

Fleet Design with Chinese Characteristics

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February 15, 2018

China's national fleet is a composite of navy, coast guard, and maritime law-enforcement shipping. These official components of the fleet operate in conjunction with merchantmen that double as minelayers or intelligence-gathering assets, and with a maritime militia embedded within the fishing fleet. If it floats, it is probably an element of Chinese sea power—official or unofficial.

The composition of China's fleet betokens a holistic understanding of what constitutes sea power. Any implement that can shape events at sea could be part of it, whether it be military or non-military, governmental or non-governmental in nature. Such a fleet furnishes Beijing options throughout the spectrum of peacetime and wartime competition. It also introduces asymmetries into U.S.-China encounters in the marine commons. U.S. naval commanders must accustom themselves to the reality that they confront an assortment of platforms that Chinese commanders can combine and recombine depending on the mission.

A Usable Way of Maritime War

Like past aspirants to great sea power, China has consulted sources both domestic and foreign to inform its maritime rise. Steeped in China's sparse maritime tradition, its weakness during the post-World War II years, the legacy of Mao Zedong's guerrilla-warfare strategy, and the influence of Soviet naval doctrine, the PLA Navy embraced a minimalist posture from its founding.² For decades China's navy remained a minor player against foreign invasion. At most it acted as an adjunct to ground forces, deploying submarines, torpedo boats, and frigates that hugged the coast. Not until the late 1970s, amid Deng Xiaoping's reform and opening campaign, did Beijing begin to articulate a more expansive vision of sea power. Urged on by PLA Navy commander Admiral Liu Huaqing, the Chinese leadership directed the navy to develop offensive capabilities to mount a forward defense of the mainland—both within and beyond the first island chain.

Even so, the service's brown-water mentality—that is, its ingrained habit of thinking in terms of defending waters just offshore—and force structure persisted well into the early 1990s. To this day the PLA Navy devotes substantial resources to missile boats useful for coastal defense, albeit in stealthier, more lethal forms than their Maoist forerunners.³ This apparent handicap in strategy in fact constitutes a blessing in disguise. Unlike Imperial Germany, which rushed into building a top-heavy naval force structure that still

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² See David G. Muller, *China as a Maritime Power* (Boulder: Westview, 1984), pp. 44-56, 111-116.

³ Ting Yu, "Complete Remake or 'Old Medicine in New Bottle'? A Brief Discussion of the Role and Application of the Type 022 Stealth Missile Boat," *Xiandai Bingqi* [Modern Weaponry], September 2, 2008, pp. 35-43.

proved no match for its main antagonist, the Chinese have approached sea power in a patient, methodical, sequential manner. Indeed, the defensive-mindedness of early PLA naval doctrine—admittedly a product of necessity rather than choice—applied a catalyst for imaginative thinking about how to beat a technologically superior foe at sea.

Chinese planners long assumed, correctly and realistically, that the PLA Navy would fight from a position of weakness should it be pitted against U.S. forces. Accordingly, they sought to array comparative Chinese strengths against critical American vulnerabilities to even the odds. PLA strategists formulated what the Pentagon terms an “anti-access strategy.” Anti-access strategy combines military with non-military measures in an effort to delay the arrival of U.S. and allied forces in a particular Asian theater of operations; preclude or disrupt the use of regional bases that are critical to sustaining U.S. military operations; and hold off U.S. power-projection assets as far from Chinese shores as possible.⁴

By selectively developing inexpensive, readily available weapon systems like submarines and anti-ship missiles (or purchasing them abroad), and by tailoring operational concepts to China’s local circumstances, the PLA may have already put itself in position to execute an anti-access strategy. If so, Beijing could contest American command of the commons, much as *jeune école* theorists aimed to deny a stronger antagonist maritime command—and thereby frustrate its operations and strategy—a century ago. The weak could make trouble for the strong—even with swarms of light, cheap combatants unable to operate far from shore for extended periods.

In the best case from China’s vantage point, anti-access defenses could in effect erect a no-go zone for U.S. forces along the East Asian seaboard. Disputed command—either real or perceived—softens American political resolve while foreclosing certain U.S. military options. It also frees up maneuver room for the Chinese, improving the likelihood that the PLA can stage a breakout from the first island chain under the protective aegis of anti-access forces. Shackled by geography and relatively short-range weaponry, Imperial Germany had no such strategic option in the North Sea.

Beyond the potential operational advantages, Chinese investments in access denial promise flexibility and efficiency in terms of force structure and costs. Beijing long eschewed an overtly symmetrical buildup of naval forces, including prohibitively expensive big-deck aircraft carriers. Even today the PLAN is taking an unhurried approach to developing carriers, having refitted a Soviet-built flattop, improved the design after taking it to sea, and started constructing an upgraded version at Chinese yards.

The Chinese seem unfazed by lopsided force ratios, since anti-access involves qualitatively different measures of effectiveness. The proper measure for PLA adequacy is the power of the PLA Navy fleet plus the shore-based firepower that air and strategic rocket forces can concentrate at the scene of battle to augment the fleet. Taken in isolation, then, the fleet’s power matters little; what matters is joint PLA combat power at the decisive place and time. If joint PLA combat power equals or exceeds that of U.S. and allied forces at the scene of action, then it is sufficient to meet China’s needs—no matter what symmetrical comparisons between navies might indicate.

Recognizing this, the PLA naval command has wisely refused to run a ship-for-ship arms race. With little pressure to compete numerically, the navy and shipbuilders enjoy the luxury of testing and refining surface and subsurface combatants, producing and field-testing a new ship class every few years before committing to mass production. This leisurely but fruitful process is ideal for fleet experimentation, and it produces a superior end product.

