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THE FINAL COUNTDOWN?

Charting a New Course for Capital Ships in Pacific War Plans

Cameron M. Rountree

If the United States of America falls under attack our job is to defend her in the past, present or future.

CAPTAIN MATTHEW YELLAND, USN (KIRK DOUGLAS),
THE FINAL COUNTDOWN, 1980

For decades, from the nineteenth to well into the twentieth century, the battleship served as the capital ship of the world's fleets.¹ The dreadnought's decline came about not because the ship type was defeated definitively in conflict but rather because weapons technology eclipsed its greatest strengths, and it became too expensive to operate relative to other warships confronting the same threats.² In the twenty-first century, the aircraft carrier occupies the prestigious position once held by the battleship: the peerless capital ship undoubtedly suited for the wars in the epoch in which it was conceived. Yet the carrier now is challenged similarly by the twin existential dangers the battleship faced: waning effectiveness and growing inefficiency. These vulnerabilities are symptomatic of a broader concern that the military is overly invested in expensive platforms that our competitors have paced.³ As the Navy is confronted with this reality, a historically minded observer may contextualize the current conundrum and suggest a solution.

In the lead-up to World War II, the U.S. Navy designed war plans that relied overwhelmingly on the battleship. In the aftermath of the war, the maritime foundation of those plans was abandoned precipitously, and the dreadnought was relegated quickly to second-tier status. This change occurred despite the battleship's comparative success in the war and the innovative ways it was employed in conjunction with vanguard carrier aviation to achieve victory.⁴ In designing Pacific war plans today, the Navy and joint force are significantly dependent on the aircraft carrier in much the same way the battleship was the keel of War Plan ORANGE one hundred years ago. Now, of course, a robust continental China, with a rapidly maturing navy, has displaced the imperial fleet of archipelagic Japan as the projected foe.

Even in the absence of the transformational war that the battleship met at its denouement, but cognizant of the hazards confronting modern aircraft carriers, the Navy and joint force should consider alternative approaches to Pacific war plans that are substantially predicated on one vessel type. As World War II demonstrated, the fleet of that time met success when the capital ship was employed collaboratively with aircraft carriers. Today, in anticipation of next-generation maritime strategy, the Navy and the joint force should redesign and redirect today's capital ship—the aircraft carrier—and combine it with a reinvestment in surface and undersea platforms with extended-range standoff weapons in the age of the “mature maritime precision-strike regime.”⁵

THE PAST: CLOCK, WAR, ORANGE

Dreadnought Predominance

Not long after the United States defeated Spain in 1898 and gained control of the Philippines and other Pacific territories, it began to formalize plans to counter threats at the farthest reaches of its protectorate. In 1907, War Plan ORANGE emerged.⁶ In essence, its objective was simple: get the fleet out to the western Pacific quickly, establish sea control, and defeat Japan through blockade. The fleet was to sail to a designated advance base at Guam and prepare to meet the main Japanese force as it steamed to the Philippines. The well-worn design matched the Navy's pre-World War II theories of naval warfare—and also the assumptions of the Imperial Japanese Navy (IJN).⁷ Both forces anticipated the decisive fleet engagement that Captain Alfred Thayer Mahan had professed to be critical for achieving sea control, like that which the Japanese had experienced at Tsushima earlier in the century. The official version of War Plan ORANGE adopted in 1924 emphasized three principles to counter the anticipated enemy: offense, speed, and superior strength through armor and firepower.⁸

Unsurprisingly, to achieve its Pacific War objectives the Navy designed a force centered on battleships.⁹ As affirmed by the Navy's General Board in October 1916, prior to direct American intervention in the First World War, nothing had transpired in that conflict to disabuse the board of its earlier belief that the battleship was the principal “backbone” of American sea power.¹⁰ Indeed, the recently concluded Battle of Jutland represented the historical acme of battleship engagement and substantiated the General Board's view.

By 1932, however, the U.S. surface force advantage had faded and, in compliance with obligations imposed by the London and Washington Naval Treaties, Japan had invested earnestly in noncapital ships, at a rate that allowed it to exceed the U.S. cruiser and destroyer inventories. Aware of this incongruity in fleet composition, American naval leaders gave battleship modernization priority over burgeoning aircraft carrier development because the dreadnoughts

still were believed to be the best way to bring maximum firepower across the Pacific to combat Japan.¹¹ In fact, in 1938, while complying with its own treaty obligations and reflective of the relative importance of battleships in relation to carriers, Congress authorized the Navy a “capital ship” (i.e., battleship and battle-cruiser) allocation of 630,000 tons, compared with 175,000 tons for carriers.¹² This statutory ratio, favoring battleship tonnage by a factor of more than three and a half, was enacted seventeen years after Brigadier General William “Billy” Mitchell’s performative sinking of the decommissioned German battleship SMS *Ostfriesland*, and a mere three years before U.S. entry into World War II. Nevertheless, the joint Army-Navy Board demurred on the importance of aviation, stating, “The airplane, like the submarine, destroyer, and mine[,] has added to the dangers to which battleships are exposed, but has not made the battleship obsolete.”¹³ The Navy did not yet envision aerial-borne warfare replacing surface combat; it thought instead that the former served merely a supplementary function to gain air control as a condition precedent to battle-fleet engagement.¹⁴

By necessity, the Pacific War deviated from the closely hewn strategy that the Army-Navy Board had spent decades developing—a design that was prescient in its major movements but incomplete in its anticipated order of battle.¹⁵ The attacks on Pearl Harbor diminished the Pacific battleship fleet, so the United States began the war with few of its flagships for the forthcoming battle with Japan. Fortuitously, American carriers were not in port during the raid and were spared the IJN’s striking surprise blow. Three days later, however, Japanese torpedo bombers sank the British battleship HMS *Prince of Wales* and the battle cruiser HMS *Repulse* while the ships were en route to defend the endangered outpost at Singapore. This sinking reiterated the plausibility of aviation as an effective offensive weapon against armored ships. At last and unavoidably, “[battleship] proponents were forced to change their thinking drastically and embrace the carrier as the sole surviving centerpiece of offensive naval lethality.”¹⁶

As the war progressed, “[f]ew if any of the great campaigns . . . resembled those embodied in the venerable ORANGE Plans.”¹⁷ The Pacific islands that had been projected as logistical hubs at which the surface fleet would refuel, repair, and replenish came to life, equally importantly, as springboards for aviation.¹⁸ In fact, naval airpower during the war was sufficiently transformative that Chief of Naval Operations (CNO) Fleet Admiral Ernest J. King highlighted the function it played in storied battles as a foreshadowing of the changes to come for the Navy. In his 1945 final report to Secretary of the Navy James V. Forrestal, he obliquely remarked about the role of carrier aviation in the defeat of Japan. “Our fleet in World War II was not solely engaged in fighting enemy fleets. On numerous occasions a large part of the fleet effort was devoted to operations against land objectives. A striking example is the capture of Okinawa. During

the three months that this operation was in progress our Pacific Fleet . . . was engaged in a continuous battle . . . yet at this time the Japanese Navy had virtually ceased to exist—we were fighting an island, not an enemy fleet.”¹⁹ Admiral King’s commentary was, thus, symbolic of naval airpower’s dramatic evolution from an interesting curiosity during the decades before the war to an unanticipated pillar of the Pacific fight.

