

Jointness and the Norwegian Campaign, 1940

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The Norwegian Campaign in the spring of 1940 was the first major joint and combined operation of World War II in the European theater. Not only did the British and French work together to attack the German occupiers in the far north but also the military forces of all the participants included land, air, and sea elements. Though this campaign—seen from both the Allied and Axis sides—included major joint and combined elements, it was also marked by major errors. In truth, the services on both sides had yet to develop a joint perspective on war—their centuries-old tradition of working alone and only grudgingly succumbing to cooperation with each other would be very hard to break. Joint training and doctrine had not yet been sufficiently developed to allow diverse elements to work together effectively.

Moreover, in Germany, the unique power of Reichsmarschall Hermann Göring, head of the Luftwaffe, added even further to the poisonous effects of service parochialism. Göring would not allow his air forces, whatever the importance or necessity, to be subservient to the commander from another arm.

The Campaign

Although Britain and France declared war on Germany in September 1939 due to the Nazi invasion of Poland, they were loath to strike the enemy head-on along the western front. The French had seemingly learned from the Great War that the defense had become supreme; they therefore intended to sit behind their impregnable Maginot Line and allow the Germans to bleed themselves white in fruitless attacks. This passive inactivity, while Germany was occupied in the east devouring Poland, was scathingly referred to by some as “sitzkrieg” to distinguish it from the German blitzkrieg. Instead, the Allies looked for a less risky venue to strike Germany, and Norway came to mind.

Germany was heavily dependent on the high-quality iron ore of Sweden that came from the northern area of the country. This ore was usually shipped by rail through Norway to the ice-free port of Narvik on the Norwegian Sea and from there traveled south by freighter to Germany.¹ Although Sweden and Norway were declared neutrals, the Allies nonetheless considered denying this resource to Germany—by force if necessary. Two weeks after the outbreak of war, the First Lord of the Admiralty, Sir Winston Churchill, suggested mining Norwegian territorial waters to force German ore freighters into the open sea where they could be destroyed by the Royal Navy.²

As the months passed, this option and even that of occupying Norway were increasingly considered and then planned. Particularly, it was feared that Germany might act first and simply invade Sweden and Norway to ensure access to the iron ore and to protect the supply lines for its transshipment. On 8 April 1940, the Royal Navy began laying mines in Norwegian territorial waters. Despite the action being against international law by violating the rights of a neutral country, it was deemed essential to British security.³

The Germans *were* in fact concerned about their access to Swedish ore and the safe access to Norwegian ports. The Allied starvation blockade of World War I, coupled with numerous violations of neutral shipping rights during the first year of the current conflict, taught them that international law provided flimsy protection in a total war. Also, German planners thought that Norway could serve as a valuable submarine basing site and provide air bases for bomber aircraft that would outflank the Allies and allow powerful strikes on Britain’s industry and lines of communication.⁴ On 3 March 1940, Nazi Germany dictator Adolph Hitler ordered plans drawn up to occupy Denmark and Norway to protect German access to the Baltic Sea and to ensure that the ore supply lines along the Norwegian coast remained intact. The invasion of Denmark and Norway was set for 9 April—coincidentally, the day before this assault was to take place, the Allies began their mining operations.⁵

The German plan called for a series of quick, powerful, and wide-ranging attacks. Denmark would be seized, and the Luftwaffe would use the two airfields at Aalborg for ferrying troops and supplies into Norway and as a base for long-range strike aircraft. (30,000 German troops were airlifted into Norway by the Luftwaffe—the first major airlift of the war.) A simultaneous attack would be launched against the five major port cities of Norway—Oslo, Bergen, Trondheim, Kristians and Narvik—along with the major airfield at Stavanger. These attacks would employ most of the German surface fleet, six army divisions, a paratroop battalion, and approximately 1,000 aircraft.⁶

The plan went off well despite bad weather and the determined resistance of Norwegian units. But by the end of the first day, the Germans had the situation under control. Denmark surrendered in a nearly bloodless assault, and the five major Norwegian cities fell, as did the main airfields near Oslo and Stavanger. (The first major combat paratroop drop in history secured the airfield at Stavanger.)⁷ The next day Allied help arrived, but it would prove to be too little and too late.

