A Strait Comparison:

Lessons Learned from the 1915 Dardanelles Campaign in the Context of a Strait of Hormuz Closure Event

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Summary

In 1915, the Allies attempted to force open the Dardanelles Straits in the face of an integrated Turkish and German defense (sea mines plus covering fire), using first their navy and then their army, with disastrous results. An analysis of the navy portion of this campaign identifies a number of lessons learned at the strategic and operational levels pertaining specifically to risk assessments, strategic communications, proper strategic and operational planning, operational leadership, and operational art. In juxtaposing these lessons to a modern attempt by a belligerent such as Iran to close the Strait of Hormuz (SoH), the differences in the two scenarios highlight how difficult it would be for Iran to actually close the Strait, but the similarities suggest it is still worthwhile thinking through what the lessons from the Dardanelles might teach us in the context of the SoH. Doing so yields a number of points to consider when thinking through the implications of a SoH closure, along with a number of corresponding recommendations for U.S. policy-makers, strategists, and planners. These include (with recommendations as sub-bullets):

- The fear that surrounds operations in mined waters that was so prevalent in the Dardanelles Campaign should not be discounted during attempts to demine the SoH. Also, in the Dardanelles the Allies applied their least capable naval assets (mine trawlers) against the strength of the Turkish defense (minefields). For the U.S. Navy, mine countermeasures (MCM) is one of its weakest capability sets. Thus, the potential exists for the U.S. to make the same mistake if it does not employ its MCM assets wisely or get significant Coalition support.
  - — U.S. planners should make reasonable assumptions regarding mine-clearing timelines in order to avoid giving false impressions of ease of the mission to policy- and decision-makers, as well as to strategic communicators.

- An analysis of operational art (time, space, and force factors) showed the Allies routinely sacrificed time and operated in a deficiency of space, and paid for it in terms of the force they needed to apply. An analysis of operational art in a SoH closure shows that Iran has many advantages across these three factors, especially early in the conflict.
  - The U.S. may want to investigate first-strike and/or quick-strike options to allow it to act swiftly against Iran's area-denial capabilities if it looks like Iran may be on the verge of attempting to close the SoH. This implies an investment in assets to provide valid, timely, reliable, and actionable intelligence along these lines.
- In the Dardanelles, the Allies gave Turkey warning of their future attack by an earlier bombardment of the Straits' outer forts, with the Turks improving their defenses as a result. Although not quite the same, the U.S. did alert Iran to weaknesses in its area-denial capabilities and doctrine during Operation Praying Mantis.[1]
  - The U.S. must account for improvements in Iran's area-denial capabilities and doctrine since Operation Praying Mantis; we should not assume Iran will make the same mistakes or discount Iran's capabilities simply because we defeated them once before.
- During the lead-up to the Dardanelles Campaign, there was debate over whether the operation should be joint army-navy, or if it could be conducted by the navy alone. Attempts to try the latter, and later the former, did not go well. In a SoH closure event, the U.S. might prefer to first deal with Iran's missile threat, and then demine the Strait, but political/economic realities might dictate dealing with these threats concurrently.
  - U.S. strategists and planners should think hard about, and decide, whether to conduct simultaneous navy-air

[1] This operation was the 18 April 1988 attack by U.S. naval forces in retaliation for Iranian mining of the Persian Gulf during the Iran-Iraq war and the subsequent mine damage to USS *Samuel B. Roberts*.

operations in order to reopen the Strait, or whether it is better to dismantle the pieces of Iran's integrated defense in sequential fashion.

- Admiral Fisher (the First Lord of the British Admiralty and most senior uniformed navy officer at the time) is one of the specific persons criticized in histories of the Dardanelles Campaign, for not raising his objections to the navy-only plan during War Council meetings. Although not pervasive in the U.S. military, there are still those who view their options as silence or resignation, and choose silence.

  — U.S. military leaders in the chain of command for an operation in the SoH must be prepared to "stand and deliver" their professional military opinions to U.S. senior civilians, even if those opinions are unpopular or politically unpalatable.

- Not making critical assumptions or strategic decision points clear during Campaign planning contributed to the Dardanelles disaster. Also, the Allies' initial analysis of the problem was poor and their subsequent learning cycle was too slow. During a campaign to reopen the SoH, the U.S. could face similar problems if its intelligence preparation of the environment is inaccurate or insufficient, if its planning is not sufficiently explicit, and/or if tactical and operational lessons are not folded immediately back into future planning.

  — In planning to reopen the SoH, the intelligence preparation of the environment will be critical to ensure planners fully understand the problem. In writing the plan, critical assumptions should be made explicit along with the risk involved if they prove faulty. The plan should also include explicit decision points at any phase that may lead to further escalation. If the plan is executed, adequate processes need to be in place to fold tactical and operational lessons learned immediately back into future planning and future operations.

- In the Dardanelles Campaign there were several examples of how differing assessments and tolerances of risk across echelons of command negatively impacted operations. This is a critical lesson to be applied to a potential SoH closure.

— Senior U.S. civilians and military members must reach an understanding of what strategic and operational risk the U.S. is willing to accept during a reopening of the SoH. This discussion should be as specific as possible, preferably to the level of number of ships and aircraft lost, number of casualties, and so on.

- Strategic communications in both words and deeds were very important during the Dardanelles Campaign, and the Allies allowed the popular narrative to constrain their options. Given the ability of the modern 24/7 news cycle to drive narratives of success or failure, strategic communications are vitally important to operations in the wake of a SoH closure.

  — Communicating effectively during a conflict in the Strait will be at least as important as actions taken there. It would behoove the U.S. to have thought through and developed communications plans for various likely scenarios that might occur during the course of, and as a result of, such a conflict.

- Although it seems unlikely that Iran would be able to keep the SoH closed for weeks or months, it is entirely possible that Iran could emerge from a conflict in the Strait militarily weaker, but politically and strategically stronger.

  — Strategists need to analyze what "failure" might look like for the U.S. as a result of a conflict over closure of the Strait (and, conversely, what "success" might look like for Iran), and how to prevent such scenarios from playing out. Simply assuming that military action is required as a response, or that tactical and operational successes will translate into strategic ones, leaves the door open for Iran to snatch a strategic win from the jaws of defeat.

In comparing the Dardanelles Campaign to a potential Strait of Hormuz closure event, it may be tempting to deem it unlikely that a near-perfect-storm of errors and misjudgments would doom the U.S. in the Strait of Hormuz as it did the British at the Dardanelles. However, it is still better to eschew faith in the odds and apply the lessons of the past than to leave open the possibility of disaster.

Introduction

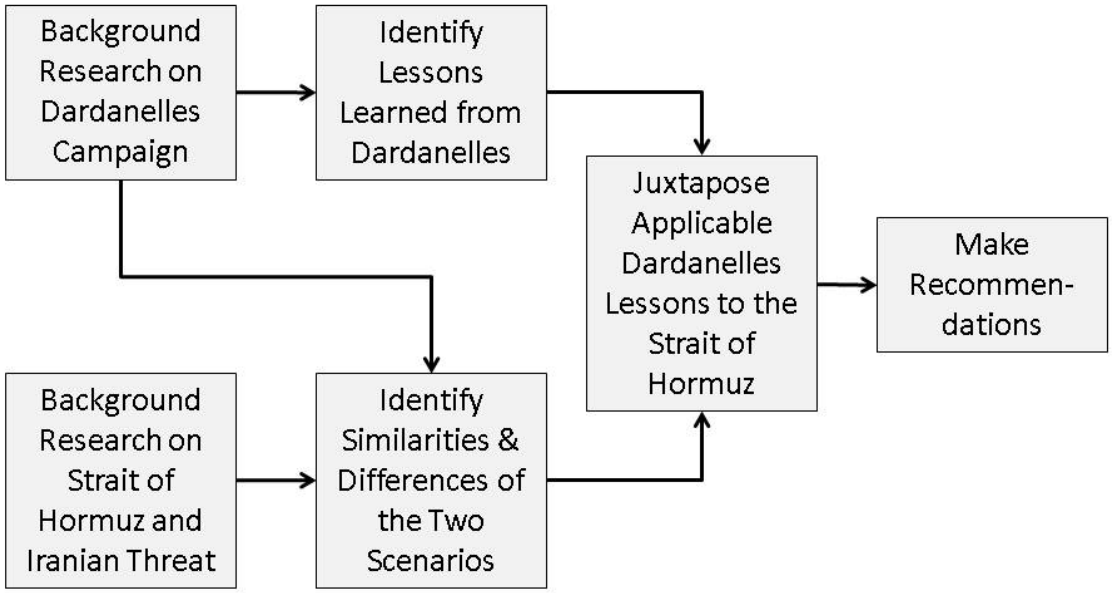
By December 1914, opposing European forces were largely deadlocked along the Western Front of World War I, as the German march towards Paris had been halted and massive armies stood trench-to-trench, each side daring the other to attempt a charge in the face of withering machine gun fire [1,2].[1] By this time, Britain and France had lost more than a million men, casualties that seem unfathomable by today's standards, but were hardly the final toll of the War. Amongst this carnage, and in part due to revulsion of it, came an idea by the British to make a bold, strategic move in the East: namely, "an attempt, first by sea and then by land, to pierce and break down the barriers separating Russia from her allies and in so doing possibly to shorten the war"[2]. These efforts, known sequentially as the Dardanelles and Gallipoli Campaigns, would become military disasters of the highest magnitude and, as such, the topic of much subsequent study.

In this paper we focus on the Dardanelles Campaign (the navy portion), and compare it to a modern-day naval scenario—potential closure of the Strait of Hormuz (SoH). Although such comparisons are not new, arguments have been made that greater attention should be paid to the Dardanelles as a learning tool for littoral warfare [3]. In addition, the literature appears to lack a detailed analysis of the similarities and differences of the two scenarios, along with what might be learned in juxtaposing lessons from the Dardanelles Campaign to a Strait of Hormuz closure. Thus, we conduct such an analysis here, using the methodology shown in figure 1. First, we examine the Dardanelles and the Allied Campaign there and identify operational and strategic lessons learned. We then examine the Strait of Hormuz and Iran's intent and capabilities to close it and, by juxtaposing the lessons learned

[1] Much of this and the next section are adapted from Nevinson's and Massie's books on the Dardanelles [1] and World War I [2], respectively.

from the Dardanelles through the lens of such an event, distill a number of recommendations for the United States and its Coalition partners relevant to their response. The remainder of this paper presents these steps in order, with general conclusions at the close.