Still, while carriers and aircraft were useful contributors to the Pacific War effort, they seldom determined sea control in their own right. Recent reexamination

Yet the carrier now is challenged similarly by the twin existential dangers the battleship faced: waning effectiveness and growing inefficiency.

of the historical interrelationship between battleships and carriers makes clear that the lore of carrier—and carrier-borne aircraft—supremacy is more myth than reality. As a

point of fact, aviation generally, and carrier aviation specifically, was never decisive against battleships in combat in any theater, and certainly it did not lead to the demise of the dreadnought, as is commonly misunderstood. For example, out of eighty-nine capital ships in the combined Allied and Axis fleets during the war, a mere five were lost to aircraft at sea in combat conditions. Furthermore, only two of those five aerial victories, the losses of the Japanese battleships *Musashi* and *Yamato*, were at the hands of carrier-based aircraft.²⁰

Undeniably, though, U.S. carrier aircraft were very effective at destroying Japanese planes, accumulating approximately fifteen thousand kills. Furthermore, carriers and their aircraft were successful at fighting other carriers, which even aviation proponents deemed to be “sitting ducks” to both surface gunfire and aerial bombardment.²¹ In fact, U.S. carriers accounted for eleven of nineteen sunk Japanese aircraft carriers. But carrier-borne kills of both nations’ capital ships were few, and smaller, less-armored warships were too elusive for reliable aerial targeting, strikes by carrier aircraft accounting for just 21 percent and 5 percent of the Japanese and American destroyers, respectively, sunk.²²

Despite the mixed results of carrier aviation in and of itself, after the war there was a precipitous change in Navy doctrine. In the period 1946–47 the Navy decided that the surface fleet was incapable of achieving command of the sea unaided. Disregarding contemporaneous evidence to the contrary, Vice Admiral Forrest Sherman, Deputy CNO for Operations, believed that deeper air strikes were at the core of a future sea-control strategy, and he solidified the role of carrier aviation by keeping “carriers at the core of his planning.”²³ Subsequently, the Navy radically altered the composition of its capital-ship fleet. From a 17 : 8 proportion favoring battleships to carriers (seven fleet carriers and one escort carrier) on 7 December 1941, the fleet was transformed to a 4 : 22 ratio

favoring carriers (fourteen fleet, eight escort) within two years of V-J Day, on 30 June 1947. This imbalance only grew further until the battleship reached its nadir in 1962 with zero commissioned battleships compared with twenty-six aircraft carriers in service.²⁴

The Battleship's Looming Perils

While the carrier clearly *replaced* the battleship as *the* capital ship of the post-war fleet, it did not *defeat* the battleship. The “battleship proved to be the most resilient surface ship against air and other attacks, and remained the ultimate determinant of sea control throughout the war.”²⁵

In the immediate aftermath of the conflict, what actually vanquished the battleship was the lack of an enemy battle fleet. This vacuum was filled in due course, but even after there was a new opponent, the dreadnought succumbed to existential infirmities. For instance, advanced weapons technology, such as guided missiles, neutralized its greatest assets: firepower and armor.²⁶ Then, given that weapons seemingly as lethal as large-caliber guns could be fired from lighter, lesser-armed, equally fast ships with smaller crews, the lumbering behemoths became too costly to operate routinely. At the twilight of their commissioned use, the annual cost of operating one U.S. battleship was \$35 million in 1989 dollars—the equivalent of more than \$76 million today.²⁷ This amount represented more than twice the \$15 million price tag to operate a cruiser and three times the \$11 million cost for a destroyer.²⁸ As University of Kentucky professor Robert Farley summed up, “The battleship era ended not because the ships lacked utility, but rather because they could no longer fulfill their roles in a cost-effective manner.”²⁹ This is a sentiment echoed by James FitzSimonds, who stated that “battleships were still the most survivable vessels at sea, but proved too expensive to operate.”³⁰

The battleship lost considerable favor because of these realities, coupled with the still-fresh impression remaining on the minds of naval leaders left by the successes of American flattops in defeating Japanese carriers and the Navy's shift in its priorities toward staving off the Air Force to preserve naval aviation.³¹ Notwithstanding these potentially fatal challenges, a few battlewagons remained in some status of readiness in the fleet for decades. Finally, on 31 March 1992, the last of the four *Iowa*-class battleships, USS *Missouri*, was decommissioned.³²

Visionary Operational Approach

In the long run, the utility the battleship offered was not enough to eclipse the persistent challenges the ship faced from guided missiles and its own inordinate costs. Ultimately, as British military historian John Keegan correctly remarked, “salthorse admirals at the head of navies were misinterpreting the future . . . if they believed that the dreadnought could live for ever.”³³

Still, USS *Iowa*, USS *New Jersey*, USS *Missouri*, and USS *Wisconsin* all contributed to post–World War II conflicts, up through the Gulf War.³⁴ So not only did the battleship survive beyond World War II, but through a symbiotic relationship with the aircraft carrier it continued to represent a potent arm of American sea power.

When employed creatively, the tandem of battleships and carriers was successful in ruling the maritime domain. American World War II commanders' exercise of what modern joint doctrine defines as the functions of *maneuver* and *fires* led to an operational art in the Pacific that alternately amassed battleships and carriers, in composite task forces, to achieve decisive effects. A few tactical examples highlight their successful interdependence.

Owing to the dearth of battleships available in the spring of 1942, carriers took the lead first. At the Battle of Coral Sea in May and at Midway the next month, Admiral Chester W. Nimitz was compelled to replace battleship gunfire with the “mobility and long-range striking capacity of aircraft.” Instead of employing the traditional battle line, Navy leadership reorganized the fleet into several task forces centered on carriers. Although carriers achieved indecisive results against capital ships in these battles, they inflicted sufficient carrier losses on the Japanese to prevail.³⁵

On the other hand, later in the war, when battleship inventories were replenished, “[d]uring offensive amphibious assaults, or any time the Japanese fleet was expected to appear in force, the command organization reverted to the traditional, prewar model of massed battleships forward as the main striking element with carriers behind in a supporting role.”³⁶ The preferred prewar doctrine that relied on the battleship was restored. This preference was observed when, in October 1944, Admiral William F. Halsey Jr. ordered his fast battleships to intercept the main Japanese battle force, which was approaching the island of Leyte from the north and putting the amphibious invasion in jeopardy. Instead of leaving it to the carrier task force to dispatch the Japanese dreadnoughts, Admiral Halsey acknowledged the “practical difficulty” of relying solely on air strikes to stop the IJN battle fleet.³⁷

As the war progressed, however, battleships provided more support functions divorced from traditional battle-fleet engagement. Commanders dispersed dreadnoughts into carrier groups and employed the “PAC-10” doctrine that placed surface ships in front of carriers to screen the latter from enemy surface or air threats.³⁸ Battleships also were assigned additional non-sea-control tasks such as shore bombardment in support of amphibious assaults.³⁹

By April–June 1945, plans for the Battle of Okinawa sidelined battleships and gave priority to carrier aviation to support the amphibious operations and counter Japanese aircraft. In fact, as Fleet Admiral King highlighted in the report to Secretary Forrestal cited earlier, much of the fighting at Okinawa was enabled by carrier aviation. As had been occurring with increasing frequency, carrier air

facilitated the amphibious invasion and provided defensive counterair (DCA) against the marauding kamikaze threat—a menace nearly 1,500 strong that destroyed approximately seven hundred American aircraft throughout the battle.⁴⁰ Notably, one of the few aviation victories against a capital ship was scored at Okinawa. Consigning the battleship to its ultimate destiny, Admiral Raymond A. Spruance opted to sink the Japanese megabattleship *Yamato* through aerial bombardment rather than sic his dreadnoughts on the flagship.⁴¹

In sum, after decades of relying on the battleship, the Navy was forced to adapt its war plans creatively and employ all the maritime weapons at its disposal to confront new threats in a practical manner. The modus operandi became less dogmatic and more utilitarian. As Edward Miller stated, “The naval war was decided more by the sheer weight of U.S. naval force than by a specific weapon.”⁴² Although the legacy capital ship inescapably was destined for obscurity, during its twilight it was able to operate in conjunction with a new tool of naval war—creating a prophetic framework.