China’s Surface-Warfare “Big Stick”

The Chinese navy’s surface fleet is a force on the march. To conjure up Theodore Roosevelt, the fleet represents Beijing’s “big stick,” just as the U.S. Navy’s Great White Fleet was TR’s. Destroyers, frigates,

⁴ Roger Cliff et. al., *Entering the Dragon’s Lair: Chinese Antiaccess Strategies and Their Implications for the United States* (Santa Monica: RAND, 2007), p. 11.

corvettes, and fast-attack craft comprise the surface fleet, along with—most strikingly—China’s first aircraft carrier, a refurbished Soviet-built flattop dubbed *Liaoning*. Since 2004 the PLA Navy has gone from importing frontline warships to fielding six new classes of indigenously built destroyers, frigates, and corvettes. Notably, the Type 052D *Luyang III* destroyer, the Type 054A *Jiangkai II* frigate, and the Type 056 *Jiangdao* corvette have all gone into serial production, adding mass, balance, and punch to the fleet.

Just over a decade has elapsed since China began to commission these modern fighting ships. Coming so far so quickly constitutes an impressive feat by any standard. The PLA Navy’s metamorphosis from a coastal-defense force composed of largely obsolescent Soviet-era technologies into a modern naval service has riveted attention within the U.S. defense community. In 2009 the Office of Naval Intelligence (ONI)—a body not known for hyperbole—hailed the advances of China’s surface fleet as “remarkable.” According to ONI’s 2015 report on the PLA Navy, “In 2013 and 2014, China launched more naval ships than any other country and is expected to continue this trend through 2015-16.”⁵ (And indeed it did.)

The Pentagon’s 2017 annual report on Chinese military power follows in this vein, observing that the PLAN is “the largest navy in Asia, with more than 300 surface ships, submarines, amphibious ships, and patrol craft.”⁶ Retired rear admiral Michael McDevitt likewise points out that “[w]hen one counts the number and variety of warships that the PLAN is likely to have in commission by around 2020, China will have both the largest navy in the world (by combatant, underway replenishment, and submarine ship count) and the second most capable ‘far seas’ navy in the world.”⁷

While the Chinese surface fleet’s modernization program may not rival the massive buildups witnessed in the years before World War I and World War II, it is nevertheless reshaping the naval balance of power in Asia. To better appreciate the implications of the PLAN’s growth spurt, it is worthwhile to: (1) examine the PLA Navy’s premier destroyer, the Type 052D, as a case study that highlights the durability of China’s maritime challenge; and (2) assess the trajectory of the U.S.-China competition at sea.

Long-held assumptions about American naval superiority are coming under mounting duress as the Chinese navy continues transforming itself into an oceangoing force. There is no reason to suppose China will fare more poorly than past maritime competitors as it takes to the sea. Hubris makes a slipshod guide to maritime strategy. Americans and their Asian allies must refuse to yield to overweening pride—lest pride presage a fall.

Luyang III: The PLAN’s Workhorse

The aircraft carrier *Liaoning* has understandably captured the public imagination since joining the fleet in 2012. But the true vanguard of seaborne Chinese endeavors are the PLAN’s surface combatants—the workhorses of any navy. These are the vessels that will make China’s turn to the seas felt in maritime Asia and beyond. In the coming years, these warships will serve as pickets guarding the carrier, project power on their own as the core of surface action groups, maintain a visible presence in disputed waters, defend good order at sea in distant theaters, and conduct naval diplomacy around the world.

Consider the Type 052D *Luyang III*-class guided-missile destroyer. The PLAN commissioned the first of the class in March 2014 amid much publicity and fanfare. The new vessel is an improved and slightly larger

⁵ Office of Naval Intelligence, *The PLA Navy: New Capabilities and Missions for the 21st Century*, p. 15, U.S. Naval Institute Website, <https://news.usni.org/wp-content/uploads/2015/04/2015_PLA_NAVY_PUB_Print.pdf#viewer.action=download>.

⁶ U.S. Department of Defense, *Annual Report to Congress: Military and Security Developments Involving the People’s Republic of China 2017*, p. 24, U.S. Naval Institute Website, <<https://news.usni.org/2017/06/07/pentagon-report-congress-chinese-military-development>>.

⁷ Michael McDevitt, “Becoming a Great ‘Maritime Power’: A Chinese Dream” (Washington, DC: Center for Naval Analyses, June 2016), p. v.

variant of the Type 052C, itself a man-of-war touted by Chinese naval enthusiasts as “China Aegis.”⁸ In other words, they portray the PLAN DDG as an peer of state-of-the-art U.S. Navy cruisers and destroyers outfitted with the Aegis combat system—a combination radar, computer, and fire-control system capable of autonomously engaging multiple air and missile targets at long range.

Do such comparisons stand up? To a point. The Type 052D is a stealthy, 7,500-ton, gas-turbine-driven ship with a cruising range of 4,500 nautical miles. Its phased-array radar system can reportedly detect, identify, and track hundreds of surface and air targets simultaneously at distances of several hundred miles. The DDG boasts 64 vertical launch cells, or VLS in Western parlance. A VLS cell is essentially a silo embedded in a ship’s hull. Each can disgorge one to four missiles, depending on the types and sizes of the missiles housed within. Outfitting a combatant with VLS permits quick firing of anti-air, anti-ship, or land-attack missiles without the bother, delay, and technical hassles associated with uploading munitions onto launchers from magazines deep within the ship.

On paper, at least, the Type 052D appears to be a humbler cousin to the U.S. Navy’s Aegis-equipped *Arleigh Burke*-class DDGs and *Ticonderoga*-class guided-missile cruisers. The PLAN DDG displaces less than the U.S. Navy warships, which displace 9,600 and 11,000 tons, respectively. Lesser tonnage indicates that it has smaller capacity for fuel, stores, and armaments, and thus shorter cruising range than its American counterparts. On the other hand, it is slightly larger than the Royal Australian Navy’s Aegis-equipped *Hobart*-class “air-warfare destroyers” now entering service. The *Hobarts* displace 6,350 tons fully loaded.

