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Abstract

Managerial attention to the leader's strategic designs has been identified as a key prerequisite for success in the adoption of new technologies. The purpose of this study is to describe and analyze how the battlecruiser concept as an organizational gestalt was developed, adopted and assessed in the British Royal Navy (RN) in 1904-1918 from the perspective of the top leader's personality and managerial attention. The battlecruiser was a pet project of the controversial Admiral Sir John Fisher, who instituted a thorough technological, organizational and cultural turnaround in the RN before the First World War (WWI). The battlecruiser, 'The Greyhound of the Sea', was the largest and most expensive type of capital ship in the WWI era. It was developed to hunt down enemy commerce-raiding cruisers all around the globe, and to act as a powerful scouting arm of the Grand Fleet. In action, however, it proved more vulnerable than expected. The contribution of the article is threefold. First, it explicates the key personal characteristics and effectuation mechanisms of top leaders in persuading the organizational adoption of a novel concept such as the battlecruiser. Second, it describes the process of adoption and change when the technology is gradually proving less efficient than predicted. Finally, it posits that the evolving organizational gestalts strongly moderate the process of adoption and correction.

Key words: leadership, attention-based view, organizational gestalt, battlecruiser, the Royal Navy, Admiral John Fisher

Introduction

Upper echelons theory (Hambrick and Mason 1984; Hambrick 2007) attributes key organizational outcomes to the personality and characteristics of the leaders (most often the CEO) and the constitution and functioning of the top-management team (TMT). Personal characteristics such as personality traits and leadership styles, and more contextual factors such as education and industry-specific experience are included in assessing corporate top leaders on their achievement of organizational goals (for a review, see Carpenter, Geletkanycz and Sanders 2004). Generally it would seem that in the context of leadership one has to envisage the person, the position and the environment in complex configurational interplay (Busenbark et al. 2016).

Gerstner, König, Enders and Hambrick (2013) recently examined the effects of CEO narcissism and audience engagement on the adoption of new technologies in the pharmaceutical industry. In essence, the authors found that narcissistic leaders engaged their organizations more aggressively, an outcome that was strongly moderated by how well the CEO mobilized key executives in supporting the adoption. As reported in earlier literature (Ocasio 1997; 2011; cf. Chen, Kuo-Hsien and Tsai 2007), managerial attention to the strategic designs of the CEO has been identified as

a key prerequisite for success in the adoption of new technologies. In fact, Gerstner and colleagues (2013) pose a focal question: what happens if the novel technology proves to be less satisfactory than predicted by the top leaders?

The purpose of this paper is to describe and analyze how the battlecruiser concept as an organizational schema or gestalt was developed, adopted and assessed in the upper echelons of the Royal Navy (RN) in 1904-1918 from the perspective of the top leader's personality and managerial attention (on the battlecruiser and related technology, see Peeks 2015; Roberts 1997; Hough 1975). The battlecruiser was a pet project of the controversial admiral Sir John Fisher, who instituted a thorough technological, organizational and cultural turnaround in the RN before the First World War (WWI) (Lambert 1999). Also known as 'The Greyhound of the Sea', the battlecruiser was the largest and most expensive type of capital ship in the WWI era. It was developed to hunt down enemy commerce-raiding cruisers all around the globe, for instance, and to act as a powerful scouting arm of the Grand Fleet. In action, however, it proved more vulnerable than expected. It has been argued that the RN was unable to develop a coherent strategic and tactical doctrine for utilizing this novel type of warship efficiently in war (Peeks 2015). However, as the study at hand will show, the top leaders and the organization of the RN managed to develop several successive battlecruiser generations, and to fix their most salient problems as they arose during the war.

The objective is thus to describe and analyze the emergence of the battlecruiser concept with a focus on managerial attention among the key actors in the upper echelons of the RN. Thus, the study builds on the attention-based view of the organization (Ocasio 1997; 2011; Joseph and Ocasio 2012; Nigam and Ocasio 2010; Vuori and Huy 2016), and extends it in developing a detailed understanding of how new innovations such as this are adopted and developed in an organization. What is more, we know little about how the organization would react, and why, if the adopted concept proved less satisfactory than expected. Insights from the literature on organizational schemas and gestalts are incorporated into the attention-based view of the organization in the following account of the adoption and correction process.

The contribution of the article is threefold. First, it sheds light on the key personal characteristics and effectuation mechanisms of top leaders in persuading the organization to adopt such a novel concept as the battlecruiser. Second, it describes the process of adoption and change when the technology is gradually proving to be less efficient than predicted. Finally, it posits that the evolving organizational gestalts strongly moderate the process of adoption and correction.

Theoretical Background

It has been generally demonstrated in evolutionary strategy and organizational research (Burgelman 1991; Lewin and Volberda 1999) that CEOs and top executives act not only as the top-down formulators of new strategies but also as role models, sounding boards and initiators of organizational change at all levels. Thus, the degree to which a new strategic vision is shared and agreed on by the key actors within the organization strongly affects the success of the desired strategic change.

Gerstner and colleagues (2013) recently demonstrated that the CEO's personality and ability to effectively shape and change managerial attention patterns is a major success factor in the adoption of a new technology. The above-mentioned study, categorized as a quantitative inquiry, focused on identifying the antecedents and consequences of the CEO's personality (and the special case of narcissism), and assessing their effect on managerial attention and the new-technology adoption. Gerstner and colleagues (2013: 281) identified a need to study instances when the new technology turns out to be a failure or is superseded by another technology. In other words, a more thorough understanding is called for of how the top leader and key executives endorse and negotiate the adoption of novel technology that eventually proves to be less effective than predicted. The theoretical proposition in this study is that the formation of a shared organizational schema or a gestalt (Joiner 1961; Mintzberg 1978; Mintzberg and Waters 1982) around the proposed disruptive technology moderates the adoption process. In cases of failure after initial claims of superiority, the schema or gestalt in the organization is quickly altered, leading to a different dominant opinion.

Based on experimental Gestalt psychology (e.g. Linschoten 1959), organizational schemas or gestalts have been studied since the 1960s and 1970s. The multiple realities that human beings construct can only be understood as gestalts in a holistic sense (Hirschman 1986, 238). A gestalt or a schema is usually defined as an abstract representation of a direct perceptual experience, a flexible and evolving structure arranged in a network of interlinking 'nodes' or constituents (Wertheimer 1923; Brunswik and Kamiya 1953). The Merriam-Webster dictionary defines a gestalt as *"…a structure, configuration, or pattern of physical, biological, or psychological phenomena so integrated as to constitute a functional unit with properties not derivable by summation of its parts*" (http://www.merriam-webster.com/dictionary/gestalt).

As Miller notes (1981),

> "…researchers should search for different organizational configurations or adaptive patterns that are richly described by the dynamic interaction among variables of environment, organization, and strategy. These configurations or patterns are expected to have tightly interdependent and mutually supportive parts, the significance of which can best be understood by making reference to the whole" (p. 3)

Miller refers to these configurations as organizational gestalts, and further claims (1981, 10) that they are strongly subject to natural selection. In the long term, only successful gestalts survive and are retained. However, Miller was generally looking for new organizational forms that fostered innovation, and focused less on lower-level gestalts that would embody the novel forms of innovation in themselves (e.g. the battlecruiser concept and its adoption in the organization of the RN of the WWI era).

Organizational schemas or schemata are sometimes used as a higher-order concept than gestalts, which are perceived to be closer to individual perception and observation. Analogically, the battlercruiser concept as a vehicle of war is a more abstract concept than the concrete ship. In this study, however, the terms organizational gestalts and schemata are used interchangeably. Schemata change dynamically through processes of assimilation and accommodation. However, existing schemata strongly influence how new information is encoded and processed.

The psychological concept of mental models is also used widely in organizational theory. Mental models are broader than schemata, and usually refer to perceived causality between objects within the model (e.g. Porac and Thomas 1990).

Mental processes involve the cognitive actions that operate on mental representation and consist of information processing, symbol manipulation, and knowledge construction. Shared mental models often come into being in organizational contexts through metaphors as the organization develops a common language, an understanding of the task environment and a means of interpreting events. Consequently, the leader and the top-management team make extensive use of metaphors both in developing a vision or mental model of their environments (sense-making) and in articulating that vision to others (sense-giving) (Hill and Levenhagen 1995, 1057-1058). In the literature on strategy, both Eisenhardt and Sull (2001and Bingham and Eisenhardt 2011) famously utilized the term 'simple rules', which organizations develop to capture opportunities in their environment. Thus, the evolution of an organizational gestalt or schema always involves the development of related heuristics to manage the process.

Both top-down (i.e. schema- or gestalt-driven) and bottom-up (i.e. stimulus-driven) processes shape managerial attention. Ocasio (2011) compared three varieties of managerial attention in a recent study: the attentional perspective (top-down), attentional engagement (combining top-down and bottom-up executive attention and vigilance), and attentional selection (the outcome of attentional processes). In Ocasio's view (2011, 1293-1294), the attention-based view of an organization constitutes a theoretical alternative to traditional theories of structural determinism versus strategic choice, with a particular focus on the role of attention in explaining organizational adaptation and change. In an earlier study, Ocasio and Joseph (2005) explicitly linked evolutionary perspectives on strategy and strategic choice with behavioral perspectives on organizational and strategic decision-making. They describe strategy processes as assemblages of tightly and loosely coupled networks of actors and governance procedures. Here, strategy formulation is constructed as a fluid, fragmented and often contested process with multiple foci of attention (cf. also Joseph and Ocasio 2012; Nigam and Ocasio 2010; Vuori and Huy 2016). Following the seminal work in organization theory by March, Mintzberg and Weick, Sarasvathy (2001) outlined a similar approach to new-venture creation termed effectuation theory. According to the theory, effectuation processes, in contrast to causation, take a set of means as given and focus on selecting between effects that can be created by those means (Sarasvathy 2001, 245). In other words, in novel and unstable venture-creation situations, both the goals and means of organizational action are ambiguous, changing and constructed. This approach is adopted in the following investigation into the evolution of the battlecruiser concept in the RN in 1904-1918.