THE PRESENT: TWENTY-FIRST-CENTURY ADVERSARIES, TWENTIETH-CENTURY PLANS

The Primacy of Carriers

Today’s Navy is centered on the carrier and carrier aviation. This modern reverence for the carrier offers sharp parallels to the prioritization of battleships a century ago. If there were any doubt, the U.S. Code clearly lays out the Navy’s statutory composition and functions in five subparagraphs of § 8062 of Title 10. Four of these five subparagraphs specifically reference “aircraft carriers,” “naval aviation,” “aircraft,” and “carrier air wings.” Remarkably, the words “vessel,” “ship,” and “submarine” are absent; and, tellingly, so is the word “missile.”⁴³ Federal law requires the Navy to maintain eleven operational carriers, and at least nine carrier air wings until enough carriers exist to support a tenth carrier air wing.⁴⁴ Congress imposes no similar law for any other naval weapons system. Unequivocally, the aircraft carrier is an institutionalized priority. In addition to their unique statutory status, carriers organizationally are specially aligned to U.S. Pacific and Atlantic Fleet *air* component commanders.⁴⁵

Yet even though the Navy classifies aircraft carriers as aviation assets, at bottom they are ships. As surface ships they are susceptible, if not more vulnerable, to the same threats as cruisers and destroyers (CRUDES ships). Also, irrespective of the express statutory partiality toward carriers, the laws of naval warfare dictate that they exist in the same multidomain threat environment as other surface vessels. This realization is critical to maintaining maritime superiority in the Pacific as the United States returns to operations within the confines of great-power competition.

Operational Limits of Carriers

As established as the carrier may be as a ship type, it faces a far different maritime environment from what it faced previously, and certainly much has changed since the end of the Cold War. As Andrew Krepinevich analyzed in detail several years ago, the future of maritime competition will be different from that to which most in naval service have grown accustomed. Many aspects of the next era remain opaque because of significant advances in technology and a lack of available data points for analysis since the last major naval war.

Yet despite the dearth of evidence, the contours of the anticipated competition are derivable from some well-founded assumptions. Relative to the future employment of carriers, a mainstay of Krepinevich's maritime assessment is recognition that the modern maritime environment is marked by a rise in precision antiaccess/area-denial (A2/AD) weapons that have become more capable and more accessible to those on the lower rungs of military evolution. This "democratization," or reduced barrier to entry, makes previously dominant maritime powers more vulnerable than at any time in decades, because of an expansion in the "gray zone" within which an actor can influence maritime affairs.⁴⁶

At present, military technology—such as hypersonic/velocity weapons that reduce reaction time, maritime reconnaissance and targeting forces that extend existing weapons' reach and accuracy, offensive cyber operations that disrupt and degrade battle networks, and artificial intelligence and autonomous weapons that make the application of lethality faster and more remote—is in the hands of less advanced powers and nonstate actors as well as great powers.⁴⁷ This multivarious proliferation of weapons and capabilities imposes a need for a doctrinal paradigm shift reminiscent of the alternating tactics that World War II-era naval leaders employed in their use of battleships and carriers. When today's newly propagated dangers are combined with long-existing technologies—such as coastal-defense cruise missiles (CDCMs), antiship cruise missiles (ASCMs), mines, midget submarines, and torpedoes—the operational environment for carriers becomes daunting.

This collection of threats, dubbed the "mature maritime precision-strike regime" (MMPSR), poses the greatest risk to naval powers, such as the United States, that are unaccustomed to a sudden capability symmetry.⁴⁸ It especially upends the traditional carrier freedom of maneuver that the Navy has enjoyed for decades. The risk is manifest in contested locations such as the East and South China Seas, where the overlapping ranges of A2/AD weapons intersect vital sea lines of communication (SLOCs). The practical impact is clear: in a permissive weapons-control environment, a carrier and its accompanying anti-air warfare (AAW) CRUDES ship(s) could be saturated quickly.

The MMPSR fundamentally presents a math problem for the carrier—or, perhaps better said, a math and geography problem. Krepinevich addressed a

myriad of complications that pervade the current maritime competition, and all deserve their attendant scrutiny. Arguably, though, the finite limit of its offensive range is what plagues the carrier most acutely.⁴⁹ Whereas the trinity of battleship design principles balanced armament, speed, and armor, the traditional defining characteristics of carrier aviation were aircraft mass, payload, and range.

Regarding range, it is axiomatic that in an exclusively kinetic engagement, physical standoff is a bedrock advantage. If an opponent can strike another reliably without fear of retaliation, the former maintains a degree of security that is unmatched in conflict. This principle cascades throughout history, with David's sling and the Macedonian sarissa, the trebuchet, the mortar, the V-2 rocket, and the intercontinental ballistic missile providing a few examples. Devoid of organic strike missiles, a carrier's offensive range extends to the limits of its air wing. On this score, since the end of the Cold War the carrier Navy has prioritized increased generation of shorter-range sorties over longer-range power projection and fleet defense. To that end, since the sunset of the F-14 Tomcat and A-6 Intruder, the offensive foundation of a modern carrier air wing is the F-18E/F Super Hornet, which has an unrefueled combat radius of five hundred nautical miles (nm).⁵⁰ This modest range is extended only marginally by the recently deployed F-35C, with its unrefueled combat radius of 600 nm.⁵¹ These figures represent a notable retreat from the fleet's historical air wing average range of 1,210 nm in 1956 to a mere 496 nm today.⁵²

In contemplating naval war in the Pacific, the problem is that China, like many U.S. adversaries, has CDCMs and ASCMs boasting ranges that are at least equivalent to those of Navy tactical aircraft (TACAIR). Thus, launching TACAIR having a range of only 500 nm when roughly 500 nm away from a threat would leave few carrier commanding officers feeling comfortable loitering at the periphery. Further, this concern does not even address more-advanced antiship ballistic missiles (ASBMs), such as China's DF-26 and DF-21D with ranges up to, and beyond, 1,000 nm.⁵³

The critical importance of strategic and operational standoff is not lost on China, America's most prominent Pacific competitor. The People's Republic of China (PRC) and the Chinese Communist Party owe their very existence to Mao Zedong's clever strategy of trading space for time to outlast and defeat the Nationalists in the Chinese Civil War (1945–49). Regarding operational standoff, today's China jealously guards the water space and terrain features within its so-called nine-dash line to the south and its territorial claims in the East China Sea. As seen by its three militarized reefs in the Spratly Islands, Woody Island (among the cluster of terrain features) in the Paracels, and its ongoing dispute with Japan concerning the Senkakus, China has established, or is expanding, its ability to project power from its near shores to the littorals and out to the blue

water of the western Pacific.⁵⁴ In doing so, it has advanced concentric rings of A2/AD protection well into a familiar USN operating area. These circles now extend beyond the range where carriers can strike effectively without engendering

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substantial risk. Like battle-ships before them, “carriers possess the U.S. fleet’s greatest combat potential”; however, “unless they can project that potential over much greater ranges . . . they will run a high risk of detection and damage or destruction” in the

MMPSR.⁵⁵ This is not just idle prophecy. Since the mistaken U.S. bombing of the Chinese embassy in Belgrade in 1999, China has set its sights on the carrier by building over-the-horizon radars, long-range reconnaissance satellites, and aircraft to hunt American carriers.⁵⁶

As long-range, precision-guided weapons become more prevalent and more perilous, the United States must reconsider risk-based decisions to employ carriers as the center of Pacific naval war plans. As recent Vice Chief of Naval Operations Admiral William K. Lescher made clear, critical to defeating China, should conflict arise in the next decade, is an ability to “send long-range fires down range, maneuver in the adversary’s weapons engagement zone, operate ships without needing frequent resupply in a contested logistics environment, and defend against incoming missiles through hard-kill and soft-kill defenses.”⁵⁷ Unfortunately, as a capital ship, the carrier is insufficiently capable of at least two of these requirements.