The *Luyang III*’s dimensions, on the other hand, appear more than adequate to discharge the types of regional missions it will likely be assigned in China’s “near seas”—the waters that lap against China’s shores—or the Indian Ocean. Its armament is smaller than that of the *Burkes* or *Ticonderogas*, which carry 96 and 122 VLS cells, respectively. (Just 48 VLS cells are installed in the *Hobart* by comparison, leaving the Australian DDG at a disadvantage on a one-to-one basis.) But again, this Chinese destroyer packs a punch for local conflicts in Asian waters—especially since it will operate within reach of shore fire support in most cases. Geographic proximity lets the fleet summon land-based anti-ship weaponry to scenes of impact, evening the firepower balance.

It is also worth noting that China’s navy did not rest after fielding the *Luyang III*. It moved on to more ambitious designs. In mid-2017 the news broke that the PLA Navy had launched the Type 055 DDG, a destroyer with dimensions exceeding those of American *Burkes* and *Ticonderogas*.⁹ If the Type 055 meets China’s needs, it could go into production alongside the Type 052D. That would open up new horizons for PLA naval operations. The U.S. Navy deploys Aegis cruisers and destroyers with its carrier strike groups and with surface action groups. Doing so lets the navy tailor forces to likely threats while holding down the cost of procuring and maintaining the fleet. The PLA Navy too could adopt a “high/low mix,” combining various ship types as tactical circumstances warrant. It could also designate the more capacious, more heavily armed, longer-range Type 055 for expeditionary duty in, say, the Indian Ocean while reserving Type 052Ds for East and Southeast Asian missions where shore-based fire support is on call.

Since commencing its naval buildup in earnest in the late 1990s, then, Beijing has taken an eminently sensible approach to fleet development. So long as China’s strategic surroundings remained hospitable and the United States was content guaranteeing safe passage through international waters and skies, the PLAN could pursue leisurely “fleet experimentation.” Shipwrights built small classes of ships, identified and kept the best features of each, and discarded the rest. This risk-averse approach made technological sense while the Chinese were attempting a qualitative leap in naval engineering.

⁸ Chi Mo, “Perspective of China’s Formidable Weapons for Attacking Taiwan,” *Sing Tao Jih Pao*, May 6, 2004, FBIS-CPP20040506000084.

⁹ “China Launches New Class of Naval Destroyer,” Reuters, June 28, 2017, <<http://www.reuters.com/article/us-china-defense-destroyer-idUSKBN19J0GX>>.

Until recently, the Chinese surface fleet, which consisted of five relatively new destroyer classes of no more than two hulls apiece, bore out this go-slow approach. Designating these ships as fleet experiments, however, does not mean they must remain close to home or forego regular maritime operations. The PLAN has extracted real value from them, dispatching experimental vessels to distant waters to fine-tune crews' skills, develop doctrine, and smooth out technical kinks. It has doubtless done so during counterpiracy patrols in the Indian Ocean and forays into the China seas and open waters of the Pacific Ocean.

Ultimately, however, the PLAN had to settle on a single design for mass production. Larger force-structure developments have likely prodded Chinese planners to draw the fleet-experimentation phase to a close. The PLAN's first aircraft carrier, the refitted Soviet-built flattop *Varyag*, has undergone a series of sea trials since entering service in 2012. The PLAN has been flight testing the J-15, a reverse-engineered derivative of the Russian Su-33 fighter plane that can operate from the *Liaoning's* decks. The chief element missing from an initial PLAN carrier group is a versatile picket ship to defend the capital ship against air and missile threats. Unless and until the Type 055 proves its mettle, it appears the PLAN has found its premier surface combatant in the Type 052D.

Admittedly, a new DDG will only complete the strictly material dimension of China's carrier ambitions. Forming a Chinese carrier battle group on par with its American counterparts will remain a formidable challenge. Chinese planners will need to combine the carrier, its air wing, surface combatants, and possibly a nuclear attack submarine screen into a seamless, mutually supporting team. This is no easy feat.

But the destroyer's usefulness will not hinge entirely on the fate of China's carrier program. These are workmanlike ships. A multipurpose DDG could be put to many other uses while the PLAN methodically masters the art of carrier operations. Notably, the Type 052D could join a surface action group or amphibious task force to support and defend high-value ships other than carriers. It could also act as the centerpiece of such a group, depending on the mission. Or it could cruise independently, much as U.S. surface combatants sometimes do.

And it could execute these functions across broad sea areas. Since 2008, surface action groups numbering up to 11 ships have transited the international straits separating the Ryukyu island chain to reach the open Western Pacific. Such naval activism strongly suggests that the surface action group will be a key organizing principle around which surface combatants will be deployed, with the Type 052D leading the way.

What will they do? Specifically, improved *Luyangs* could fend off air attacks against China's Soviet-built *Sovremenny*-class destroyers, which specialize in ship-killing engagements. They could also accompany the small but growing numbers of amphibious assault ships Beijing has constructed to project power ashore. Such expeditionary strike groups easily outmatch those deployed by Southeast Asian navies. They would be particularly well-suited to seize islands in the South China Sea, or to fend off assault on the artificial islands Chinese engineers have manufactured from rocks and atolls. The Type 052D, furthermore, could extend its protective air-defense umbrella over the nimble and stealthy Type 022 *Houbei* catamarans. These craft belie their diminutive size, sporting long-range ship-killing cruise missiles that allow them to assert or deny control of the seas vis-à-vis superior fleets. Type 022s can accomplish a lot if shielded from aerial attack.