Figure 1. Analytic methodology used for the study



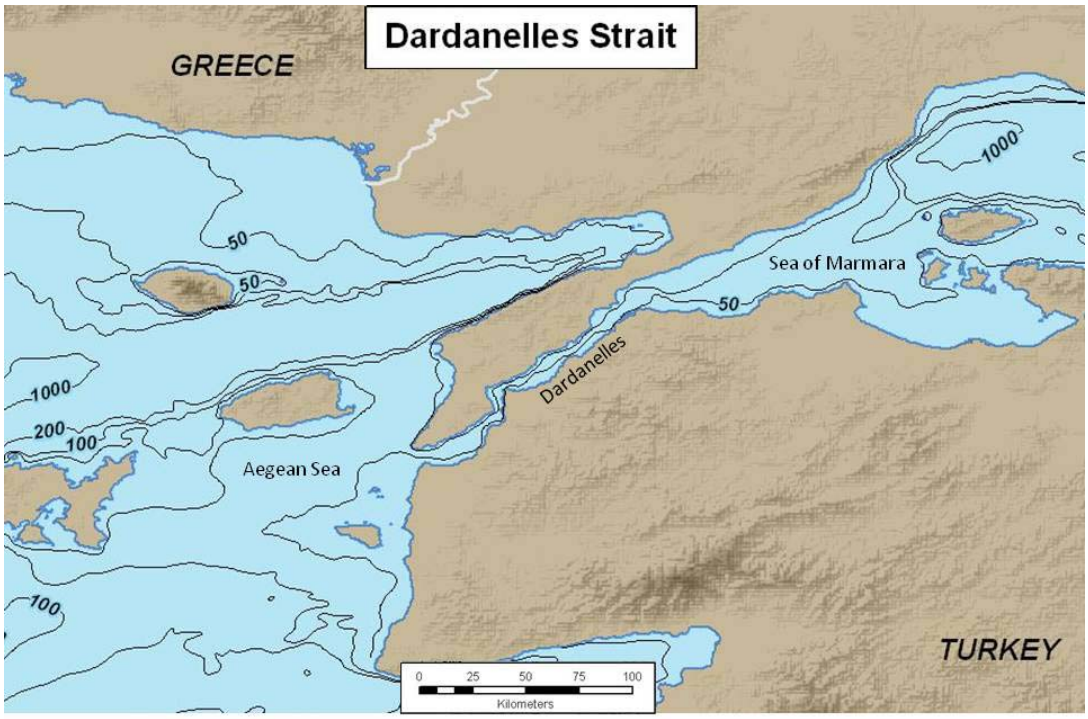
The Dardanelles Straits

Disaster at the Dardanelles

The geography of the Dardanelles is shown in figure 2 and is described more than adequately by Massie:

> The Dardanelles are a water passageway from the Mediterranean Sea and the Aegean to the Sea of Marmara. The mouth of the channel at Cape Helles on the Aegean is two miles wide, but once inside the Straits, the shoreline on either side opens out to a width of four and a half miles, then gradually comes together again at the Narrows, fourteen miles upstream. Above the Narrows, the passage widens again to an average of four miles until, twenty-six miles later, it reaches the Sea of Marmara. The water in the Straits is deep, up to 300 feet at the Narrows. Steep cliffs line the northern side, the shore of the Gallipoli peninsula; across, in Asia, where the Trojan plain reaches down to the island of Tenedos, the shoreline is low and the bottom is shallow. There is no tide in the Dardanelles, but water flowing from the Black Sea rivers and from the melting snows of the Caucasus Mountains creates a permanent current of 2 to 4 knots. Three connected bodies of water—the Dardanelles, the Sea of Marmara, and the Bosporus—together make up one of the most important water passageways in the world. Linked, they form the only entrance to and exit from the Black Sea; they are a highway for all trade coming from the Danube, the Dniester, the Dnieper, and the Don and the great ports of Constantinople [now Istanbul], Odessa, and Sebastopol. In 1914, an endless flow of steamships carried nine-tenths of Russia's exported grain through the Dardanelles. Control of this channel meant control of Russia's lifeline to the sea, to the West, to her allies. Because the Dardanelles were a Turkish waterway, Germany, Turkey's ally, meant to block them and thereby to isolate and strangle the empire of the tsars [2].

Figure 2. Dardanelles Strait, with bathymetry contours (in meters)



Turkey, which in 1914 was still technically neutral, had nonetheless laid sea mines across the Dardanelles at German insistence, though it left a small channel open for transit of specially piloted ships.[2] This changed, however, after 27 September 1914, when British sailors boarded a Turkish destroyer exiting the Dardanelles and discovered Germans on board, thereby violating Turkey's neutrality. In the wake of this incident, the German colonel in command of the forts at the Narrows ordered the minefield extended and the waterway closed. A month later, in response to this incident and a later one involving the shelling of Russian ports by Turkish ships (which had been donated by Germany), Britain and Turkey formally declared war against each other.

[2] For a detailed timeline of events of the Dardanelles and Gallipoli Campaigns, see the Appendix.

Not long after, the first mention of an attack against the Dardanelles was made in a British War Council meeting, by Winston Churchill. Churchill, who as the First Lord of the Admiralty, had helped build the impressive British fleet, also felt the passive role being played by the navy at that time was a waste of capability. With this in mind, Churchill suggested a combined sea and land operation against the Dardanelles and the Gallipoli peninsula. Lord Kitchener, the dominant force in the British War Council, agreed with the merit of the idea but felt he could not spare any troops to support it. Undeterred, and with a recent request by the Commander-in-Chief of the Russian army for Allied action against the Turks to relieve pressure in the Caucasus, Churchill seized on a navy-only plan for the Dardanelles:

> The Dardanelles forts, it was believed, were armed mainly with old guns, which could be outranged by heavy naval guns; the bombarding ships need not come in close and would therefore be untouched. Once the fleet had overcome the decrepit Turkish forts, the minefields could be rapidly cleared and the battleships could sail through to the Sea of Marmara [2].

If this could be accomplished, Churchill reasoned the further strategic implications: Turkey, being considered a weak state, would certainly surrender as battleships approached its capital, and if it did not, those same ships would shell it into submission, as Constantinople was built largely of wood and Turkey's only munitions and primary gun and rifle factories were located within range of naval gunfire from the Sea of Marmara. With Turkey thus pacified, the sea route to Russia would be reopened, allowing materiel and supplies to flow to Russia, and Russian wheat to flow to the Western Front. In addition, the neutral Balkan states (Greece, Romania, and Bulgaria) would be pressed to join the Allies once Turkey was defeated. And, as Massie says, "all of this—the delivery of a masterstroke to shorten the war—would have been achieved by the great weapon Churchill held in his hand, the Royal Navy" [2].

Thus inclined, Churchill sought the opinion of his Admiralty. Admiral Carden (figure 3), commander of the British East Mediterranean Squadron, replied that he did not think a rush through the Straits was possible, but that extended operations with a large number of ships might meet with success. Asked further to

provide an operational plan along these lines, Carden provided a linear scheme of slow progress employing overwhelming force, in which his ships would first silence the forts protecting the Straits one by one, then proceed into the Straits to silence the concealed guns and mobile batteries while providing cover for minesweepers to clear a channel to the Narrows. Once this channel was opened, the ships could advance to demolish the forts protecting the Narrows and into the Sea of Marmara. To do so, Carden requested a force of twelve battleships, three battle cruisers, three light cruisers, sixteen destroyers, six submarines, and twelve minesweepers. On 13 January 1915, Churchill presented this plan to the War Council, and it was approved with no opposition. The conclusion of the war council, as penned by Prime Minister Asquith, was "that the Admiralty should prepare for a naval expedition in February to bombard and take the Gallipoli peninsula with Constantinople as its objective" [2].

Figure 3. Admiral Sir Sackville Hamilton Carden (1857-1930)

As the preparations and planning for the Dardanelles offensive continued, the First Sea Lord, Admiral Fisher (figure 4), began to have doubts about a navy-only plan. He voiced these concerns to Churchill and the Prime Minister, but the latter did not circulate them to the War Council (at Churchill's recommendation). Thus,

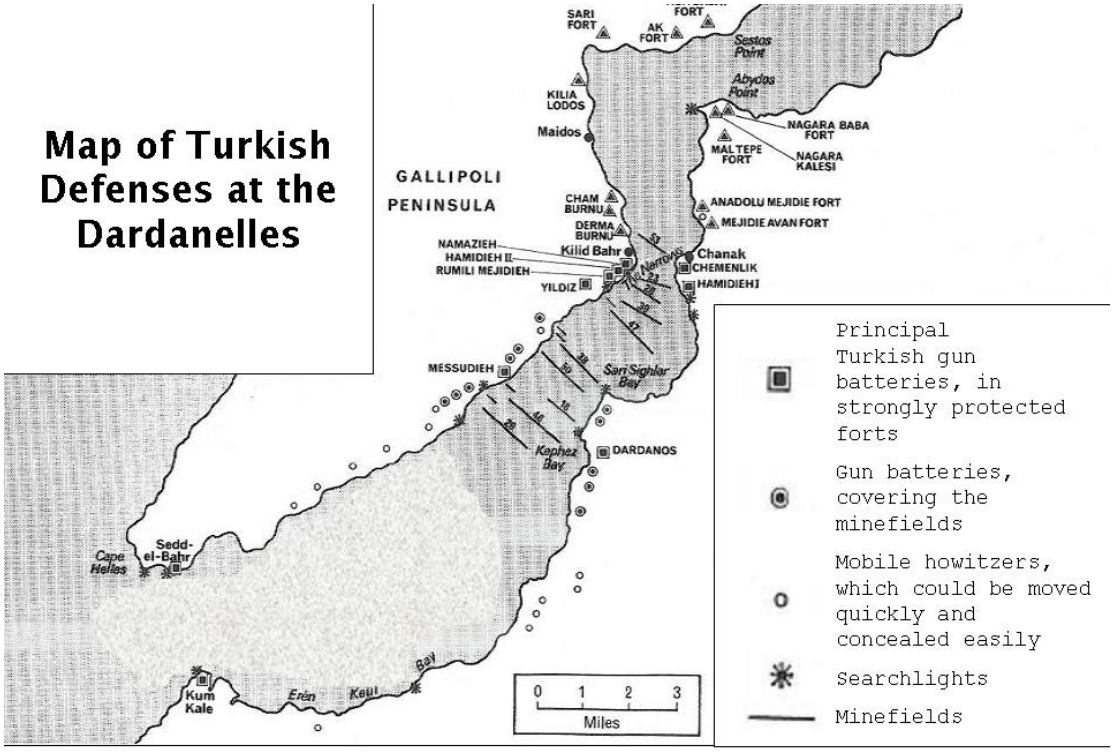
on 28 January 1915, when the War Council was to meet to give final approval for the operation, Admiral Fisher attempted to resign in protest. However, after expressing his views to the Prime Minister in person and finding an unreceptive audience, and after a long talk with Churchill, he relented to remain in his position and to accede to the Dardanelles operation, going so far as to add *Queen Elizabeth*, the first of a series of new dreadnought battleships with 15-inch guns, and the two latest pre-dreadnoughts as well.

Figure 4. Admiral of the Fleet John Arbuthnot Fisher (1841-1920)

The Turkish defenses at the Dardanelles were constructed in three layers (figure 5). The entrance was guarded by four old forts, containing a total of sixteen heavy and seven medium-range guns. Past the entrance where the Straits widen, the second layer of defense consisted of numerous permanent batteries of 6-inch guns. Following an ill-advised preliminary shelling of the forts by British ships in November 1914, this second layer was fortified with mobile 6-inch howitzer batteries of four guns each along with numerous searchlight batteries. At the Narrows was the third layer of defense, consisting of two huge ancient fortresses armed with 72 guns of various calibers. Even more important, though, was the inclusion of

324 mines laid in ten lines across the Narrows.[3] Thus, the Turks had in place a complex, integrated defense: the mines blocked passage of the Straits; the mobile howitzers prevented sweeping of the mines; and the larger guns of the forts protected the howitzers by keeping the ships at bay [4]. Unraveling this defense would prove more difficult than Carden could imagine.

Figure 5. Map of Turkish defenses at the Dardanelles (adapted from [5])



When Admiral Carden's attack began on the morning of 19 February 1915, he had been given all the forces he requested and more (figure 6): *Queen Elizabeth*; the battle cruiser *Inflexible*; twelve pre-dreadnought battleships; four light cruisers; fifteen destroyers; eight submarines; and thirty-five fishing trawlers converted into minesweepers. He also had two battalions of Royal Marines to serve as a temporary landing force if needed.

[3] Note that a recent analysis of Turkish sources suggests the Turks may have laid as many as 402 mines in the Straits [4].

Over the course of the first day of attack, the battleships fired 139 12-inch shells at the Turkish forts, and, although they hit the forts many times, at the end of the day the forts were still firing. As the ships retreated for the night, the lesson learned was that it was exceedingly difficult for the ships to destroy the Turkish guns—a direct hit was required. However, it was noted that the ships could suppress the enemy gun crews, thereby potentially allowing the ships to move in ever closer and eventually pound the forts at close range. This knowledge was applied at the next opportunity, which did not come until 25 February when the weather cleared again. On this day, Carden's ships resumed shelling the entrance forts, scoring several direct hits on Turkish guns and forcing the abandonment of the forts. The next day, the Royal Marines were put ashore and went through the still-abandoned forts, blowing up at least fifty guns of significant caliber by hand.