Cause for alarm is not isolated to military planners. The concern over carriers’ future viability has risen to such a level that lawmakers, even proponents of the Navy, have questioned the underlying reliance on them. As Senator Angus S. King (I-ME) stated in summer 2019, “Every aircraft carrier that we own can disappear in a coordinated attack.”⁵⁸ He added, “I think it does raise a question of the role of the aircraft carrier if we cannot figure a way to counter this capability. . . . I don’t want indefensible, \$12 billion sitting ducks out there. I’m not prepared to say the carrier is obsolete, but I say that [the hypersonic missile] undermines the viability of the carrier.”⁵⁹

This sober forewarning is resonant of the Army-Navy Board’s remarks disregarding the threat of aviation to dreadnoughts, yet simultaneously and paradoxically it is the same critique lodged against the carrier eighty years ago by some of its own proponents, extending even to use of the same language—“sitting ducks.”⁶⁰ The criticism of carriers is not reserved solely for their operational

limitations, though. Carriers' price tags and preeminence relative to other warships in the fleet are also problematic.

Carriers' Costs Impose a Zero-Sum Proposition

In addition to the operational concerns surrounding carriers in the MMPSR, expense further exacerbates the strains the carrier fleet imposes on operational plans in the Pacific. As a useful benchmark, the total fiscal year (FY) 2021 Department of the Navy (DON) budget was \$207 billion.⁶¹ Even understanding that the procurement costs of carriers are dispersed across several fiscal years, they still are expensive. One aircraft carrier costs approximately \$13 billion, which is roughly ten times more than an installation on land, and multiple ships are required to provide a continuous theater presence. Thus, "depending on carriers, rather than land bases, to provide constant combat airpower in a given region is a generally a [*sic*] dubious economic proposition if you know that the threat is going to be around for a while."⁶² This is especially cogent when every dollar spent on carrier procurement is one that cannot be invested otherwise in emerging technology for the fleet or simply more-efficient weapons systems.

Furthermore, the costs associated with the ship exclude the price of the aircraft flown from it. The Congressional Budget Office (CBO) estimates that DON aircraft procurement outlays will average approximately \$12.5 billion *a year* from 2020 to 2050, and that estimate does not include expenditures for maintenance, training, development, or personnel. To be clear, this is procurement cost of *all* DON aircraft, which includes non-carrier-based aircraft such as the P-8A Poseidon and Marine Corps aircraft found aboard other ship types or ashore. Nevertheless, CBO notes that carrier-based fighter/attack aircraft such as the F-18E/F and F-35C represent half the thirty-year total, or \$190 billion.⁶³

Training is an additional cost consideration for carriers. The initial training of a naval aviator is estimated conservatively to cost in the range of \$5–\$11 million. On top of that, the price for the minimal hours of annual sustainment training for TACAIR aviators, who fly offensive carrier missions, is approximately \$2.2 million each.⁶⁴ There are approximately seven thousand naval aviators (pilots and naval flight officers), and just over half fly TACAIR, resulting in approximate annual sustainment training costs of \$7.7 billion per year.⁶⁵ That amount includes nothing for the training of enlisted sailors associated with carrier aviation. Moreover, these procurement and training costs assume the DON fleet size remains static at four thousand aircraft and does not increase; however, as noted, an increase is in fact the congressionally desired end state, reflected in the statutory reference to a tenth carrier air wing.⁶⁶

These carrier-aviation expenses accumulate quickly and represent a significant portion of the overall DON budget. Even considering procurement and training costs exclusively, it is reasonable to question whether maintaining such

a sizable carrier fleet is worth the continued capitalization, especially considering the ships' operational limitations in the MMPSR. If this criticism sounds familiar—reduced efficacy coupled with ballooning cost—that is because it is the same line of reasoning that led to the scuttling of battleships.

THE FUTURE: A WEATHER EYE OVER THE HORIZON

Latitude to Adapt

If carriers are expensive, the relative cost of missiles is cheap. As comparison, for the procurement price of just one carrier the Navy could purchase over seven thousand Block IV Tactical Tomahawk land-attack missiles (TLAMs) at \$1.79 million each.⁶⁷ Even if that figure were halved so as to include the cost of one or more additional substitute vessels as TLAM firing platforms, that still would represent a stunning volume of strike missiles—roughly fourteen years' worth of DON TLAM procurement.⁶⁸ And that is just one aircraft carrier, and those trade-offs do not include the savings for deferred TACAIR purchases associated with the reduction of an air wing and the concomitant personnel, operations, and training savings.⁶⁹ These figures suggest that land-attack cruise missiles (LACMs) and other standoff weapons, such as the TLAM and Block V ASCM-TLAM, are an efficient means to provide strike capability in the joint force's Pacific war plans in which geography, adversaries' capabilities, and costs are critical factors.

Introduced in 1984, the TLAM comes in several variations. The original, well-known, Block III version—employed famously in the Gulf War and other strikes in the Middle East and Africa in the 1990s—includes two adaptations. The first, TLAM-C, contains a standard thousand-pound blast/fragmentary warhead with a range of 1,000 nm. The second, TLAM-D, “includes a submunitions dispenser with combined effect bomblets,” making it particularly effective for use against airfields and runways.⁷⁰ Introduced in 2004, the second-generation Block IV TLAM adds several improved features, including an ability to loiter over a target area, increased flexibility via satellite communications for in-flight retargeting, an ability to provide battle-damage information to warfighters, improved navigation, and antijamming capabilities.⁷¹ The latest evolution, the Block V maritime-strike TLAM, was introduced to the fleet in 2021 and adds even more capability, including the capacity to strike surface ships, improved communication and navigation systems, stable cost, and the TLAM's customary extended range.⁷²

Not only has the Navy iteratively improved the TLAM, to the point that a weapons system older than most sailors in the service is still used, but it is also highly sought after. The success of the program and desire for it are self-evident. To date, the missile has been reserved exclusively for the arsenals of the U.S. and Royal Navies, but there now is a demand, and plans, for further distribution to

Canada, Australia, the Marine Corps, and even the U.S. Army.⁷³ This should be no surprise. The TLAM is an unmanned strike weapon with an extended range, able to minimize or neutralize the standoff advantage of ASCMs, CDCMs, and ASBMs; it is adaptable, affordable, and, therefore, relatively expendable, with an appreciable payload.⁷⁴

As a comparison, the joint air-to-surface standoff missile (JASSM) has a comparable price at \$1.2 million, and it also has a thousand-pound warhead, but even the extended-range variant, JASSM-ER, has an unclassified range of just greater than 500 nm.⁷⁵ Similarly, the air-launched long-range antiship missile (LRASM), which attained early operational capability with the Navy only in November 2019, has a thousand-pound warhead but comes at a cost roughly double that of the TLAM.⁷⁶

Collectively, though, these weapons are the Navy's most-offensive, long-range, nonnuclear, cost-effective response available to challenge China's land-based A2/AD weapons and its control of the approaches to and around the western Pacific. In addressing the critical importance of having a long-range standoff weapon to counter surface combatants in addition to land targets, Vice Admiral Joseph Tofalo, former commander of Naval Submarine Forces, noted that, "[along with] our surface brothers and sisters, we got to get the long-range missile so we're not held out by that A2/AD bubble and we have the stick to hit inside."⁷⁷ Consequently, with such a versatile and effective tool in the proverbial kit bag, TLAM (and the JASSM and LRASM, for that matter) provides naval planners with another reason to reconsider seriously the traditional employment of capital ships.