In a Taiwan contingency, moreover, cutting-edge DDGs would offer Beijing a sea-based air-defense option that would further threaten the survivability of the embattled Taiwan Air Force. With its long detection and engagement horizon, a single Type 052D could cover wide swathes of airspace near or over the island, beyond the effective firing range of shore-based surface-to-air missile units emplaced on the Chinese mainland. Type 052Ds cruising east of Taiwan could in effect surround the island's air defenders, mounting a threat from all points of the compass when pilots take to the air.

Finally, the PLAN could dispatch these imposing frontline warships overseas, showcasing China's military prowess to foreign audiences while advancing naval diplomacy. They are tokens of political commitment,

helping coerce or deter foes or support allies and friends. The bottom line is that more—and more capable—large-displacement destroyers will allow China to combine different elements of its naval power imaginatively for a multitude of missions.

It is worth speculating whether the regional naval balance of power will shift as a result of China's DDG buildup. The short answer: yes. A casual calculation based on reports from the Pentagon and the U.S. Office of Naval Intelligence is telling. Such sources estimate that the PLAN will put to sea at least ten Type 052Ds. If so, then China will boast a fleet of sixteen or more Aegis-equivalent warships—even in the unlikely case that it builds no more combatant ships of this type. (The Type 055's debut appears to settle the question of whether it intends to keep manufacturing capital ships.)

By comparison, Japan and South Korea are the only Asian powers with similar Aegis-equipped naval heavyweights in their inventories. Southeast Asian powers that buck China's will would be utterly outmatched in surface engagements against the PLAN. They have nothing remotely comparable. On paper, at least, the Type 052D's debut makes China's the leading indigenous Asian navy. Once the full 052D contingent joins the fleet, the PLAN can expect to take on any regional fleet—excluding the U.S. Navy, of course—with better-than-average prospects of success.

Will the prospect of a tilt in China's favor spur a new round of naval construction across the region in the coming years? Much depends on the United States' staying power in the region, and on Asian countries' capacity and willingness to bear the costs of an arms race.

The Challenge to the U.S. Navy

Despite compelling evidence that Chinese naval power is growing in quantity and quality, debate persists over this metamorphosis. Skeptics doubt the PLA Navy will translate its material heft into real combat effectiveness. One sanguine view holds that the U.S. Navy surface fleet is more than a match for any rival in the contest for sea control—the arbiter of any naval war—and will remain so for the foreseeable future. The implication is that while Beijing may be able to exact a price from the U.S. Navy for attempting to use the seas and airspace in China's environs, the United States will still command the seas when the chips are down.

At the tactical level, this comforting narrative holds that U.S. naval forces remain able to land a devastating blow before opposing warships get close enough to fire their first shot. In a fleet-on-fleet engagement, for example, carrier-based warplanes would unleash missiles at enemy surface combatants from standoff distances, meaning beyond the engagement range of the opponent's anti-ship arsenal. This scenario conforms to the longstanding American doctrinal preference for shooting the “archer,” an enemy warship or warplane, before the archer can let fly his “arrow,” or anti-ship weapon. This tactical and technological margin of superiority will endure and perhaps even widen, so goes this storyline, letting the U.S. Navy perpetuate its dominant position in maritime Asia.

Such a soothing narrative is quickly losing cogency as the PLAN's surface fleet catches up across the board. For one thing, China's mariners are cementing core competencies while closing the capability gap. For years, Chinese ships' lack of sophisticated area-wide air defenses exposed them to air and missile attacks. This shortcoming reaffirmed U.S. commanders' conviction that carrier aviators would handily defeat the PLA Navy in a fight. Now, however, near-state-of-the-art systems on board some Chinese combatants outrange the anti-ship weaponry sported by U.S. aircraft. ONI reports that the Type 052D carries a new variant of the HHQ-99 surface-to-air missile with a range of 80 nautical miles, comparable in reach to the U.S. Navy's premier air-defense missile, the Standard Missile-2. The *Luyang*-class guided-missile destroyers are apparently equipped with phased-array radars similar in appearance—and, according to Chinese pundits, in capability—to the American Aegis combat system, a combination radar, computer, and fire-control system that can detect and target multiple aircraft simultaneously at long range.

At the same time, the PLA Navy has armed its warships to the teeth with a family of Russian- and Chinese-made anti-ship cruise missiles (ASCMs) boasting ranges of 120-130 nautical miles. Worse from the

American standpoint, the Pentagon pegs the range of the supersonic YJ-18 ASCM now entering service aboard PLAN combatants at an impressive 290 nautical miles. The only comparable weapon currently in the U.S. inventory is the subsonic, four-decade-old Harpoon anti-ship missile, whose advertised striking range is around 70 nautical miles. In other words, major Chinese combatants can not only keep U.S. aircraft at bay, but can also unleash volleys of ASCMs at the U.S. fleet from beyond American weapons range. Even if PLAN vessels remain inferior to their U.S. Navy counterparts on a ship-for-ship basis, getting in several missile engagements before a U.S. fleet can return fire could provide the PLAN its great equalizer against a stronger foe. Not American but Chinese archers may now hold the initiative.

Both the defensive and offensive sides of sea combat, then, are stacking up in China's favor—and progressively eroding or nullifying altogether some of the U.S. Navy's tactical advantages. In short, the U.S. Navy's surface battle capacity has fallen behind the times. Since the Cold War, the navy has grown accustomed to operating in uncontested waters. Indeed, directives from on high stated that no one was likely to dispute American command of the sea, and thus that the fleet could and should devote its energies exclusively to projecting power ashore from this safe nautical sanctuary. Having taken such strong bureaucratic signals to heart, the surface fleet let the skills and hardware for striking at sea atrophy. Why practice fighting for something no one can dispute?