Figure 6. Photograph of the Allied fleet at the Dardanelles

This initial success played well in the War Council, which began discussing what to do after the fall of Constantinople. It perhaps played too well. Admiral Carden, apparently realizing the utility of having troops ashore to act as spotters for naval gunfire, requested 10,000 men to be landed on the Gallipoli peninsula, since the forts had been silenced. Lord Kitchener declined this request, and, as Admiral Carden had claimed only a few weeks earlier that he could force the Straits alone, the latter had now to prove he could do it.

With the outer forts silenced, the ships began several days of attacks on the second and third layers of defense. Here, geography took an opposing hand. In the Aegean, the ships had plenty of maneuver space and could fire from outside the range of Turkish guns. The

narrowness of the Straits, however, confined the ships and put them in the range of artillery fire from both sides. Although this was not enough to sink the bigger ships, it was nonetheless disconcerting. And it made the next task at hand, namely the clearing of the minefields at the Narrows, even more difficult. To do this, Carden had been given a set of fishing trawlers, equipped with minesweeping gear and steel plating and manned by fishermen who were designated naval reserves. These fishermen, already disheartened knowing the draft of their ships was deeper than the minefields (exposing them to the mines), were further discouraged by the howitzer fire their battleship protectors were unable to silence. To circumvent this, Carden put the minesweepers to work at night, but Turkish searchlights were powerful enough to illuminate the slow-moving sweepers, and at night the battleships were even less effective at silencing the howitzers. These attempts were repeated several nights in a row, with predictably disappointing results.

On the seventh night of minesweeping, Carden took a different approach. The minesweepers, which could only make 2-3 knots going against the current of the Straits, were to steam past the minefields, turn, and sweep them coming back downstream. Seven trawlers set out to do this: four of the crews were so agitated by the surrounding gunfire that, when the time came to begin sweeping, they did not even extend their gear; one pair swept and then exploded two mines; and the last struck a mine and was destroyed. All the while, 6-inch howitzer shells rained down around them. The next night, the trawlers were sent completely unprotected, in an attempt to "surprise" the Turks. This time, all the trawlers turned and fled the instant they took fire. On 13 March, Carden made his last attempt to sweep the fields at night. Having replaced the fishermen with navy volunteers, he sent seven trawlers up the Straits again, this time preceding them with two hours of naval gunfire directed at the searchlights and howitzer batteries. The Turks, having seen this tactic before, trained searchlights on the trawlers and rained gunfire upon them. The result was again predictable: two trawlers had their gear shot away; one had its entire crew killed; two rammed into one another and became one, drawing concerted fire while drifting powerless; while only a few mines were swept. In the meantime, the battleship *Amethyst* was hit in her steering gear

and then in the mess deck, killing 24 and wounding 36. Thus ended Carden's attempts to sweep at night, and indeed his attempts altogether. The Admiral fell ill and was diagnosed with a dangerous ulcer; he was also proclaimed to be on the verge of a nervous breakdown, due to constant worrying about the mines, the weather, the howitzers, and the Admiralty. On 17 March, Carden resigned his post, and his deputy, Rear Admiral John de Robeck (figure 7), was put in charge.

Figure 7. Rear Admiral John Michael de Robeck (1862-1928)

De Robeck, who had accepted Carden's plan to force the Straits, launched his attack on the Narrows the next day. As attempting to sweep the mines at night did not work, de Robeck decided to eschew the element of surprise and rely instead on brute force. As Massie describes, using his armada of (now) eighteen battleships, his plan was:

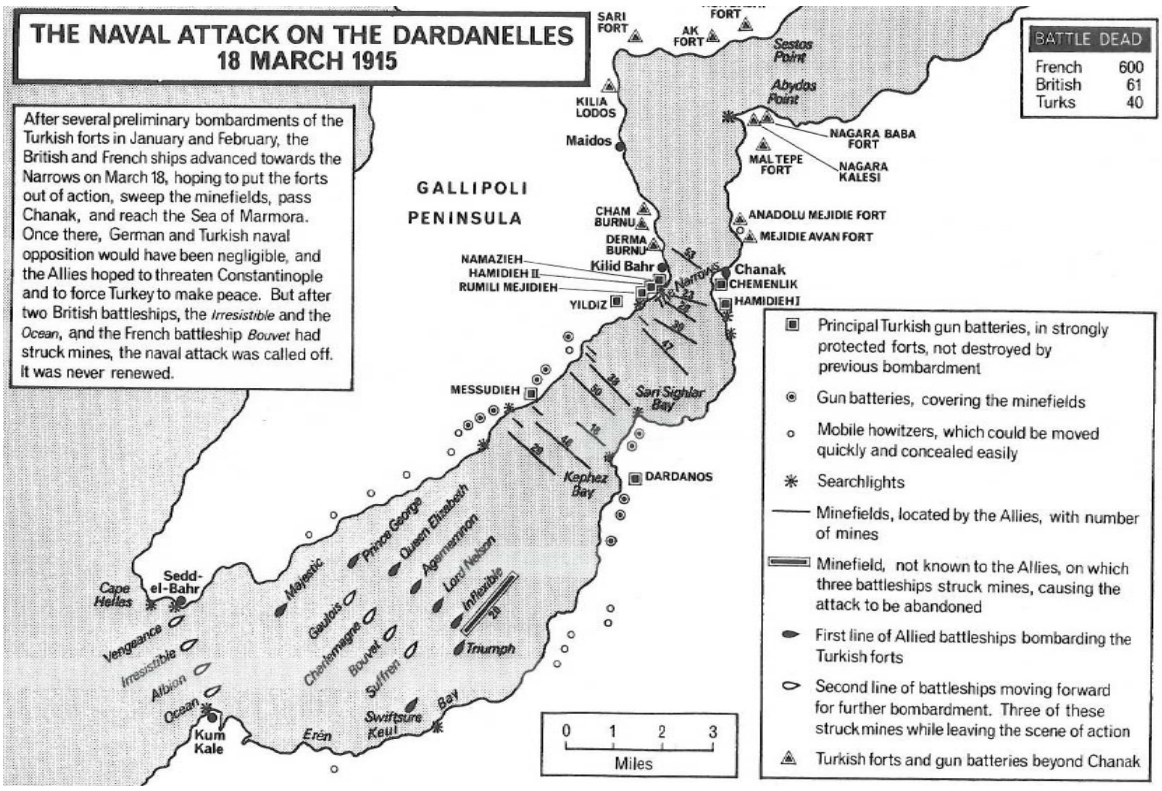
> …to silence the Turkish forts and big guns at the Narrows by long-range bombardment. Once these guns were subdued, the battleships would advance up the Straits and engage the batteries protecting the minefields. As soon as the Narrows forts and the mobile batteries were suppressed, the minesweeping trawlers would advance and, in broad daylight, sweep a passage 900 yards wide.

> The battleships would then advance through this swept channel up to the Narrows forts and complete their destruction at close range. If, as the admiral hoped, he could batter the forts into silence by the evening of the first day, then his fleet might complete its other assignments and enter the Sea of Marmara the following day [2].

De Robeck's scheme of maneuver is shown in figure 8. He organized his ships into three lines: Line A consisted of his four most powerful ships (to include *Queen Elizabeth*) along with two pre-dreadnoughts; Line B consisted of the four old French battleships flanked by two more pre-dreadnoughts; and Line C was made up of four old British battleships. The plan was for the ships in Line A to sail to within 14,000 yards of the Narrows forts and open fire on them (with the two pre-dreadnoughts focusing on silencing the howitzer batteries on the shores). Once the Narrows' big guns had been silenced, the ships from Line B would advance through Line A to within 10,000 yards and add their fire to that of Line A.

As the bombardment continued, both Lines A and B would advance another 2,000 yards. Line C was to wait outside the Straits until called for by de Robeck to relieve Line B. Once this massive display of firepower had suppressed the forts, six mine trawlers would advance under the protection of two more old battleships and sweep a channel, through which the battleships could then proceed to pound the Narrows' forts at point-blank range.

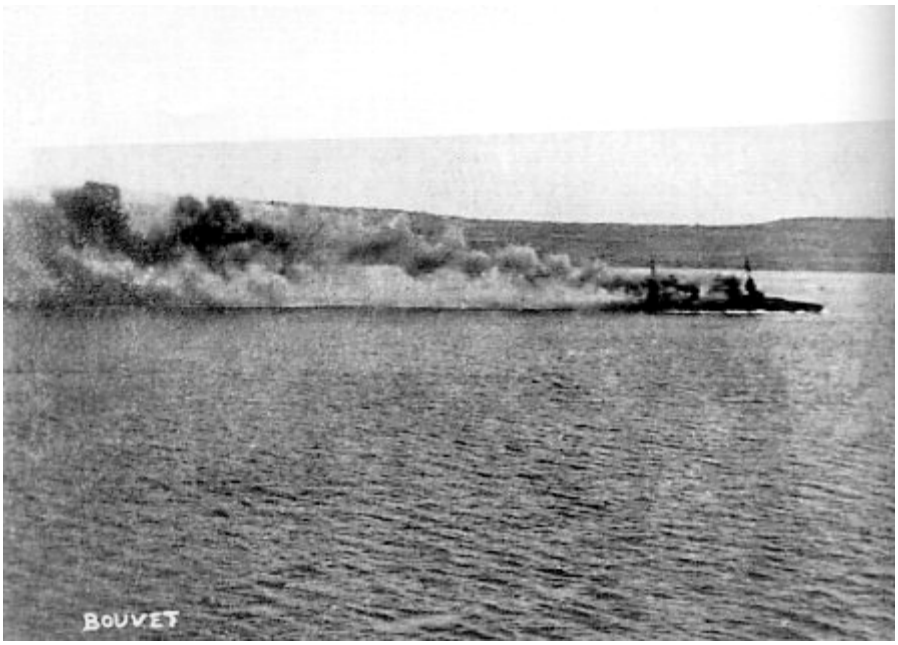
Figure 8. Schematic of the naval attack on the Dardanelles [5]



The attack began around 1030 on 18 March, with the Line A ships reaching their position and beginning their barrage about an hour later. Within a half hour, a huge explosion was seen at one of the forts, and de Robeck judged this the time to advance the Line B ships through Line A. They did so, bringing a total of eight 15-inch and thirty-two 12-inch guns to bear on the forts. The combination of this amount of naval firepower with that contained in the forts, confined to the narrowness of the Straits can only be imagined, but must have been a truly awesome sight to behold. The firing continued for several hours, with only one of the French battleships suffering serious damage (*Gaulois* was hit by a 14-inch shell and had to beach on a small island just outside the Straits). Around 1400, de Robeck ordered Line C to come forward, and, as Line B withdrew, *Bouvet* was "rocked by a tremendous explosion…heeled over, capsized, and vanished—all within sixty seconds" [2]. Ninety percent of her crew went down with her (figure 9). Nonetheless, the

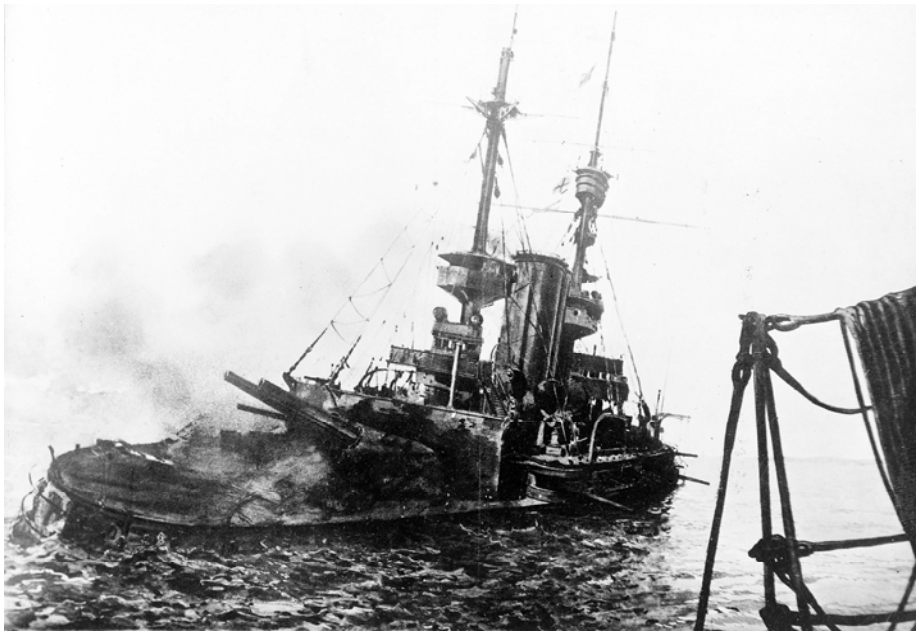
ships of Line C came forward, and the pummeling of the forts continued.