Obviously, the proposition to employ carriers in a different way is not simply a matter of decommissioning one *Nimitz*-class carrier to purchase several thousand missiles immediately; an exchange of seven thousand TLAMs for one carrier is unrealistic. To start, since TLAMs were added to the Navy's arsenal, only a total of approximately two thousand have been employed; therefore, seven thousand would be excessive under almost any scenario.⁷⁸ Furthermore, long-range cruise missiles are not invincible. TLAMs are subsonic and vulnerable to sophisticated surface-to-air defenses. Additionally, with limited exceptions, even "tactical" cruise missiles cannot adapt to highly maneuverable, real-time changes on the surface to engage targets on the sea or land the way TACAIR can. Yet naval aviation pioneers such as Chambers, Moffett, and Towers persisted in advocating revolutionary thinking to graybeard battleship stalwarts over one hundred years ago.⁷⁹ Their ideas can be extrapolated to support the broad proposition to use long-range, unmanned, precision-guided munitions in place of a portion of the well-established, yet exposed, aircraft carrier fleet; this proposition should not fall on deaf ears.⁸⁰

Longitudinal Concerns

U.S. Advantage. To start, one rationale to rebalance U.S. fleet employment between missile platforms and carriers is the advantage the United States maintains over China in ship and submarine vertical launch system (VLS) missile cells. With an estimated 10 : 1 ratio favoring it, the United States could exploit this dominance fully by putting teeth behind additional surface and subsurface strike combatants in lieu of carriers—in the form not only of more missiles but of more missile-capable platforms from which to fire them.⁸¹ Capital-ship reemployment would be particularly advantageous considering the Chinese numerical superiority in battle-force ships.⁸² More Chinese surface ships and submarines represent a greater threat to carriers, but Chinese ships also represent more Block V TLAM targets for U.S. submarines and CRUDES ships. The United States could “flood the zone” with missile cells, and thereby increase the volume of strike missiles (both land and maritime) to saturate air-defense systems. In fact, this concept is already under some consideration, as the Navy is exploring once again the feasibility of an “arsenal ship” by incorporating in the fleet a large, unmanned surface vessel capable of carrying scores, even hundreds, of missiles to augment the Navy’s need for long-range fires.⁸³ As Navy veteran and U.S. representative Elaine Luria (D-VA) has explained, there may be efficient and expedient techniques to create “Tomahawk arsenals” out of noncombatant ships, similar to the way in which the fleet retrofitted *Spruance*-class destroyers to be VLS shooters in the 1980s and ’90s.⁸⁴ This particular prospect provides general support to the feasibility of shifting from expensive, vulnerable capital ships to more-practical assets that provide capability and efficiency.

Operational Environment. A second consideration in favor of capital-ship reemployment in the Pacific is the nature of the operational environment and the low density of available carriers. With only eleven flattops in the entire fleet, there are simply not enough to threaten credibly the vast Chinese littorals, associated A2/AD batteries, and land-based maritime tactical and patrol aircraft. Without question, maneuverable carriers augment Air Force and ally airfields in Guam, the Philippines, Taiwan, South Korea, Australia, Japan, and other locations, but given China’s nine-thousand-mile coastline it is reasonable to assume that at least six carriers would be required to provide the necessary sorties in a significant conflict with that country.⁸⁵ This is a rough estimate, using the Gulf War as a comparator, in which six carriers were deployed to U.S. Central Command during Operations DESERT SHIELD and DESERT STORM to face a far-less-potent opponent.⁸⁶ Importantly, though, the U.S. fleet in 1991 consisted of fifteen carriers, not eleven.⁸⁷ Forty percent of that U.S. carrier inventory was deployed to counter the world’s fourth-largest army, a navy of only a few thousand sailors, scarce

“warships,” no naval aircraft, and certainly no aircraft carriers.⁸⁸ Clearly, the PRC would represent an enemy orders of magnitude more formidable than Iraq, and even four carriers (if rounding up generously to near the historical percentage of commissioned carriers) would not be sufficient in a major conflict. In fact, the level of carrier support required, if carriers were to remain the nucleus of naval doctrine, has not been seen at least since World War II.

On the other hand, the Navy currently has guided-missile submarines, attack submarines, destroyers, and cruisers in spades. This includes an inventory of four *Ohio*-class nuclear-powered guided-missile submarines (with a payload of 154 TLAMs each), nineteen *Virginia*-class nuclear-powered attack submarines (each equipped with up to twelve VLS cells), thirty *Los Angeles*-class submarines (each equipped with up to twelve VLS cells), sixty-nine *Arleigh Burke*-class guided-missile destroyers (DDGs) (each equipped with up to ninety-six VLS cells), and over twenty *Ticonderoga*-class cruisers (each equipped with up to 122 VLS cells).⁸⁹ Not all CRUDES-ship VLS cells are available for LACMs and ASCMs, owing to the need to carry AAW missiles, but a fraction of these platforms could provide more cost-effective, menacing combat power, at distance, than even multiple carriers, given the latter’s operational vulnerability in the MMPSR.

Carrier Scarcity and Renown. A third reason for concern about the overreliance on carrier operations is precisely because of their scarcity and associated renown. Simply put, carriers are too prized to risk. The last sinking of a U.S. carrier in battle occurred in February 1945 at Iwo Jima. It was the escort carrier USS *Bismarck Sea*, a ship whose name is largely lost to history.⁹⁰ As Fleet Admiral King described, that fleet was part of “the greatest naval force ever assembled in the history of the world,” when U.S. ships numbered in the thousands.⁹¹ The gravity of the war and the ubiquity of “carriers” such as *Bismarck Sea* made such losses inevitable, but there is no comparison between a *Ford*- or *Nimitz*-class supercarrier of today and a *Casablanca*-class escort carrier of yesteryear. The latter ships displaced a mere 10,200 tons fully loaded, a fraction of the more than one hundred thousand tons of today’s carriers. Escort carriers were 498 feet long—even less than the 505 feet of the modern Flight I/II *Arleigh Burke*-class destroyers. They had a complement of eight hundred sailors, compared with the over three thousand of today’s carrier crews, and were powered by oil-fired reciprocating engines, not complex nuclear-powered steam turbines.⁹²

The unspeakable sinking of a modern aircraft carrier in any battle short of one for the preservation of the homeland would be profoundly more grave than any preceding USN casualty. The psychological blow would be devastating under normal circumstances, let alone in America’s polarized twenty-four-hour news cycle. Perhaps the most fitting analogy would be to make use of the historical

coincidence. Few remember the Navy's loss of *Bismarck Sea*—a second-rate, non-capital ship—but even a casual observer of military history recalls Britain's May 1941 quest for and sinking of the German battleship *Bismarck*—a world-class

Recent reexamination of the historical inter-relationship between battleships and carriers makes clear that the lore of carrier—and carrier-borne aircraft—supremacy is more myth than reality.

capital ship—that presaged the downfall of the Kriegsmarine surface force. While the destruction of any U.S. warship would be a disaster, there can be little doubt that the effect would be magni-

fied exponentially if the loss were of a capital ship such as a supercarrier. Critics subscribing to the overwrought “Thucydides’s Trap” theory would need no more evidence to relegate the United States to permanent decline.

Offense versus Defense. An added reason underscoring a need to pursue capital-ship reemployment is the principle that offense is cheaper than defense. Missile defense, whether ballistic or cruise, requires a great deal of resources. A carrier with limited AAW defenses relies almost entirely on its escort—its “shotgun” CRUDES ships—to engage enemy missiles. Moreover, a carrier likewise has limited antisubmarine warfare (ASW) defenses, relying primarily on underwater surveillance, its maritime-strike helicopter squadron, and any ASW escort (surface or subsurface). In addition to its shotgun escort, a carrier *at least* requires a helicopter squadron, if not more, to provide a fig leaf of ASW coverage. Thus, to provide the striking capability associated with the carrier air wing, the ship must trail along several inorganic defensive assets, many of which can provide a comparable, albeit shorter-duration, strike capability of their own.