Other missions have preoccupied the service since the Cold War. Naval aviators have spent the past decade supporting ground forces rather than girding to duel enemy armadas. Dropping smart bombs on insurgents and terrorists in Iraq and Afghanistan demands different skills from evading enemy defenses and pummeling enemy men-of-war. Meanwhile, guided-missile destroyers have been burdened with an ever wider array of missions, including ballistic-missile defense (BMD). Competing missions—some of which, like BMD, command national-level scrutiny—siphon finite resources, crew attention, and, equally important, physical space aboard ship away from the combat function.

In effect, then, the service has demoted war at sea, the *raison d'être* for any navy, to secondary status. Both the hardware (weaponry, sensors, and hulls) and the software (training and exercises) for sea control have doubtless suffered as a result. In an era of tight budgetary constraints, reversing two decades of steady decline in surface warfare will be neither easy nor quick. In short, prevailing assumptions about American naval supremacy have come under strain. U.S. naval officials have conceded this—and have initiated, for instance, a crash program to develop and field new long-range shipboard ASCMs. They have instructed the fleet to experiment with “distributed lethality,” arming more and more surface vessels more heavily to cause trouble for antagonists.

It would be a grievous mistake, nonetheless, to concentrate wholly on the technical and operational progress the PLA Navy surface fleet has made or the tactical travails that could hold back the U.S. Navy surface fleet. Competition is about more than just gee-whiz weaponry or comparing entries in *Jane's Fighting Ships*. It is about politics. It is about how much of the nation's naval power the political leadership is prepared to hazard in combat, considering the political stakes and competing requirements elsewhere around the world.

The only meaningful standard for gauging a seagoing force's adequacy, that is, is its ability to mass superior combat power at the decisive time, at the decisive place on the nautical chart, to overpower the strongest probable adversary. This is a tough standard to meet when operating across intercontinental distances. An Asian power fighting close to home can fling most or all of its forces into battle. A faraway global power may have no such luxury. Unless it diverts forces from pressing commitments in other theaters, placing those commitments in jeopardy, Washington can commit only a fraction of U.S. naval forces to action. And it ranges from hard to impossible for a fraction of one force to defeat the whole of a peer competitor's force.

It is far from clear that the United States retains its accustomed supremacy by this unforgiving standard, any more than it retains peerless technological supremacy. Budgetary factors are also at work. It costs the United States far more than China to stage a unit of combat power at a given scene of action in maritime Asia. Distance from the theater demands more capacious ships able to carry more fuel, arms, and stores.

Forward bases and a sizable logistics fleet are a must. The U.S. armed forces pay generous salaries and pensions. And on and on: whether the Pentagon can afford to mount superior strength in a rival great power's backyard, whether the sea services are investing in the right people and hardware to constitute that strength, and whether American seafarers have the requisite skills to prevail when battle is joined are questions worth pondering.

Doubts about U.S. maritime mastery cast U.S.-China competition in a whole new light. And to further compound the strategic and operational dilemma, a purely fleet-on-fleet engagement is improbable within the China seas or the western reaches of the Pacific Ocean. In those expanses, Beijing has the luxury of throwing the combined weight of Chinese sea power into a sea fight. It can dispatch not just the PLAN surface fleet but missile-toting submarines and swarms of missile-armed patrol craft to trouble spots.

Furthermore, land-based implements of sea power can strike a blow in any fleet action that takes place within their combat radii. PLA Air Force warplanes can join the fray, making land-based airfields into de facto aircraft carriers to supplement the fleet's combat power. So can anti-ship ballistic missiles fielded by the PLA Rocket Force. Lord Horatio Nelson, who knew a thing or two about operating fleets under the shadow of shore-based weaponry, counseled that "a ship's a fool to fight a fort." Nelson, Britain's sage of sea warfare, would blanch at a Fortress China that can strike hundreds of miles out to sea without even ordering fleets to get underway.

Because the U.S. sea services are dispersed throughout Asia and the world, one part of the U.S. Navy and Marine Corps could conceivably confront the whole of Chinese maritime might. To estimate the outcome of a fleet action, we thus have to determine how whatever contingent the U.S. Navy is likely to commit to battle—including its aerial and subsurface components, along with any assets supplied by allies like the Japan Maritime Self-Defense Force—stacks up to the massed power of the PLA Navy fleet, backed by the array of anti-access weaponry at PLA commanders' disposal. (This assumes Chinese commanders do the smart thing in wartime and combine their three regionally based fleets for action.) If China's navy outmatches the U.S. or allied fleet contingent under such conditions, it is adequate to the tasks entrusted to it by political leaders in Beijing. If not, the advantage resides with the United States and its allies.

The unenviable task before Washington, then, is to regain, preserve, or extend the margin of superiority of a fraction of its naval force deployed to Asia over the entire maritime force, sea and land, that Beijing can use to shape events on the high seas. It's tough to pull off such a feat, especially under present circumstances. Finances are straitened. Overall numbers are under stress as a result, as is the military's capacity to innovate. To make ends meet, the U.S. Navy is substituting light combatants such as its new littoral combat ships for multi-mission warships bristling with heavier firepower. To aggravate these problems, the fleet finds itself outranged by its most likely antagonist—and could well take a pummeling while trying to close to missile range. This problem will persist for some time, until new anti-ship missiles restore long-range hitting power to the fleet, or until exotic armaments such as electromagnetic railguns or shipboard lasers augment combatants' main battery.

From a grand-strategic standpoint, the lag in U.S. weapons development could open a danger zone in which Beijing is tempted to strike before its range advantage evanesces. Imperial Japan made a similar now-or-never calculation in 1904, realizing that rival Russia was constructing new battlewagons for its Pacific Squadron. Its navy struck before St. Petersburg could amass insuperable strength in Far Eastern waters. In 1941, likewise, Tokyo hit the U.S. Pacific Fleet before the entirely new fleet being built under the Two-Ocean Navy Act of 1940 could arrive in the theater to shift the naval balance against Japan. U.S. and allied leaders must remain watchful, lest Beijing too succumb to the temptation to settle disputes around its nautical periphery by force. It would be far from the first combatant to act before a window of opportunity slams shut.