Allied plans were deeply flawed and took little account of the role airpower would play in such a major campaign. Historian John Terraine later wrote that the joint planning staff “displayed an amateurishness and feebleness which to this day can make the reader alternatively blush and shiver.”⁸ Like the Germans, the Allies did not institute a joint command for Norway; instead, each service maintained control over its own forces. In the Narvik area, for example, Adm Lord Cork commanded naval forces and Maj Gen P. J. Mackesy headed the ground troops. However, both received orders from London—sometimes contradictory. For example, Admiral Cork thought the army should assault Narvik forthwith, but General Mackesy considered that “sheer bloody murder” and refused. He had been told unequivocally by his army superiors not to land on an opposed shore. Admiral Cork had not been told of these orders.⁹ So instead, General Mackesy landed 45 miles away on an undefended island and approached Narvik in a systematic land operation, all the while Admiral Cork chaffing at the “delay.”¹⁰ Such problems were aggravated when General Mackesy established his headquarters on land while the admiral remained afloat. Close coordination was impossible. The general was eventually relieved in the hope that joint cooperation would improve, but by then the campaign was virtually over.

The other Allied task force was directed to liberate Trondheim. However, this port was well within range of Luftwaffe aircraft, and Allied operations there were a disaster. The Royal Navy cruiser *Suffolk* was so badly mauled by German bombers, it barely limped back to port. The Admiralty was therefore convinced that a direct assault on Trondheim was impossible in the face of enemy air superiority. Instead, landings were made north and south of the city, and it was hoped that these two independent pincers would be able to march on Trondheim and retake it by land assault.¹¹ This ambition was soon seen to be impossible, again due to the Luftwaffe controlling the skies. Maj Gen Carton de Wiart, commander of the northern pincer, signaled London the day following his landing: “I see little chance of carrying out decisive, or indeed, any operations unless enemy air activity is considerably restricted.”¹² The following day, 21 April, he was even more emphatic: there was “no alternative to evacuation” unless he could gain air superiority.¹³ With its nearest air

base more than 600 miles distant, the Royal Air Force (RAF) could not intervene, and the Fleet Air Arm (FAA) was simply outmatched—its aircraft, neglected during the interwar years, were obsolescent in comparison to those of the Luftwaffe. On 1 May the Royal Navy moved two aircraft carriers—the *Ark Royal* and *Glorious*—toward the area in an attempt to gain local air superiority over the landing areas, but the Luftwaffe drove off these ships. Because the Germans controlled the sky over the littoral, the ground forces were soon evacuated.

The situation at Narvik was not quite as dismal for the Allies—despite the disagreements between Admiral Cork and General Mackesy—simply because it was so far north the Luftwaffe had difficulty covering the area. The RAF, through Herculean efforts, carved three airstrips out of the snow and ice and deployed some Gladiator and Hurricane aircraft that had been transported by aircraft carrier. The German garrison had been resupplied by seaplane and flying boat, but the RAF quickly neutralized these reinforcements.

As a result, Allied ground forces were able to make some headway.¹⁴ Unfortunately, on 11 May the Battle of France began, and Norway became a sideshow. Before the Allies had even retaken Narvik, they were planning its evacuation. It fell on 25 May, but the Allies returned to their ships and departed two weeks later. The Germans quickly moved back in, and the campaign was over. Norway would remain in Nazi hands until the end of the war.