On the other hand, while streams of TLAMs or other long-range strike weapons are not inexpensive, they are markedly cheaper than the costs of a carrier and all its attendant enablers. The *daily* operational cost of a carrier, its air wing, accompanying surface combatants, and a fast-attack submarine is estimated to be about \$6.5 million.⁹³ During a notional six-month deployment, that would total \$1.17 billion—without ever firing a shot. If a number of missiles equal to half of all the TLAMs ever fired was added to Pacific fleet inventories, it still would represent a cost less than the amount the DON budgeted in FY21 for sailors’ basic allowance for subsistence.⁹⁴ In conflict, waves of hundreds of TLAMs would be difficult for any adversary, even China, to defend against; but an equally important factor is that in times of peace such a strike posture imposes an immense defensive financial onus and presents a planning conundrum.

Efficiency. Related to the cost of defense, a fifth reason capital-ship reemployment is logical is the efficiency of self-sufficiency. When it comes to noncyber

threats, CRUDES ships and submarines are organically self-defensive and require fewer enablers. This is a corollary to the fact that carriers require escorts, whereas submarines and CRUDES ships often steam alone. To be sure, both carriers and CRUDES ships would not last long without fleet replenishment oilers and other combat-logistics force support, but these vital assets are a relative wash between Pacific air forces and surface forces since both require that assistance. CRUDES ships and submarines transport the weapons necessary to defeat their counterparts. For example, with regard to surface warfare, in addition to the Block V TLAM that both CRUDES ships and submarines can embark, both platforms also employ the Harpoon ASCM; carriers carry neither weapon. With regard to ASW, CRUDES ships and submarines carry torpedoes (either the Mk 46 light-weight or the Mk 48 heavyweight advanced capability, respectively); carriers cannot fire torpedoes. And as it pertains to AAW, the one domain in which a carrier possesses some organic self-defense, CRUDES ships carry a broader array of AAW missiles (including the Evolved Sea Sparrow Missile, Sea Rolling Airframe Missile, Standard Missile [SM] 2, and SM-6), well beyond the limited inventory on which a carrier relies. This capability is only improved with the addition of Aegis Baseline 10, the integrated air and missile defense system inherent in all forthcoming Flight III *Arleigh Burke*-class DDGs, which allows them to provide ballistic-missile defense (BMD) and AAW simultaneously.⁹⁵ Yes, carriers also are protected from nonmissile aviation threats by their DCA, but DCA cannot provide protection from ASCMs or ASBMs. Thus, not only do the surface and sub-surface assets pack an offensive punch with their strike weapons organically, but they also have better means of self-defense.

Shared Domain. Yet another reason for redesigning the role of the carrier as today's capital ship is because it operates in a shared domain. While submarines and CRUDES ships exercise a virtual monopoly on U.S. operations on the sea surface and below, the Air Force can, and likely will, vie to fill the same aviation function in the Indo-Pacific theater as carriers and carrier aviation perform. With a network of airfields in allied and friendly nations, the Air Force can provide longer-range aircraft, capable of greater payloads, at a reduced price—when accounting for the costs associated with the carrier (not necessarily the per-flight-hour cost). The same long-range aerial-strike capability exists regardless of whether a JASSM or LRASM is launched from an Air Force F-15 or a Navy F-18. If it is acknowledged that the Air Force is going to play some role in the air domain, even over the sea, then USN efforts to establish a carrier-borne strike capability most likely will achieve, at best, half a loaf—and even then, only after bargaining with the joint force air component commander, who is likely to be an Air Force officer. Meanwhile, there is no interservice competitor able to provide sea surface or

subsurface strike capacity. And to be clear, no matter how beneficial the aviation strike potential, it is safe to say that no force can provide long-distance strike as stealthily or as voluminously as a guided-missile submarine.

Budget Considerations. Finally, a temporal reason to consider capital-ship reemployment has to do with budgeting cycles. If the military procurement process is like the turning radius of a battleship, any doctrinal deviation will need space to implement.⁹⁶ With some *Nimitz*-class carriers exceeding forty years of commissioned service, hard choices will be required regarding the future of naval warfare, especially whether to replace the ships at a one-for-one ratio. Factoring into this calculus is the question of whether to pursue costly midlife refueling and complex overhaul for later hull numbers.⁹⁷ Can the carrier be a powerful weapon for the next ten years? Yes. The next twenty years? Probably. The next thirty years? Probably not. And even if it remains potent for that long, should it continue to serve as the cornerstone of the fleet, at its current expense? If not, does the United States need so many? If the ships average a fifty-year service life, now is the time to think about the replacement rate, and now also is the time to think about capital-ship employment in the Pacific in a more deliberate way than that reflected in the battleship's sudden, inglorious withdrawal.

Anticipated Headwinds

Significant deviations from the status quo invite and deserve criticism. Prudence, indeed, dictates that naval doctrine long established should not be changed for light and transient causes.

Insufficient VLS Cells. To start, critics of employing capital ships differently in the Pacific would be right to point out that the number of VLS cells on CRUDES ships is insufficient for the volume of attacks necessary to counter the threats from China's vast coast in a major conflict. Even guided-missile submarines, with their considerable TLAM inventories, are not capable of providing the sustained punishment of cyclical strike-fighter operations using cheap joint direct-attack munitions and laser-guided bombs. In fact, turning once again to the example of the Gulf War, in the six weeks preceding the ground invasion of Operation DESERT STORM allied air forces dropped a staggering 88,500 *tons* of munitions.⁹⁸ Even if sufficient precision-strike ordnance to approach such a massive expenditure as seen in that war was possessed in the current U.S. inventory, long-range precision missiles are too expensive to employ on a similar scale. There is no question that these criticisms highlight valid limitations of standoff weapons. They also implicate another legitimate weakness of surface and subsurface TLAM-capable platforms: their inability to replenish missiles at sea. Although requiring solutions, these concerns do not abrogate the need for a doctrinal shift away from overreliance on the carrier in war plans.

First, the scale of a potential conflict in the Pacific needs to be considered. Certainly, one harrowing scenario has the PRC crossing the strait to invade Taiwan, and the United States responding with a ground force. Setting aside the likelihood of this, or the immense risk of escalation should this occur, it is reasonable to assume that a ground component of at least half a million combatants—to mirror the component that forcefully ejected Iraq from Kuwait—would be necessary. In such a scenario, faced with deploying a similar scale of munitions, the Navy already would be at a considerable disadvantage. To recall, relative to its composition and end strength in 1991, the carrier fleet is diminished. Then, six of fifteen carriers deployed in support of Operations DESERT SHIELD and DESERT STORM. It is difficult to see how a six-carrier force, leave aside a larger one, would be available from an inventory of eleven to confront a much fiercer foe in China. Moreover, the Gulf War generated 2,500 sorties per day.⁹⁹ *Nimitz*-class carriers are capable of surging to 240 daily sorties through twenty-four-hour operations.¹⁰⁰ If the Navy were responsible for only half the air-tasking-order sorties in a similar conflict, this would require more than five carriers operating at a breakneck pace. Thus, the Air Force or allies would be required to make up the difference—thereby exposing an unenviable capability asymmetry for the Navy or the U.S. joint force. Almost by necessity, a reconceptualization of carrier use in this era is required. Alternatively, in a less direct confrontation—perhaps one for control of the SLOCs to and around Taiwan—CRUDES ships and submarines would be well suited. Thanks to CRUDES ships' increased survivability against CDCMs and ASCMs and their ability to conduct AAW and ASW, added to American submarine superiority over China, these platforms represent a compelling option to deny the PRC access to Taiwan via the SLOCs and airspace of the East China Sea. Consequently, in anything less than a major conflict, the reduced volume of standoff strike weapons may not be problematic.

