. The RMA was already very security conscious when it came to the foreign contracts under construction at some private yards. The yards had to give the navy any information it required on these vessels.[91] However, RMA procedures did not take into account possible security problems with the foreign workers employed at the private yards. Both Schichau and Vulcan complained about less than stringent security measures taken against foreigners working for Blohm und Voss in Hamburg. These accusations were possibly a by-product of competition. Nonetheless, the RMA rewrote its paragraph in the General Construction Guidelines Manual in 1913 to avoid any further danger, real or imaginary, posed by non-Germans working on naval projects.[92] At the same time it tightened security on the exchange of private or patented technical

---

[90]BA/MA RM3/2209 HK für den Kreis Siegen to SS/RMA, Berlin 3.30.10. RM3/2256 HK, Plauen to SS/RMA, Berlin 5.3.10.

[91]BA/MA RM3/6010 RMA, Berlin to Germaniawerft, Kiel-Gaarden 1.27.09; Blohm und Voss, Hamburg 2.6.09; Schichau, Danzig 1.25.09.

[92]BA/MA RM3/284 Vulcan, Hamburg 7.3.13; Blohm und Voss, Hamburg 7.12.13; to RMA, Berlin.

systems and methods employed by certain private yards. It seems that RMA engineers and inspectors were too freely disseminating information that private yards often wished to keep to themselves.[93]

As the RMA prepared for the 1912 Naval Budget, it gave more consideration to expanding the Imperial Yards and lending greater financial support to the services they performed for the RMA. By this time construction was only one facet of the work at the Imperial Shipyards. They were the fleet repair bases, dock facilities, centers for training technical personnel, and competition for the private yards. They assisted in research and the accounting and disbursal of construction funds.[94] Every yard and subcontractor was required to give the Imperial Yards at least thirty days' notice with regard to cost, weight and design changes so the quarterly financial reports to Berlin were accurate.[95] Thus, the RMA knew whether the construction funds for a particular project were adequate or overdrawn and just how much was due each vendor. No Imperial Yard did the cost accounting for its own projects. Rather, one of its sister yards would then play the role of naval auditor.[96]

---

[93]BA/MA RM3/281 Blohm und Voss, Hamburg to RMA, Berlin 6.28.10.

[94]BA/MA RM3/11713 Handakten Capelle, "Notizen für Seine Exzellenz den Herrn Staatssekretar zu den Beschuldigungen im Prozess Heinrich Frankenthal. Betr: Schlendrian in der Marineverwaltung." Part 2, "Werftorganization," 11.12.09.

[95]BA/MA RM3/6089 KWK to Construction Dept., RMA, Berlin 4.22.11. "Aufstellung der Ausgabekontrollen, Berucksichtigung von Geldüberweisung."

[96]BA/MA RM3/6121 KWW to Construction Dept., RMA, Berlin 8.22.12. Ausgabekontrolle für das 1. Vierteljahr 1912. RM3/6119 KWW to

Only in the spring and summer of every year was the fleet together, ready for exercises. At other times it was paraded, in stages, through the Imperial Yards for most of its repairs.[97] In 1912 Wilhelmshaven could dock forty ships of various sizes and types and the Kiel yard provided thirty-two more places. However, given the size and continuous growth of the fleet, these two primary Imperial Yards needed even better facilities. Sixteen million marks were added to the budget proposals of May, 1912 to enlargen both Wilhelmshaven and Kiel for capital ship and U-boat work.[98]

A further frustration plaguing Tirpitz was the rising cost of construction. The RMA was finding it more and more difficult to build at cost in the Imperial Shipyards and keep expenditures within reasonable limits. The rising price of materials and labor, long construction schedules, the ambitions of private firms for maximum profits and lengthy repair work in the Imperial Yards all contributed to Tirpitz's financial dilemma.[99]

---

Construction Dept., RMA, Berlin 11.10.11. RM3/6091 KWK: "Vierteljarliche Ausgabekontrolle den Fonds für den Neubau des Linienschiffes "Ostfriesland" für das IV Vierteljahr 1911."

[97]BA/MA RM3/2021 Jahresausbildungsplan der Flotte, 1910.

[98]BA/MA RM3/3611 "Denkschrift betreffend den weiteren Ausbau der Werften auf Grund der Flottengesetznovelle 1912," Berlin 5.7.12.

[99]BA/MA RM3/11599 "Denkschrift über die Notwendigkeit der Beibehaltung der Deckungsgemeinschaften bei den Schiffbauund Armierungsfond," 1911.

In his efforts to cut cost, Tirpitz did have some assets. RMA accounting procedures were generally accurate, and more companies were forced to absorb excess costs than ever before.[100] In the fall of 1911, the navy tightened up on its transport expenses. The RMA lowered its transport costs by reducing the weight of the heavy metal containers for the bulk delivery of rivets.[101] It also insisted that reluctant firms assume any transport costs from factory to shipyard as stipulated in their contracts.[102]

Sometimes a technological breakthrough helped the chronic budget problems. Schichau and Blohm und Voss initially deemed a new system for reducing the number of steel ribs supporting a ship's hull too risky and expensive. When Vulcan tested the design change in a 1909 prototype nothing was further from the truth. It promised to markedly reduce the weight of light cruisers at an initial expense which was only one-quarter of that predicted.[103]

Unfortunately, the sheer number of overruns still outweighed these small successes. Revisions of a battleship's rudder system at the Imperial Yard in Wilhelmshaven in 1911 amounted to over 1,600

---

[100]BA/MA RM3/539 Krupp, Essen to SS/RMA, Berlin 6.18.10. RM3/1480 BBS, Blohm und Voss, Hamburg to SS/RMA, Berlin 12.2.13.

[101]BA/MA RM3/308 Reports to RMA by: Inspektion des Torpedowesens, Kiel 10.24.11; KWW 11.11.11; KWD 11.24.11; KWK 11.30.11.

[102]BA/MA RM3/548 Inspektion des Torpedowesen, Kiel to Ohlrich (representative A. G. Weser), Friedrichsort 4.19.09.

[103]BA/MA RM3/361 Vulcan, Stettin to RMA, Berlin 3.13.09.

marks, including labor costs.[104] The regularity of these cases continued unabated into the war years.

An article in the 1912 edition of the naval annual, Nauticus, extolled the advantages of the fleet construction program for the workers. One dreadnought type battleship supplied work and pay for seven thousand men for about two years. The navy estimated that this total would include about 1,500 administrators of various sorts and 5,500 workers.[105] These shipyard workers were glad, no doubt, to have a job, but their satisfaction stopped there. The socialists in the Reichstag complained that wage rates were hardly keeping pace with the profits reaped by the private yards or the pressure placed upon the worker by the navy's construction schedule.

The socialists were comparing the cost of living in the north German shipbuilding centers with the worker's take home pay and publicizing the obvious plight of their constituents. During a session of the Reichstag Budget Commission, representative Brandes (SPD, Halberstadt) asserted that at Kiel and Elbing a worker could expect only between 32 and 40 pf per hour. If he worked a fifteen hour day for six days every week, he would take home a maximum of 36 marks. After investing 1.62 marks in government social welfare programs and about 3.29 marks each week for rent, he had a mere 31.09 for his family's food, clothing and other needs.[106] Brandes

---

[104] BA/MA RM3/583 KWW to Construction Dept., RMA, Berlin 8.11.11.

[105] Nauticus, 1912, 296.

[106] BA/MA RM3/5996 pt. 2. Reichstag Budget Commission, 63. session 5.15.12.

sarcastically wondered why workers were left with about thirty marks each week, when estimated Krupp profits from navy contracts in 1911 alone were 28 million marks.[107]

Brandes' information was accurate. At Schichau's Elbing yard the average wage was 37.6 pf per hour. The company's Danzig workers were even worse off. Forty-seven percent of a work force of approximately 6,000 were earning between 20 and 30 pf. Only 5% reached the top range of 40 to 50 pf, with the rest hovering at various levels in between.[108] With the exception of the slightly higher wage levels common in Hamburg, these figures were typical of six top private yards not much better at the Imperial Yards. A master ship's mechanic working for the RMA in 1909 could expect about 49 pf per hour at the outset with the possibility of raises to over 50 pf.[109] However, in most skilled categories naval wages were stable at between 40 and 53 pf whereas private industry sometimes offered up to 58 pf for an experienced machine or ship builder.[110] Most workers never achieved the highest wage levels because the majority were only slightly skilled or completely unskilled labor.

In spite of these problems, strikes were infrequent and ineffective. They were small, isolated and sporadic, and were

---

[107] Ibid.

[108] Ibid.