Figure 9. The last moments of *Bouvet*



By 1600, the forts had stopped firing and de Robeck called for the minesweepers. Four trawlers came forward, put out their gear, and swept three mines. But, as before, the shore-based howitzers opened up on them, and, even with navy crews, they eventually turned and fled the Straits. About this same time, *Inflexible* struck a mine that ripped a hole in its bow and forced it to limp back out of the Straits. Fifteen minutes later, *Irresistible* also struck a mine that disabled its engines and left it adrift amidst the shells of Turkish guns. At this point, de Robeck decided to break contact. As the fleet withdrew, he ordered *Ocean* to take *Irresistible* in tow to recover the ship, but, before this could be done, *Ocean* itself struck a mine and was hit by a shell in its steering, rendering it helpless as well.

Figure 10. The abandoned HMS *Irresistible*



Upon retreat from the Straits, de Robeck counted the damage: *Bouvet*, *Irresistible*, and *Ocean* were lost (figure 10); *Gaulois* was beached; *Suffren* was so damaged it had to go into dry dock; and *Inflexible* had to retreat to Malta for extensive repair. Initially in low spirits, his second-in-command Roger Keyes cheered him up by pointing out that the three lost battleships were destined for the scrap heap anyway, and his fleet still had enough power to punch through the Straits. Keyes later wrote of this day:

> Except for the searchlights, there seemed to be no sign of life [inside the Dardanelles]. I had a most indelible impression that we were in the presence of a beaten foe. I thought he was beaten at 2 p.m. I know he was beaten by 4 p.m.—and at midnight I knew with still greater certainty that he was absolutely beaten. It only remained for us to organize a proper sweeping force…to reap the fruits of our efforts. I felt that the guns of the forts and batteries and the concealed howitzers and mobile field guns were no longer a menace [2].

The battle could not be continued the next day due to weather, but Keyes had no doubt it would resume soon. Indeed, reinforcements in the form of five battleships and sixty-two minesweepers to be

manned by members of the lost ships were on the way. Even the War Council, at its 19 March meeting, told de Robeck to continue operations if he saw fit to do so. But, as the bad-weather days went by, de Robeck brooded on what had happened, and, although it was true the battleships lost were destined for the scrap heap, he still did not know exactly what caused their loss or whether he would lose more to the same unknown cause. For, while mine-spotting planes had identified the main mine lines in the Narrows, what de Robeck would not know until after the war was that, ten days before his attack, a Turkish mine expert, having analyzed the fleet's tactics, laid another line of twenty mines perpendicular to the ten lines already in place (figure 8). This line of silent killers damaged both de Robeck's fleet and his enthusiasm for the operation.

On 22 March, at a meeting of senior commanders on *Queen Elizabeth*, de Robeck announced that he now felt the fleet could not force the Dardanelles on its own. In agreement with him was the recently arrived General Sir Ian Hamilton, who had been sent to command the troops that were waiting to take control of the peninsula following the navy's success.[4] Hamilton, who had witnessed the attack on the Narrows, had reached the same conclusion and communicated his views back to Lord Kitchener. With de Robeck and Hamilton of the same mind, it was settled to wait until the latter could assemble his forces for an amphibious landing, which was estimated to take three weeks.[5] This decision was sent to the War Council, and, although Churchill strongly opposed it, it had the support of the Admiralty, Lord Kitchener, and the Prime Minister, and so was approved. But Hamilton's troops were not ready to begin their assault until the end of April, and, when they did, so began a second disaster at the Dardanelles. This one was to be orders of magnitude more costly. By the end of the eight-and-a-half month Gallipoli Campaign, more than a half million Allied men had been landed, with more than half becoming casualties. A full 50,000 of these were killed. On the other side, the

[4] These troops had recently become available as a result of developments on other fronts.

[5] It is worth noting that Roger Keyes, who was convinced the Dardanelles could yet be forced by the navy alone, was away from this meeting organizing the minesweepers.

Turks suffered between 250,000 and 350,000 casualties of their own. The magnitude of these disasters led to the downfall of Prime Minister Asquith's government and the end of many careers—though not Churchill's, who later wrote of the campaigns, "Searching my heart, I cannot regret the effort. It was good to go as far as we did. Not to persevere—that was the crime" [2].

Lessons from the Dardanelles

Given the magnitude of the disasters that occurred at the Dardanelles, it is no surprise that much has been written about them. Thorough study of the academic literature, as well as official documents such as the reports of the British Commission that was stood up in the wake of the events, shows a multitude of lessons that could be learned [6,7]. The list below attempts to capture these lessons, along with several we have identified, and is organized into three categories: operational, strategic, and cross-echelon lessons.

Operational Lessons

When it comes to operating in mined waters, one should not discount the impact of fear that surrounds these operations. Generally speaking, navy ships are expensive and nowadays significantly less expendable than they were a hundred years ago. Thus, those responsible for these ships rightfully fear the damage a sea mine can do. When it comes to clearing mines, any crew attempting to do so is at risk, and, if they are forced to do so while under fire, that risk is greatly magnified both in reality and in the minds of the crew. As Roger Keyes said regarding minesweeping operations in the Dardanelles, "I did not think the fire from the concealed howitzers and field guns would ever be a decisive factor. I was wrong. The *fear* of their fire was actually the deciding factor..." [2].

Ways and means must be properly aligned with ends, if ends are to be reached at minimum cost. Naval gunfire is not generally very effective against land-based artillery, especially when unsupported by spotters. Traditional wisdom, even at the time of World War I, was that ships should be used in battles against other ships for supremacy of the seas, and not against forts. As Massie states, "Ships are more vulnerable than forts: a battleship 500 feet long is a large

target; any part of it can be hit, sometimes with drastic consequences for the entire vessel. A fort, on the other hand, cannot be greatly harmed except by hitting the guns themselves…" [2]. Also, ships are generally not useful for taking land. As the Dardanelles Commission asked in its examination of the purpose of the Campaign as stated by the War Council, "How could a fleet 'take' a peninsula? How could it occupy Constantinople?" [6] Finally, the Allied fleet applied its least capable set of assets, that of fishing trawlers turned minesweepers manned by civilian crews, against the most difficult part of the Campaign, that of clearing minefields under fire. Had the Allies used naval minesweepers (e.g., destroyers fitted with sweeping gear) manned by navy crews, the results of their mine clearing operations might have been dramatically different [8,9].

Operational art consists of space, time, and force factors, and, in the case of closing a maritime strait, these factors tend to favor the actor attempting to close it [10]. Straits by their nature result in reduced maneuver space; Carden and de Robeck learned this lesson the hard way during their assault on the forts in the Straits and the minefields at the Narrows. The lack of maneuver space for their ships likely contributed to their repeat tactics, which the Turks exploited by planting the eleventh, perpendicular mine line shown in figure 8. The aspect of time initially favors the closing actor, since the initiative to close a maritime strait is strictly his, and the longer the countering forces wait, the stronger the closer's defense can be made. In the case of the Dardanelles, the Allies routinely sacrificed the element of time, to detrimental effect. Finally, in part as a result of the inherent advantages of space and time, the closer also enjoys the ability to confound the countering force using lesser forces than the latter requires. Asymmetric and low-cost options such as sea mines can be very effective multipliers of the space-time advantages, as the Dardanelles example amply illustrates.

Quality operational leadership is critical. Admiral Carden, prior to being assigned as commander of the East Mediterranean Squadron, was on the verge of retirement from his post as superintendent of the Malta dockyard after an otherwise undistinguished career. Carden was described by one contemporary as "very second rate—no 'go' in him, or ideas, or initiative" [2]. Even Admiral Fisher, the First Sea Lord, commented during the Dardanelles Campaign that

he "had a sort of feeling that the thing was rather too much for Carden" [2]. Given that Carden nearly had a nervous breakdown during the Campaign, it would appear Fisher was right. Similar criticisms have been levied against General Hamilton during the Gallipoli Campaign, despite his later behind-the-scenes attempts to keep his name clear [11].

Strategic Lessons

If there is the possibility of conducting an operation against an enemy's weakness, it is generally advisable not to bring attention to that enemy's weakness beforehand. Prior to the Dardanelles Campaign, Churchill, angry at the Turks for formally siding with Germany, ordered Admiral Carden to bombard the outer forts of the Dardanelles as a show of displeasure. The latter did so for twenty minutes, and, although some destruction was visited on the forts, this action highlighted the weakness of the Straits' defenses at that time. In response, the Turks and Germans linked the fortresses via telephone; added range finders, range buoys and more searchlights; brought in additional mobile howitzers; and, most importantly, doubled the number of mine lines in the Narrows. Obviously, this made the subsequent Campaign at the Dardanelles significantly more difficult [2, 6].

Joint operations tend to be more effective when conducted in parallel, vice in sequence. Similarly, it is not advisable to "cherry pick" aspects of a coherent plan and expect their implementation to achieve the objectives of the plan as a whole. The original suggested plan for the Dardanelles consisted of amphibious assaults on both sides of the Straits, naval action in the Straits, and land assaults towards Adrianople and Constantinople. Because Lord Kitchener felt he could not spare troops from the Western Front for the amphibious assaults, Churchill seized on the naval portion of the plan alone [2,12]. And, even when the former eventually relented

and gave the 29th Division in support, his orders precluded the use of that force until the navy had failed.[6]

At strategic-level meetings, presence is often taken as participation and silence is often taken as consent. Admiral Fisher, the First Lord of the Admiralty, tried several times to convince Churchill and others that the Dardanelles Campaign required support from ground troops—but he never raised these objections at an actual War Council meeting. Thus, his silence at the War Council was taken as consent for Churchill's position, which was contrary to his own. When asked by the Commission why he felt his only options in disagreement were to remain silent or resign (which he eventually did), he replied that he was not a member of the War Council, but merely an expert on hand to answer questions when asked. And when it came to the Dardanelles, he maintained he was never asked [6, 12,13].[7]

During planning, it is crucial to make critical assumptions clear and to revisit them as operations unfold, especially when plans run counter to prior wisdom. For the Dardanelles Campaign, as recently as the decade prior (1906), the General Staff of the British War Office, in conjunction with the Director of Naval Intelligence at the Admiralty, considered a joint sea and land operation against the Gallipoli Peninsula, and concluded "military opinion…will be in entire agreement with the naval view that unaided action by the Fleet, bearing in mind the risks involved, is much to be deprecated" [6]. This memo was brought before the War Council in February 1915, and the latter decided to ignore its conclusion, based on a set of five assumptions related to Turkish strength and recent developments in naval gunfire [7]. This decision was made before the naval attack; the subsequent failure of that attack largely

[6] Lord Kitchener's orders to General Sir Ian Hamilton were as follows: "If possible a landing was to be avoided; none was to be attempted until the fleet had made every effort to penetrate the Straits and had failed; if a landing should become unavoidable, none should be made until the full force available had assembled; and no adventurous operations were to be undertaken on the Asiatic side" [1].