Observations

- Germany's strategic plan was logical and achievable. Swedish iron ore, which comprised 40 percent of the German supply, was an essential war resource that needed to be assured.¹⁵ This plan was a worthy goal that justified Germany's campaign to seize Denmark and Norway. On Hitler's part, the strategy was a necessary prelude to further operations—Germany was securing its resources for an extended war. Similarly, the plan to use Norway for submarine bases was wise; the U-boat pens at Trondheim became essential to the German navy and were a thorn in the Allied side for the rest of war. On the other hand, the plan to use Norway for Luftwaffe bases from which to bomb Britain proved to be a chimera—the bases were too distant from Britain to be useful.¹⁶ The strategic concept of the Allies also made some sense. Opening a second front in Norway and avoiding the main enemy deployed opposite France—which was believed to be very powerful—was logical. For the same reasons that Norway was valuable to Germany, so too was its denial to the Nazi regime of great import to the Allies. Without Swedish iron ore, Germany would have serious difficulties attempting to manufacture the armaments it needed to sustain a total war. The problem for the Allies was in the execution.
- Although the Germans were no more experienced in joint planning than the Allies, they had greater foresight in their net assessment. Airpower was realized as essential, as were the innovative tactics of airlifting troops and supplies and employing vertical attack using paratroops. Both air missions were pioneered during this campaign. The Allies failed to appreciate the fundamental

change that airpower had made to the conduct of modern war. RAF aircraft lacked the range to operate effectively over Norway from their bases in Britain, and the aircraft of the Royal Navy's FAA were obsolescent and no match for the first-rate Luftwaffe fighters they would encounter.¹⁷ This campaign would open British eyes to the need for more air assets more creatively used.

- British planning was poor. One observer noted that “the British had only the vaguest ideas as to those two most important elements in coming up with a workable operational plan: the enemy and the terrain.” Troops departing for Norway were told that there was little snow in the Narvik area. Upon arrival they found several feet of it piled up all the way to the water's edge! General Mackesy's orders from his superior were not shared with the navy or air force. One observer, Gen Hastings Ismay, summarized the problem clearly: “The Chief of the Naval Staff and the Chief of the Imperial General Staff acted with sturdy independence. They appointed their respective commanders without consultations with each other; and worse still, they gave directives to those commanders without harmonizing them. Thereafter they continued to issue separate orders to them. Thus was confusion worse confounded.”¹⁸
- Unity of command is a recognized principle of war and is especially necessary in the case of an amphibious assault against a defended shore. There must be a single commander in charge at all times, and all components must recognize that authority. During the Norwegian Campaign, both sides were deficient in this area. At times, component commanders received conflicting orders from their respective services back home. Also, there must be no conflict between sea and land commanders during such hazardous operations—which again was the case in Norway. Today, US joint doctrine insists on such unity, embodied in a “joint force commander” to whom all the other components—air, land, sea, space, and special forces—are explicitly subordinate at all times.¹⁹
- Although the German forces found a Norwegian population hostile to their presence, the typically rigorous and no-nonsense approach that the Wehrmacht traditionally took to such occupations ensured that there were no serious problems. On the one hand, this passive situation allowed the Germans to establish a solid base for extended operations within the country. On the other hand, the Allies were successful only in the far north at Narvik, where they could build rudimentary airfields from which to base aircraft and establish a supply and staging area. The intent was to use Narvik as a stepping-off point to attack German forces to the south. This plan, which would have been difficult to implement in any event, was never attempted due to the invasion of France and subsequent Allied withdrawal from Narvik.
- It is extremely difficult for any invader to launch an amphibious operation against a defended enemy shore. In the Norwegian Campaign, the British field commanders flatly refused to land at Trondheim or Narvik for this very reason—and they were supported in these decisions by superiors in London. When a vigorous enemy defense is expected, the attacker must take great pains to soften up enemy positions through a prolonged and heavy artillery

bombardment from sea, aerial bombing operations, or both. The alternative is to achieve near total tactical surprise—a rare occurrence.