[109] BA/MA RM3/1011 KWD to Construction Dept., RMA, Berlin 8.20.09.

[110] BA/MA RM3/5997 pt. 1. Speech by representative Brandes (SPD). Reichstag Verhandlung 124. session 3.3.13.

perceived more as a loss of valuable time rather than a real threat to the industry or RMA. In the Fall of 1910, the Howaldtswerke in Kiel experienced a strike that delayed its construction schedule for weeks. This event presented a real problem for Howaldt only when the RMA insisted upon the original completion date for the ships involved. It was not considered an important independent action by the workers.[111] The same was the case when Vulcan noted difficulties with its workers on the Ersatz Friedrich Wilhelm in August of 1911.[112] The Schichau-werft's low wages also prompted a work action in 1911 lasting twenty weeks. The workers gained nothing and an SPD Reichstag member angrily noted that the yard's profits amounted to 800 marks per worker in that year.[113] A strike against Krupp in Kiel during Christmas week, 1912, met with the same result. The 5,000 men that walked out at the Germaniawerft had nothing to show for their trouble. The Krupp directors lamented the slowdown and railed against the SPD and the socialist press in Schleswig-Holstein for inspiring the workers.[114] As far as Gustav Krupp was concerned the government was failing to protect the rights of those who were willing to work. By now many industrialists used this traditional argument to isolate strikers and then precipitate government action against them. The head of the Krupp

---

[111]BA/MA RM3/368 Howaldtswerke, Kiel to RMA, Berlin 1.5.12.

[112]BA/MA RM3/379 Telegram: Vulcan, Stettin to RMA, Berlin 8.10.11.

[113]BA/MA RM3/5996 pt. 2. See footnote 106.

[114]HA Krupp FAH IV C90 Direktorium to Krupp von Bohlen und Halbach, Essen 12.21.12.

family even turned this point of view into an official memo which he presented to the Bethmann-Hollweg government during the strikes in the Ruhr in early 1912.[115]

Although the Hamburg harbor workers struck three times between 1897 and 1914, the shipyard workers did not manage any unified, effective effort during this period.[116] Labor unrest became more intense after 1910 as the naval construction program reached its maturity. Nonetheless, strikes had a relatively small number of participants and were regularly limited to a single yard. In the shipbuilding industry, union activities were still primitive and the power of organized labor did not extend to every yard. Wages, especially for unskilled workers or those with a minimum of experience, remained low. However, the increasing power of the SPD could at least guarantee that workers' complaints would quickly find political expression.

## The Money Runs Out: The 1912 Supplementary Naval Law

Tirpitz probably faced the greatest challenge of his career in the debate over the 1912 Supplementary Naval Law. The technical and strategic demands posed by his consistent fleet goals were staggering

---

[115]D. Fricke, "Eine Denkschrift Krupps aus dem Jahre 1912 über den Schutz der Arbeitswilligen," Zeitschrift für Geschichtswissenschaft VI (1957), 1245-48.

[116]These "hafenarbeiter" strikes took place in 1896/97, 1910 and 1913/14. See: E. Böhm, Überseehandel . . . passim.

in financial terms.[117] Outside the navy he was under attack by both the Reichstag and the Imperial Treasury Office. Managing the former was second nature to Tirpitz by now. The Treasury was quite another matter. In the State Secretary of the Treasury Office, Tirpitz met his match, at least in determination. Peter-Christian Witt has characterized the relationship between Wermuth of the Treasury and Tirpitz as an "extremely bitter, small scale war."[118] The head of the Treasury saw the 1912 Novelle as symptomatic of a general "egotistical department-policy" that characterized both the army and the navy.[119]

Supported by Chancellor Bethmann-Hollweg, Wermuth was bent on redrawing the budget priorities of the Reich in 1912. He wanted a broader fiscal foundation for the country. This included resurrecting the old tax question that plagued the Reichstag throughout the years of naval development. Without a modern tax law, most of the programs desired by the armed forces would depend upon traditional sources of revenue, augmented by increased taxes on consumer products.[120] In the military sphere, he agreed with the chancellor that Germany's true power lay with the army. The best possible public investment in defense should reflect this fact. Ever since the outset of Tirpitz's

---

[117]BA/MA RM3/11599 "Denkschrift Über die Notwendigkeit der Beibehaltung der Deckungsgemeindschaften bei den Schiffbauund Armierungfonds," 1910, p. 5.

[118]P.-C. Witt, op. cit., 261-62.

[119]Ibid., 341-43.

[120]Ibid., 341-43; 375.

construction program the navy's rate of growth far outstripped that of the army. In spite of a budget three to five times larger, the army's war readiness suffered from the vast increase in funds piped into naval hardware. The navy's rate of growth in the short period since Wermuth took office in 1909 was alone more than twice that of the army.[121]

The Secretary of the Treasury Office used traditional political and social forces to oppose Tirpitz's 1912 proposals. He never succeeded in passing more equitable tax laws. However, the assets he had in this confrontation were the conservatives' antipathy to an inheritance tax and their traditional ties to the army, coupled with the political clout he and Bethmann could muster. These were the forces Tirpitz faced in 1912.[122]

The State Secretary clung to his theories of strategy and fleet composition with a dogged determination. He used RMA inspired reports from the London Naval Attache to convince Wilhelm that the British were expecting a further German naval buildup and were grudgingly resigned to it.[123] He argued that in spite of what the British might say publicly, they would not place their navy above every other consideration and go into a building frenzy. Thus he defended and promoted his current fleet composition, his reliance upon the capital ship, and the distribution of the fleet in the Baltic and North

---

[121] Ibid., 206.

[122] Ibid., 343.

[123] G. Ritter, Staatskunst, vol. 2, 233-36.

Seas.[124] However, he was worried for some time before the debate over the naval supplement about tighter financial conditions within the Reich. Privately, he expressed doubts to his RMA colleagues about the possibility of pushing much further beyond the 1911 spending levels. Inflation, the colossal cost of the newer dreadnoughts, and the high price of technology were drying up his reserves and making success in the Reichstag less certain than ever before.[125]

In the debates over the 1912 Supplementary Naval Law in the Budget Commission hearings and then in the regular sessions of the Reichstag, Tirpitz pounded away at his old themes. Britain was the enemy and Germany could achieve at least a 2:3 ratio in capital ships in the near future. He told the Reichstag that British vows to outbuild Germany at any cost were efforts at inflammatory propaganda designed to intimidate rather than express reality.[126] Actually, the members of the Reichstag seemed less concerned with British points of view than they were with the Reich's financial condition. The challenges Tirpitz faced in the Reichstag touched on high prices, efficiency of the Imperial Yards, monopoly, and cases of cheaper

---

[124]BA/MA RM3/11639 Handakten Dahnhardt, Capelle memo to Budget Dept., RMA, Berlin 1911.

[125]V. Berghahn, Coming of War . . . 99.

[126]HA Krupp FAH IV E64 Krupp to Ehrensberger, Berlin 1.19.10. BA/MA RM3/11594 "Begrundung der Novelle in der Budgetkommission," Administrative Dept., RMA, Berlin 1912. One such example was W. Churchill's speech in the Commons on 22 July 1912.

shipbuilding abroad.[127] The Reichstag representatives were taking a greater interest in shipyard fact-finding tours. These were no longer the show-tours of the 1898-1900 period. More often than not a representative of every political point of view participated. Thus, they were now criticizing the RMA budget proposals from a much more informed and concerned position.[128] After the heated naval supplement debates the Reichstag established an Armaments Committee to look at the financial aspects of military arms purchases more closely.[129]

The 1912 naval supplement passed the Reichstag on 14 June, but for the first time in fourteen years the event was a setback for the State Secretary. On the surface it seemed that Tirpitz had achieved his ends. There was an increase in construction funds and the active fleet was to receive a third squadron. However, the reserves in home waters were tapped to form the third squadron. All of the battleships and cruisers of the active fleet and one quarter of those in reserve were now kept permanently in commission. This increased the active fleet by four battleships, four heavy and four light cruisers. The reserve fleet flagship was also activated and new funds completed the

---

[127]BA/MA RM3/5996 pt. 2. 63. session, Reichstag Verhandlungen 5.15.12. 33. und 34. Sitzung, Reichstag, 13. Legislatur-Periode, 1. session 1912. Kommission für den Reichshaushalts Etat.

[128]BA/MA RM3/11691 "Nachweisung der Teilnehmer an einer Reichstagsinformationsreise im Juni," 1913.