[7] It has also been argued that Fisher's views were symptomatic of a larger issue of conditioned obedience in the British military at that time [13].

nullified the assumptions on which the memo was ignored. However, these assumptions were not revisited prior to decisions to land amphibious forces on the Gallipoli peninsula [12].

Cross-Echelon Lessons

In kinetic warfare, incremental learning may not be fast enough. An examination of the minesweeping attempts of the Dardanelles shows the Allies tried to change their tactics based on lessons learned: they switched from sweeping upstream to downstream; they attempted sweeping at night to better protect the trawlers; and they replaced the civilian fishermen crews of the trawlers with navy volunteers when the former proved unwilling to sweep under fire. That said it took many sweeping attempts to learn these lessons, during which time the Turks could observe the repeat tactics and adjust to them. At the operational level, this could also be attributed to poor analysis and understanding of the problem at hand, and/or poor planning to address it.

A common understanding of risk across echelons is critical. The Dardanelles Campaign provides two examples of this:

- Roger Keyes, who oversaw minesweeping operations during the Campaign, was flabbergasted by the retreat of the trawlers under fire. In his mind, the mines had to be swept, and even if he lost the seven trawlers conducting operations on a given night, he had reserves to replace them. His thoughts were echoed by Churchill, who wrote, "I do not understand why minesweepers should be interfered with by firing which causes no casualties. Two or three hundred casualties would be a moderate price to pay for sweeping…" [2]. Unfortunately, these assessments were not shared by the trawlers' crews who were repeatedly sent into harm's way with little protection and no way of defending themselves.
- Churchill, who realized that sixteen ships in the British fleet were scheduled for scrapping in 1915, saw these as expendable and therefore worth the risk inherent to the Dardanelles operation. In the words of a telegram from the Admiralty to Carden before the Campaign, "The importance of the results would justify severe loss" [6]. In contrast, Admiral Carden was so worried over the threat to his ships

that he departed the scene on the verge of a nervous breakdown, and, after the 18 March attack at the Narrows, even de Robeck was distraught over the total loss of three battleships (all of which were due to be scrapped) and the operational loss of three more. His assessment of further risk appears to have stood in direct contrast to Churchill's, as the latter had already dispatched two battleships as replacements and had four more in line to follow. De Robeck's subsequent decision to yield the Campaign to the army left Churchill at a loss, the latter saying, "It never occurred to me for a moment that we should not go on within the limits of what *we had decided to risk*, until we reached a decision one way or another [emphasis added]" [6]. Unfortunately, the "we" to whom Churchill refers does not seem to have included Carden and de Robeck.

In planning an operation consisting of multiple stages (and/or branches), it is worth incorporating deliberate decision points along with the stages of the plan to prevent unchecked escalation from occurring. Carden's plan for the Dardanelles consisted of several stages, the first of which was the destruction of the outer forts. Once this was accomplished, the War Council was enthusiastic about the next stage. However, when it became clear the second stage would be more difficult to accomplish than originally thought, the War Council did not deliberate on what to do next; rather, the decision to halt the naval assault and wait for the army was made at the operational level by de Robeck and Hamilton. Had a deliberate decision point been included in the plan, the War Council might have been forced to meet and discuss the way ahead. The two deliberate options on the table at that time were: to call off the attack once it appeared that a large ground force would be necessary to support the navy, and weather the loss of prestige; or, to make a determined effort to force the Straits by a rapid and massive joint operation. Yet the Council did not formally consider these courses of action—instead it vacillated for several weeks, eventually "drifting" into acquiescence of de Robeck's and Hamilton's decision [6]. The end result was a significant escalation of the efforts against the Straits, one that was unchecked by strategic decision-makers. A more obvious example of "mission creep" may be hard to find.

If strategic communications are not thought through in detail prior to the launch of a major operation, the media can seize the opportunity to shape the narrative and constrain options available to decision-makers. In the Dardanelles case, following the 19 February bombardment of the outer forts, an article appeared in *The Times* emphasizing the importance and supposed brilliance of the campaign to force the Straits, but this article also commented that military support to the naval attack would be required. Even more important, the article stated, "the one thing that the Allies dare not risk in a persistent attack on the Dardanelles is failure" [12]. Several similar articles appeared in major outlets around the same time, and the net effect of these articles was to frame the initial attack on the outer forts as a resounding success and any attempt thereafter to break off the campaign as a slight on British national prestige. Thus, although Lord Kitchener had earlier stated, "we could leave off the bombardment if it did not prove effective," [6] it would have been difficult for the War Council to call off the remainder of the naval attack without losing face. Indeed, the Commission concluded "the argument based upon the loss of prestige…exercised so predominant an influence as practically both to nullify the intentions which had been originally formed and to obliterate the recollection of the considerations which were advanced prior to any definite action having been taken" [6].

Strategic communications can take the form of words, but also of *deeds*. On 16 February, the War Council decided, based on events recently transpired, that enough troops were available to muster an army division in the region as a "just in case" force. This decision, in conjunction with the press reports cited above that highlighted an expectation of army support to the navy, [6] signaled to the world that escalation was likely, when in fact such a decision had not been made (indeed, the naval attack had not even begun yet).[8] As the Commission concluded, "whatever may have been the intentions of the Government, the public opinion of the world must have been

[8] This may have also signaled to Admiral Carden that a large ground force would be available to him if he ran into difficulty forcing the Straits alone, and this may have contributed to the operational pause he called between 8 and 10 March [8].

led to believe that an intention existed of making a serious attack both by land and sea" [6].

In formulating a strategy, one should always consider what failure of that strategy would entail, in addition to what success might look like. In the case of the Dardanelles, the Commission concluded "the stress laid upon the unquestionable advantages which would accrue from success was so great that the disadvantages which would arise in the not improbable case of failure were insufficiently considered" [6].

Was the Strategy Sound?

Before shifting gears to an examination of the Strait of Hormuz, it is worth briefly examining what history has to say about the potential of the strategy for the Dardanelles Campaign to actually work. Recall that, although the operational objectives were to destroy the Turkish defenses and clear a path through the minefields, the strategic objectives were to reopen this line of communication for Russia and, more importantly, to pacify Turkey and get the neutral Balkan states to join the Allies' cause—all in the hopes of shortening the war. But did this "shortcut to victory" have a chance?

History gives a mixed answer to this question. Some believe that, although British ships had visited relatively minor damage on the forts at the Narrows (destroying only eight of the seventy-two big guns there), the Turks had fired such a large fraction of their available ammunition as to be running short. If this was true, the Allies had only to attack again, draw fire until the Turks ran out, and send the minesweepers in to open the Straits relatively unhindered [2]. Churchill was among the first to advance this possibility, writing in his memoirs, "And yet if the navy had tried again they would have found that the door was open" [14]. However, a recent study of Turkish sources has called this into question, suggesting the Turks had enough ammunition remaining to continue contesting the Straits and that any further naval assault would have resulted in further losses for the Allies [4]. Thus, the ability of the Allies to achieve their operational objective of opening the Straits via navy action alone seems questionable at best and dubious at worst.

Recall also Churchill's belief that if the Straits could have been forced, the arrival of Allied gunships within range of Constantinople would have caused Turkey's capitulation. This, too, is subject to debate. Massie writes that even the initial naval attack on the Straits caused a mass exodus from the Turkish capital; that state archives were hidden; and that banks were emptied of gold [2]. Such actions suggest Turkey was afraid of the Allies breaking through, but was this enough to cause capitulation? As the Dardanelles Commission pointed out, the Allied navy could not take the capital—only an army could do that [6]. Because the Allies' initial strategy relied on the navy alone, their only hope for an army in Constantinople relied upon a revolution in the Turkish military. As Ellison states, Turkish orders were, in the event of Allied success, for the Government and the central reserve of the army to withdraw into Asia Minor. As he says:

> In these circumstances a revolution depended on the Turkish army mutinying and refusing to obey orders. But a mutiny in the presence of an enemy is an unlikely event, especially when a nation, as was the case with the Turks in 1915, knows it is fighting for its national existence. History records very few examples of such a breakdown of military discipline. Accordingly the underlying idea of the whole plan was Utopian in the extreme [12].

Thus, although Allied success in opening the Straits would have accomplished one of the strategic goals (opening the passageway to Russia), it seems doubtful it would have achieved the second, that of causing Turkey to submit. In the interest of fairness, however, it is worth pointing out the two "beneficial effects" of the Campaign that were cited by Prime Minister Asquith: it postponed Bulgaria's joining the Central Powers; and it kept a Turkish force of about 300,000 occupied for nine months, when that force would have been a much bigger asset to the enemy if employed elsewhere [6]. But as the Commission concluded, "whether those advantages were worth the loss of life and treasure involved is, and must always remain, a matter of opinion" [6].

The Strait of Hormuz

Geography and Bathymetry

No matter who you ask, the Strait of Hormuz (SoH) will be listed as one of the top geostrategic maritime chokepoints in the world. This is in large part due to the fact that the countries of the Persian Gulf produce nearly 40 percent of the world's oil, while holding about 60 percent and 45 percent of the world's proven reserves of oil and natural gas, respectively. The vast majority of the oil and gas produced by these countries transits the Strait of Hormuz in the bellies of supertankers (e.g. nearly 17 million barrels of oil per day). This alone would make the Strait an important maritime feature, but when its geography and geopolitics are added to the picture it is easy to see the importance of this waterway to the economies of the world [15,16,17,18].

Figure 11 shows the geography and bathymetry of the SoH; figure 12 shows aerial photographs taken from the space shuttle *Challenger*. The Strait, which separates the Gulf of Oman to the east from the Persian Gulf to the west, is approximately 280 km (170 miles) long and 56 km (35 miles) wide at its narrowest point, north of the Omani exclave of the Musandam Peninsula to the south. This peninsula consists largely of the Hajar Mountain Range, which descends sharply to the Strait and features a number of fjords and small fishing villages. On the other side of the Strait lie Iran and its Zagros Mountains, which descend to lime and sandy hills and the coastal plain parallel to the Gulf. The water depth in the Strait varies from 40 to 200 meters (130 to 660 feet), with an average depth of about 50 meters (160 feet). The drop-off from the coast is steeper on the Omani side, with south-to-north shoaling occurring as one moves towards the coast of Iran where the water becomes much shallower. The Persian Gulf has reverse shoaling from the Strait (north-to-south) but is generally relatively shallow as well, while the Gulf of Oman drops off sharply from the Strait with waters quickly reaching depths in excess of 2000 meters. The Strait has strong tides with a range greater than one meter throughout (as

does the Persian Gulf), and these tend to mask the weak residual currents that vary across the Strait [16].

The internationally accepted transit lanes through the Strait (figure 11) consist of 2-mile-wide channels for inbound and outbound traffic, with a 2-mile-wide buffer zone in between. The water in these channels is less than 50 meters deep. These transit lanes are dominated by a group of seven islands just outside the Strait, of which Iran controls the islands of Abu Musa, as well as the Greater and Lesser Tunbs (Iran seized the latter in 1971, though they are still claimed by the UAE) [16,18].