Second, the point is not to eliminate carriers but to consider better their indispensability in war plans vis-à-vis their costs and vulnerabilities in the MMPSR. As stated, the Navy is at a comparative disadvantage (particularly when facing a near peer today) to its own past peak capacity, and the service ought to reevaluate its emphasis, in dollars and doctrine, on a single platform that Father Time may jettison as effortlessly as the dreadnought.

Employing Current Assets. Skeptics also would be right to point out that the United States already owns the eleven carriers and nine air wings; why would we not use them? Of course, that is true. Yet, as alluded to, now is the time for choosing. Three of the ten *Nimitz*-class carriers have not undergone refueling and complex overhaul, nor are they yet scheduled to begin that expensive and time-consuming process. Furthermore, with an anticipated fifty-year service life, ships

such as USS *Nimitz* and USS *Dwight D. Eisenhower* will reach their operational horizon in the next five years. Combined, these five ships represent potential cost-shifting and cost-saving opportunities over the next decade. Ultimately, as the proverbial law cautions, if you find yourself in a hole, stop digging. History suggests that unchallenged reliance on the status quo, without introspection and foresight, can result in abrupt and inefficient change, as demonstrated in the mid-1940s. And again, the argument in favor of capital-ship reemployment is not to stop using carriers entirely, but rather to reimagine their use in a new relationship with CRUDES ships and submarines and with unmanned, extended-range, maritime-strike capabilities.

Air Bases Make Easy Targets. Additional criticism might come from air planners, who point out that air bases are at higher risk than carriers in the Pacific, since they are static and more easily targetable than mobile carriers. This is a rational concern. Admittedly, in this sense carriers possess the same superior survivability over airfields and runways—at the operational level—that ballistic-missile submarines maintain relative to missile silos and bomber bases at the strategic level. This is a unique USN contribution to the joint force that should not be understated.

However, the setting is not irrelevant. In the Pacific theater, save for Guam—at a greater physical distance from China than alternatives—no prospective air bases are located on sovereign U.S. territory, in contrast with their strategic counterparts (bomber bases and missile silos), which are in the continental United States. Therefore, other risk-to-force considerations (i.e., personnel, aircraft, infrastructure) being relatively equal between carriers and air bases, one side of the equation implicates a runway on foreign soil and the other a U.S. national asset. Comprehensively, the analysis is of whether the heightened risk to one of multiple airfields on allied/friendly territory, each representing a fraction of a carrier's financial cost, outweighs putting a U.S. nuclear-powered capital ship in increased danger. Not only would the mission kill or sinking of a U.S. super-carrier usher in a tremendous loss of national prestige and reduced combat effectiveness, but a destroyed, or even severely damaged, nuclear-powered carrier would pose dire economic and ecological impacts affecting the energy, shipping, fishing, and tourism sectors in the region, with cascading effects throughout the globe. On the other hand, a recomposed fleet presence with fewer carriers could mitigate the naval risk while still providing a degree of increased survivability to compensate for the static presence of terrestrial airfields.

Missile Risk. Detractors also might posit that CRUDES ships will be at no less risk from long-range missile attacks than carriers. Thus, VLS cells on those platforms will not be a survivable substitute for carrier air strikes. However, CRUDES ships are accustomed to operating in waters within an adversary's CDCM and

ASCM weapons engagement zone; therefore, the long-range cruise-missile threat (supersonic and subsonic) would not be an unusual challenge. In fact, there have been only two carrier transits of the Taiwan Strait in roughly the last fifty years, whereas CRUDES ships often make the same freedom-of-navigation pas-

In sum, after decades of relying on the battleship, the Navy was forced to adapt its war plans creatively and employ all the maritime weapons at its disposal to confront new threats in a practical manner. The modus operandi became less dogmatic and more utilitarian.

sage within the PRC's cruise-missile weapons engagement zone.¹⁰¹ Meanwhile, with regard to ASBMs, the danger may not be as dire as critics assume. As mentioned, Aegis Baselines 9 and 10 incorporate simultaneous AAW and

BMD capabilities, even if BMD success against ASBMs is unproved.¹⁰² Still, this critique overlooks a simpler rebuttal: the stark numerical imbalance of CRUDES ships to carriers and the planning dilemma that reemploying those capital ships would impose on the adversary.

To recall, there are around ninety CRUDES ships in the fleet, compared with the eleven carriers. Targeting one high-value asset, or even a few, is an uncomplicated decision and provides a much greater return on investment than using valuable and scarce ASBMs on one of dozens or scores of smaller warships. No doubt classified intelligence assessments could confirm this, but logic suggests that China does not have an endless supply of DF-26 or DF-21D missiles. The DF-21D, after all, is branded the "carrier killer," not the "destroyer killer."¹⁰³ Although it is arguable that CRUDES ships are similarly endangered by ASBMs, China is less likely to prioritize noncapital ships with these missiles, for the simple reason that they are not worth the expense. Even in the disastrous event that one or more CRUDES ships were destroyed by ASBMs, the fleet balance makes these ships more easily replaceable, their loss less injurious to American stature and less costly in human lives. Reemploying carriers would not eliminate the targeting risk to carriers deployed to the western Pacific. In fact, reducing the overall quantity of carriers in the region would make any *one* carrier arguably *more* exposed to the ASBM threat. Nevertheless, as Senator King noted, fewer carriers in the operating area decreases the likelihood that multiple aircraft carriers are targeted in a coordinated attack and would preserve a larger share of the carrier fleet for operations in other phases of a Pacific war or for use in other geographical combatant commands.

A useful framework for considering this alternate means of projecting American naval power, ironically, is a maritime analogue of the ancient Chinese practice of *lingchi*. Instead of concentrated power originating from a single decisive source, as represented by the awe-inspiring might of the *Ford*-class supercarrier, the future

lies in an ability to deliver a spectrum of lethal “pinpricks.” As CNO Admiral Michael M. Gilday recently stated, when “[l]ooking through the lens of the distributed maritime operations concept,” he keeps “coming back to long-range fires as a key capability for the future that we’re going to need to deliver on,” noting that missiles capable of such fires will be “central to power projection” at sea.¹⁰⁴

In sum, despite reasonable skepticism, the combination of operational vulnerability, cost, and the relative merits of alternatives puts the carrier on a course similar to that of the dreadnought a century ago. When comparing the Navy of the 2020s to that of the 1920s, one must note the alarming parallels between the current statutory and administrative prominence of the aircraft carrier and the General Board’s prioritization of battleships in the early twentieth century. Then, the Navy overlooked the battleship’s enduring weaknesses, only to upend decades of doctrine abruptly. In this era, the transition should follow a smoother glide slope, guided by historical experience and the foresight of today’s USN leaders.

DON’T GIVE UP THE SHIP . . . YET

To be sure, few are yet ready to borrow a phrase from Admiral William S. Sims and pronounce “the aircraft carrier dead.”¹⁰⁵ As argued above, the future role of carriers and their associated air wings requires introspection and evolution, not eradication.