- Similarly, the Allied forces that attempted to liberate Norway in 1940 were inadequate for the task. Not only were the participating ground troops insufficient to dislodge the Germans from their entrenched positions but also the air forces—both land- and sea-based—were likewise too sparse, and, as noted, in the case of the FAA were of inadequate capability. The importance of airpower in military operations during World War II will be discussed more fully, but in Norway, Luftwaffe superiority at the point of attack was a critical factor in Allied failure.
- Joint military leadership underwent a transformation due to this campaign. The addition of airpower to the equation made joint planning and command essential. Previously, a grudging cooperation between sailors and soldiers might have been sufficient, but the advent of airpower—necessary for the successful conduct of both land and sea operations—made joint coordination essential. Aircraft from land and sea bases operated in the same airspace—a danger unless those air arms closely coordinated their efforts. Simple factors of efficiency and effectiveness were also apparent. There was no unity of command in Norway—on either side—and as has been noted, conflicting orders were often sent to the component commanders, who maintained separate headquarters. Unity of command was ignored. From this point on, a joint commander, responsible for all forces within his theater, would be a *sine qua non* of effective military operations. What today is termed jointness was barely present in this campaign. As the war progressed, it became apparent that the Allies learned more quickly than did the Germans. The German official history ruefully admits this situation: “The successful conclusion of *Weserübung* [the German code word for the Norwegian/Danish invasion] did not encourage critical analysis; rather, it tended to divert attention from the shortcomings of the German command organization and the weaknesses of the *Wehrmacht*.”²⁰
- Doctrines among the services were seldom compatible, and the lack of joint exercises during peacetime became painfully obvious. These deficits were especially apparent in the poor results by naval gunfire in support of troops ashore and in the inadequacy of close air support. Such myopia now had to be cured by the harsh teacher of combat.
- This campaign demonstrated that intelligence was vitally important for success. The Allies had superior intelligence-gathering assets and also enjoyed the supreme advantage of having broken the German codes—the Enigma machine that transmitted Ultra intelligence. Yet because intelligence was poorly shared among the services and even within each service, the numbers, quality, and location of enemy aircraft, vessels, and shore batteries were often unknown to the key parties.²¹

- The notion of sea superiority underwent a fundamental and irreversible change because of the Norwegian Campaign. It was now realized that command of the air was essential to ensure command of the sea. The Luftwaffe controlled the air, and the Royal Navy could not maintain a presence in the face of that control. The Royal Navy's official historian later concluded that "if effective air cover was lacking, warships could not be maintained overseas."²² This admission was startling. Gen Alan Brooke, later chief of the Imperial General Staff, concurred with this assessment, writing at the conclusion of the campaign that Norway demonstrated "the undermining of sea power by air power."²³ The sole bright spot for the Allies during the campaign was at Narvik, but this was so only because the Luftwaffe was unable to intervene effectively. Therefore, the RAF was able to gain localized air superiority.

A major tenet of naval theorists had been that one of sea power's great strengths was its ability to prevent an enemy from conducting a major amphibious operation. If such an operation were initiated, a navy could strangle it by preventing resupply to the troops ashore—a major lesson demonstrated in Napoleon Bonaparte's Egyptian Campaign of 1798 when his entire fleet was destroyed by Adm Horatio Nelson at Aboukir Bay. But this Mahanian concept of neutralizing an enemy fleet to gain sea control was a serious miscalculation that did not take into account the emerging importance of airpower. The British Cabinet initially believed that sea power would dispose of German forces in Norway in "a week or two."²⁴ Instead, the tone of the campaign was set on the first day when the Luftwaffe intercepted a portion of the British fleet at sea. Without air cover, one destroyer was sunk, and the battleship *Rodney* was damaged. In response, the fleet moved north out of range of German aircraft.²⁵ The Royal Navy was thus unable to lend effective support to the troops landing on the coast. The Luftwaffe had achieved air superiority over the littoral, and control of the air determined control of the surface below.