[129]Ibid. Handakten von Gohren, "Betrifft: Rüstungsausschuss," Berlin 7.13.13. (Dahnhardt to Tirpitz, Berlin).

third squadron by providing for three more battleships and two light cruisers.[130]

Personnel had always taken a back seat to Tirpitz's instruction program. As historian Gerhard Ritter explained: "Clearly, the rate of construction had far outstripped the facilities for procuring trained personnel, especially officers."[131] In 1912, however, in response to requests by the Chief of the High Seas Fleet, Admiral von Holtzendorff, a greater amount of money was diverted to the acquisition and training of personnel to man the fleet. Support for this measure also came from some of Tirpitz's associates in the RMA. Rollmann of the Construction Department had increased personnel spending as far back as 1909.[132]

Although the addition of the reserves to the active fleet momentarily obscured it, Tirpitz's precious building rate was markedly reduced. From 1908 through 1911 the State Secretary built at a tempo of four capital ships per year, three battleships and a heavy cruiser. Now, reduced resources allowed only one of each type for the 1912 budget year, and the Supplementary Naval Law funds only increased this

---

[130]Hurd & Castle, op. cit., 337-39. BA/MA RM3/11637 Handakten Dahnhardt, Scheme of Fleet Composition and Development from 1898 to 1912.

[131]G. Ritter, Staatskunst, vol. 2, 237-38.

[132]BA/MA RM3/2500 Rollmann's personnel requests were often drastically reduced. The 1910 Budget is one example. See the above volume passim.

by one battleship in 1913.[133] (Table 5) The days of rapid growth and plentiful funds were at an end.

Summary

A variety of forces acted on the naval construction program during the 1909-12 period. On the one hand, Tirpitz did not thoroughly appreciate political and military realities like the British unwillingness to allow the German challenge to go unanswered. He chose to play down the British threat when it called for a real reduction in German shipbuilding because this did not further his goals or satisfy his imperative to complete the fleet required by the Risk Theory. By this time, however, his vanity and the public and industrial momentum gained by fleet expansion were pushing the navy toward the very confrontation the State Secretary repeatedly said he wished to avoid.

On the other hand, Tirpitz fully appreciated the opportunity presented by American competition in the steel industry. He very effectively used this situation to force the Krupp-Dillinger alliance into the concessions the RMA had sought since 1897. Tirpitz had lost none of his ability to recognize a line of activity that could further his aims, like the triple pressures he placed on Krupp-Dillinger by using Midvale, Thyssen and Prince von Oppersdorff.

Domestic forces exerted enough pressure to hand Tirpitz his first legislative defeat in fourteen years. The reduced construction

---

[133]BA/MA RM3/6673-6674 Annual Reports of the Shipbuilding Commission 1906-1915.

TABLE 5

CAPITAL SHIPS BUILT BY THE RMA
IN THE 1909-18 PERIOD*

| Capital Ship | Company | Year |
|---|---|---|
| **Battleships** | | |
| Kaiser | KWK | 1909-12 |
| Friedrich der Grosse | Vulcan | 1910-12 |
| Kaiserin | Howaldtswerke | 1910-13 |
| König Albert | Schichau | 1910-13 |
| Prinzregent Luitpold | Germaniawerft | 1911-13 |
| König | KWW | 1911-14 |
| Grosser Kurfürst | Vulcan | 1911-14 |
| Markgraf | Weser | 1911-14 |
| Kronprinz | Germaniawerft | 1912-14 |
| Bayern | Howaldtswerke | 1914-16 |
| Baden | Schichau | 1913-16 |
| Württemburg | Vulcan | 1914- |
| Sachsen | Germaniawerft | 1914- |
| **Heavy Cruisers** | | |
| Moltke | Blohm und Voss | 1909-11 |
| Goeben | Blohm und Voss | 1909-12 |
| Seydlitz | Blohm und Voss | 1911-13 |
| Derfflinger | Blohm und Voss | 1912-14 |
| Lutzow | Schichau | 1912-15 |
| Hindenberg | KWW | 1913-17 |
| Mackensen | Blohm und Voss | 1914- |
| Graf Spee | Schichau | 1915- |
| Prinz Eitel Friedrich | Blohm und Voss | 1915- |
| Fürst Bismarck | KWW | 1915- |
| Ersatz Yorck | Vulcan | 1916- |
| Ersatz Gneisenau | Germaniawerft | 1916- |
| Ersatz Scharnhorst | Blohm und Voss | 1916- |
| **Light Cruisers** | | |
| 28 ships, eight of which were never completed. | | |

*Statistics taken from E. Groner, Die Deutsche Kriegsschiffe, 1815-1945 (Munich, 1966), vol. 1.

funds and slower building tempo indicated that Tirpitz's construction program had reached its zenith. The decisive factors were Bethmann, Wermuth, and the vulnerability of the navy to public and political attack exhibited by the Kiel scandal. These proved too much even for the State Secretary's political talents. Even strikes were becoming a bit more frequent. The SPD's election victory in 1912 assured that they would have a great political and economic effect in the future.

Save for the pressures that finally gave the RMA relief from oppressive armor prices, every other instance pointed to the difficulty of attaining Tirpitz's ideal. Political and diplomatic realities in Germany's relations with Britain had begun to change as far back as 1902, and Bethmann-Hollweg's opposition to Tirpitz reflected this change. The burden of ship construction was becoming unbearable for the Reich's narrow financial foundation, thus Wermuth's attitude. In 1912, the government's decision to increase army spending at the expense of the navy revealed a necessary recognition of political and military reality. The army was a proven commodity, needed in a time of stress and instability. The navy was still a binding social force domestically, but now it was also an expensive burden and a source of some domestic and international strife.

# CHAPTER VI

## CONCLUSION

The key to naval-industrial relations in Germany between 1897 and 1912 is Admiral Tirpitz. He was a man of immense determination, political talent, and personal ambition. Unfortunately for Germany, he also possessed the blindness of a dogmatist. Paul Kennedy has shown that the Admiral's relentless efforts to build a fleet to rival Great Britain contributed to Germany's political and military isolation from most of the world's great powers.[1] His dogmatism was also reflected in his insensitivity to the Reich's difficult financial condition. This is affirmed by Peter-Christian Witt's work.[2] Indeed, as Volker Berghahn has revealed, Tirpitz's defense of the Risk Theory tended to obscure almost every facet of the changing political scene during this period.[3] His actions indicate an inclination toward what is often called "tunnel vision." Spurred on by the support of the Kaiser and heavy industry, Tirpitz came to look upon his theories as Germany's only means for achieving world power status. Tirpitz perceived officers, publicists, and politicians as friends or enemies by the degree of support or opposition they rendered. He acknowledged

---

[1]Paul Kennedy, The Rise of Anglo-German Antagonism, 1860-1914 (London, 1980).

[2]P.-C. Witt, Die Finanzpolitik des deutschen Reiches von 1903 bis 1913 (Historischen Studien 415. Lübeck, 1970).

[3]V. Berghahn, Der Tirpitz Plan . . . (Düsseldorf, 1970).

or ignored events affecting the navy depending on how they might further his goals.

Some of the baser aspects of Tirpitz's behavior revealed themselves in his treatment of opponents. The RMA chief drove von Maltzahn, Galster and Persius into professional obscurity. Later, when the Admiral's power began to falter, Galster reemerged as the theoretical mentor of Tirpitz's strategic opponents. Only Lothar Persius struck back at Tirpitz with an equal ferocity both in and out of the service. In 1918 he took particular relish in a final published condemnation of Tirpitz's composition of the fleet and his strategic ideas.

After the success of the 1898 and 1900 Fleet Laws, Tirpitz's personal inclinations were reinforced by other factors. Industry was certainly one of the single most influential forces. This was not because Tirpitz commanded respect, but simply for the huge profits his political administrative talents produced. Various other popular groups also kept up the pressure. Historian Wilhelm Deist's analysis of the enthusiastic response of the Naval League and other organizations to the RMA's fleet propaganda clearly indicates the kind of independent momentum developed by these civilian groups.[4] As the political climate in Germany and abroad changed, these popular forces prompted the State Secretary to remain unbending.

For the navy and industry the most pressing problem was rapid expansion and having to keep up with Tirpitz's plans. The liabilities inherent in a rapid pace soon became evident. Too little money was invested in personnel to man the fleet during construction and in

---

[4]Wilhelm Deist, Flottenpolitik und Flottenpropaganda: Das Nachrichtenburo des Reichmarineamts, 1897-1914 (Stuttgart, 1976).

service. The difficulties of the Purchasing Office in completing its technical examinations of purchased materials on schedule were one manifestation of this problem. Handicaps of this sort expanded like a chain reaction causing lost construction time, increasing the cost of a ship and often delaying the installation of turbines, armor and guns. It was increasingly characteristic of a diverse program on a tight schedule that one problem frequently caused a multitude of others.