Research Site, Aims and Materials

The development of the battlecruiser was of keen interest to the controversial Admiral of the Fleet Sir John 'Jacky' Fisher (1841-1920). Fisher acted as the First Sea Lord of the British Admiralty in 1904-1910, and again after the outbreak of the First World War (WWI) in 1914-1915 (see Bacon 1929a; 1929b; Hough 1969; Mackay 1973; Morris 1995). He has been chronicled as a strong and visionary leader, instituting a

comprehensive strategic, organizational and technological turnaround of the RN before WWI broke out, which is often termed 'Sir John Fisher's naval revolution' (Lambert 1999; Sumida 1989).

Fisher was a controversial character, exhibiting many narcissistic features (Morris 1995). From a historiographical perspective, his genius, clear-headed articulateness, incisiveness of mind, courage, eagerness for efficiency, power of accurate prophecy, religiousness and devotion to his cause and colleagues have been emphasized as his key personal traits (e.g. Hough 1969, 27-51, 191-192; Mackay 1973, 1, 23, 515). On the other hand, his megalomania and 'foot of pride', lack of modesty, self-advertisement, ruthlessness, vindictiveness, increasing autocracy and unpredictable behavior have also been identified as personal deficiencies (Hough 1969, 56-77, 253, 343-345; Mackay 1973, 230-231, 284, 499-502). What is more, Fisher was able to build a loyal coterie of favorites and followers (i.e. the 'Fishpond') who helped him in accomplishing the naval turnaround (Bacon 1929a; 1929b; Mackay 1973). Winston S. Churchill characterized Fisher as follows: *"Steadfast and even violent, no one who has not experienced it has any idea of the passion and eloquence of the old lion*" (Hough 1969, cover).

The RN built battlecruisers from 1906 until the end of the Great War in 1918. The dreadnought battlecruiser was a completely novel type of man-of-war, directly comparable to no earlier class of ships (Peeks 2015). However, despite his central role in its adoption, First Sea Lord Fisher was not solely responsible for developing and implementing novel technological and tactical concepts in the RN. His former subordinates at the Admiralty continued his work during his interregnum period in 1911-1914, and 1915-1918.

Organizationally, an admiral acting as First Sea Lord was subordinate to a civilian First Lord of the Admiralty, a Cabinet member and a politician. In this position Fisher famously worked with First Lord Winston S. Churchill during 1912-1915. However, with the exception of Churchill, most First Lords had little interest or expertise in questions related to naval technology and materiél *per se*. First Sea Lords centrally worked with the Admiralty Board, consisting of three additional subordinate Sea Lords, themselves flag officers, and a number of other influential members such as the Controller of the Navy (a Fifth Sea Lord was added for the first time during WWI, in 1917) (Hamilton 2011, 213-241). There was no official naval staff at the British Admiralty until 1912, largely because of Fisher's belief in being able to work perfectly well without a formal staff organization, using his Fishpond and *ad hoc* committees to support his initiatives. (Hamilton 2011; Black 2009) One of these was the Committee on Designs, which oversaw the design and construction of the first dreadnought battleships and battlecruisers in 1904-1907. After 1912, the chiefs of the Naval Staff and some other staff members were also heavily involved in developing the battlecruiser concept (Peeks 2015). I use the *battlecruiser concept* here with reference to both the evolving technological specifications of the vessel type (especially in terms of its size, speed, armor, armament and fire-control system) as well as the strategic and tactical specifications (which Peeks 2015 calls the 'battlecruiser doctrine') of how these vessels were to be used in action in war as part of the fleet. The *battlecruiser gestalt*, in turn, is the fluid and evolving dominant representation of how the key actors in the upper echelons of the RN perceived the concept. Senior fleet and battlecruiser squadron commanders assumed an increasingly

central role during the war years, especially concerning issues of strategy and tactics. The key figures in this respect were Admirals Sir John Jellicoe, later Earl Jellicoe (Commander-in-Chief of the Grand Fleet, 1914-1916, and First Sea Lord, 1916-1917) and Sir David Beatty, later Earl Beatty (Commander of the 1st Battlecruiser Squadron/Fleet, 1913–1916, C-in-C of the Grand Fleet, 1916–1918, and First Sea Lord after the war).

In terms of new naval technology, Sir John Fisher is famous for his introduction of the heavily armored, Parsons turbine-engine-powered, all-big-gun battleship HMS *Dreadnought* in 1906. All modern capital ships were termed 'dreadnoughts' from then on (Hough 1975). Fisher personally preferred other types of weaponry than the cumbersome battleship. At the time, quickly evolving naval technology had made mines, torpedoes and submarines very potent weapons against large capital ships. Fisher therefore wanted to create a considerably faster, less heavily armored but all-big-gun vessel type, originally called the 'heavy armoured cruiser' termed a battlecruiser in the RN in 1911-1912. The original main objective of this new class of vessels, which were even larger than battleships themselves, was to hunt down and destroy enemy ships (primarily fast, armored cruisers and liners converted for military duty) threatening the British Empire's shipping lanes and communications. Battlecruisers could also be used as a powerfully armed scouting arm of the main battle fleet. It was claimed that they could catch, outrange, outgun and annihilate any individual ship in existence. If faced with a stronger enemy force or a more heavily armored battleship it could use its superior speed to make its escape (Roberts 1997; Peeks 2015).

The first battlecruisers were the three ships of the *Invincible* class (HMS *Invincible*, HMS *Indomitable* and HMS *Inflexible*) launched in 1909. Thirteen full-scale dreadnought battlecruisers (in addition to 33 dreadnought battleships) were subsequently built before and during WWI until the last wartime battlecruiser HMS *Hood* was launched in 1918 (Roberts 1997). Other navies, most notably the Imperial Navies of Germany and Japan, also built a number of battlecruisers following the British example (Peeks 2015). In fact, Anglo-German rivalry over the building of ever more efficient battlecruiser generations in 1906-1916 was a significant aspect of the notorious naval arms race between the two empires (Seligmann, Nägler and Epkenhans 2015; Padfield 2013). Despite the fact that many British officers, even in the Fishpond, harbored serious doubts about the viability of the battlecruiser concept in general (the US Navy decided not to build them in the WWI era), the RN needed to develop increasingly advanced generations to combat the Germans, who had also adopted the design. British battleships could not be guaranteed to catch German battlecruisers if they tried to escape from the North Sea to harass British shipping.

The battlecruisers were able to fulfill part of their mission at war. For instance, a squadron consisting of two British battlecruisers commanded by Vice-Admiral Sir Frederick Doveton Sturdee swiftly annihilated the German East Asian Squadron, which consisted of more lightly armored cruisers commanded by Vice-Admiral Maximilian Graf von Spee in the Falklands in November 1914. However, three battlecruisers were catastrophically lost in action in the battle of Jutland against the Imperial German High Seas Fleet in 1916 (Brooks 2016; Bennett 1964). During WWI, casualties were blamed primarily on faults in the design of the vessel type and the ineffectiveness of its fire-control system. There has thus been constant

historiographical discussion and debate among historians and naval professionals as to the merits of the WWI-era battlecruiser concept as a whole (Peeks 2015).

One may well wonder about the key personal characteristics and effectuation mechanisms of top leaders who bring about the organizational adoption of a novel concept such as the battlecruiser. How does the process of adoption unfold and change when the technology is gradually proving less efficient than predicted? How do evolving organizational schemas or gestalts emerge and moderate this process?

This study is based on the following primary materials and on earlier studies. First, I consulted the edited papers of Admirals of the Fleet John Fisher (Marder 1956; 1959; Kemp 1960; 1964), John Jellicoe (Patterson 1966; 1968), and David Beatty (Ranft 1989; 1993; Chalmers 1951), the notes of Arthur Pollen (Sumida 1984) who was the inventor of the controversial Pollen director firing system disqualified by the Admiralty, and edited papers related to the Anglo-German naval race in general (Seligmann et al. 2015).

Second, I studied Fisher's two autobiographies (Fisher 1919; 1920) and the biographies of the key RN officers involved in the process of designing, commissioning and operating with battlecruisers: these included the ones on Fisher (Bacon 1929a; 1929b; Hough 1969; Mackay 1973; Morris 1995), his key naval opponent Admiral Lord Charles Beresford (Freeman 2015), Jellicoe (Bacon 1936; Patterson 1969), Beatty (Roskill 1980), Admiral of the Fleet Sir Arthur Knyvet Wilson, First Sea Lord 1910-1911 (Bradford 1923), Admiral Sir Francis Bridgeman, First Sea Lord 1911-1912 (Ross 1998), Admiral of the Fleet Prince Louis of Battenberg, First Sea Lord 1912-1914 (Hough 1984; Kerr 1934), Admiral of the Fleet Sir Henry Jackson, First Sea Lord 1915-1916 (Murfett 1995), Admiral of the Fleet Sir Rosslyn Wemyss, First Sea Lord 1917-1918 (Wemyss 1935), Admiral of the Fleet Sir Henry Oliver, Chief of the Admiralty War Staff during the most of WWI, and in 1918 the Commander of the 1st Battlecruiser Squadron (James 1956), Admiral Sir Percy Scott, the inventor of the Scott director firing system essential for accurate gunnery (Padfield 1966), and central WWI fleet commanders and later Admirals of the Fleet Reginald Tyrwhitt (Patterson 1973) and Roger Keyes (Aspinall-Oglander 1951).