Figure 11. Strait of Hormuz, with bathymetry contours (in meters). The defined shipping transit lanes are shown in yellow

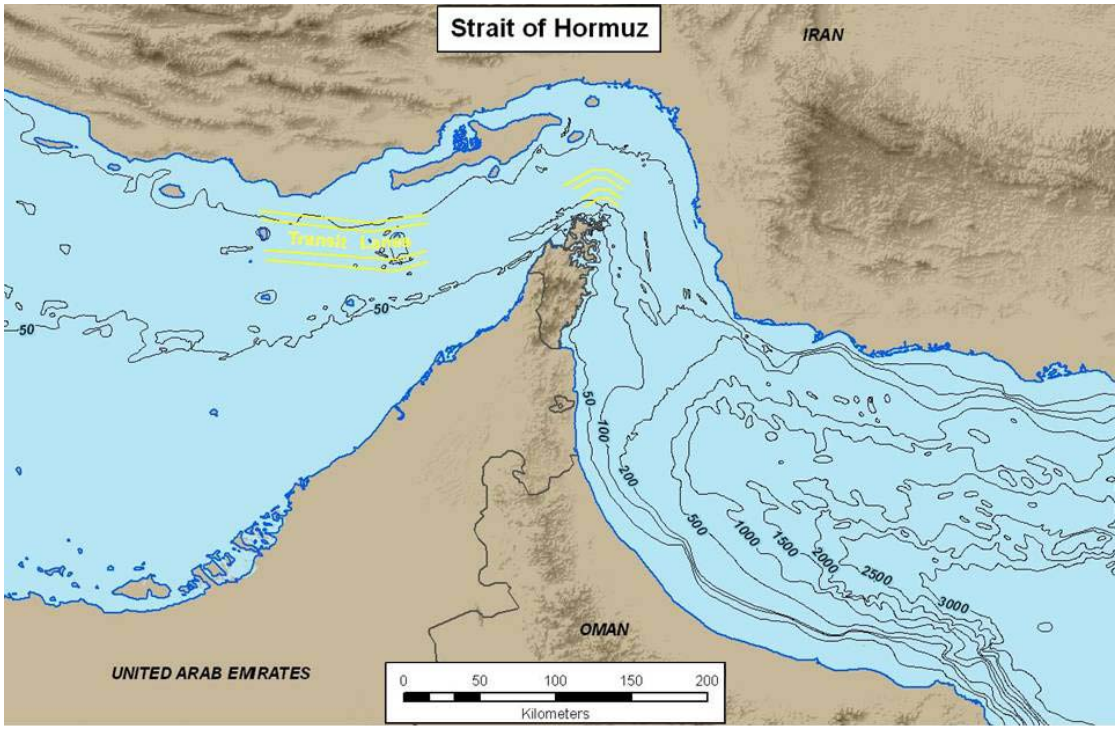
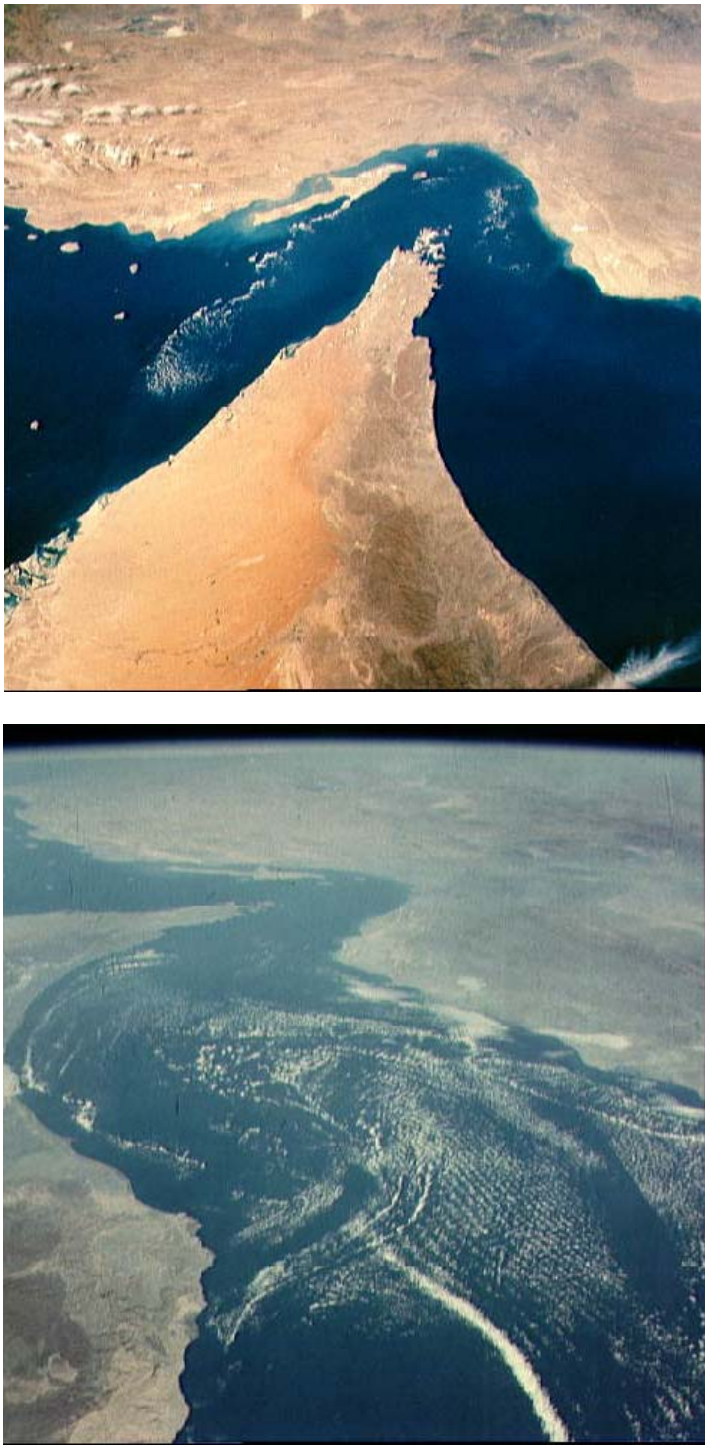


Figure 12. Aerial photographs of the Strait of Hormuz (courtesy of NASA)



Threat to the Strait

Given the geostrategic importance of the Strait, it is no surprise that Iran has realized its deterrence value in preventing an attack. Iran has stated openly and often its intent to threaten international transit through the Strait in the event of hostilities. Even the Supreme Leader Ayatollah Khameini has stated, "If the Americans make a wrong move toward Iran, the shipment of energy will definitely face danger, and the Americans would not be able to protect energy supply in the region" [19].

Iranian Capabilities

To back up this threat, Iran has been building its military options. The Iranian navy during the time of the Shah focused on conventional capabilities. Iran's modern navy consists of both its regular navy and a naval component of its Revolutionary Guard Corps, the latter of which has strongly focused on the development of asymmetric capabilities. This focus was largely born of the Iran-Iraq War (and, more specifically, during the Tanker War of 1984-1988), when Iran attempted to control shipping through the SoH. To do this, Iran used both conventional attacks (naval gunfire and anti-ship cruise missiles) and asymmetric tactics (sea mines and small boat attacks). As a result of lessons learned by Iran at the hands of the United States Navy (Operation Praying Mantis[9]) and an inability to procure a first-rate conventional navy, asymmetric tactics became the basis for much of Iran's modern naval doctrine, which the U.S. Office of Naval Intelligence describes as follows:

> Within the context of Iran's naval strategy, asymmetric warfare can be described as incorporating one or more of the following concepts: the use of conventional weapons in unconventional ways, for example, using small boats to lay small mine lines directly in the path of a target; Capitalizing on the strengths of atypical assets, such as the speed, maneuverability, and stealth of small boats, to target the weaknesses of more typical naval assets, such as the relative sluggishness of a large warship; Incorporating

[9] This was the 18 April 1988 attack by U.S. naval forces in retaliation for Iranian mining of the Persian Gulf during the Iran-Iraq war and the subsequent mine damage to USS *Samuel B. Roberts*.

> concepts such as mass, in which assets leverage large numbers to overwhelm their targets. Finally, for Iran, asymmetric warfare uniquely includes concepts of a revolutionary spirit, jihad, and martyrdom [20].

In addition to emphasizing asymmetric naval warfare, Iran has also incorporated notions of passive defense (camouflage, concealment, and deception), decentralized command (so-called "mosaic defense"), destabilization of the region (internationalizing conflict), and integrated operations (combining various capabilities to achieve force multiplication). Finally, Iran realizes that, in any conflict, political factors are at least as important as military ones, and, even if it suffers a military defeat, there remains the possibility of being successful in achieving various political and strategic goals [20]. One needs only to study the experience of Iran's proxy, Lebanese Hezbollah, in its 33-day war with Israel in 2006 to see why Iran believes this is possible [21].

In terms of the means to conduct this type of warfare, Iran has been busy procuring and producing naval assets with capabilities in line with its asymmetric doctrine. Although a full discussion of the Iranian naval order of battle is beyond the scope of this paper, such discussions tend to focus on capabilities in the following areas:

- *Surface vessels:* Although Iran does have a small number of conventional surface ships such as corvettes and missile boats, it has also built or acquired many small- and medium-size fast-attack craft (FAC). These FACs typically have the capability to carry armaments such as heavy machine guns or rocket launchers, as well as torpedoes and anti-ship missiles. Some are also equipped to act as covert minelayers. Iran would likely use these small boats as "swarms" in order to overwhelm a larger ship's defenses.

- *Submarines and torpedoes:* Iran has three KILO-class diesel-electric submarines, as well as seven YONO-class, and one NAHANG-class, midget submarines. These submarines are most likely intended to be used for mine-laying, as well as special and anti-shipping operations. Iran also has a recently expanded torpedo capability.

- *Missiles and rockets:* Iran prides itself on having a large arsenal of anti-ship cruise missiles (ASCMs). This arsenal includes:

variants of the Chinese Silkworm missile; extended-range variants of the Rad missile (a follow-on to the Seersucker) that can perform evasive maneuvers and carry warheads up to 500 kg (1000 lbs); the Noor missile, which is an upgraded version of the Chinese C-802 and is deployed in mobile batteries along Iran's coast and islands; and the diverse Kosar series of small ASCMs which are reportedly truck-mounted and deployed on Iran's Gulf islands. With this suite of missiles, Iran can target any part of the SoH, and much of the Persian Gulf and Gulf of Oman as well. Iran also maintains a number of rocket systems (some of which are gyro-stabilized for use on boats), as well as shore-based artillery rockets (the Fajr series). Many of these systems would be based along the relatively mountainous Iranian coastline, which lends itself well to the shielding and bunkering of such assets.

- *Naval mines*: The Iranian navy fully appreciates the power of the naval mine and considers mine-laying one of its most important missions. As such, Iran has procured or produced a wide variety of naval mines (an estimated 2,000 in total), to include: bottom-moored contact mines; moored and bottom influence mines using magnetic, acoustic, and pressure fuses; limpet mines for special operations; drifting mines; and remote-controlled mines. In terms of minelayers, Iran could use its submarines and conventional navy ships, but realistically almost any boat can lay mines, and Iran would likely also use small boats and civilian vessels to do so.

With an understanding of the Strait's geography and bathymetry and Iran's naval order of battle, the next questions are: How credible is Iran's threat to international shipping in the Strait? Would Iran really want to close the Strait? If so, could Iran actually do it and for how long? A full analysis of these questions is again outside the scope of this paper, but we briefly address each one here.

How Credible Is the Threat?

As we have described above, Iran has constructed a navy with considerable asymmetric and other capabilities designed specifically to be used in an integrated way to conduct area denial operations in the Persian Gulf and SoH, and they routinely exercise these

capabilities and issue statements of intent to use them. This combination of capabilities and expressed intent does present a credible threat to international shipping in the Strait (at least in principle, more on this below). Further, it provides Iran with a level of deterrence for hostile action against it.

Would Iran Really Want To Close the Strait?