The Major Lesson of the Campaign

World War II demonstrated almost from its outset that control of the sea was difficult if not impossible to maintain if the air above the sea was not controlled as well. This had been the belief of many airmen between the wars, but they had no historical precedents to back it up. However, soon after World War II began, the truth of this new proposition was made apparent. During the Norwegian Campaign of 1940, the Royal Navy realized on the first day of operations that its ships were extremely vulnerable to the Luftwaffe—and throughout the campaign, air superiority had a critical impact on military operations. The RAF's aircraft, based in England and Scotland, didn't have the range to extend an air control bubble over the landing areas. While the FAA's aircraft had reasonable range—given that the Royal Navy's carriers were in Norwegian waters—they were substantially underpowered and obsolescent compared to the Luftwaffe's aircraft. Only in the far north, at Narvik, was the RAF able to scrape out rudimentary airfields for its use and thus contest command of the air with the Germans. Unfortunately, it was for naught because the Al-

lies almost immediately evacuated Narvik after the Germans invaded France, and Norway soon returned to Nazi hands.

The need for air superiority over the littoral was repeatedly shown during the war. In May 1941 at Crete, more than 23,000 German invaders—transported mostly by air—landed on the island, which was defended by more than 42,000 British, Commonwealth, and Greek troops. Remarkably, the Germans were successful in less than a week, largely because the Luftwaffe had command of the air. The Royal Navy aircraft carrier *Formidable* was driven off with heavy damage, thereby eliminating its group of aircraft from use.

As in Norway, the RAF's aircraft lacked the range to cover the island from RAF bases in Egypt, and the result for the Royal Navy was catastrophic. The Luftwaffe sank three cruisers and six destroyers while heavily damaging an aircraft carrier, three battleships, and 15 other major ships. Counting smaller ships in the harbor at Suda Bay, a total of 42 vessels were sunk or damaged with a loss of more than 2,000 lives due to German air attacks.²⁶ The words of the British land and sea commanders are compelling. Maj Gen Bernard Freyberg cabled his superior during the battle that "a small, ill-equipped and immobile force such as ours cannot stand up against the concentrated bombing that we have been faced with during the last seven days."²⁷ The Royal Navy commander in the Mediterranean, Adm Andrew Cunningham, wrote at the time of the debacle, "As I have always feared, enemy command of the air, unchallenged by our own Air Force, and in these restricted waters, with Mediterranean weather, is too great odds for us to take on except by seizing opportunities of surprise and using the utmost circumspection—it is perhaps fortunate that HMS *Formidable* was immobilized, as I doubt if she would now be afloat."²⁸

In one of the greatest shocks in the war to Churchill, Japanese land-based aircraft sank the battleship *Prince of Wales* and battle cruiser *Repulse* on 9 December 1941 off the coast of Malaya—those were the Royal Navy's only two capital ships in the Pacific. Adm Tom Phillips, the task force commander, had not commanded operationally since the Great War, and clearly the revolution in air warfare had passed him by. He did not wait for air cover, and when Japanese aircraft were first sighted, he also refused to break radio silence to call for help from RAF airfields within range. It was a fatal mistake.²⁹

The eminent historian Michael Howard observed this shift in war, writing that the Second World War in Europe involved the transportation and then continued supply of massive armies from seemingly small and fragile port facilities. As a result, the defender moving up his reserves by road and rail enjoyed the customary flexibility of internal lines of supply, but "it was the new weapon of air-power, rather than the traditional one of sea-power, that had to be called upon to counter it."³⁰