The most effective weapon Tirpitz had in his efforts to reach his goals in the fleet construction program was the Protocol System. This was the labyrinth of rules and regulations that governed the RMA's relationship with industry. As State Secretary of the RMA, Tirpitz broadened and perfected this system, using as his groundwork the General Construction Guidelines and the other various regulations that obliged most of the naval armaments industry to play by the RMA's rules. The Protocol System was not a unique or ingenious system of infallible controls that assured RMA dominance over the armaments industry. Rather, the RMA was able to assert itself in its relations with industry through the Protocol System by means of superior administration and management.

The Protocol System gave the RMA many advantages in its dealings with the industry. The most obvious example of this is the Suppliers List, which helped the RMA enforce its wishes with industry. Through its own inspectors and with help from Chambers of Commerce, the RMA developed a profile of every company that applied for naval work. It then had the opportunity to test all of the

materials and products for use at the shipyards, withholding approval until the standards were met.

The Suppliers List did have its flaws. The RMA could have shown more care in assembling the firms in each category in order to avoid creating unfair competition. More careful definition of Suppliers List categories and a clear indication of affiliate relationships would have placed the private yards in a position to select a qualified subcontractor at a better price. This would have reduced direct supervision by the RMA and perhaps prompted fewer accusations of unwarranted interference from industry. Yet, overall, the Suppliers List was an effective tool in an efficient system of restraints upon industry.

In the supervision of the construction program Tirpitz allowed von Eickstedt and Rollman a great deal of freedom to pick their own people and employ their own style. The latter were very capable administrators and effectively employed the Protocol System to achieve Tirpitz's ends. This freedom also extended to those who actually supervised the shipbuilding at the yards. The Construction Inspector attached to each project was able to make most decisions with a bare minimum of contact with Berlin. All business correspondence with the Königin Augusta Strasse regarding a given project had to go via the Inspector for his commentary. This way the RMA was better able to evaluate the performance of the firms, the Inspectorate and relations with industry in general.

Another valuable facet of the Protocol System was the part played by the Imperial Yards. These yards effectively supplied the

RMA with an alternative when bids from the private yards were far too high. They were, of course, the ones to set the example for private industry when von Stosch first called for a completely home-based shipbuilding industry. The Imperial Yards fulfilled a variety of functions for Tirpitz as the navy's pace of growth quickened and the RMA had a real need for alternatives to private industry. Although it was not exploited to the full, the U-boat research at the Danzig Imperial Yard gave the RMA a great deal of technical expertise. It also supplied an alternative to Krupp when Tirpitz reluctantly decided to build submarines. Thus, the RMA was never placed at the same disadvantage with respect to U-boats as it was with the turbine engine. However, the Danzig Yard was not allowed to advance its U-boat work as far and as fast as the Germaniawerft. It remained Tirpitz's policy throughout this period to leave the development of major technical innovation entirely in the hands of private enterprise.

The Imperial Shipyard at Kiel was also used as a torpedo manufacturing center. This area was, of course, the State Secretary's professional specialty and his estimate of the torpedoes produced at Friedrichsort, adjacent to the Imperial Yard at Kiel, was very high. Tirpitz kept this naval monopoly intact until 1914, and expanded Kiel's extensive research and testing facilities. Furthermore, the Imperial Yards were collectively entrusted with the difficult task of disbursing construction funds to the private yards as each stage of a project was completed.

Tirpitz obviously sought to keep as much of the building program within the precincts of the RMA as possible. The Protocol System and the various parts the Imperial Yards played in it allowed him to limit his dependence on private industry. He then sought to keep the Reich's political and financial forces at arm's length. The less naval influence wielded by the Reichstag, Chancellor and Treasury Office, the better the State Secretary liked it. By 1909, however, this effort was thwarted. Tirpitz found it too difficult to handle both the Wermuth's and Bethmann-Hollweg's determination to moderate the navy's negative impact on the Reich's domestic and foreign policies.

A source of frustration that neither the Protocol System nor the Imperial Yards were ever able to resolve fully was overruns in cost and weight. They were a disagreeable, unavoidable part of building sophisticated weaponry. Every design revision, every price change and every small production delay resulted in cost or weight increases. This was the kind of added expense that the RMA could accept and minimize but never fully solve.

Additional sources of extra costs lay in the area of transport and labor. There was a constant contest between the RMA and its suppliers over who was responsible for transport costs from the factory to the shipyard. In most cases the RMA coerced the suppliers into arranging transport and paying the cost. In the area of labor, both the RMA and industry were undisturbed by any major shipbuilders' strikes through 1912. The socialist and independent labor unions were as yet unable to force any dramatic changes in hours, pay or

conditions. While the situation was different at many of the Ruhr mines and foundries, the wages paid to the shipyard workers rose only slightly. Nonetheless, the frequency of isolated work actions began to increase between 1910 and 1912. With the political success of the SPD in 1912 the future of union influence at the shipyards looked promising.

The RMA's relative success in keeping the upper hand in its relationship with vendors found its exception in the Krupp-Dillinger alliance. In the spring of 1900, Tirpitz's major clash with Fritz Krupp over armor prices forced the latter to play his trump card, i.e., his close relationship with the Kaiser. The incident did nothing to enhance the RMA's relationship with Essen. Indeed, Capelle and other RMA leaders were afraid to bring up the subject of armor prices lest the scene be replayed. Obviously, Tirpitz himself avoided another confrontation until favorable external forces changed his mind.

Only Krupp and Dillinger were able to produce the nickel steel armor in the quality and quantity that the navy needed. Although intra-industry competition among steel suppliers was often rigorous, there was never any chance to use this against the armor alliance. Not only did the industry usually manage to present a united front to the navy in business matters, but also it seemed dangerous to attack Krupp-Dillinger. The RMA always had a chance of doing slight damage to the alliance, but to what end? Tirpitz needed the armor, there was no alternative, and the threat of realiation was too

great. A production slowdown at Essen would have presented the building program with a major setback. Besides, Krupp owned the Germaniawerft and monopolized ship artillery production. To attack Essen without some expectation of dramatic success would merely invite disaster. Tirpitz knew this, and it colored his relationship with Krupp. Eickstedt and his successor, Rollmann, also counseled against attacks on Krupp or Dillinger.

Krupp operated as the most powerful and independent of all navy contractors. The RMA had no control over the firm's tendency to consume its competitors. The annexation of Gruson in Magdeburg gave Krupp its preeminent position in armor production. The firm's attempted takeover of Vulcan in Stettin-Bredow was one of its few failures. However, in this case it was more the strength of the Vulcan leadership than aid from the RMA that made the difference. By 1906 Vulcan's expansion into its new Hamburg facility assured it of a greater number of capital ship contracts from the RMA. This guaranteed continuity for its workers and greater profits and stability for the firm as a whole.

Krupp's efforts to enter into alliances met with mixed results. As Krupp's successful alliance with Dillinger in armor plate showed, the great advantage of this procedure was to assure complete control in a particular market. Dillinger had to enter this union, because in the long run Krupp might have driven the company out of the armor business with lower prices or annexed it. From Essen's perspective either of these options could cause a price war redounding to the

benefit of the navy and army and squandering possible profits. The further possibility of the armed services supporting Dillinger as an effective opponent also loomed large. Thus, from Fritz Krupp's point of view, the alliance assured a monopoly and kept Dillinger from becoming an effective competitor in the future.

Krupp's failure to draw the American Lake Company into such an alliance was a portent of things to come. The Holland type U-boats which the Lake Company sold in Europe were as good or better than the Germaniawerft products. Furthermore, many American firms were not inclined toward Krupp's comfortable alliance proposals if a chance of out competing Essen was still a real possibility. It was Krupp's inability to extend its alliance and combination practices to the international scene that later gave the RMA its first real chance to reduce armor prices.

The activities of the American Midvale Company in Europe and its amazingly low armor price of 1,450 marks per ton in 1906 provided a source of competition the alliance could not control. Midvale was beyond Essen's reach. Tirpitz skillfully combined early overtures to Midvale, serious RMA-Thyssen negotiations with the opportune attacks on the alliance by Oppersdorff later in 1909, to pressure Krupp into lower prices. Thyssen also became a real threat simply because the Reichstag and RMA could give it advantages that would endanger the hold the alliance possessed over the armor market. At the very least, Krupp perceived this combination as a threat, and that was exactly what Tirpitz needed. Domestic German armor prices dropped

more in the period between 1906 and 1910 than in the entire history of naval expansion to that time. Thus, the armor contract signed with Krupp-Dillinger in 1910 at 1,550 marks per ton was initially made possible by competitive forces outside of Germany. Tirpitz's ability to perceive the advantage allowed the RMA to exploit it to the fullest.