Moreover, despite the fact that the civilian First Lords of the Admiralty (with the exception of Churchill) seldom interfered with matters related to naval technology and tactics, I used the biographies of Reginald McKenna (Farr 2007), Winston S. Churchill (Gilbert 1991, a one-volume version of the massive eight-volume biography started in 1966 by Randolph Churchill and finished by Gilbert in 1988), Arthur Balfour (Mackay 1985), Edward Carson (Stewart 1981), and Eric Geddes (Grieves 1989), the autobiography of Lord Tweedmouth (Marjoribanks 2015), and the papers of Earl of Selborne 1895-1910 (Boyce 1990) as secondary sources, especially to highlight the relationship between First Lords and First Sea Lords.

Third, I consulted key studies on the battlecruiser concept and the related naval materiél and technology, in particular Peeks' (2015) excellent recent study on the 'cavalry of the fleet' and Roberts' (1997) thorough technological and historical overview of battlecruisers (see also Burr 2006; Burt 1993; Hough 1975). Fourth, other key sources included recent influential studies on the organization of the British Admiralty (Hamilton 2011), its culture (Gordon 1996), the emergence of the naval

staff after its inception as late as in 1912 (Black 2009), its strategy and war planning (Grimes 2012), and on Admiralty plans to counter the German threat (Seligmann 2012) during the WWI era. Finally, I used Arthur J. Marder's classic five-volume study on the RN during the Fisher era of 1904-1918 as a source of historical detail (Marder 1961; 1963; 1966; 1969; 1970).

It has to be noted that a variegated historiographical debate has arisen as to the evolution of the RN during the 'Fisher era'. 'Revisionist' scholars (e.g. Sumida, Lambert) postulating various novel ideas about the key organizational and tactical developments in the era (e.g. the effectiveness of Fisher's revolution in general and his views on flotilla defense, the battlecruiser vis-à-vis the battleship) have questioned many interpretations of early 'orthodox' scholars such as Marder and Roskill. Finally, 'evolutionary' scholars have recently presented a more nuanced view. Combining key interpretations from the two above-mentioned approaches they conceptualize most developmental trajectories in the RN as essentially evolutionary within their complex organizational contexts (Bell 2016; Seligmann 2015; Seligmann and Morgan-Owen 2015). I follow the emerging evolutionary stream of historiography my research on the battlecruiser concept.

The Adoption and Evolution of the Battlecruiser Concept in the Royal Navy, 1904-1918

Fisher initiates the battlecruiser concept

Immediately after his appointment to the post of the First Sea Lord[1] of the British Admiralty in October 1904, Admiral Sir John Fisher initiated a considerable technological and organizational turnaround[2] in the Royal Navy (Lambert 1999; Sumida 1989). He outlined the main points of his scheme in a collection of writings dubbed *Naval Necessities* that were released soon after his installation (Peeks 2015, 47). The scheme could be described relentless. Literarily hundreds of old, obsolete men-of-war were scrapped and their personnel transferred to more modern ships. A nucleus crew system for ships in the naval reserve was introduced. The main resources of the RN were concentrated in home waters to counter the increasing German threat. Importantly, Fisher triggered a technological revolution in capital-ship design when he commissioned a new type of battleship, HMS *Dreadnought*, in 1906 (Hough 1975). As mentioned, it was an all-big-gun, turbine-powered, 20,000 ton, heavily armored battleship with a firepower equal at minimum to that of two battleships from the previous era. Consequently, older battleships were soon termed 'pre-dreadnoughts'. The commissioning of the Dreadnought started a costly naval arms race specifically between Britain and the German Empire (Seligmann et al. 2015; Padfield 2013).

However, Fisher recognized the vulnerability of even the most modern capital ships to recent advances in the development of the torpedo, the mine, and the submarine. In fact, he preferred a different type of capital ship to the dreadnought battleship that was later termed the battlecruiser. It was initially referred to as a large or all-big-gun armored cruiser in the proceedings of the Board of the Admiralty and the Committee on Designs that Fisher appointed in December 1904. He set up the committee to oversee and consider the new battleship, cruiser, destroyer, and submarine designs,

and appointed several influential officers from among his closest associates (the so-called 'Fishpond') to serve on it, including John Jellicoe, Reginald Bacon and Prince Louis of Battenberg. What is more, he set up two further committees in 1905 to consider fleet auxiliaries, especially the use of armed merchant cruisers against armed German liners with the potential to threaten the shipping lanes of the British Empire. Fisher's point was that a novel type of fast, big armored cruiser was needed to protect British shipping (Seligmann 2012, 75-76). The Committee on Designs agreed on the introduction of a novel type of large capital ship, and the first vessels were laid down in February 1906 (Roberts 1997, 25). This was the *Invincible* class of battlecruisers, capable of 'mopping up' any type of enemy surface vessel around the Empire.

HMS Invincible causes an international sensation

Long anticipated in naval circles, HMS *Dreadnought*'s design came as no surprise. The Italian naval architect Vittorio Cuniberti had put forward the concept of an all-big-gun battleship in 1903. He also wrote an article about the new type in Jane's Fighting Ships (Brown 1997, 182). Nevertheless, HMS *Invincible* and her two sister ships, HMS *Indomitable* and HMS *Inflexible*, caused an international sensation when they were unveiled in 1906. Naval experts especially admired their firepower and superior speed (Peeks 2015, 44).

The first and the second generations of battlecruisers are designed and commissioned

The *Invincible* class ships, initially also called cruiser-battleships and dreadnought cruisers, were officially designated battlecruisers by the RN in 1911 (Roberts 1997, 25). The three ships were built and commissioned between February 1906 and October 1908 (Hough 1975, 242). They were as big as the *Dreadnought* (20,000 tons), armed with eight 12-inch guns, and capable of steaming at 25 knots (4 knots faster than the *Dreadnought*). However, the additional speed came at the cost of considerably lighter armor protection (Roberts 1997, 24). 'Speed is armor', declared Fisher, and claimed that the new vessels could catch any enemy vessel and flee any superior force. What is more, he wanted to defend the home isles primarily with flotilla craft (light cruisers, destroyers/torpedo boats and submarines), and to use the high-speed battlecruisers to protect the Empire's shipping lanes and communications. He thought the narrow seas around the British Isles were too dangerous for large capital ships given the rapidly advancing naval technologies used to produce weapons such as torpedoes and mines (Lambert 1995).

However, Fisher's eventual capital-ship-building program during his first tenure as the First Sea Lord 1904-1909 was a compromise, as he stated:

> "…at the present moment naval experience is not sufficiently ripe to abolish totally the building of battleships so long as other countries do not do so" (Roberts 1997, 25).

With the help of the Committee on Navy Estimates, Fisher laid out a radical vision for the development of capital ships during 1906-07. The committee, which he dominated as the only professional sailor on it, advocated a perpetual revolution in shipbuilding so that each year's capital-ship designs would double the offensive power of any vessel of the same nominal class in existence. This approach was at odds with the RN tradition of allowing other navies to experiment with new ship designs first before

outbuilding them with Britain's superior shipyard capacity. The battlecruiser loomed large in Fisher's strategic designs. However, at no time did he explicitly explain what he thought its mission was, not at least to larger circles in the RN (Peeks 2015, 71-77).

A second generation of battlecruisers was built and commissioned between February 1909 and June 1913 (Hough 1975, 242). This was the *Indefatigable* class, consisting of three ships (HMS *Indefatigable*, HMAS *Australia* and HMS *New Zealand*, the latter two funded by their eponymous dominions). Compared to the first-generation vessels, these ships were essentially enlarged *Invincibles,* the only major difference being their ability to fire wing turrets across the deck. They were criticized for not showing any real improvement such as in armor protection at a time when Germany was launching its larger and better-protected first battlecruiser SMS *Von der Tann* (Roberts 1997, 28-31). In this respect, the *Indefatigables* did not live up to Fisher's promises of perpetual revolution.

The third-generation battlecruisers or Fisher's 'Splendid Cats'

The *Indefatigables* were rapidly followed by a third generation of battlecruisers, the 'Splendid Cats' of the *Lion* class that were built and commissioned between November 1909 and September 1913 (Hough 1975, 242). They included HMS *Lion*, HMS *Princess Royal* and HMS *Queen Mary*, and were larger and somewhat faster ships than their predecessors (26,350 tons and 26 knots).

The construction of the evolving German battlecruiser clearly had an effect on the British Admiralty in that it went along with Fisher's desire for a considerable leap in speed and power (Peeks 2015, 144). HMS *Tiger*, built and commissioned between June 1912 and October 1914, was an updated Splendid Cat, the largest (28,500 tons), fastest (29 knots) and the most expensive (£2,086,458) dreadnought of her time. She was also the only battlecruiser with secondary six-inch armament intended for use against enemy torpedo craft, and her armor protection was superior to that of the *Lion* class (Hough 1975, 242-243). The *Tiger* was not yet fully operational when she was put to the test in the battle of Dogger Bank in early 1915.

Jon Sumida argued for a so-called technical-tactical synthesis, which meant that instead of trading blows at a long distance, the (secret) British tactical doctrine for battlecruiser action would be to overwhelm the enemy with a flurry of effective mid-range gunnery before they could respond. Speed and the ability to maneuver quickly would be essential components in achieving this (Sumida 1989, 160-162). Given the lack of convincing documentary evidence, however, many naval historians are not convinced of the existence of such a doctrine (Bell 2016).