The specific impact on amphibious operations was also first revealed in Norway. For the rest of the war, commanders realized that amphibious operations could not succeed if the enemy controlled the air—regardless of the size of the flotilla supporting the landings. American amphibious assaults in the Pacific were dependent on air superiority. Indeed, it was not a coincidence that Gen Douglas MacArthur's "island-hopping" campaign consisted of jumps of around 300 miles—the radius of most US fighter aircraft at the time. Also, the islands chosen for assault either already had a runway in operation or the terrain allowed one to be rapidly built. In

the central Pacific, the invading forces of Adm Chester Nimitz were always accompanied by multiple aircraft carriers to ensure air control over the beaches. The aircraft carrier replaced the battleship as the center of the US fleet. Air superiority was no less crucial in Europe. It was an integral part of the Allied landings in North Africa, Sicily, and Italy. In June 1944, the Allies landed on the coast of France. Air superiority was considered a prerequisite by Gen Dwight Eisenhower. Later he would testify before Congress regarding the importance of air superiority for the Normandy invasion:

The Normandy invasion was based on a deep-seated faith in the power of the air forces, in overwhelming numbers, to intervene in the land battle. That is, a faith that the air forces, by their action, could have the effect on the ground of making it possible for a small force of land troops to invade a continent. . . . Without that air force, without the aid of its power, entirely aside from its anticipated ability to sweep the enemy air forces out of the sky, without its power to intervene in the land battle, that invasion would have been fantastic. . . . It would have been more than fantastic, it would have been criminal.³¹

Field Marshal Erwin Rommel, General Eisenhower's opponent in Normandy, admitted the accuracy of the above statement, acknowledging that "anyone who has to fight, even with the most modern weapons, against an enemy in complete command of the air, fights like a savage against modern European troops, under the same handicaps and with the same chances of success."³² The noted historian Paul Kennedy summed up this new fact of war succinctly: "Airpower in the Second World War created winners and losers; either they had it or they didn't."³³

Lt Gen Claude Auchinleck, who succeeded General Mackesy in command of the Narvik operation in 1940, wrote in his report of the campaign about the value of airpower in all its forms: "He [the enemy] used it first, to support his troops by low-flying attacks, by bombing [in the latter stages by dive-bombing], by surprise landing of combat troops by parachute, and from seaplanes. The enemy advanced detachments were supplied by air. And secondly, [airpower was used] to deny us the use of sea communications in the narrow coastal waters in the theatre of operations."³⁴ He concluded that "to commit troops to a campaign in which they cannot be provided with adequate air support is to court disaster."³⁵

Air superiority allowed the Luftwaffe to conduct interdiction, close air support, reconnaissance, resupply, and reinforcement with little interference—almost 30,000 German troops were moved into Norway by air. Also of consequence, the psychological impact of having enemy aircraft continually overhead was a severe blow: "in some cases, frustration built up to a sense of hopelessness and a serious lowering of morale."³⁶ In short, the psychological impact of air attack was often as great as its physical impact. Germany's campaign in Norway proved to be highly successful at a relatively low cost; for the British and French, the opposite was the case. One other, and vitally important, result of this failed Allied campaign was the government fall of Neville Chamberlain. The new prime minister was Winston Churchill. 🌟