Tirpitz was unable to exploit the possible advantage of the U-boat because he did not consider the U-boat a necessary part of the construction program. Thus he had little interest in the vessel save for keeping abreast of the technology. Even this concern represented less a concession to the U-boat's future possibilities, than a partial surrender to pressures from German government officials to keep abreast of naval development. The construction of U-boats by the RMA between 1906 and 1912 was Tirpitz's reaction to a successive series of stimuli provided by a number of individuals and pressure groups. The Foreign Office provided the RMA with many reports on the progress made by France and the United States with regard to the U-boat. Both countries were making an effort to find a place for this new technology in their respective naval strategies. The State Secretary's colleagues in the navy and many of those in the Reichstag frequently wondered why the RMA was not fully exploiting the possibilities of the U-boat. Tirpitz felt he had to respond to foreign pressures and knew the importance of naval and Reichstag support for his construction program. Therefore, he involved the RMA in U-boat development just enough to satisfy most critics and

preserve the progress of his ambitions for the High Seas Fleet. When it came to the U-boat, Tirpitz's dogmatism was at its worst. To him the U-boat was never anything but a defensive weapon and a minor auxiliary to the battleship. The ideas in Service Memo IX left no room for the offensive strategy the U-boat represented. Tirpitz felt that extensive development of the weapon only detracted from the major goal of the construction program, building capital ships.

One result of this situation was the strong position of the Germaniawerft in 1904 when Tirpitz grudgingly allowed U-boats to become part of the Imperial Navy. Krupp was the only private manufacturer available. On the positive side, the Germaniawerft's extensive research and development facilities showed the diversification of German industry and its ability to adapt. The negative side was the possibility of a Krupp U-boat monopoly, only narrowly averted by the Danzig Imperial Yard's modest advances in the field. On the whole, U-boat production was a lost opportunity for most of the German shipbuilding industry before 1904 and remained so until A. G. Weser first expanded into the area in 1914.

The RMA's experience with the U-boat illustrated the advent of expensive high technology weapons. The capital ships became increasingly sophisticated with the dreadnought, and the U-boats added to the cost of technical innovation. Approximately 4% of the cost of a dreadnought went into revolutionary technology or recent innovation. The estimate of between 3% and 4% for the much smaller U-boats made them as expensive in this respect as a ship many times their size. In spite of the mastery of such advanced technology

exhibited by German industry, Tirpitz's strategic dogmas prevented them from pursuing U-boat development on a larger scale. Thus, his faith in battleship strategy created a flaw in his policy regarding research and development.

Tirpitz's research and development policies also provided a handicap to the RMA's electrical needs. The major advantage for the navy in the electrical industry was the intense competition, the high demand for products and resulting ability of smaller firms to survive. There was plenty of profit available both inside and out of naval work, and a real opportunity for the newer companies to compete. In the case of the turbine, however, this became a disadvantage. It was exactly the opposite of the RMA's problem with the armor alliance. Tirpitz insisted that research and development was the province of the private sector, yet his need for turbines to power his ships might have motivated him to guide the private firms in their efforts to rival Parsons. German shipbuilding and electrical firms diluted their efforts to produce a truly domestic turbine by experimenting with a number of different types in various business syndicates and alliances. As a result the building program reached its peak in 1912 without a German turbine to compete with the Parsons' System.

By employing the options open to him, especially through the Protocol System and Suppliers List, Tirpitz could have reduced much of this wasted effort. By limiting RMA vendors to the Parsons' System at the outset, and encouraging research and development to

develop variations and improvements, the results might have been much better. Certainly, he was not above this sort of interference in business affairs. Greater RMA involvement might have focused the powers of industry to a higher degree. In this case, Tirpitz's policy of removing the RMA from any major technological innovation until it was perfected encouraged too much competition. Parsons' early prominence should have quickly given way to a German variation. Instead the British company dominated this type of propulsion via its German subsidiary.

The final questions regarding the RMA's relationship with the shipbuilding industry are twofold. First, did the navy achieve its goals within the strict boundaries defined by Tirpitz? Second, an evaluation of Tirpitz is necessary. Was he an asset or a liability to RMA-industrial relations in the long run?

Within the limits stipulated by Tirpitz, the RMA was very successful in purchasing quality naval hardware and keeping the upper hand in its relations with industry. The RMA was dealing with a multitude of diverse vendors and shipyards which the Protocol System managed to coordinate and tame with a few notable exceptions. Of these even the power of the Krupp-Dillinger alliance was moderated with some success in spite of a degree of dependence upon outside forces. Furthermore, there is little question that the ships built by Tirpitz performed well in war. Indeed, the British were surprised by the high degree of quality they confronted at Jutland, only two months after Tirpitz resigned as State Secretary in 1916.

The building program was a boon to German business. Tirpitz's well defined ambitions brought the shipbuilding industry to a greater stage of maturity, more quickly than von Stosch would have thought possible. The diversity of the skills required and the technological expertise needed to create the High Seas Fleet benefitted Krupp and Siemens, M.A.N., Körting and many smaller concerns.

Throughout the construction program Tirpitz's outstanding political and administrative abilities shone forth. He took an extremely primitive navy and gave it purpose and direction. The Reichstag committed itself to Tirpitz's ambitions for the navy less than two years after it spurned Hollmann's meager requests. Tirpitz also managed to mobilize the industrial strength needed to fulfill his expansion program. At the same time he preserved an advantage for the navy in its relations with industry. In particular, the Admiral's accomplishments between 1897 and 1902 were nothing less than phenomenal.

However, there is still another perspective. Tirpitz's theories of naval warfare placed strict limits on what the navy could build. The construction program was the opening shot of the decisive battle he was determined to have with the British. Unfortunately, he believed that he could defeat Great Britain at its own game. Instead of focusing on the vulnerability of Britain's geographic position and the weak points of the Royal Navy, he advocated a head-on confrontation between capital ships. The British, given their naval traditions and head start in sheer numbers, naturally relied on their battleship strength. Germany possessed neither the numbers nor such honored

traditions but it had the industrial potential. If Tirpitz had worked for a Handelskrieg strategy as hard as he did for his Risk Theory, the danger to Great Britain would have been far greater. The U-boat might have penetrated the Imperial Navy sooner and in greater numbers, as it did in France. The building program designed to fulfill such a strategy would have equally benefitted industry. A large force of fast cruisers, and hundreds of smaller craft including the U-boat, also promised industrial challenges and profits.

On the one hand, Tirpitz showed an amazing ability to adapt politically and to sense an advantage that would further his goals. These talents he used effectively in the Reichstag and among the industrialists and manufacturers who contracted to build the fleet. On the other hand, his dogmas prevented him from transferring this adaptability into the areas of strategy and technological innovation. Thus the RMA had difficulty with the turbine and the substantial advantages of the U-boat were by and large lost to the navy and industry until 1914.

With Tirpitz, the fleet construction program satisfied both the RMA and industry. Without his dogmatic views the fleet might have played a greater role in the war. It was the ultimate contradiction to have the State Secretary of the RMA dictating strategy to the Admiral Staff. However, that is exactly what his decisions on fleet composition did, and without the agreement of those whose job it was to direct the navy in wartime. As an administrator and politician, Tirpitz was necessary for the success of the 1898-1912 naval expansion

program. As a strategist he proved a liability, playing into his chosen enemy's strength and reducing the options open to the Admiral Staff.

The Kaiser was the only arbiter between the Admiral Staff and the RMA. Rather than solve the problem by encouraging collaboration between them or subordinating one authority to the other, Wilhelm supplied no direction at all. Therefore, Tirpitz efficiently created a fleet of his own design, paying little attention to the needs of the Admiral Staff. This situation accurately reflects the chaotic political and social system of which Tirpitz and Wilhelm were only one part.

# BIBLIOGRAPHY

# BIBLIOGRAPHY

## I. PRIMARY SOURCES

### Unpublished


Bundesarchiv-Militärarchiv, Freiburg im Breisgau
Imperial Admiralty to 1889 (RM1)
Naval Cabinet (RM2)
Imperial Naval Office (RM3)
Imperial Naval High Command 1889-1899 (RM4)
Admiralty Staff, from 1899 (RM5)
Office of the Naval Command, post 1918 (RM20)
General Naval Office, post 1918 (RM21)
Office of Naval Administration, post 1918 (RM23)
Private Papers: Tirpitz (N253)
Capelle (N170)
von Senden-Bibran (N160)
Behncke (N173)

Historisches Archiv Fried. Krupp, Villa Hügel, Essen
Works Archive (WA)
Family Archive (FAH)


### Published


von Alten, Georg. Handbuch für Heer und Flotte, volume 5, Berlin, 1913.