Churchill drops the construction of battle cruisers

With the help of his supporter King Edward VII, Fisher emerged victorious in the 'Great Edwardian Naval Feud' of 1909 between the Fishpond and the 'Syndicate of Discontent' led by Admirals Lord Charles Beresford and Sir Reginald Custance (Freeman 2009; 2015). Custance in particular held strong views against the building of dreadnoughts in general and battlecruisers in particular. Fisher was elevated to the Peerage as the 1st Baron Fisher of Kilverstone at the end of 1909, and retired soon

after. He still continued as a member of the Committee of Imperial Defense and advisor to the First Lord (Mackay 1973). In October 1911 the young politician Winston S. Churchill replaced Reginald McKenna, Fisher's close ally and a successful First Lord (Farr 2007).

Churchill was adamant in making his mark on Admiralty strategy. He immediately replaced Fisher's successor, the timid and authoritarian Admiral of the Fleet Sir Arthur Knyvet Wilson with Admiral Sir Francis Bridgeman as the First Sea Lord (in office from the 5th of December, 1911 until the 9th of December, 1912). Wilson had made an unfavorable impression as a strategist in the Committee of Imperial Defense, for example (Bradford 1923). Bridgeman, an able administrator but a colorless personality, was not a good match for the energetic and flamboyant Churchill and was soon replaced by Admiral Prince Louis of Battenberg (in the office of the First Sea Lord from the 9th of December, 1912 until the 30th of October, 1914) (Ross 1998). Prince Louis also proved a capable administrator but lacked a strategic vision and the will to contradict his superior in any way (Hough 1984). None of the above-mentioned three First Sea Lords were similarly attached to the battlecruiser concept as Fisher, and simply saw it as a necessary response to German efforts at building fast ships of a similar design.

The RN shed the last remnants of Fisher's global strategy (e.g. the idea of building a strong fleet around fast battlecruisers in the Asia-Pacific) early on in Churchill's term of office, even though Fisher and Churchill continued to correspond very actively (Peeks 2015, 192). Despite Fisher's vocal advice to the contrary, Churchill decided to stop constructing battlecruisers altogether. Instead, he ordered a new class of fast super-dreadnought oil-fired battleships, the *Queen Elizabeth* class, to be designed and constructed between October 1912 and February 1916 and comprising five 27,500 ton heavily armored battleships (HMS *Queen Elizabeth*, HMS *Warspite*, HMS *Valiant,* HMS *Barham*, and HMS *Malaya*, the last-mentioned financed by the Malayan government). These ships were armed with eight enormous 15-inch guns and had a top speed of 25 knots, which made them the fastest battleships well into the 1930s (Hough 1975, 240). Churchill evidently wanted more heavily armored, fast ships that were capable of acting as the fast wing of the main battle fleet in action.

Fisher considered the new ships too slow for battlecruiser duties, and excessively costly (Bell 2015). He still saw their main function as reconnaissance and hunting enemy raiders, secondary to their direct duties against the battlecruiser squadron of the enemy (i.e. Germany). The RN had nine battlecruisers in commission at the beginning of the war in August 1914, and the tenth (*Tiger*) was nearing completion. The main opponent, the Imperial German Navy, had four in commission (SMS *Von der Tann*, SMS *Moltke*, SMS *Goeben*, and SMS *Seydlitz*) and a fifth (SMS *Derfflinger*) nearing its commissioning (Hough 1975, 251-252). The German battlecruisers were better armored and compartmentalized, and had a more advanced fire-control system.

The Battle of Heligoland Bight

After the outbreak of the war the RN saw action in the battle of Heligoland Bight on the 28th of August 1914. The British battle plan was based on the observation that German light cruisers and destroyers had adopted a fairly regular pattern of patrols in

Heligoland Bight each evening. The idea was thus to send a superior force commanded by Commodore Reginald Tyrwhitt in the darkness to annihilate the German destroyers as they returned from their patrols. Submarines led by Commodore Roger Keyes would also lie in wait to ambush any larger German ships leaving the Jade Estuary to support the other ships.

The Germans were taken by surprise and overwhelmed in the ensuing battle. Despite fighting gallantly, three German light cruisers (SMS *Mainz*, SMS *Cöln*, and SMS *Ariadne*) and one torpedo boat were sunk. The German dreadnoughts at the Jade could not join the battle in the morning because the low tide prevented them from exiting the estuary. Three additional light cruisers were damaged, and a total of 712 men were killed (including the German commander, Rear Admiral Leberecht von Maass), 530 were injured, and 336 were taken prisoner. The British had only one light cruiser and three destroyers damaged, with 35 men killed and 40 wounded. However, the raid might have been a disaster for them had the additional heavy forces under Beatty not been sent to reinforce the raiders. (Goldrick 2015, 111-138; Marder 1963, 50-54) In fact, Beatty's battlecruisers saved the day for the RN. The battle was publically hailed as a great victory in Britain (Osborne, 2006: ix, 78), even if the German ships proved difficult to sink despite being heavily damaged, and the German gunnery and seamanship were excellent. Despite not being very active in the battle, Beatty and his battlecruisers were publically hailed as heroes. The squadron started to assume an aura of heroism, a battle-hardened band of brothers.

The Battle of the Falkland Islands

After a humiliating defeat in the battle of Coronel between the squadrons of Rear Admiral Christopher Cradock and the German East Asian Squadron commanded by Vice-Admiral Maximilian Graf von Spee off the coast of Chile at the beginning of November 1914, the British quickly assembled a new naval force under Vice-Admiral Sir Fredrick Doveton Sturdee (a prominent member of the Syndicate of Discontent whom Fisher detested). Meanwhile, Fisher had returned to the Admiralty for his second term as the First Sea Lord after Prince Louis was forced to step down on the 30th of October 1914, not least because of his German birth (Hough 1984, 307). As the Chief of the Admiralty War Staff, Sturdee had made the unfortunate decision to send Cradock's inferior squadron against von Spee. Upon his return, Fisher immediately removed him from that post and sent him to 'clean up his mess' in the South Atlantic (Hough 1969, 327).

Sturdee's squadron consisted of the first-generation battlecruisers HMS *Invincible* and HMS *Inflexible*, four armored cruisers, and two light cruisers. The plan was to hunt down and destroy von Spee's force. The battlecruisers would fulfill one of their original missions – to find and annihilate enemy cruisers threatening the sea lanes of the British Empire. Fisher sent a third battlecruiser, HMS *Princess Royal,* to the West Indies in case von Spee attempted to enter the Atlantic through the Panama Canal.

While Sturdee was steaming towards the South Atlantic, von Spee sailed round the Horn, and on the 8th of December 1914 he attempted to raid the British supply base at Stanley in the Falkland Islands. This time luck was not on his side. Sturdee had arrived in the port only one day before and Von Spee was taken by surprise:

> "…about 8 o'clock on December 8 his leading ship (the *Gneisenau*) was in sight of the main harbour of the Falklands. A few minutes later a terrible apparition broke upon German eyes. Rising from behind the promontory, sharply visible in the clear air, were a pair of tripod masts. One glance was enough. They meant certain death. (Only dreadnoughts had tripods)" (Churchill 1923, 474)

There was maximum visibility and the sea was placid. The advance cruisers of the German squadron were detected early on from Stanley harbor. Had von Spee caught the British squadron by surprise there and attacked immediately he might have had a fighting chance. All the German vessels except two were hunted down and sunk during the ensuing battle. Coronel was avenged: the RN sank two armored cruisers and two light cruisers, and captured and scuttled two transporters. A total of 1,871 Germans (including von Spee) were killed and 215 were captured. On the British side only 10 people were killed and 19 wounded, and no ships were lost – despite the fact that accurate German gunnery made several hits on many British vessels. (Marder 1963, 118-129)

The battle of the Falklands practically put to an end to the raiding on the high seas by the regular warships of the German Imperial Navy. Sturdee was hailed as a great victor upon his return to the British Isles. (Spencer-Cooper 2011)

The Battle of Dogger Bank

The battle of Dogger Bank was fought on the 24th of January 1915. The prompt appearance of the British forces during an earlier German raid led the German battlecruiser squadron commander Vice-Admiral Hipper to suspect that British fishing boats were providing intelligence on German fleet movements, and he decided to attack them on Dogger Bank in the middle of the North Sea. The German force consisted of the 1st Scouting Group of the High Seas Fleet augmented with four light cruisers of the 2nd Scouting Group and two flotillas of 18 torpedo boats.

Through Room 40 Intelligence activity at the Admiralty, which had access to the German naval code-books captured by the Russians in August 1914, the British had learned of the planned sortie a day earlier. Again, they dispatched a considerable force to trap Hipper. Beatty sailed from Rosyth with a force of five battlecruisers and four light cruisers reinforced with three additional cruisers and 35 destroyers from the Harwich Force. He headed south, encountering Hipper's screen at Dogger Bank at 0705, with unusually good visibility. Taken by surprise, the weaker and slower German force immediately turned back and headed for their well defended home port.