Modern soft-kill and countertargeting techniques, such as decoys, obscurants, and electronic attack measures, have not been developed and tested sufficiently to support the conclusion that the carrier, categorically, will not be survivable within an enemy weapons-engagement zone. Similarly, some potential hard-kill defenses such as antiballistic missiles, directed energy, lasers, and electromagnetic rail guns may be capable of defeating MMPSR threats, although they have not been proved yet.¹⁰⁶ There also is the prospect that other technology, including high-powered, rapid-pulse microwaves, could offer up an effective close-in defense that could disable scores of simultaneous incoming antiship-weapon seekers—producing an effective missile-defense shield analogous to the Aegis weapons system.¹⁰⁷

A viable alternative also might mean a return to building less complex “carriers” like those of yesteryear, such as light carriers or escort carriers, instead of post-*Forrestal*-class supercarriers—something akin to the fleet’s current *America*-class amphibious assault ship or the sea-control ship envisioned in the 1970s. Such a vessel could be powered conventionally and would be relatively cheap to build. It could leverage a broader industrial base and provide ASW protection and DCA to both the “carrier” and CRUDES ships—which could allocate more missile real estate to long-range precision-strike weapons.¹⁰⁸

Presumably, unlike USS *Gerald R. Ford*, which took over seven and a half years from keel laying to delivery, these ships could be produced at a rate closer to that of USS *America*, which reached the Navy in just under five years—a time savings of over 33 percent.¹⁰⁹ Producing a larger number of smaller, nonfleet carriers, at a faster pace, is another creative diversion from the supercapital ships of the twentieth century that consume so much of our resources and of the adversary's attention.

Additionally, carriers likely can continue to succeed with the advent and incorporation of longer-range aircraft. If area denial is presently the carrier's greatest weakness, extending offensive reach is a potential solution. The answer may lie in increased use of unmanned aircraft.¹¹⁰ Currently, unmanned carrier-based aircraft are envisioned only for aerial refueling, but the addition of extended-range unmanned tactical aircraft also could be key to prolonging the viability of carriers.¹¹¹ As Jerry Hendrix expertly summarized, the Navy could “build on the lessons of naval aviation's evolution in the post-World War II period and purchase a carrier-based unmanned combat aerial system [that] could provide the long-range, deep strike capability necessary to keep the supercarrier relevant and in the fight, even in a mature anti-access/area-denial environment.”¹¹²

Aside from hardware providing a panacea, other prospective solutions rely on creative thinking. One suggestion would be to employ carriers more agilely—the way Admirals Nimitz, Halsey, and Spruance used the capital ships of their day. A logical start would be to reconsider and redefine the fleet's supporting/supported relationships. For instance, instead of massing carriers in A2/AD waters of the western Pacific with their air wings as the primary offensive threat, these capital ships could be used better in the converse of their traditional application. By *supporting* CRUDES AAW capabilities, especially against land-based maritime patrol aircraft and TACAIR, the carrier and its wing could free up support for CRUDES ships' long-range strike missions. With fewer carriers in theater requiring protection, the 1 : 1 or 1 : 2 carrier-to-CRUDES ship ratio would be loosed. Proportionally, this would allow CRUDES ships to carry fewer AAW SMs to fulfill fleet air-defense responsibilities, owing to the reduced number of carriers in theater. The result would be that CRUDES ships could alter the balance of strike and AAW missiles in their magazines to carry more TLAMs (LACMs and ASCMs). Moreover, carriers also could supplement antisubmarine missions with additional maritime-strike helicopter squadrons in support of TLAM-capable submarines and ships, instead of the customary four strike-fighter squadrons. In this modified function, a reduced but attainable number of carriers still could support Pacific war plans, but in a new way.

However, this “distributive offensive” idea is not new. Vice Admiral Henry C. Mustin promoted the concept clairvoyantly at the twilight of the Cold War. His

idea envisioned carriers replacing offensive assaults with a defensive umbrella for TLAM submarines and CRUDES ships. In 1988, Vice Admiral Mustin stated, “The power projection capability represented by U.S. SLCMs [sea-launched cruise missiles] is as important to our naval strength as were earlier developments of the aircraft carrier and nuclear submarines.” Mindful of the symbiosis between carrier aviation and long-range strike weapons, he went on to add, “The synergistic effect of combining carrier . . . air with cruise missiles has . . . revolutionized the very nature of naval war.”¹¹³

These are just a few suggested adaptations that portend a diminished, but not eliminated, future for carriers. Although they may sound revolutionary, they are not as far-fetched as might initially be perceived, particularly in consideration of a sister service’s recent course change.

As of 2020, the Marines, after thoughtful examination, fundamentally modified their principal doctrine. The Marine Corps, as Commandant General David H. Berger wrote in a starkly candid article, “is at its core optimized for amphibious forcible entry and sustained operations ashore.”¹¹⁴ In reversing course on a mission hand selected by Major General John A. Lejeune in 1919, General Berger went on to add that he was “convinced that the defining attributes of our current force are no longer what the Nation requires of the Marine Corps.”¹¹⁵ The Commandant argued that the Corps “is weighted too heavily toward amphibious forcible entry and sustained land operations” and must change. Among his proposed revisions are to divest the service of performing those same amphibious operations, to develop new doctrine and technology, and to contemplate new ways to compete with great powers in other-than-lethal conflicts. The net effect will be a force that is lighter, smaller, and capable of greater standoff—even if that comes at the (almost heretical) cost of downsizing exalted Marine infantry battalions.¹¹⁶

With this frank analysis, the Corps began the process of uprooting one hundred years of tightly embraced doctrine and tradition. In turning aside from enduring ground campaigns and occupations, the Marines have opted to embrace a future with expeditionary advanced base operations, area AAW capabilities, antisurface artillery and missiles, and even possibly ASW capabilities.¹¹⁷ This change reflects a return to the Corps’s traditional naval roots. The Commandant, thus, has made the focus of the future Marine Corps reflective of its past—precisely what the Navy should consider in reinvesting in surface and subsurface strike platforms. If the Marines can make such a surprising foundational change, the Navy is capable of the same self-reflection.

The sun has not set on the aircraft carrier, nor does the future diminish the significant contributions of naval aviation throughout the Cold War or in the last generation of conflict. Indeed, in the past twenty years naval aviators were far more likely to have been engaged in combat in sorties over Iraq or Afghanistan

than their subsurface and surface-bound comrades, who often were relegated to support responsibilities in noncombat or less-intense-combat environments. The carrier's future is jeopardized in a context in which confronting an ascending China constitutes the U.S. military's greatest challenge, but the carrier is still quite capable, particularly in less foreboding environments. It will maintain a dominant role against adversaries that are incapable of creating an offshore "no man's land" in the MMPSR.¹¹⁸

In the first forty years of the twentieth century, the Navy adhered to conventional wisdom—at the cost of obscuring the future of the capital ship. It never deviated significantly from that course despite the flickers indicating naval aviation's broadening importance and the battleship's plaguing vulnerabilities. Fortunately, American adaptability, ingenuity, and resilience overcame creative complacency and led to victory in World War II and thereafter.

Similarly to the period a century ago, the Navy finds itself at an inflection point. The aircraft carrier still has a part in the Navy and in Pacific war plans, just as *Iowa*-class battleships played a role in foreign affairs and defense policy for fifty years after Leyte Gulf. Now, however, the carrier no longer should be the sole anchor of great-power-competition maritime strategy. Reflecting on the cooperative, adaptive approach of our naval forebears and respecting the history of the carrier while leveraging the capabilities of modern precision-strike weapons, we of the Navy can take solace in another CNO's words: that it "has both a tradition and a future—and we look with pride and confidence in both directions."¹¹⁹

NOTES

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16. Smith, *Carrier Battles*, p. 43.
17. Spector, *Eagle against the Sun*, p. 252.
18. Baer, *One Hundred Years of Sea Power*, p. 214.
19. Quoted in *ibid.*, p. 286.
20. FitzSimonds, “Aircraft Carriers versus Battleships,” pp. 843, 846–47.
21. *Ibid.*, p. 852; Baer, *One Hundred Years of Sea Power*, p. 213.
22. FitzSimonds, “Aircraft Carriers versus Battleships,” p. 848.
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26. *Ibid.*, p. 863.
27. Molly Moore, “Questions over Battleship Role Resurface,” *Washington Post*, 23 April 1989, www.washingtonpost.com/; “Inflation Calculator,” *Federal Reserve Bank of Minneapolis*, www.minneapolisfed.org/.
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