Bryer, Siegfried. Battleships and Battlecruisers, 1905-1970. Garden City, NY, 1973.

von Bülow, Bernard Fürst. Denkwürdigkeiten, volume 1, Berlin, 1930.

Görlitz, Walter, ed. Der Kaiser . . . Aufzeichnungen des Chefs des Marinekabinettes Admiral Georg Alexander von Müller uber die Ära Wilhelms II. Berlin, 1965.

Görlitz, Walter, ed. Regierte der Kaiser? Kriegstagebücher, Aufzeichnungen und Briefe des Chefs des Marinekabinettes Admiral Georg von Müller, 1914-1918. Göttingen, 1959.

Gröner, Erich. Die deutsche Kriegsschiffe 1815-1945. 2 volumes. Munich, 1966.

Hohenlohe-Schillingsfürst, Chlodwig K. V. Fürst zu. Memoirs of Prince Chlodwig of Hohenlohe-Schillingsfürst. Edited by Friedrich Curtius. New York, 1906.

Hohenlohe-Schillingsfürst, Chlodwig K. V., Fürst zu. Denkwürdigkeiten der Reichskanzlerzeit. Edited by Karl Alexander von Müller. Stuttgart, 1931.

von Holstein, Friedrich. Die Geheimen Papiere Friedrich von Holsteins, volume 4. Edited by Norman Rich and M. H. Fisher. Göttingen, 1963.

Lepsius, J., Mendelssohn-Bartholdy, A. and Thimme, F. Die grosse politik der europäischen Kabinette 1871-1914. Berlin, 1921-1927.

Preston, A. Warships of World War I. Harrisburg, Pa., 1972.

Rangliste der kaiserlichen deutschen Marine. Berlin, 1890-1918.

Verhandlung des Reichtages, Stenographische Berichte. 1898, 1900, 1906, 1908, 1912.

Riezler, K. Tagebücher, Aufsätze, Dokumente. Edited by K. D. Erdmann. Göttingen, 1972.

Rössler, E. Geschichte der deutsche U-bootbaues. Munich, 1979.

von Tirpitz, A. Erinnerungen. Leipzig, 1919.

von Tirpitz, A. My Memoirs. 2 volumes. London, 1919.

von Tirpitz, A. Politische Dokumente. 2 volumes. Stuttgart, 1924-1926.

Weslicenus, Georg. Deutschlands Seemacht sonst und jetzt. Leipzig, 1896.

## II. SECONDARY SOURCES

Baecker, Thomas. "Mahan über Deutschland," MR, 73 (Jan.-Feb. 1976), 10-19; 86-102.

Boyd, Carl. "The Wasted Ten Years, 1888-1898. The Kaiser Finds an Admiral." Royal United Services Institution Journal, 111 (1966), 291-297.

Berghahn, V. R. and Deist, W. "Kaiserliche Marine und Kriegsausbruch 1914." MGM, 7 (1970), 37ff.

Berghahn, V. R. "Zu den Zielen des deutschen Flottenbaues unter Wilhelm II." HZ 210 (Feb., 1970), 34-100.

Berghahn, V. R. Der Tirpitz Plan. Düsseldorf, 1971.

Berghahn, V. R. Germany and the Approach of War in 1914. New York, 1973.

Berghahn, V. R. "Flottenrüstung und Machtgefüge" in Das kaiserliche Deutschland: Politik und Gesellschaft 1870-1918. Edited by M. Stürmer. Düsseldorf, 1970.

Böhm, E. Überseehandel und Flottenbau. Hanseatische Kaufmannschaft und deutsche Seerüstung, 1879-1902. Hamburg, 1972.

Boelcke, W. A., ed. Krupp und die Hohenzollern in Dokumenten: Krupp-Korrespondenz mit Kaisern, Kabinettschefs, und Ministern 1850-1910. Frankfurt a.M., 1970.

Born, K. E. Moderne deutsche Wirtschaftsgeschichte. Cologne, 1966.

Bueb, V. Die "Junge Schule" der französischen Marine. Strategie und Politik 1875-1900. Boppard a.Rh., 1971.

Cecil, L. Albert Ballin. Princeton, 1967.

Cooling, B. F. Grey Steel and Blue Water Navy. The Formative Years of America's Military Industrial Complex, 1881-1917. Hamden, Conn., 1979.

Deist, W. Flottenpolitik und Flottenpropaganda: Das Nachrichtenbüro des Reichsmarineamts, 1897-1914, Stuttgart, 1976.

Deist, W. Militär und Innenpolitik im Weltkrieg, 1914-1918, 2 volumes. Dusseldorf, 1970.

Feldmann, G. "The Large Firm in the German Industrial System" in Industrielle Gesellschaft und Politisches System. Edited by D. Stegmann, et al. Bonn, 1978.

Feldmann, G. Army, Industry, and Labor in Germany, 1914-1918. Princeton, 1966.

Feldmann, G. Industrie und der Inflation: Studien und Dokumente zur Politik der deutscher Unternehmer 1916-1923. Hamburg, 1977.

Fraley, J. D. "Government by Procrastination: Chancellor Hohenlohe and Kaiser Wilhelm II, 1894-1900," CEH (1974), 159-183.

Fricke, D. Die deutsche Arbeiterbewegung, 1896-1914. Berlin, 1976.

Fricke, D. "Eine Denkschrift Krupps aus dem Jahre 1912 über den Schutz der Arbeitswilligen," Zeitschrift für Geschichtswissenschaft, 6 (1957), 1245-1253.

Gemzell, C.-A. Organization, Conflict and Innovation: A Study of German Naval Strategic Planning, 1888-1940. Lund, 1973.

Graham, G. The Politics of Naval Supremacy. Cambridge, 1965.

Hallgarten, G.W.F. Imperialismus vor 1914. 2 volumes. Munich, 1963.

Hallgarten, G.W.F., and Radkau, J. Deutsche Industrie und Politik von Bismarck bis heute. Frankfurt a.M., 1974.

Herwig, H. The German Naval Officer Corps. Oxford, 1973.

Herwig, H. "Feudalization of the Burgeoisie: The Role of the Nobility in the German Naval Officer Corps, 1890-1918." Historian, 38 (Feb., 1976), 268-280.

Herwig, H. and Trask, D. F. "Naval Operations Plans Between Germany and the United States of America, 1898-1913. A Study of Strategic Planning in the Age of Imperialism," MGM, 8 (1970), 5-32.

Hollyday, F.B.M. Bismarck's Rival: A Political Biography of General and Admiral von Stosch. Durham, 1960.

Hubatsch, W. Kaiserliche Marine. Augsburg, 1975.

Hubatsch, W. Der Admiralstab und die obersten Marinebehörden in Deutschland, 1848-1945. Frankfurt a.M., 1958.

Hubatsch, W. "Der Kulminationspunkt der deutschen Marinepolitik im Jahre 1912," HZ 422 (No. 2, Oct. 1953), 291-332.

Hubatsch, W. Die Tirpitz Ära: Studien zur deutschen Marinepolitik, 1890-1918. Berlin, 1955.

Huntington, S. P. The Soldier and the State: The Theory and Politics of Civil-Military Relations. Cambridge, MA, 1957.

Hurd, A. and Castle, H. German Seapower: Its Rise, Progress, and Economic Basis. New York, 1915.

Kaeble, H. Industielle Interessenpolitik in der Wilhelminischen Gesellschaft. Centralverband deutscher Industrieller 1895-1914. Berlin, 1967.

Jarausch, K. The Enigmatic Chancellor: Bethmann-Hollweg and the Hubris of Imperial Germany. New Haven, 1972.

Kehr, E. Primat der Innenpolitik. Berlin, 1970.

Kehr, E. "The Munitions Industry." Encyclopedia of Social Sciences (First Edition), 11, 132.

Kehr, E. Schlachtflottenbau und Parteipolitik, 1894-1901. Berlin, 1930.

Kennedy, P. The Samoan Tangle. Dublin, 1974.

Kennedy, P. The Rise of Anglo-German Antagonism, 1860-1914. London, 1980.

Kennedy, P. "The Development of German Naval Operations Plans Against England 1896-1914." English Historical Review, 89 (No. 350, Jan., 1974), 48-76.

Kennedy, P. "Fisher and Tirpitz: Political Admirals in the Age of Imperialism," in Naval Warfare in the Twentieth Century, 1900-1945. Essays in Honor of Arthur Marder. Edited by Gerald Jordan. London, 1977.

Kennedy, P. "Tirpitz, England and the Second Naval Law." MGM, 2 (1970), 33ff.