Notes

1. J. R. M. Butler, *History of the Second World War: Grand Strategy*, vol. 2, *September 1939–June 1941* (London: Her Majesty's Stationery Office [HMSO], 1957), 119–23. Iron ore was also shipped from Swedish ports through the Baltic Sea to Germany (*ibid.*, 121–22).
2. Klaus A. Maier et al., eds., *Germany and the Second World War*, vol. 2, *Germany's Initial Conquests in Europe* (Oxford, UK: Clarendon, 1991), 184–85.
3. Adam R. A. Claasen, *Hitler's Northern War: The Luftwaffe's Ill-Fated Campaign, 1940–1945* (Lawrence: University Press of Kansas, 2001), 58.
4. *Ibid.*, 3, 5, 11.
5. Maier et al., *Germany and the Second World War*, 192.
6. Claasen, *Hitler's Northern War*, 41, 44.
7. *Ibid.*, 49, 62, 69.
8. John Terraine, *A Time for Courage: The Royal Air Force in the European War, 1939–1945* (New York: Macmillan, 1985), 115.
9. Jack Adams, *The Doomed Expedition: The Norwegian Campaign of 1940* (London: Leo Cooper, 1989), 93.
10. Butler, *History of the Second World War*, 132–34, 141. Cork received orders direct from the Admiralty, even bypassing the commander-in-chief, Home Fleet, his nominal naval superior, 132.
11. Claasen, *Hitler's Northern War*, 103–5.
12. Denis Richards, *Royal Air Force 1939–1945*, vol. 1, *The Fight at Odds* (London: Her Majesty's Stationery Office, 1974), 86.
13. *Ibid.*
14. Claasen, *Hitler's Northern War*, 111–15.
15. *Ibid.*, 9.
16. *Ibid.*, 90. Germany never fielded a long-range bomber in any quantity during the war, and its medium bombers simply did not have the range to span the distance from Norway to industrial targets in Britain.
17. The Fleet Air Arm was part of the RAF until 1937, when it was turned over to the Royal Navy. It was not given a high priority by either service, so upon entering World War II its aircraft were definitely substandard. See Phillip S. Meilinger, "Between the Devil and the Deep Blue Sea: The Fleet Air Arm before World War II," *Royal United Services Institute Journal* 144, no. 5 (October 1999): 73–78.
18. Henrik O. Lunde, *Hitler's Pre-Emptive War: The Battle for Norway, 1940* (Philadelphia: Casemate, 2009), 245.
19. Joint Publication 3-02, *Amphibious Operations*, 18 July 2014, chap. 2, "Command and Control."
20. Maier et al., *Germany and the Second World War*, 219.
21. F. H. Hinsley et al., *British Intelligence in the Second World War*, 5 vols. (London: Her Majesty's Stationery Office, 1979–90), vol. 1, 136–43.
22. Claasen, *Hitler's Northern War*, 118.
23. *Ibid.*
24. Butler, *History of the Second World War*, 128.
25. Geoffrey Till, *Air Power and the Royal Navy, 1914–1945: A Historical Survey* (London: Jane's, 1979), 15.
26. Gerhard L. Weinberg, *A World at Arms: A Global History of World War II* (New York: Cambridge University Press, 2005), 229; and George Forty, *Battle of Crete* (Surrey, UK: Ian Allen, 2001), 162–71. Forty notes that a total of 23,464 German troops were moved into Crete by air (*ibid.*, 162).
27. Alan Clark, *The Fall of Crete* (New York: William Morrow, 1962), 162.
28. *Ibid.*, 120.
29. John Prados, *Combined Fleet Decoded: The Secret History of American Intelligence and the Japanese Navy in World War II* (New York: Random House, 1995), 215–22; and David Hein, "Vulnerable: HMSO Prince of Wales in 1941," *Journal of Military History* 77, no. 3 (July 2013): 955–89. Not just capital ships at sea were vulnerable: four US Navy battleships were sunk by Japanese aircraft in port at Pearl Harbor, with four others damaged. In addition, aircraft sank or damaged three cruisers, three destroyers, and two other ships.

30. Michael Howard, *The Mediterranean Strategy in the Second World War* (London: Greenhill Books, 1968), 4.
31. Testimony of Gen Dwight D. Eisenhower to Senate, Department of Armed Forces, *Department of Military Security: Hearings before the Committee on Military Affairs on S. 84 and S. 1482*, 79th Cong., 1st sess., 1945, 360.
32. B. H. Liddell Hart, ed., *The Rommel Papers* (London: Collins, 1953), 285.
33. Paul Kennedy, *Engineers of Victory: The Problem Solvers Who Turned the Tide in the Second World War* (New York: Random House, 2013), 226.
34. Adams, *Doomed Expedition*, 172.
35. Lunde, *Hitler's Pre-Emptive War*, 547.
36. Adams, *Doomed Expedition*, 173.



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