Are submarines the remedy for the surface navy's shortcomings? Do they constitute a U.S. Navy game-changer akin to the "assassin's mace" that so beguiles Chinese strategists? (A weaker opponent armed with an assassin's mace strikes down a stronger opponent by assailing that opponent's fatal weaknesses.) Many

Westerners appear to think so. They consider undersea warfare a talisman, assuming that the U.S. Navy can simply dive beneath the waves and pummel the PLA Navy from below. Submariners voice confidence in the superiority of American and allied boats over anything China has put to sea. There is little reason to question the allies' qualitative superiority in this sphere, and indeed the subsurface fleet remains a core competitive advantage for the United States.

But while quality remains on the allies' side, numbers are more problematic. Under the Obama administration's "pivot" to Asia—a strategy evidently adopted by the Trump administration—60 percent of the U.S. Navy's 69-vessel submarine force now calls the Pacific Ocean home.¹⁰ But 18 of those 69 are *Ohio*-class ballistic- or cruise-missile boats (14 SSBNs, 4 SSGNs) meant for shore bombardment. That leaves 51 attack submarines (SSNs) suitable for a tilt against the PLA Navy. Sixty percent of that figure, or 30-31 SSNs, will be in the Pacific theater.

That may sound like ample strength, but bear in mind that no ship or plane is ready for service all of the time. Routine upkeep, extended overhauls and refueling, crew rest, and training lodge inexorable claims on a vessel's schedule. A hoary U.S. Navy axiom holds that it takes three U.S.-based ships to keep one on foreign station. One is in the shipyards and completely out of service; another is preparing for deployment; and the third is actually on cruise. (If anything, according to Congressional Research Service naval experts, the 3:1 ratio overstates the proportion of ships available for combat duty.¹¹) Using this ratio for the sake of discussion, U.S. naval commanders can expect to have 11 fully combat-ready subs at their disposal at any time. Assuming the rhythm from overhaul to deployment holds up, another 11 may be available in varying states of readiness. (Permanently basing ships overseas improves the readiness ratio, but a safe thumb rule is that it takes two hulls to assure one is battleworthy.¹²)

Twenty-two SSNs, no matter how good individually, constitutes a slender force to cover the vasty China seas and Western Pacific in wartime. Theorist Julian S. Corbett advises commanders to post vessels at the origin of an enemy fleet's voyage; at its destination, if known; or at focal points such as straits where shipping has to congregate as it passes from point A to point B. Otherwise it may be hard to make contact. Monitoring Chinese seaports, along with narrow seas such as the Luzon Strait and the passages through the Ryukyu Islands, will stretch the tactically proficient but lean U.S. submarine fleet. That in turn will leave broad operating grounds open to the PLA Navy.

This is doubly true since American SSNs are armed only with torpedoes for anti-ship missions. Unlike Chinese boats, they do not carry ASCMs to multiply their striking range. Indeed, the range of the U.S. submarine force's standard Mk-48 heavyweight torpedo is 10 nautical miles at the outside—compared to well over 100 nautical miles for PLAN submarines. Depending on short-range weaponry sharply limits the area on the map covered by any individual SSN's weaponry, leaving sizable expanses uncovered. Trying to get the job done under these conditions stresses the undersea fleet's numbers even more.

Undersea warfare, then, remains an advantage, owing not just to American skill but to the PLA Navy's neglect of antisubmarine warfare. But it is not the silver bullet the hype implies. The U.S. Navy needs more mass—meaning more boats, preferably with extended-range armament—if it is to vanquish China's navy from the depths. Practitioners and pundits err if they view the silent service as currently configured as a cure-all for what ails the surface navy. Indeed, doubling the navy's submarine inventory would represent a prudent move for Washington in its strategic competition with Beijing. The service might accelerate SSN acquisitions, or it might even consider fielding a diesel-submarine contingent. It could procure several

¹⁰ Figures as of June 26, 2017. See Naval Vessel Register, <<http://www.nvr.navy.mil/NVRSHIPS/FLEETSIZESIZE.HTML>>.

¹¹ Ronald O'Rourke, *Naval Force Structure Planning: Breaking Old Habits of Thought* (Washington, DC: Congressional Research Service, March 19, 1993).

¹² Ronald O'Rourke, *Naval Force Structure and the Size of the Navy* (Washington, DC: Congressional Research Service, November 13, 1992).

conventional boats to the price of one SSN—stretching finite shipbuilding dollars. Fielding a submarine-launched anti-ship cruise missile, furthermore, would extend American subs' combat reach.

Where does all of this leave us? It's commonplace among China-watchers to make the U.S. Navy the benchmark by which to judge the PLA Navy's size and composition. This misleads. As noted here, the proper yardstick is the navy's capacity to fulfill the goals assigned to it by political leaders, in the expanses that matter, against the strongest likely opponent. Beijing's immediate goals and its likely opponents fall within reach of the abundant shore-based armaments festooning Fortress China. Combining land- with sea-based implements of marine combat yields a force far more formidable than side-by-side comparisons of surface fleets would indicate. The PLA Navy, then, may not need a surface fleet symmetrical with the U.S. Navy's—in terms of flattops, air wings, destroyers, and so forth—to get its job done.

Observers must apply standards unique to China to determine whether China's navy has struck the right balance of capabilities. Comparing it to a globe-spanning navy like America's reveals little.

It is worth observing that China's growing surface fleet is just one expression of Beijing's larger, longer-term challenge to stability in maritime Asia. China's "comprehensive national power," to use a term coined by Chinese strategists, furnishes the foundations for developing durable sea power. Despite slackening GDP growth, the Chinese economy is already roughly half the size of America's. Beijing is also one of the largest shipbuilding powers in the world, while its naval yards are riveting together warships of every kind at breakneck speed.