"150 Jahre Fried. Krupp." Krupp Mitteilungen (No. 50), 1961.

Kuczynski, J. Studien zur Geschichte des deutschen Imperialismus. Band 1. Berlin, 1951.

Langer, W. L. The Diplomacy of Imperialism, 1890-1902. Volume 2. New York, 1935.

Leckebusch, G. "Die Beziehungen der deutschen Seeschiffswerften zur Eisenindustrie an der Ruhr in der Zeit von 1850 bis 1930." Schriften zur rheinisch-westfälischen Wirtschsftsgeschichte Band 8. Edited by the Rheinisch-Westfälischen Wirtschafts-archiv zu Köln. Cologne, 1963.

Leckebusch, G. "Der Beginn des deutschen Eisenschiffbaues, 1850-1890." Moderne deutsche Wirtschaftsgeschichte. Edited by K. E. Born. Cologne, 1966.

Mahan, A. T. The Influence of Seapower upon History. Boston, 1947.

Manchester, W. The Arms of Krupp. Boston, 1968.

Marder, A. J. From the Dreadnought to Scapa Flow: The Royal Navy in the Fisher Era, 1904-1914. London, 1961.

Marienfelde, W. Wissenschaft und Schlachtflottenbau in Deutschland, 1897 bis 1906. Frankfurt a.M., 1957.

Marinearchiv, ed. Der Krieg zur See, 1914-1918. 22 volumes. Edited by Rear Admiral E. von Mantey. Berlin, 1920.

Mommsen, W. J. "Domestic Factors in German Foreign Policy before 1914." CEH, 6 (1973), 3-43.

Nichols, J. A. Germany after Bismarck: The Caprivi Era, 1890-1894. Cambridge, MA, 1958.

O'Byron, L. "Die Beurteilung der deutschen Flottenpolitik in amerikanischen Zeugnessen der Vorkriegszeit." Historische Studien, 257. Berlin, 1934.

Owen, R. "Military Industrial Relations: Krupp and the Imperial Naval Office" in Society and Politics in Wilhelmine Germany. Edited by R. J. Evans. London, 1978.

Pistorius, Capt. F. "Die Vulcan-Werke A. G., Stettin. Aufstieg, Gluck, und Ende einer grossen deutschen Werft," MR, 35 (July, 1930), 312-322.

Rahn, W. "Wilhelm und seine Marine," MR, 73 (May, 1976), 285-291.

Ritter, G. Staatskunst und Kriegshandwerk. Volume 2. Munich, 1965.

Rohl, J. "Admiral von Müller and the Approach of War, 1911-1914," HJ, 12 (No. 4, 1969), 651-673.

Rohl, J. Deutschland ohne Bismarck. Tubingen, 1969.

Rosenberg, H. "Political and Social Consequences of the Great Depression of 1873-1896 in Central Europe," EHR, 13 (1943), 58-73.

Rössler, E. Geschichte des deutschen U-Bootbaues. Munich, 1975.

Rössler, E. Die deutsche U-Bootbau bis Ende des 1. Weltkrieg. Munich, 1979.

Saul, K. Staat, Industrie, und Arbeiterbewegung im Wilhelminischen Reich. Düsseldorf, 1973.

Schorske, C. German Social Democracy, 1905-1917. Cambridge, MA., 1955.

Schröder, E. Albrecht von Stosch. Historische Studien 353. Berlin, 1939.

Schottelius, H. and Deist, W., eds. Marine und Marinepolitik im kaiserlichen Deutschland, 1871-1914. Düsseldorf, 1972.

Schussler, W. Weltmachtstreben und Flottenbau. Witten a. Ruhr, 1956.

Schwarz, T. and von Halle, E., eds. Die Schiffbauindustrie in Deutschland und im Ausland. 2 volumes. Berlin, 1902.

Stearns, P. N. "Adaption to Industrialization: The German Workers as a Test Case," CEH, 3 (Dec., 1970), 803ff.

Steinberg, J. Yesterday's Deterrent. New York, 1965.

Steinberg, J. "Germany and the Russo-Japanese War," AHR, 75 (No. 7, 1970), 1965-1986.

von Strandmann, H. P. Unternehmenspolitik und Unternehmensführung. Düsseldorf, 1978.

Stumpf, R. War, Mutiny, and Revolution in the German Navy. Edited by D. Horn. New Brunswick, 1967.

Sturmer, M., ed. Das Kaiserliche Deutschland. Düsseldorf, 1970.

Techel, H. Der Bau von Unterseebooten auf der Germaniawerft. Munich, 1969. (Reprint from the 1923 edition.)

Thalheimer, S. Das deutsche Flottengesetz von 1898. Düsseldorf, 1926.

Trebelcock, C. "British Armaments and European Industrialization, 1890-1914," EHR, Series 26 (No. 2, May 2, 1973), 254-272.

Vagts, A. "Hopes and Fears of a German American War, 1870-1915." Political Science Quarterly, 54 (1939), 514-535.

Wagner, Lt. Capt. "75 Jahre Marinewerft Wilhelmshaven," MR, 36 (1931), 320-323.

Widenmann, W. Memoiren. Gottingen, 1952.

Witt, P.-C. Die Finanzpolitik des deutschen Reiches von 1903 bis 1913. Historische Studien 415. Lubeck, 1970.

Zmarzlik, H.-G. Bethmann-Hollweg als Reichskanzler 1909-1914. Dusseldorf, 1957.

# APPENDIXES

# APPENDIX A

## BIOGRAPHICAL SKETCHES

These biographical sketches are intended as a supplement to the footnotes and an aid to the reader. Source: Rangliste der kaiserlichen deutschen Marine, 1890-1918; Eherenrangliste der kaiserlichen deutschen Marine, 1914-1918.

Admiral Behncke (8.13. 1866- 1.4.1937): entered the navy on April 4, 1883 and by 1911 had accumulated 14 years and 2 months of sea duty.
Promotions and positions:
Captain: 9.12.08 Admiralty Staff Dept. Head.
Rear Admiral 7.14.14 Official representative of the Admiralty Staff 1914-1915.
Vice Admiral 11.25.16 Same as above until January 1916; then in charge of the 3rd Battle Squadron to Sept. 1918.

Admiral Capelle: Entered the German Navy on April 18, 1872. He spent a total of 13 years working at sea.
Promotions and positions:
Captain: 10.8.00 Dir. of the Administrative Dept., RMA (to 1906)
Rear Admiral 7.7.06 Same as above (to 1909)
Vice Admiral 9.5.09 Same as above (to 1913)
Admiral 1913 Same as above until 1914; Asst. State Secretary of the RMA until 1916.
17 March 1916 He succeeded Tirpitz as State Secretary of the RMA.

Admiral Dahnhardt: Was born on October 27, 1863 and entered the service in April of 1879. He was a Lt. Captain under Pohl in the Central Div. of the RMA until 1902 when he became first adjutant to Diedrichs, Chief of the Admiralty Staff.
Promotions and positions:
Captain 1905 Dir., Budget Div. of Capelle's Administrative Dept.
Rear Admiral 1910 Same position
Vice Admiral 3.31.14 Dir., Budget Dept. of the RMA
Retired: 1.15.16

Admiral von Eickstedt: Took over as head of the Construction Dept. of the RMA as of November 10, 1899 (Captain)
Promotions and positions:
Rear Admiral 3.11.02 Same as above until his retirement in 1906
Vice Admiral 1.27.06.

Admiral Galster: Was one of Tirpitz's strongest and best known critics. He advocated the integration of the U-boat into German naval strategy.
Promotions and positions:
Rear Admiral 9.13.01
Vice Admiral 3.14.05
1904 Dir. of the Ship Artillery Inspectorate at the Imperial Shipyard in Wilhelmshaven.
Retired: 1907

Admiral von Heeringen: Entered the service in 1872 (4.18) and rose to the rank of Captain by 1900, when he commanded the S.M.S. Worth.
Promotions and positions:
Rear Admiral 7.7.06 Commander of the Scout Cruiser Squadron
Admiral 1.27.13 Chief of the North Sea Naval Station
Retired: 1914.

Admiral Heusner: Entered the navy on 18 June 1857 and served in the Admiralty and as Director of the Naval Department. In 1889 he was given the newly created position of State Secretary of the RMA.
Retired: 1891.

Admiral Hollmann: Was Tirpitz's immediate predecessor as State Secretary of the RMA. He took over that position in 1891.
Promotions and positions:
Captain: 2.15.1881 Commander of the First Sailor Division.
Rear Admiral 8.14.1888 Chief of the Instruction Squadron.
Vice Admiral 11.18.90.