During a chase that lasted several hours, the British forces slowly caught up with the Germans, who were slowed down by the lower top speed of the obsolete cruiser SMS *Blücher*, and finally engaged them in a long-range gunnery duel. The British disabled the *Blücher*, the rear German ship, but the Germans also inflicted heavy damage on Beatty's flagship HMS *Lion* and put it out of action. In return, SMS *Seydlitz*, Hipper's flagship, was also heavily damaged and almost exploded due to a direct hit on one of its main turrets. Because of a severe signaling error made by Beatty, the remaining British ships led by his second in command, Rear Admiral Sir Gordon Moore on HMS *New Zealand*, broke off the pursuit to finish off the hapless *Blücher*. To the aggressive Beatty's great disappointment, the rest of the German force managed to escape. (Marder 1963, 156-175)

Unlike the Britons, the Germans took the lessons of the battle of Dogger Bank to heart. The battle highlighted their dangerous ammunition-handling procedures (there were similar flaws in the British ships, but practically no action was taken). Although the Germans realized that the repeated appearance of the Royal Navy at dawn could not have been mere coincidence, they did not suspect that their wireless codes had been compromised.

The battle of Dogger Bank was not particularly consequential in itself. Despite the fact that Fisher and Beatty regarded it as a disappointing failure, it gave British morale a great boost. It also clearly showed the tactical challenges of two battlecruiser squadrons engaging with each other. Being able to maintain a high speed, the quality of communications between the ships, and accurate gunnery were the essential success factors. There were considerable shortcomings in all three areas on the British side. It was also evident that the armor protection of the battlecruisers and their ammunition-handling procedures were seriously flawed, a problem that was to cost them dearly in the Battle of Jutland.

Fisher's 'Rhadamanthus' project: the fourth and fifth generations of battlecruisers

Upon his return to the Admiralty Fisher immediately began planning the construction of a new class of battlecruisers, the working name of which was '*Rhadamanthus*' (Peeks 2015, 262). The following quotation from his correspondence explains the situation:

> "90. Fisher to Jellicoe (Add. MSS. 49006, ff. 91-2) Admiralty, Whitehall, December 23rd, 1914. …I am now alone here fighting the battle for more battle cruisers. I wish, when you have leisure, you would write me a casual sort of letter which I can show to the Cabinet (not as if you were responding to my request; not an official memorandum) that the supposed existing superiority that we have in fast battleships that we now have is FALLACIOUS! More especially in quoting Queen Elizabeths as they do. None of our existing ships have the necessary FUTURE speed! The new German Lützow battle cruiser, with possibly 14-inch guns, or even 16-inch, will have certainly over 28 knots speed! We must have 32 knots speed to give us a margin for being long out of dock, and to give the necessary excess of speed to CATCH a 28-knot ship! …SPEED is EVERYTHING… If I don't get these 3 battle cruisers of 32 knots speed, I shall have to leave the Admiralty on January 25 next." (Patterson 1966, 115)

Fisher wanted more heavily armed (even 16-inch guns), very fast and lightly armored battlecruisers. These ships would be swiftly and cheaply built and would not last for decades, but they would be capable of immediate action. His plans eventually materialized in two new battlecruiser classes: the *Renown* class and the *Courageous* class. The two 26,500-ton, 32-knot *Renown*-class ships (HMS *Renown* and HMS *Repulse*), constructed between January and September in 1915, were the fastest capital ships in the world at the time. They carried six 15-inch guns, and had an original belt armor of only four inches (later increased to nine inches). The *Courageous* class battlecruisers (HMS *Courageous* and HMS *Glorious*) were built between May 1915 and January 1917. They were the smallest dreadnoughts (sometimes called large light cruisers or light battlecruisers), with a displacement of 18,600 tons and a top speed of 33 knots, and carried four 15-inch guns. Both were later converted into aircraft carriers, as was their sister ship HMS *Furious* (originally designed with two 18-inch guns as the main armament). (Hough 1975, 243) The last

three vessels, sometimes called ‘Lord Fisher’s Oddities’, were badly suited for war (Harkins 2015). As Peeks (2015) notes:

> “Fisher, however, despite his correspondence with and personal affection for Beatty and especially Jellicoe, was entirely at odds with the prevailing thinking in Scapa Flow and Rosyth. The result was the construction of five ships that took none of the supposed lessons of the war to heart.” (p. 272)

Fisher harbored wild strategic dreams, such as sending a large naval force, protected by the new and fast but shallow-draft battlecruisers, to the Baltic to land an army (British or Russian) on the coast of Pomerania (Marder 1963, 191-198). Nothing came of them.

All in all, Fisher was able to convince the Board of the Admiralty to build his oddities. When he resigned in May 1915, on account of the unsuccessful naval campaign in the Dardanelles, there was nobody at the Admiralty who shared his obsession with building battlecruisers. Churchill also had to resign shortly afterwards due to the Dardanelles fiasco. The problems with battlecruiser design and the lack of a strategic and tactical doctrine for their effective use in combat were also becoming clear. The novel First Lord–First Sea Lord duo, Arthur Balfour and Admiral Henry B. Jackson (in office until November 1916), took a highly phlegmatic approach to administration and leadership at the Admiralty (Peeks 2015, 292). From the top down, they did nothing to clarify the RN’s battlecruiser doctrine before the vessels were put to a serious test in battle.

The Battle of Jutland

The infamous battle of Jutland was fought at the turn of May and June in 1916. To give a concise account, in the largest naval engagement of the war (151 British ships against 99 German vessels), the battlecruiser fleet commanded by Beatty was able to lure the entire German High Seas Fleet into the arms of Jellicoe’s Grand Fleet. However, the cautious Jellicoe did not want to expose his numerically superior fleet to enemy torpedoes and mines in direct pursuit when the German Commander-in-Chief Vice-Admiral Reinhard Scheer twice decided to use his well-rehearsed tactic of quickly turning away from the approaching British force. (Brooks 2016)

The outcome of the battle was tactically indecisive, the British losing fourteen and the Germans eleven ships. However, due to the sinking of three British battlecruisers (HMS *Indefatigable*, HMS *Queen Mary* as well as HMS *Invincible*) and three older large armored cruisers, the British casualties were considerably higher: 6,094 officers and ratings lost vis-à-vis 2,551 among the Germans. The Germans were also forced to scuttle their newest and most powerful battlecruiser SMS *Lützow* during the battle. The outcome of the battle did little to change the strategic outlook of the RN in terms of controlling the North Sea and endorsing a distance blockade of Germany. Although the Germans claimed victory, an American war correspondent put it as follows: “The prisoner has assaulted his jailer, but he is still in jail.” (Marder 1966, 37-195)

As far as the battlecruisers were concerned, the battle of Jutland proved controversial. The fighting was heroic but there were heavy losses. In the midst of it, Beatty reportedly uttered his famous words to his Flag Captain Ernle Chatfield of HMS *Lion*: “There must be something wrong with our bloody ships today, and our bloody

system" (Lambert 1998, 29; Chalmers 1951, 262)[3]. The *Lion* was also almost lost at Jutland, and Rear Admiral Sir Horace Hood perished on his flagship HMS *Invincible* when it was destroyed by heavy German fire.

In the aftermath of the battle, the Admiralty found several reasons for the appalling loss of so many battlecruisers. Much of the blame was attributed to insufficient armor protection, and additional belt and deck armor was soon installed on most of the remaining ships. Later historiography highlighted the dangerous ammunition and cordite-handling procedures onboard as key explanations for the losses. It has also been claimed that inefficient British gunnery combined with the wrong tactical decision to use the vulnerable battlecruisers as a fast wing of the entire fleet significantly contributed to the loss of so many vessels. Finally, Beatty's leadership has been described as unnecessarily aggressive and even reckless. Indeed, he used his fast ships as the 'cavalry of the fleet', luring the Germans into the potentially deadly embrace of the entire Grand Fleet. After the battle there was a long-lasting controversy between supporters of the cautious Jellicoe on the one hand and of the aggressive Beatty on the other (Roskill 1980, 322-349).

The second Battle of Heligoland Bight

After the Imperial German Navy's successful raid on a Scandinavian convoy on the 17th of October 1917, Commander-in-Chief Beatty ordered the Grand Fleet to retaliate. A strong force of cruisers under Vice Admiral Trevylyan Napier set sail on the 17th of November to attack German minesweepers in Heligoland Bight. Room 40 Intelligence at the British Admiralty had again revealed the intentions of the Germans in advance. The German minesweepers were escorted by a group of cruisers and torpedo boats under Rear Admiral Ludwig von Reuter.

The clash resulted in an inconclusive battle between the British and German forces in which the light battlecruisers HMS *Courageous* and HMS *Glorious* and the battlecruiser HMS *Repulse* played a major role. The British withdrew when two German supporting battleships joined the battle. A German minesweeper was sunk, a German light cruiser was damaged by a direct hit from the *Repulse*, and a German direct hit killed all the personnel on the bridge of the RN light cruiser HMS *Calypso*. (Harkins 2015, 45-52) A high-ranking naval officer present at the battle wrote directly to Lord Fisher on the 12th of December 1917:

> "In the late action of the Heligoland Bight the only heavy ships which could get up with the enemy were the "Repulse", "Courageous", and "Glorious" (the "Renown" and "Furious" were elsewhere). They very nearly brought off an important coup! …It is a pleasure for me, therefore, to be able to let you know that they have fully justified your anticipation of their success." (Harkins 2015, 53)

The 'Mighty Hood': the last battlecruiser

The last of the British battlecruisers, HMS *Hood* was built between May 1916 (in fact, she was laid down on the 31st of May when the Battle of Jutland commenced) and March 1920. She displaced 41,200 tons, had eight 15-inch guns as her main armament, and was capable of steaming at 31 knots. For more than two decades she was the largest warship in the world, showing the White Ensign all around the Empire (Hough 1975, 244).