Such sinews of national power will not only help the Chinese navy catch up more quickly, but they will also keep Beijing competitive at sea over the long haul. China's current economic, financial, and industrial position relative to the United States is enviable compared to Japan's on the eve of Pearl Harbor or the Soviet Union's during the late Cold War era. (Japan's economy was about one-tenth the size of America's in 1941.) Even so, as noted at the outset, both the Japanese and the Soviet navies posed a formidable threat to the United States.

At the same time, the inputs of naval power are inherently long-lasting. High-end vessels such as the Type 052Ds are built to stay in service for twenty to thirty years. (The U.S. Navy tries to wring even more service out of its surface combatants.) A ship commissioned in 2016, in other words, could in theory ride the waves until mid-century. Provided that the PLAN is a good steward of its capital-intensive assets, undertaking regular maintenance and repairs, China promises to maintain a decades-long presence in Asian waters. Moreover, the warships that entered serial production over the past decade were almost certainly designed, developed, and procured years in advance.

Thus there is a built-in time lag between the initial Chinese decision to launch a new ship type and the physical construction of that vessel at a shipyard. The new developments we are observing today are products of much earlier plans. It is therefore anybody's guess what additional new classes of warships—and in what volume—the PLAN has in store for the region. The Type 055 remained mostly in the realm of rumor until it debuted publicly in June 2017. As noted before, the vessel reportedly displaces more than U.S. Navy DDGs or cruisers—suggesting increased capacity for fuel, munitions, and armaments. Once it joins the fleet, consequently, the Type 055 will extend the PLAN fleet's operating radius while amplifying its combat punch.

The changes afoot may be a sign of things to come. These structural factors suggest that the United States need to think beyond the technical, tactical, and operational implications of the PLAN's burgeoning surface fleet. A balanced regional fleet is now in the making. Such a new entry will no doubt alter the geometry of the naval balance in maritime Asia. Even if Beijing's economic growth rates slow further in the coming years, China will have laid the basis for a competition that will be measured in decades. The United States and its allies must accustom themselves to the notion that they face a long-term rivalry at sea.

A National Fleet Executes a “Cabbage Strategy”

Nor, it bears noting, is China’s naval buildup solely about high-seas combat. In peacetime China deploys non-military shipping as an arm of sea power, holding naval and military force in reserve to supply a backstop should things go wrong. By asserting physical control of the waters within the “nine-dashed line” inscribed on the map of the South China Sea, and by policing those waters, Beijing has sought to impose a monopoly of force there. And a monopoly of force is what qualifies a would-be sovereign to exercise sovereignty with boundaries sketched on the map.¹³

While the Permanent Court of Arbitration ruling (2016) striking down China’s territorial claims sent its hybrid civil/military maritime strategy into overdrive, it has been visible at least since the 2012 encounter between Philippine and Chinese vessels at Scarborough Shoal. In May 2013, for instance, the State Oceanic Administration published a commentary proclaiming:

We should claim our nation’s legitimate rights and interests in our territorial waters through normal fishing production and through the routine patrol of fishery administration ships, marine surveillance ships, and other law enforcement ships, and should also safeguard our nation’s maritime rights and interests with the *backup of our Navy and Air Force*.¹⁴ (our italics).

In other words, fishing craft ply their trade in disputed fishing grounds. Law-enforcement agencies protect the fishing fleet from low-level resistance from rival coast guards. The PLA Navy and Air Force remain watchful in case Beijing decides to rush heavier firepower to the scene—creating a power mismatch in its favor and, if all goes well, cowing the opponent into retreat.

At the risk of mixing metaphors, then, Beijing deploys its small and big sticks to prosecute what some Chinese commentators dub a “cabbage strategy,” encasing dispute objects with concentric layers of unarmed or lightly armed hulls while hardening the outer layer with military force. In May 2013 the Xinhua Domestic Service carried an unattributed editorial explaining how the cabbage strategy advanced China’s grand strategy of consolidating its territorial claims.

Precipitating the article was a clash between Manila and Beijing over Second Thomas Shoal, a feature around one hundred nautical miles west of the Philippine island of Palawan and deep within the Philippine exclusive economic zone. The Xinhua editorialist restated the legal groundwork, insisting that China held indisputable sovereignty over South China Sea land features and the adjacent waters. It framed China’s actions in moral terms, claiming they were “beyond reproach” while denying China was bullying a weaker neighbor. It implored rival claimants to comply with the 2002 Declaration of Conduct of Parties in the South China Sea, refraining from “actions that expand and complicate disputes, and that influence the peace and stability of the South China Sea.” And it applied a historical patina to Beijing’s case, insisting that Chinese fishermen had “always” used the shoal as a fishing ground.¹⁵

In short, the editorialist reiterated China’s brief for sovereignty, conjuring up the full range of political and legal arguments. Chinese emissaries grasp an elemental truth about diplomatic persuasion: it is not enough to say something once. A message must be broadcast early, often, and consistently in order to persuade. Having done so, the Xinhua editorial turned to “noted military expert” Zhang Zhaozhong to explain how a cabbage strategy works. Such a strategy, says Zhang, can be encapsulated in “just one word, which is squeezing.” His explanation is worth quoting at length:

¹³ Max Weber, “Politics as a Vocation” (New York: Oxford University Press, 1946), <https://archive.org/details/weber_max_1864_1920_politics_as_a_vocation>.

¹⁴ “PRC SOA Commentary Calls for Strengthening Maritime Sovereignty Protection,” Beijing *Zhongguo Haiyang Bao Online*, May 8, 2013.