To answer this question, some basic economics of oil and natural gas must be understood. As mentioned above, 17 million barrels of oil transit the Strait every day, and it is widely appreciated that there is insufficient pipeline capacity in the Middle East to compensate for the loss of the Strait [22,23].[10] Economic simulations conducted in 2007 showed that, even if Iran were able to fully close the Strait for only a week (with continuing threats but some shipping getting through thereafter), worst-case results would be a more-than-doubling of the price of crude oil; a decrease in U.S. gross domestic product of more than $161 billion, and a decline in real disposable personal income of more than $260 billion, over the course of the following year; and a loss of more than a million U.S. jobs over the following year and a half [24]. Although moderate-case scenarios were not quite as dire, they still showed a major impact to U.S. and world economies. So, there are incentives for Iran to close the Strait if it wanted to economically hurt countries like the U.S.

However, there are disincentives as well. The first is that international maritime law says passage through straits, even if they are entirely within a country's territorial waters, must be unimpeded and at no cost. Thus, any closure of the SoH by Iran would immediately and rightly be considered a *casus belli* [22]. In addition, Iran itself is the second-largest exporter of oil among OPEC countries, with roughly two-thirds of its annual revenue coming from oil exports. Thus, blocking the Strait would significantly hurt Iran's economy as well. And, although Iran does have large foreign exchange reserves, these are much smaller than in countries like

[10] The only major functioning pipeline that could currently serve as a bypass is the trans-Saudi Arabia Petroline, which has a capacity of 5 million barrels per day (MBD), though this could, in principle, be increased to 11 MBD using drag-reducing agents [23].

Saudi Arabia and the UAE, and Iran has a large, restive population that, in the past, has reacted negatively to economic hardships [25,26]. With all of the above taken into account, it seems likely that Iran would not *offensively* attempt to close the SoH, but, if it were attacked and wished to retaliate and/or escalate a conflict, an attempted closure remains a possibility.[11]

Could Iran Actually Close the Strait?

Although the modern Iranian navy is certainly designed with area-denial operations in mind, it is still relevant to ask whether it has the requisite capabilities to actually close the Strait. Although many such analyses are likely classified, there are several open-source attempts to address this question. Cordesman concluded in 2007 that Iran "could not 'close the Gulf' for more than a few days to two weeks even if it was willing to sacrifice all of these [naval] assets, suffer massive retaliation, and potentially lose many of its own oil facilities and export revenues" [15]. U.S. defense officials have apparently come to similar conclusions, as evidenced by a statement from Vice Admiral Jacoby of the Defense Intelligence Agency to the U.S. Senate in which he said, "Iran's navy…could stem the flow of oil from the Gulf for brief periods by employing a layered force of diesel-powered Kilo submarines, missile patrol boats, naval mines, and sea and shore-based anti-ship cruise missiles" [25].

A detailed analysis of this question was conducted by Talmadge using a scenario in which Iran was able to lay several hundred mines in the Strait and the Persian Gulf [27]. In her analysis, Talmadge assumes the U.S. considers its mine countermeasure (MCM) forces too vulnerable and scarce to use in a hostile environment, and so would instead wait to use them until it had essentially eliminated the threat from ASCMs. Using a technical analysis of U.S. air and

[11] There is the possibility that Iran could mine all but a small "Q-route" through the SoH that would be known only to it, such that Iranian oil ships could still get through. However, the U.S. could likely use surveillance assets such as satellites and Unmanned Aerial Systems to accurately map the path of these ships and communicate it to others. In addition, it is possible that ideology could trump common sense in Iran's strategic thinking, thereby rendering many assumptions such as these invalid.

Iranian ASCM and air-defense capabilities, she concluded it could take between 9 and 72 days for the U.S. to do so. Using mine-clearance rates based on previous efforts in the Persian Gulf (e.g., Operation Candid Hammer), she concluded it would take between 28 and 40 days to adequately clear the minefields. Putting these two timelines together, she concluded overall that it could take 37 to 112 days for the U.S. to reopen the Strait under such a scenario [27]. Many of her assumptions regarding Iranian capabilities were subsequently disputed as giving the Iranians too much credit, but the disputer did not rule out completely the capability of Iran to threaten the Strait [28]. More recent (though less detailed) analyses have cited the ability of modern supertankers to withstand both mine strikes and ASCMs [29], as well as the operational challenges of attempting to covertly mine the entire navigable channel of the Strait [30], to argue that Iran's capabilities are not enough to close it and its threats to do so are nothing more than an information campaign [31], claiming this threat is "not cause for alarm" [29] and that the "world can afford to relax from its current hair-trigger alert" [30]. Clearly, because there is still dispute among analysts on this point, perhaps the best arbiter is oil prices themselves. As Republican Congressman Jim Saxton stated in a July 2007 report, "It is…a matter of judgment how real the threats are, but the market does attribute some credibility to them" [32].

In considering Iran's area-denial capabilities for the SoH, one should also bear in mind that, in taking such an action, Iran would undoubtedly have specific objectives in mind (e.g. causing economic harm to the U.S.), and it may not be necessary to fully close the Strait to accomplish these objectives. At any rate, if we are going to analyze the lessons learned from the Dardanelles Campaign in the context of the SoH, we must assume for the moment that Iran has both the intent and the capability to close the Strait (or at least seriously threaten freedom of movement through it). Thus, we do so and move on.

The Dardanelles and Hormuz—A Strait Comparison

Similarities and Differences

In comparing the Dardanelles Straits and the Allied Campaign there to a potential Iranian closure of the Strait of Hormuz, a number of similarities and differences arise. Some of the similarities include:

- Both straits are strategic maritime chokepoints. Just as Russia needed the Dardanelles to receive war materiel and ship her wheat to market, so too does the U.S. and much of the world need the SoH to receive oil and natural gas supplies from the Middle East.
- The Turks employed an integrated defense at the Dardanelles (mines plus covering fire). The Iranians would likely employ an integrated defense of the SoH as well (mines plus submarines plus small-boat swarms and ASCMs).
- Although some have referred to the Turkish minefields at the Dardanelles as strictly defensive in nature [28], as described above the Turks did lay a perpendicular minefield to *offensively* target Allied ships based on observations of their repeat tactics [33]. In a SoH closure, it seems likely the Iranians would attempt to use dynamic offensive mining to target enemy naval (and possibly merchant) ships in addition to its initial sowing of naval mines to close the Strait.

Some of the differences include:

- The Dardanelles are dominated by a single country; the SoH is not. Thus, although Turkey was able to lay mines across the Dardanelles with ease, it would be much harder for Iran to do so undetected. Also, international law now forbids closing a strait; such was not the case in 1915.

- The Dardanelles is a much narrower strait, with a width of only two miles at the entrance and roughly half that at the Narrows. The SoH, on the other hand, is 35 miles wide at its narrowest (and, although the shipping transit lanes are only two miles wide with a two-mile buffer, fully 20 miles of the Strait's width is navigable by large ships). Also, the Dardanelles is relatively deep (300 feet at the Narrows); the SoH is, on average, only about 160 feet deep (shallower than that near the Iranian coast). That said, the Turks could range the entirety of the Narrows with the guns of their forts, and the Iranians can cover the entire SoH with their ASCMs (assuming effective over-the-horizon targeting). The larger width of the SoH makes it more difficult to mine and sustain small-boat operations, while the shallower depth makes it more difficult for submarines.
- The merchant ships the Turks were preventing from passing through the Dardanelles were highly susceptible to damage from the mines they used. Modern supertankers, however, are massive ships with little in the way of precious components throughout much of their length. They also have double hulls that are not easily penetrated, and even in such an event, they generally contain too much fuel and too little oxygen for the oil in them to seriously catch fire [29]. That said, damage from a mine to a supertanker can still quickly run into the millions of dollars, and, because there is not a large surplus of supertankers in the world, the opportunity cost from having one put out of commission for some time is not insignificant.
- In the Dardanelles campaign, the Allies were limited to the use of surface combatants (they had spotting airplanes, but no ability to deliver ordnance by air). In a SoH closure, the U.S. would most certainly bring its considerable air power to bear in addition to its naval vessels, and the U.S. has technical methods for locating ASCM launchers [27, 28] whereas the Allies had no such means of identifying the locations of the Turkish howitzers.

The above list may entice the reader to think that, although at first glance the two scenarios appear to have similarities (in that they both involve integrated defense of a maritime strait), that the differences between the two render them incomparable, and thus

the lessons learned from the Dardanelles Campaign might have little relevance to a modern SoH closure. Yet, the lessons we identified from the Dardanelles were primarily at the operational and strategic levels, as opposed to the tactical, where many of the above differences lie. Thus, although the differences mainly highlight the difficulty Iran would face in trying to actually close the SoH, a juxtaposition of the lessons from the Dardanelles might still be useful under the assumption that Iran is able to do so.

Dardanelles Lessons Applied

Examining the list of lessons from the Dardanelles in the context of an Iranian closure of the Strait of Hormuz might yield the following points of interest.

- The fear that surrounds operations in mined waters that was so prevalent in the Dardanelles Campaign should not be discounted during attempts to demine the SoH. Given the cost of modern warships and past U.S. experiences with them being damaged by mines in the Persian Gulf (e.g., USS *Samuel B. Roberts*), there would definitely be a fear of using them in or near waters known to be mined. And, although the U.S. Navy and its likely Coalition partners would be using professional military crews and dedicated mine-clearing platforms and systems (as opposed to civilian crews on fishing trawlers), if these crews were ordered to clear mines while taking fire from ASCMs and being harassed by small-boat swarms, it is not unreasonable to assume they would harbor a good deal of fear as well. As has been noticed in the past, the psychological effects of mines on naval operations should not be discounted [34].
- In the Dardanelles Campaign, the Allies applied their least capable naval assets, the mine trawlers, against the strength of the Turkish defense, the minefields. Although the U.S. and its Coalition partners have significantly greater mine-clearing technologies than existed a hundred years ago, at least for the U.S. Navy, MCM represents one of its weakest capability sets [35]. Although the U.S. does keep four MCM ships and a squadron of MH-53E Sea Dragon helicopters forward-deployed in the Persian Gulf [34], the U.S. Navy has

consistently undervalued and under-resourced mine-clearing capabilities under the belief that investments in other warfare areas assumed less risk overall [3]. This assumption may be true in the face of a blue-water naval threat, but, when it comes to a sea-mining scenario, it could not be further from accurate. In addition, the U.S. Navy has not traditionally considered service in the MCM fleet to be career-enhancing [34]. Thus, the potential exists for the U.S. to make the same mistake as the Allies if it does not employ its MCM assets wisely or get significant additional capabilities from a Coalition.

- An analysis of operational art (time, space, and force factors) showed the Allies routinely sacrificed the element of time and operated in a deficiency of space, and they paid for this in terms of the force they needed to apply. Lowell's analysis of operational art for an Iranian SoH closure concluded the following:

  > Iran's closing doctrine takes advantage of the Space-Time interaction by quickly acting across the AOR [area of responsibility] before announcing it [sic] actions—achieving control and surprise. It also employs the right combination of weapons needed to extend the time the Strait is controlled. Iran's doctrine takes advantage of the Force-Space interaction by maximizing its combat density at D-day. The Time-Force interaction is maximized simply by location; forces only need to traverse a few miles from protected bases to establish strait control. Finally, by utilizing a clandestine means of force employment within an existing training AOR, the IRGCN retains the advantages of timing, reliability, and economy of force. …Iran maintains the upper hand, as long as it holds the advantage of Space-Time-Force [10].

- The Dardanelles illustrated the importance of quality operational leadership. Although specific leaders that would be involved in responding to a closure of the SoH are unknown, and therefore not subject to comment here, the U.S. does maintain a 3-star Admiral in charge of its forward-deployed naval forces in the Middle East (the Commander of U.S. Naval Forces Central Command). Given the seriousness of the threats to U.S. interests in the Middle East, it is probably safe to assume that quality leaders are chosen for

this position (3-star billets also require Congressional approval). That said, it is worth pointing out that part of Admiral Carden's mental troubles in the Dardanelles Campaign stemmed from the pressure he felt from his civilian chain of command. A modern SoH closure event would almost certainly become highly politicized overnight, and it is likely U.S. civilian leaders would become involved at the slightest sign of operational difficulties, with the possibility of political considerations trumping operational expertise. As such, the operational leader may find himself in a position of having to risk future promotion by standing up to those in Washington, DC [36].