Both Jellicoe and Beatty had strongly advocated the construction of new, more powerful battlecruisers (instead of the planned Admiral class battleships) in 1915. Jellicoe in particular was convinced of the superiority of new German battlecruisers (the Germans only managed to build SMS *Hindenburg* instead of the class of five vessels that had been laid down). Only the *Hood* was built for the RN, instead of four additional battlecruisers (Roberts 1997, 55-62). She was not finished in time to be used in WWI, but was famously annihilated by the modern German battleship *Bismarck* in WWII in the battle of the Denmark Strait on the 24th of May, 1941 (Winklareth 2012). Vice Admiral Sir Lancelot Holland, the commander of the British force, joined Rear Admiral Hood among the RN admirals killed in battlecruiser action. Again, despite considerable rebuilds and extra armor added between the two world wars, the loss of the Hood was attributed primarily to insufficient armor protection. The RN saga of Fisher's Greyhounds of the Seas came to an end in the RN with the sinking of the Hood and the destruction of the Repulse by Japanese aircraft in December 1941[4].

Leaders, organizational attention, and the moderating effect of organizational gestalts

Fisher, Jellicoe, Churchill, and Beatty as Leaders and Proponents of the Battlecruiser Concept

As must now be evident to the reader, Fisher was the originator and the most vehement proponent of the battlecruiser concept. He wanted this powerful class of ships to protect the sea lanes of the Empire from German armored cruisers and armed merchantmen, and later from the more and more powerful German battlecruisers that had been built in accordance with the British model. It gradually became clear to the key officers of the RN that German battlecruisers were in many ways superior to their British counterparts in design and operational use. To some extent, Fisher wanted to use battlecruisers as a reconnaissance force in the Grand Fleet, although he did not emphasize the need to use them as a fast wing of the Grand Fleet in the battle line. As Peeks (2015) points out, his greatest shortcoming was perhaps that he failed to develop and communicate a consistent battlecruiser doctrine for the RN.

According to Ross (2010, 198), Fisher was typically over-confident in his convictions. He thought explaining himself beyond his Fishpond as unwise and unnecessary. This did not serve him well in promoting his designs. His controversial character inspired his supporters but enraged his opponents, most famously admirals of the 'Syndicate of Discontent' such as Beresford and Custance (Freeman 2015). In the long run, Fisher's demeanor caused a lot of officers to abandon the battlecruiser, despite its merits. The concept was too novel, many officers who favored the heavily armored battleship had serious misgivings about the light armor protection, and Fisher's vehement endorsement even annoyed many like-minded officers.

John Jellicoe was perhaps the second-most-important figure in the development of the battlecruiser concept in general. He was an original member of the Committee on Designs, serving from 1904 until 1905, and as one of Fisher's 'seven brains' was the

Director of Naval Ordnance in 1905-1907, Third Sea Lord and Controller of the Navy in 1908-1914, C-in-C, Grand Fleet in 1914-1916, and finally the First Sea Lord in 1916-1917. He was a calm and rational man, very different from Fisher as a character. However, his subordinates admired and respected him immensely for his likeability and humbleness. (Bacon 1936; Patterson 1969) He originally thought that the battlecruiser would be extremely useful and, after the Germans started building their own versions, a necessary class of ships. Unlike Fisher, he was thoroughly informed about the technological details, and even before the war broke out he was deeply concerned about the perceived tactical inferiority of British battlecruisers vis-á-vis their German counterparts (e.g. Patterson 1966, 39-40).

Winston S. Churchill, the First Lord of the Admiralty during Fisher's interregnum period and his second term as the First Sea Lord in 1912-1915, gradually became opposed to building battlecruisers. Fisher's successors, First Sea Lords Wilson and Bridgeman, had continued and even stepped up their construction in 1910-1912. The main reasons for opposing the concept in the Senior Service remained the same: their insufficient armor protection and the ambiguous tactical concept of the role of this class of ships in battle. Thus, Churchill ended up merging the battleship and battlecruiser concepts in his *Queen Elizabeth* class of fast super-dreadnoughts.

Finally, Sir David Beatty, the battlecruiser commander and later Commander-in-Chief, took an active role in developing the concept. He was deeply aware of the defects of the different generations of battlecruisers, but was nevertheless adamant about using them aggressively against the enemy line in the battle of Dogger Bank and at Jutland, for example. ‚Both battles were severe disappointments to him (Marder 1966, 239), having been unable to annihilate his main opponent Vice-Admiral Hipper's German Battlecruiser Squadron. Thus, Beatty essentially saw the role of the battlecruisers as acting against their opposite German numbers and preventing them from exiting the North Sea.

He spent considerable energy in discussing the battlecruiser concept and its strengths and weaknesses with his superiors and his subordinates, and he was especially interested in how the public and the navy regarded his leadership:

> *"(iii) Beatty to Jellicoe (Add. MSS. 49008, f. 116)*
> *Lion,*
> *20th June 1916.*
>
> *I wired you this morning asking for my expurgated despatch to be published as a supplement to yours. I fear greatly that quotation will never make clear the movements etc. of my little lot. They can always be twisted and turned.*
> *I have already had unpleasant experiences in this matter. Vide after 24th Jan. [the battle of the Dogger Bank] when the Admiralty stated that at — p.m. I broke off the action, this purporting to be a quotation from my report, which was of course absolutely not in accordance with the facts in my report. This caused considerable adverse criticism in one instance. I was stigmatised as [a] rotter of the worst description and ought to have been shot with the shade of Byng standing by as a witness. I am not particularly sensitive to criticism but it cannot be good for the Service to be always put down as a bloody fool while still commanding a unit of the Fleet."* (Ranft 1993, 288-289)

The evolution of organizational attention to the battlecruiser concept

This boils down to how the key proponents (and opponents) of the concept advocated (or argued against) it. It is essential to understand how the concept evolved technologically and strategically (including battle tactics) during the design and commissioning of the successive generations. Each of them was relatively distinct and reflected the developments in German battlecruisers during the Anglo-German naval arms race. What is more, it is necessary to understand the role of formal organizational structures (such as the Board of the Admiralty), ad hoc committees (such as Fisher's early Committee on Designs), and other bodies the proponents used to put forward their ideas.

There are sufficient related communications in the study material to form a rich overall picture of how the battlecruiser concept was generally perceived in the RN. To put it simply, the new vessel type was always approached with caution within the Senior Service despite Fisher's early claims of superiority (Roberts 1997, 114). Without a proper naval staff before 1912, and with the First Lords/First Sea Lords running one-man shows at the top, the RN was ill-equipped to develop a well-functioning battlecruiser doctrine, not to mention its effective communication to key admirals afloat, for example. With accumulating experience of their use in battle, a number of ad hoc improvements were made both to materials and tactics in subsequent generations. The perceived urgency of refining the concept is evident in the following excerpts:

> "Jellicoe to Beatty 18.11.15
>
> I am afraid you must have been very disappointed at Lion and Tiger's battle practice results. I can't understand how a control officer of experience could have made such a shocking blunder as that made by Lion's control officer. It's elementary. I fear the rapidity ideas was carried to excess in one case (Queen Mary I think). Also the RF [rangefinder] operators were bad. It is most difficult for you to give them proper practice I know and I wish I could see a cure. I suggest your coming north or sending one or two BCF squadrons north for our next exercise cruise which I propose to carry out as soon as the moon is less brilliant, in about 10 days. Will that suit you? I think it would be useful to have the battle-cruisers with us for some PZ's1 and will get out a programme. The locality must depend on the known position of German ships at the time of course.... I am only too sorry you can get so little sea work, but while the Germans sit so tight one cannot do anything..." (Patterson 1966, 188)
>
> "Jellicoe to Jackson 6.6.16.
>
> The fight itself was mismanaged...The battle-cruiser is aventuresome ship, and our battle-cruisers are under a venturesome commander—more power to him. But those responsible seem to have forgotten that the Germans can see where we are blind, otherwise they could never have so disposed their forces as to leave the cruisers to withstand the attack of the entire German fleet alone." (Patterson 1966, 273)

Patterson (1966) summarized the key lessons the RN learned before and after the battle of Jutland as follows:

> "Some British inferiorities in matters of materiel were or had formerly been realised by Jellicoe, though perhaps not fully—shells, armour protection, especially of the battle-cruisers, and ship-construction in general, as shown throughout the war by the fact that whereas British ships frequently blew up, German ships had to be battered to pieces before they sank. Others remained for the battle itself to demonstrate at our expense—the danger of ships being destroyed by a flash to the magazine via the ammunition hoist, the

> advantage the German stereoscopic rangefinder tended to give in the vital matter of getting on target first (though the British system of director control was better for holding the target), the German superiority in the use of smoke-screens, and at night star-shells (of which the British had none), searchlights and rapid recognition signals." (p. 212)

Thus, in an evolutionary fashion, the RN became increasingly aware of the following key technological and organizational problems with the battlecruiser: (1) inefficient fire control, (2) insufficient armor protection, (3) insufficient speed in older ships, and (4) dangerous ammunition and cordite-handling procedures. These four issues were the major topics the RN as an organization deliberated when addressing the emergent problems with the battlecruiser concept as a whole.