Admiral von Holtzendorf: Entered the service on April 11, 1869. As of 1902 he had almost twenty years of service at sea.
Promotions and positions:
Captain 6.30.97 Dir. of the Imperial Yard at Danzig
Rear Admiral 1.27.04 Attached to the Dir. of the Baltic Sea Naval Station.
Vice Admiral 4.27.07 Chief of the First Squadron.
Admiral 1.27.10 Chief of the High Seas Fleet
Retired: 1913.

Admiral Freiherr von Maltzahn: (1849-1930) Began his career in 1866. He was Chief of the Baltic Naval Station and participated in tactical experiments on maneuvers under Dahnhardt, Koester, and Thompson.
Positions:
Commander, S.M.S. Württemberg, 1893-1895.
Commander, School Ship "Stosch," 1898.
Transferred to the Naval Academy, 1899.
He was a strategic opponent of Tirpitz.
Retired: 1903.

Admiral von Müller: (1854-1940) Entered the service in May of 1871 and spent some time as a Lt. Commander in Tirpitz's Torpedo arm in 1879. Early in his career he was assigned to the German Embassy in Stockholm as Naval Attaché.
Promotions and positions:
1891 Commander, canon boat Iltis (China).
1897-1898 Personal Adjutant to Prince Heinrich (the Kaiser's brother) in China; Chief of Staff to the Cruiser Squadron.
1898-1900 Commander, S.M.S. Deutschland.
1900 Captain, assigned to the Naval Cabinet.
1902-1904 Commander, S.M.S. Wettin
1907 Replaced von Senden-Bibran as Chief of the Naval Cabinet.
1910 Admiral.

Captain Persius: Was Tirpitz's most relentless opponent and a U-boat advocate. Professionally isolated and hounded by Tirpitz, his career ended prematurely. He entered the service on April 16, 1883 and was promoted to Corvette-Captain by 1903.

Admiral Rollmann: Replaced von Eickstedt as head of the RMA Construction Dept. in 1907. He held that position until the opening of the World War in 1914.
Positions and promotions:
Corvette-Captain 1906 Second Adjutant under Capt. Engel, Dir. of the Shipyard Div., RMA
Rear Admiral 4.27.07 Dir. RMA Construction Dept.
Vice Admiral 1.27.10 Same as above.

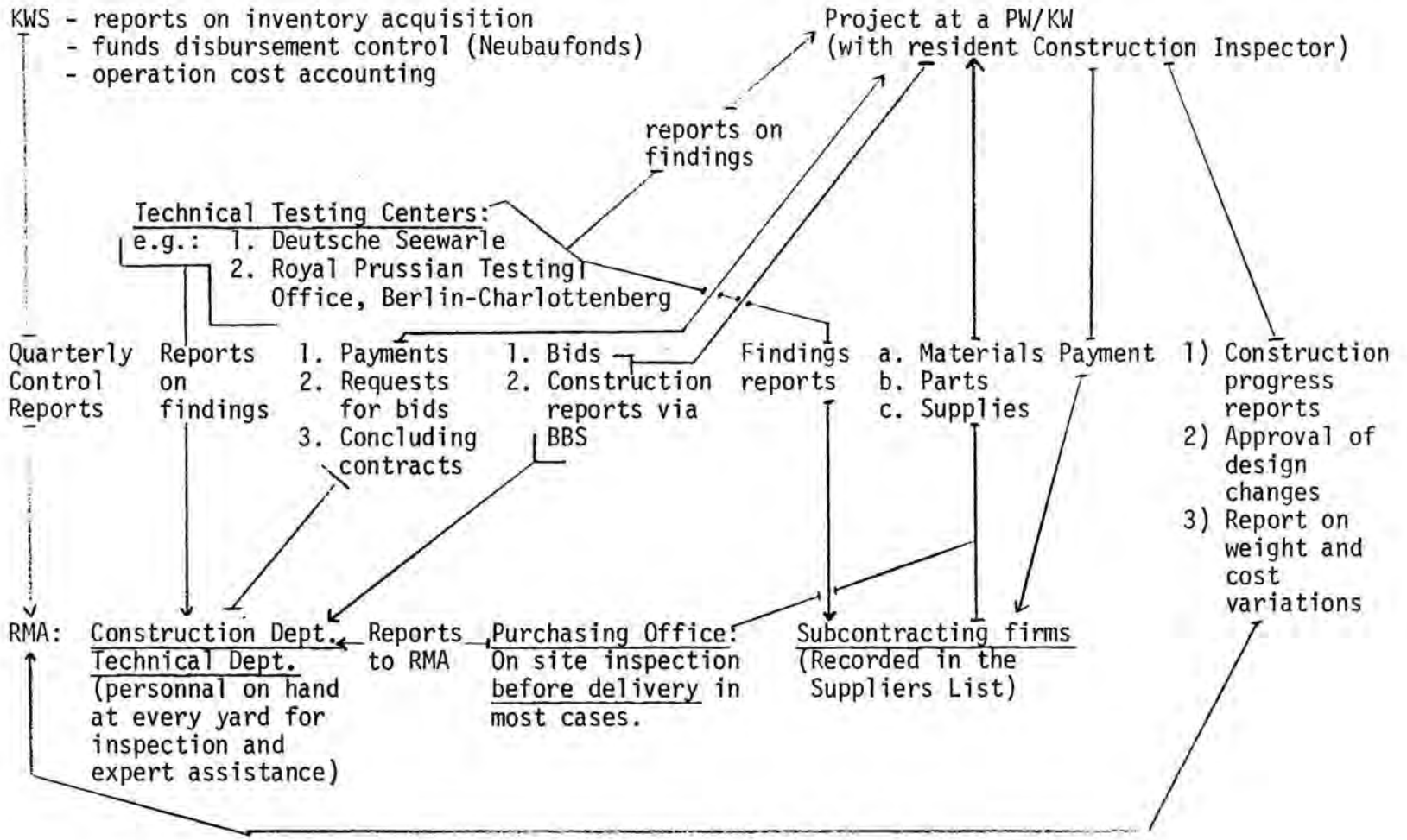
Admiral Tirpitz: (1849-1930) Director of the RMA and architect of the German naval buildup between 1897 and 1912.
Promotions and positions:
Cadet 1865.
Naval Academy years 1874-1876
Rear Admiral 1895
Vice Admiral 1899
1896-1897 Commander, East Asian Cruiser Squadron
January 1897 State Secretary of the RMA
1901 knighted
Replaced by Capelle as State Secretary in March of 1916.

Admiral von Usedom: Was Director of the Imperial Shipyard at Kiel and its Technical Institute. He entered the service in May of 1871 and put in 17 years and 9 months at sea.
Promotions and positions:
Captain 9.18.1899 Adjutant to the Kaiser and commander of the Imperial Yacht, S.M.S. Hohenzollern.
Rear Admiral 3.14.05 Dir. of the Imperial Shipyard, Kiel.

Admiral Wegener: Had an impact on strategic thinking by virtue of his experience with command at sea. He challenged Tirpitz by writing a service memo against the Risk Theory.
Promotions and positions:
Entered the service 1894
1897-1899 Far East Cruiser Squadron
1905-1907 Academy
1907-1908 Second Battle Squadron
1908-1909 First Battle Squadron (under von Holtzendorf)
1909-1910 Scout Forces
Staff Officer with the Scout Forces under Bachmann, 1911-1912; under Lans and Eckermann 1913-1917.
Frigate Captain 4.26.17
Captain 1.21.20 (Reichsmarine)
Rear Admiral 3.1.23 "
Retired: Vice Admiral 9.30.26

APPENDIX B

STRUCTURE OF THE RMA PROTOCOL SYSTEM



# VITA

Gary E. Weir was born in New York City on June 28, 1951. He attended Saint Nicholas of Tolentine elementary school and was graduated from Archbishop Molloy High School in 1969. The following September he entered Manhattan College, a Christian Brothers institution in New York City and was graduated with the Bachelor of Arts degree, Teacher Preparation (cum laude) in 1973.

Mr. Weir accepted a graduate assistantship in the fall of 1973 and thus began work toward his Master's degree at The University of Tennessee, Knoxville. He was awarded a teaching assistantship in 1974 and received his Master's degree with a major in History in December, 1975.

After completing the preliminary exams for his doctorate, Mr. Weir began teaching history at Sacred Heart School in Knoxville. He spent the 1980-81 academic year with his wife Catherine Tuggle in Germany doing dissertation research sponsored by the Deutscher Akademischer Austauschdienst.

Mr. Weir received his doctorate in history in June of 1982. He is a member of the Manhattan College Honor Society (Epsilon Sigma Pi), Phi Alpha Theta and the National Educational Honor Society.