- In the Dardanelles case, the Allies gave Turkey warning of their future attack (and of the weakness of the Straits' defenses) by the earlier bombardment of the outer forts, with the Turks improving their defenses as a result. Although not quite the same, the U.S. did alert Iran to weaknesses in its area-denial capabilities and doctrine during Operation Praying Mantis. As a result of lessons learned during that campaign, Iran has spent years shoring up its capabilities and developing its asymmetric warfare doctrine.

- During the lead-up to the Dardanelles Campaign, there was much debate over whether the operation should be a joint army-navy one, or if it could be conducted by the navy alone. Obviously, the decision to try the latter, and later the former, did not work out well. In a SoH closure event, the U.S. might prefer to use its limited MCM assets in a later role, once it has first dealt with the Iranian ASCM threat, as Talmadge suggests [27]. However, political considerations may not afford the U.S. military the time for that option, and political/economic realities of a SoH closure might dictate the use of naval and air assets to deal with Iranian threats concurrently.

- One of the major criticisms of specific persons in the Dardanelles was levied at Admiral Fisher for not raising his objections to the navy-only plan during War Council meetings. In the wake of a SoH closure, it is unlikely but still possible that senior U.S. military members, such as the Chairman of the Joint Chiefs of Staff and the Commander, U.S. Central Command, might view their role as simply to

provide advice to civilian decision-makers, but not to contradict civilian leaders such as the Secretary of Defense if the latter represents views to the President with which they disagree. Although not pervasive, there are still those in the military and government who view their options as silence or resignation, and choose silence.

- Making critical assumptions explicit during strategic and operational planning is a lesson taught and stressed in U.S. military schools and doctrine, but one that bears repeating. In addition, challenging and re-verifying assumptions early and often is critical.

- The Allies' initial analysis of the problem at the Dardanelles was poor, and their subsequent incremental learning proved to be too slow to adapt their tactics before the Turks could take advantage of them. During a campaign to reopen the SoH, the U.S. and its Coalition partners could face a similar problem if their intelligence preparation of the environment is inaccurate or insufficient, and/or if they do not immediately fold tactical and operational lessons back into future planning.

- In the Dardanelles Campaign, there were several examples of how differing assessments and tolerances of risk across echelons of command negatively impacted operations. This is a critical lesson to be applied to a potential SoH closure, where there is a distinct possibility of loss of U.S. naval and air assets and associated personnel (as well as for civilian casualties). The amount of risk the military may be willing to assume may differ greatly from the amount civilian leaders are willing to assume, which can create enormous friction if the differences are too great.

- The plan for the Dardanelles did not contain explicit strategic decision points between its phases, which contributed to unchecked escalation of military involvement. This is another critical lesson for a SoH closure, because such a scenario carries enormous risk of escalation of hostilities between Iran and the U.S. (as well as regional countries and Coalition partners).

- Strategic communications in both words and deeds were very important during the Dardanelles Campaign, and the Allies failed in allowing the popular narrative to constrain their options (and telegraph their intentions). Given the modern 24/7 news cycle and its ability to drive popular narratives of success or failure, strategic communications are vitally important to any operations in the wake of a SoH closure. Getting these wrong has the potential to prolong the conflict, significantly constrain U.S. options, exacerbate the economic and political impacts of the closure, reduce U.S. prestige, and allow Iran to achieve a strategic victory even in the face of a tactical and operational defeat.

Although it seems, based on available evidence, highly unlikely that Iran would be able to keep the SoH closed for weeks or months on end, it is worth bearing in mind that reopening the Strait would represent only a tactical and/or operational success on the part of the U.S. and its Coalition partners. As evidenced by Lebanese Hezbollah's political successes in the wake of its 2006 war with Israel, it is entirely possible that Iran could emerge from a conflict in the Strait militarily weaker, but politically and strategically stronger, depending on how events played out.

Recommendations

Based on the lessons applied discussed above, we offer the following recommendations to U.S. policymakers, strategists, and military planners and operators.

U.S. planners should not underestimate the difficulties of conducting mine-clearance operations in the SoH. Given the inherent uncertainties and difficulties in this very difficult mission, the limited quantities and capabilities of U.S. and Coalition mine-clearing assets, the dangerous threat environment in which they may have to operate, and the psychological effects of operating both in mined waters and under fire, it is incumbent upon planners to make reasonable assumptions regarding mine-clearing timelines in order to avoid giving false impressions of ease and swiftness of the mission to policy- and decision-makers, as well as to our strategic communicators.

Given Iran's initial advantages of space, force, and time, the U.S. and its Coalition partners may want to investigate first-strike and/or quick-strike options to allow swift action against Iran's area-denial capabilities if it looks like Iran may be on the verge of attempting to close the SoH. Of course, this implies an investment in assets to provide valid, timely, reliable, and actionable intelligence along these lines, as well as forward-deployed assets to act on such intelligence [10]. It also raises questions about the ability of forward-deployed forces to carry out such operations without reinforcements.

U.S. military leaders in the chain of command for an operation in the Strait must be prepared to "stand and deliver" their professional military opinions to U.S. senior civilians, even if those opinions are unpopular or politically unpalatable. Conversely, U.S. civilian decision-makers must ensure they seek out, and get, the true professional opinions of their senior military experts. This sounds easy in principle; in practice, personalities and politics frequently get in the way.

The U.S. and its Coalition partners must realize, and account for, improvements in Iran's area-denial capabilities and doctrine in the past 22 years. Iran has learned many lessons from Operation Praying Mantis and years of observing our operations in the SoH; we should not simply assume the next conflict in the Strait will play out as well or that Iran will make the same mistakes it made then.

U.S. strategists and planners should think hard about, and decide, whether to conduct simultaneous navy-air operations in order to reopen the Strait, or whether it is better to dismantle the pieces of Iran's integrated defense in sequential fashion (e.g., by first dealing with their ASCM and small-boat capabilities and then clearing mines in a less hostile environment). Making these decisions in an informed way and being able to articulate the reasons why may prevent the "cherry-picking" of aspects of the plan.

In writing a plan to reopen the SoH, planners should ensure they have the latest and greatest intelligence preparation of the environment (and intelligence analysts should endeavor to make this a high-quality product), to ensure they fully understand the problem they are attempting to solve. In writing the plan, they

should be as explicit as possible as to what their critical assumptions are, and what risk is involved if those assumptions prove faulty. The plan should also include explicit decision points at any phase of the plan that may lead to further escalation of the conflict. If the plan is put into execution, the U.S. military should ensure it has adequate mechanisms and processes in place to fold tactical and operational lessons learned immediately back into future planning and future operations.

Senior U.S. civilians and military members alike must come to a common understanding of what the U.S. is willing to accept in terms of strategic and operational risk during a reopening of the SoH. This discussion should be as specific as possible, preferably to the level of number of ships and aircraft lost, number of casualties, and so on.

Communicating effectively during a conflict in the Strait will be at least as important as actions taken there. All echelons of U.S. civilian and military establishments need to be given guidance regarding what to say and how and when to say it. Planning for this is at least as important as planning for kinetic action, and it would behoove the U.S. to have thought through and developed communications plans for various likely scenarios that might occur during the course of, and as a result of, such a conflict.

Strategists need to think through what "failure" might look like for the U.S. and its Coalition partners as a result of a conflict over closure of the Strait (and conversely, what "success" might look like for Iran), and how to prevent such scenarios from playing out. Simply assuming that military action is required as a response, or that tactical and operational successes will translate into strategic ones, leaves the door open for Iran to snatch a strategic win from the jaws of defeat [37].

Conclusion

A comparison of the 1915 Allied Campaign to force open the Dardanelles Straits to a modern Strait of Hormuz closure event shows a number of significant similarities, as well as some significant differences. Although many of the differences highlight how difficult it would be for Iran to actually close the Strait of Hormuz, the similarities suggest it is still worthwhile thinking through what the lessons from the Dardanelles might teach us in the context of the SoH. Doing so yields a number of points to consider when thinking through the strategic implications of how a SoH closure event would play out, as well as during operational planning to reopen the SoH and counter Iranian threats to naval and merchant shipping. Although it may seem unlikely that a near-perfect-storm of errors and misjudgments would doom the U.S. to disaster in the SoH as it did the British at the Dardanelles, it is still better to eschew faith in the odds and apply the lessons of the past than to leave open such a possibility.

Appendix

The following table shows a timeline of events for the Dardanelles and Gallipoli Campaigns.

Date	Event
28 Jun 1914	Archduke Franz Ferdinand of Austria-Hungary is assassinated
1 Aug 1914	Germany declares war on Russia
3 Aug 1914	Germany declares war on France. Turkey mobilizes its army and navy
4 Aug 1914	Britain declares war on Germany
10 Aug 1914	*Goeben* and *Breslau* enter the Dardanelles
26 Sep 1914	Turks close the Dardanelles by laying mines and cut Russia's line of communications
29 Oct 1914	*Goeben*, *Breslau*, and a Turkish squadron attack Odessa harbor
31 Oct 1914	Britain declares war on Turkey
2 Nov 1914	Russia declares war on Turkey
3 Nov 1914	British and French ships bombard the outer forts of the Dardanelles
2 Jan 1915	Russia asks Britain for a demonstration against Turkey
3 Jan 1915	Churchill asks Carden if he thinks forcing the Dardanelles by ships alone is feasible
28 Jan 1915	The British War Council decides on a naval attack against the Dardanelles
19 Feb 1915	Allied naval attack against the Dardanelles begins
26 Feb 1915	Outer forts of the Dardanelles are evacuated by the Turks
27 Feb – 8 Mar 1915	Naval attack and minesweeping continues as weather permits
8-9 Mar 1915	Weather pause in Allied attack. Turks lay perpendicular minefield in previously cleared area
15 Mar 1915	Carden resigns his post and de Robeck takes over
17 Mar 1915	General Hamilton arrives on scene as Commander-in-Chief of the Mediterranean Expeditionary Force (MEF)
18 Mar 1915	Concerted attack by the Allied fleet fails
22 Mar 1915	De Robeck and Hamilton decide to halt the naval attack in favor of a later joint land and sea assault
25 Apr 1915	Military landings on the Gallipoli peninsula begin
28 Apr 1915	Trench warfare begins on the peninsula

Date	Event
10 May 1915	German submarine threat increases to the point that supply and store ships are ordered to retreat to staging areas at Mudros
17 May 1915	General Hamilton asks for two additional army corps
7 Jun 1915	Britain decides to reinforce the MEF
6 Aug 1915	The Battle of Sari Bair and the landing at Suvla Bay begin
28 Oct 1915	General Munro assumes command of the MEF and shortly after urges evacuation of the peninsula
15 Nov 1915	Lord Kitchener also recommends evacuation
7 Dec 1915	The War Council agrees to evacuate the Suvla and Anzac fronts
20 Dec 1915	Evacuation of Suvla and Anzac completed
28 Dec 1915	Evacuation of the Helles front is ordered
8 Jan 1916	Evacuation of the Gallipoli peninsula is complete

Glossary

AOR: Area of responsibility

ASCM: Anti-ship cruise missile

FAC: Fast-attack craft

IRGCN: Iran Revolutionary Guard Corps Navy

MBD: Million barrels [of oil] per day

MEF: Mediterranean Expeditionary Force

MCM: Mine countermeasures

NASA: National Air and Space Administration

OPEC: Organization of the Petroleum Exporting Countries

SoH: Strait of Hormuz

UAE: United Arab Emirates

US: United States

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