Pollen complained about dreadnought's fire control in spring 1916, immediately before the Battle of Jutland:

> "The Orion is the only ship so far fitted with the Pollen Clock, and it is said that all the battle cruisers are to have it, as well as the Scott Director. The director complements the clock. While one finds the spot at which to aim, the other centres the fire of all the guns on that object. There seems to be a widespread feeling here that as soon as these appliances are in more general use the conditions of battle practice should be made more exacting, so as to ascertain exactly what extension of gunnery possibilities the Pollen system throws open." (Sumida 1984, 349)

However, when the battle started not much had been done to make battlecruiser gunnery more effective in terms of improved fire control, despite the fact that the gunnery of this class of ships had been found wanting since the first battle of Heligoland Bight. After the Falklands victory, for instance, Fisher was dismayed to learn that Sturdee's battlecruisers had needed to fire 1,174 rounds, or almost 75 percent of their ammunition to annihilate the enemy (Marder 1963,126).

However, as John Brooks (2016; 2005) has shown, the Pollen system was not as superior to the Dreyer system as implied in earlier historians' studies, especially in the foggy North Sea conditions. The key problem with the firing of British battlecruisers was that, being based at Rosyth rather than at Scapa Flow, by the time of Jutland they had not had enough real-life target practice. That is primarily why their fire control was less efficient than that of British battleships. Because of the conditions at Jutland, the equipment was less of an issue than the capability of the gun crews. (Brooks 2016, 497-505; 2005, 284-287, 292-298)

With regard to armor protection, every successive battlecruiser generation had more armor until 'Sir John Fisher's oddities' built after 1915. This was largely because corresponding German battlecruiser generations tended to be more heavily armored than their British counterparts because they were designed to operate mainly in the North Sea. Extra belt and deck armor and better protection for the gun turrets were also added to many of the ships (e.g. the *Lion* and the *Tiger*) during the war, largely based on the fact that, after Jutland, the vulnerability of the battlecruisers was attributed to insufficient armor protection instead of lacking anti-flash measures. (Roberts 1997, 99-111)

Fisher's credo, "speed is armor" had proven only partially sound during the war. For battlecruisers to use their superior speed effectively against slower enemies, the long-

range gunnery needed to be much more accurate than it was in practice. Range finding was also difficult in combat situations, and it was hard to estimate whether or not the ship was within the enemy's efficient range. Older and slower models also became decreasingly useful as part of the Battlecruiser Squadron/Fleet because they could not keep up with the newer RN and enemy units. The breakout of German battlecruisers into the Atlantic to harass merchant and later US troop convoys was the ultimate nightmare of Beatty and other battlecruiser commanders (Peeks 2015, 195). RN battleships and older battlecruisers were not able to outrun fast, new German vessels such as SMS *Seydlitz* and SMS *Lützow*. Only the newer British ships such as the *Lion* and the *Tiger* were up to the task. Notably, the Germans had never seriously considered this kind of daring operation.

The problems with careless ammunition and propellant handling, and with insufficient anti-flash procedures in gun turrets were not realized in the RN even though such practices almost caused the loss of the *Lion* at Dogger Bank and on another occasion at Jutland. A high rate of fire was emphasized at the expense of safety. The Germans nearly lost the *Seydlitz* at Dogger Bank for similar reasons, but immediately changed their dangerous procedures. Beatty's post-Jutland investigations revealed this error, albeit most of the blame for defects in battlecruisers was put on faulty design. As Peeks (2015) put it:

> "Immediately after the battle, Beatty appointed a series of committees to examine the battle and its lessons. The "Committee on Construction of Battle Cruisers," chaired by Pakenham, concluded by mid-June that "British battle cruisers, whether in service or about to be commissioned, are unequal to the duties assigned to them," on account of their thin armor. Even taking into account that this body was invested in placing blame on battlecruiser design (rather than their ammunition-handling practices), the committee's judgment here is hard to rebut." (p. 304)

Finally, as mentioned above on several occasions, the gravest problem was perhaps the fact that the RN lacked a sound strategic doctrine for the use of battlecruisers in combat (Peeks 2015). For instance, Sturdee deliberately aimed at keeping his thin-skinned ships beyond the range of the guns of the enemy in the Battle of the Falkland Islands, in line with Fisher's original argument that the ship would use its superior all-big-gun armament to annihilate its enemy from a safe distance.

However, at both Dogger Bank and Jutland Beatty faced a potentially technologically superior enemy with potentially more efficient fire control, and failed to keep his ships at a distance. The RN almost lost the *Lion* at Dogger Bank, and the Imperial Navy lost the obsolete cruiser SMS *Blücher* in the gunnery duel between the two squadrons. The RN lost three battlecruisers at Jutland against one (SMS *Lützow*) that the Germans scuttled themselves. In addition, Beatty failed to appreciate the problems with the ammunition handling as a root cause of his ships' failures. On a more general level, the strategic misconceptions relate to the fact that there was no general agreement within the RN as to whether a battlecruiser was essentially a vessel to hunt down enemy ships threatening British commerce, a fast and powerful scout ship, or a fast addition or wing to the battle line of the Grand Fleet.

Jellicoe's battle orders from spring 1916 stated (Patterson 1966):

> "The primary function of battle-cruisers is the destruction of the battle-cruisers of the enemy. …If the enemy has no battle-cruisers present, or after his battle-cruisers have been destroyed, the function of our vessels of this class is to act as a fast division of the Battle Fleet and to attack the van of the enemy if it is possible to attain a sufficiently commanding position." (p. 251)

The most dangerous situation for this thinly armored vessel type would naturally be its last-mentioned role of a fast wing, for which it was never originally intended. However, and also in accordance with Jellicoe's battle orders cited above, both Beatty and Hood used their battlecruisers for this purpose at Jutland – with disastrous consequences.

The moderating effect of organizational gestalts

As the battlecruiser concept evolved within the RN, two levels of organizational configuration interacted to produce the class of vessels that eventually comprised 13 ships plus the three light battlecruisers of the Courageous class. The first was the organizational structure (the positions of the First Sea Lord and the Board of the Admiralty, for example) and key leaders fulfilling their different official and unofficial roles. As mentioned, the British Admiralty was frequently run as a sort of one-man show, especially under powerful figures such as Fisher and Churchill, and given the absence of a well-functioning naval staff before 1912 (Black 2009). Second, and more importantly with regard to battlecruisers, there was the level on which the key actors perceived the concept as an amalgamation of technical, strategic and tactical issues pertinent to the design and use of the class of ships in combat.

Most of the discussions in the Committee on Designs and at the Board of the Admiralty naturally revolved around issues related to naval technology (e.g. the propulsion system, armaments, and armor) and their application in different generations of battlecruisers. Leaders such as Jellicoe who were also technological experts could easily dominate these discussions (after all, Fisher was not an expert in the newest naval technologies). However, strategic conceptions concerning the use of the battlecruiser were surprisingly vague. In practice, it was only Fisher and later Jellicoe and Beatty who tried to put forward such higher-level considerations. The problem with Fisher was that he was very vague and secretive in his formulations ('the strategic plan exists mainly in the head of the First Sea Lord'). Conversely, Jellicoe favored extremely detailed battle orders, and was prepared to account for every possible contingency. The problem here lay in the fact that there was very little strategic and tactical experience of the use of battlecruisers in combat, and it was impossible to draft such detailed instructions *ex ante*. Finally, Beatty had the most hands-on perceptions of the strengths and weaknesses of his ships. His habit of giving individual commanders and captains a considerable degree of tactical freedom specifically suited the 'cavalry of the fleet'. However, this contrasted sharply with the traditional authoritarian culture of the RN, in which subordinate commanders had to follow their instructions to the letter. The RN of the WWI era paid a heavy price for this in suppressing individual commanders' initiative in combat (Gordon 1996).

One could argue that the central organizational schema or gestalt dominating key officers' thinking about battlecruisers related to the Anglo-German naval arms race, and *the comparison* between British and German ships. Once the Germans started building their own dreadnought battlecruisers the RN was locked into this sub-race to

out-build and outclass the enemy. As mentioned, neither the older battlecruisers nor any battleship could match the speed of the newest battlecruisers, and each party was forced to build ever more powerful classes of ships to counter the threat from the other. HMS *Hood*, the last battlecruiser, was twice the size and three times the cost of the first one, HMS *Invincible*. The entire 'I' class was already practically obsolete in comparison to the most modern enemy battlecruisers when war broke out. However, the *Invincibles* did well in their more traditional role that Fisher had envisaged – hunting down armored enemy cruisers globally.

The British realized after the war that their assessment of the German battlecruiser construction program during it was considerably exaggerated. Jellicoe in particular was almost frenetic in arguing for the strengthening of the British force, quite correctly perceiving the German ships to be significantly superior to the British vessels in terms of endurance and fighting ability (Roberts 1997, 40; see also Dodson 2016). Considerable organizational attention was devoted to making constant comparisons between different generations of battlecruisers in the two countries. The same applied to the Imperial German Navy, which suffered from what could be described as an inferiority complex vis-à-vis the RN. However, these comparisons were not service-wide or systematic in the RN (Peeks 2015). Organizational attention to new vessel designs did not rely on specifically designed procedures as it did in the US Navy, which involved officers studying in the Naval Academy in its assessment and communication processes, for example (Peeks 2015, 169-170). The RN way was more individual and leader-centered, haphazard and unsystematic. However, one could still argue that, in the end, it was rather effective in developing a functioning battlecruiser concept to be used in combat during war. Once problems were detected – with some notable exceptions such as the procedures for handling cordite and ammunition - organizational attention was heavily channeled and directed to relevant issues in gradually bringing about improvements. However, throughout the entire period under analysis the RN organization lacked a formal governance structure that facilitated this (cf. Joseph and Ocasio 2012).

Conclusions

All in all, the battlecruiser proved far less disruptive technologically than Fisher and some of his disciples originally claimed. The general historiographical interpretation has been that the WWI-era battlecruisers proved faulty in design and in combat. This was also the impression of most contemporary officers of the RN. However, as I hope the above discussion has shown, this was not such a clear-cut case in reality. There were some successes (as in the Falklands) and some dismal failures (such as Jutland) in their tactical use in WWI. Both outcomes could be attributed to the different roles played by this new class of ships, from mopping up enemy cruisers to acting as a fast wing of the Grand Fleet. As the ships became more powerful throughout successive generations and as the war progressed, caution gave way to aggression. After Jutland and the loss of three battlecruisers, however, even the aggressive and impulsive Commander Beatty toned his ambitions down. As C-in-C later on he acted almost as cautiously as the calculative Jellicoe (Roskill 1980). Lessons had evidently been learned the hard way.

As Fisher had envisaged, after the war the battlecruiser gradually merged with the battleship as the top speed in the new models gradually increased towards 30 knots. The last of the British battleships, the 44,500-ton HMS *Vanguard* commissioned in 1946, was capable of steaming at 30 knots (Hough 1975, 241). Thus, the rationale for building more battlecruisers vanished as technology developed in the 1920s and 1930s[5]. One could argue that the British battleships of the WWII era were essentially heavily armored battlecruisers. Moreover, the dreadnought capital ship in general became increasingly vulnerable as submarines, torpedoes, mines and naval aviation developed. Fisher had also foreseen this evolution, and the dreadnought became extinct as a fighting machine during and after WWII (although the USS *Missouri* and the USS *Wisconsin* still operated and were in combat for the last time in the First Gulf War of 1991). The aircraft carrier quickly replaced it as the primary class of capital ships.

In sum, the following observations could be made about the theoretical lessons learned from the above discussion. The first research question concerned the key personal characteristics and effectuation mechanisms of top leaders in persuading the organizational adoption of a novel technological concept such as the battlecruiser. As I have shown, the RN needed a vehement character such as Sir John Fisher to institute the naval revolution that occurred before WWI broke out. Had it not been for him, the battlecruiser concept would probably not have become a reality. Considering it his favorite technological brainchild, Fisher practically shoved the battlecruiser down the throat of the more or less reluctant RN. He used all of his persuasive powers and a vast quantity of memos, letters and other correspondence to put forward his views. He was also a skilled and early user of the media and public relations to direct attention to his designs (cf. Nigam and Ocasio 2010). What is more, he instituted several high-profile committees within the organization of the RN to endorse, the building of battlecruisers, among other things. However, despite all the energy he put into advertising the concept within the RN and in the media, he failed to develop and communicate a sound doctrine for their use in practice. Later on, as the performance of this class of ships in combat proved less satisfactory than expected, criticism quickly mounted as many high-ranking officers began to doubt their prospects in general. All in all, it is strongly indicative of Fisher's superb persuasive powers that upon his return to the Admiralty in 1914-1915 he was immediately able to revive the organization's faltering interest in battlecruisers and to order the *Renown* and '*Sir John Fisher's Oddities*' at the beginning of 1915. In terms of Ocasio's (2011) three varieties of managerial attention, Fisher's early actions mainly represented the traditional top-down perspective. He was also skilled in using expert committees and his trusted Fishpond members as agents to promote his battlecruiser concept to achieve attentional engagement throughout the organization of the RN. His actions and the reactions within the RN could also be seen as a very clear case of how organizational effectuation works in practice (Sarasvathy 2001). Novel technological concepts are put forward, negotiated and re-negotiated in a fluid process of adoption and opposition within the organization. Even if Fisher had originally wanted to completely replace the battleship with the battlecruiser as the predominant type of capital ship, he was clearly not able to convince the RN to abandon the prevailing dominant concept.

What is more, Jellicoe and Beatty oversaw the rapid evolution of the battlecruiser concept with generation after generation of faster and more powerful ships being built

in the naval arms race between the British and the German Empires. For them it was no longer primarily a matter of whether the ships were needed in the first place, or even how they would be employed most efficiently in battle. As the Germans were (supposedly) stepping up battlecruiser construction, the British had to do the same. Both admirals were successful in convincing the RN organization of the need always to maintain its numerical superiority over the German High Seas Fleet. Thus, it was no longer the case of a visionary leader or genius (see Hough 1969, 277) putting forward a novel, potentially disruptive technological and organizational concept. More technocratic, rationalistic leaders were taking over as the battlecruiser was developing and maturing[6]. In Ocasio's (2011) terms, Jellicoe and Beatty were able to deepen attentional engagement in the concept within the RN, efficiently combining top-down and bottom-up executive attention and vigilance.

The second research question concerned the process of adoption and how it unfolds and changes when the technology is gradually proving to be less efficient than predicted. This relates directly to attentional selection within an organization, in other words to the outcome dimension of attentional processes (Ocasio 2011). As mentioned, voices that were critical of the battlecruiser concept emerged immediately after the launch of the first dreadnoughts (Ross 2010) and during the fierce Beresford-Fisher feud (Freeman 2015). Later on this led to a 'hot stove effect' (Denrell and March 2003) within the RN organization, meaning that it essentially declined to learn from ongoing experimentation and the selection of best solutions. Once the cat has sat on the hot stove, it refuses to sit on a stove that is cold. Thus, the organization starts acting conservatively and refuses to take any risks, even if that would have been the sensible path to follow (Denrell and March 2003). Churchill's decision to invest in the construction of fast battleships instead of building new battlecruisers just before WWII could be seen as an indication of the hot stove effect. This became more visible later on during the war as it became evident that the Germans were unable to realize their once-ambitious battlecruiser construction program. Resources were diverted to building other types of vessels, especially smaller craft and submarines. However, the battlecruiser concept proved resilient: the RN still built the *Renown*, the '*Oddities*' and the '*Mighty Hood*' during the war. What is more, considerable attention and resources were devoted to fixing the major problems identified in the design of the existing ships. All in all, the battlecruiser case reported in this study corroborates the distributed assemblage viewpoint on strategy processes put forward by Ocasio and Joseph (2005). The central focus of attention was the fluid and ever-changing concept, in other words the focal organizational schema or gestalt.

My final question concerned how evolving organizational schemas or gestalts emerge and moderate the process of adopting and improving on a novel technological and organizational concept. This is probably where the major contribution of my study lies. In essence, as Linschoten (1959) put it:

> "… A gestalt is a completed unit of human experience. It is a unique aesthetic formulation of a whole; it will to some degree involve contact, awareness, attention, and figure formation out of the ground of my experience; it arises out of emergent needs and is mobilized by aggressive energy." (p. 289)

The gestalt of the battlecruiser started with the technical specifications of the ship and emerging ideas about its potential use as a revolutionary weapon of war for protecting commerce and mopping up enemy raiders. This was well in line with the more or less

prevailing materialist school of thought of the time. The more numerous and the more powerful the ships were, the better. Gradually, the gestalt behind the concept became increasingly complex and nuanced during the Anglo-German naval arms race, and essentially related to the different battlecruiser generations created by the participants. The dominant viewpoint was that the older generations of ships were becoming obsolete at an ever-accelerating pace. The media and strong public interest in naval matters in both the UK and Germany intensified the overall attention to the battlecruiser gestalt. When the British ships were tested in combat and some of their features were found seriously wanting, the gestalt assumed more critical tones geared towards their perceived flaws in design and in operational use. Thus, the evolving battlecruiser gestalt could be argued to have strongly moderated the adoption and correction process of the ship type. After the Jutland catastrophe the decision was made to attach additional armor plate to existing battlecruisers to make them less vulnerable, for instance. However, nobody – not even Fisher – was in full charge of the whole adoption and correction process in the RN, and no systematic procedures were developed to test and develop it further.

A key point is that the visionary but somewhat disorganized Fisher as the creator and a strong advocate of the battlecruiser concept gradually yielded ground to more rational and operationally capable leaders (Jellicoe and Beatty in particular) as the battlecruiser gestalt evolved generation after generation of vessels that were built and used in action during the war. The case is a good illustration of how organizational attention evolves, especially in combining top-down and bottom-up attentional processes. Conceptually, it deepens understanding of how the leader's personality and the three attentional processes (Ocasio 2011) intertwine, and of the role played by organizational gestalts related to an emerging technological concept in this process. Thus, the main theoretical contribution of the study is the emphasis on the evolving schema or gestalt, in this case the battlecruiser concept as a technological innovation. The gestalt is to be seen as a key mediating organizational mechanism, the evolution of which is not to be understood as an exclusively top-down (contrary to what Ocasio 2011, 1288-1289 suggests with reference to research on managerial mental models or schemas) or bottom-up (i.e. purely stimulus-based) process. As the case study demonstrates, this process essentially involves the complex interplay of visionary leadership, vigilance, engagement, and attentional selection, in which top-down and bottom-up inputs intertwine as the gestalt evolves.

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[1] The position was previously called the post of the First Naval Lord.

[2] In line with the key literature on strategic management (see e.g. Barker and Duhaime 1997), the term organizational turnaround is defined here as the implementation of the strategic and operational actions required to save an organization from failure, based on an understanding of the causes of organizational decline. This requires visionary leadership, organizational restructuring and the creation of a new organizational culture.

[3] Out of courtesy to Beatty, Chalmers omitted the word 'bloody' from his original account.

[4] HMS Renown survived both World Wars and was scrapped in 1948 (Burt 1993, 242).

[5] However, the US Navy built two reconnaissance battlecruisers of the lightly armored 'Fisher design' for use in WWII.

[6] Even the flamboyant and impulsive Beatty seemed to adopt a more cool and rational approach in his later career as C-in-C of the Grand Fleet and First Sea Lord (Roskill 1980).