¹⁵ “PRC Commentator Suggests ‘Cabbage’ Strategy on the Second Thomas Shoal,” Beijing Xinhua Domestic Service, May 30, 2013, OSC-CPP20130620671001.

For every measure there is a counter-measure. You send fishing ships If you send fishing vessels to resupply, then we will use fishing vessels to keep them out; if your coast guard sends supplies, then we will send marine surveillance to keep them out. If your Philippine Navy ships hurry over, we will use naval vessels to keep them out. There is nothing to be afraid of, and we must stick it out to the end. The cabbage strategy of which I have spoken many times is to

surround them layer by layer, and make them unable to enter [Second Thomas Shoal].¹⁶ (our italics).

Zhang's summary is rich in content. In strategic terms, the approach he espouses evokes an axiom from German general Helmuth Moltke the Elder, who maintained that the "tactical defense is the stronger" form of war, while "the strategic offensive" constitutes "the more effective form."¹⁷ Julian Corbett interprets Moltke's idea of combining strategic offense with tactical defense thus:

. . . this form of war presupposes that we are able by superior readiness or mobility or by being more conveniently situated to establish ourselves in the territorial object before our opponent can gather strength to prevent us. This done, we have the initiative, and the enemy being unable by hypothesis to attack us at home, must conform to our opening by endeavoring to turn us out. We are in a position to meet his attack on ground of our own choice and to avail ourselves of such opportunities of counter-attack as his distant and therefore exhausting offensive movements are likely to offer.¹⁸

In other words, says Corbett, if the combatant waging a strategic offensive can seize ground it covets, it can then defy its antagonist to reverse its occupation of that ground. From a military standpoint, defending something is easier than taking it away. Tactical defense is stronger, after all. And from a diplomatic standpoint, the combatant trying to retake turf from rival forces could brand itself the aggressor—even though its rival committed aggression first. China can create the new normal of Chinese ownership of some disputed feature, then plead with challengers not to disturb the peace—and play the aggrieved party if they do.

This is a particularly effective approach in the "gray zone," that shadowland between peacetime diplomacy and outright warfare.¹⁹ As Zhang notes, China's national fleet so outclasses any individual Southeast Asian claimant that China will control escalation in any one-on-one confrontation. If Manila or Hanoi sends fishing boats to uphold its claims, Beijing can probably send more. If Manila or Hanoi escalates, dispatching coast-guard white hulls, Beijing can probably send more, bigger, and more capable white hulls. Indeed, the China Coast Guard could outpunch the Philippine Navy. And if any opponent escalated to military force, it would do so in full knowledge that the PLA Navy was ready to steam into action—building up an insuperable edge in physical might for Beijing. Cabbage strategy is hard to beat.

It bears mentioning that Zhang neglects one aspect of the cabbage strategy. He seems to imply that his approach is entirely outward-facing. Chinese maritime forces encircle a disputed object first with fishing craft, then law-enforcement craft, then military vessels if need be. This is how Chinese mariners "surround them layer by layer, and make them unable to enter"—waging tactical defense against an external opponent. But there is also an inward-facing component to the cabbage strategy, implicit in Zhang's depiction of his strategy as an exercise in squeezing adversaries into submission.

If Chinese forces can mount a layered defense against outward opponents, in other words, they can also lay siege to an opponent holding the disputed island or atoll. They can squeeze that opponent into submission,

¹⁶ "PRC Commentator Suggests 'Cabbage' Strategy," May 30, 2013.

¹⁷ Helmuth von Moltke, in *Moltke on the Art of War: Selected Writings* (Novato: Presidio, 1993), pp. 68-69.

¹⁸ Corbett, *Some Principles of Maritime Strategy*, p. 73.

¹⁹ James R. Holmes and Toshi Yoshihara, "Deterring China in the 'Gray Zone': Lessons of the South China Sea for U.S. Alliances," *Orbis* 61, no. 3 (summer 2017), <<https://www.fpri.org/article/2017/06/deterring-china-gray-zone-lessons-south-china-sea-u-s-alliances/>>.

constricting its supply lines and fending off outside relief until the occupants must abandon their redoubt or starve. This is the approach China has taken at Reed Bank, where the Philippine government has marooned a rusty amphibious transport, *Sierra Madre*, in an effort to preserve sovereignty over the feature. The handful of marines clinging to *Sierra Madre* are lonely defenders of Philippine claims to Reed Bank.²⁰ That tactical defense represents the stronger form of war must come as cold comfort, encircled as they are by vastly stronger forces and facing scant prospect of relief.

Fleet-Building Is About More Than the PLAN

Chinese maritime strategy is a grand strategy of a type B. H. Liddell Hart and Alfred Thayer Mahan would instantly recognize: it aims at securing a “better state of peace” for China, guaranteeing commercial, political, and military access to seas and theaters Beijing deems important.²¹ For China, sea power is about more than the PLA Navy. It encompasses any implement able to mold events out at sea, whether that implement is a navy warship or a PLA Air Force stealth fighter/attack plane or a ballistic missile fired by the PLA Rocket Force. It encompasses law-enforcement vessels from the China Coast Guard or sister maritime surveillance or enforcement agencies. And it encompasses unofficial implements such as fishing boats crewed by militiamen or trawlers packed with electronic snooping equipment.

Clearly, then, Americans and their allies confront a multifaceted Chinese challenge. Recent history suggests the allies must fashion a likewise all-encompassing maritime counterstrategy for the China seas—or surrender their nautical rights and privileges to China by default. They must band together while harnessing every resource available to them.

²⁰ Jeff Himmelman, “A Game of Shark and Minnow,” *New York Times Magazine*, October 27, 2013, <<http://www.nytimes.com/newsgraphics/2013/10/27/south-china-sea/>>.

²¹ B. H. Liddell Hart, *Strategy*, 2d ed., rev. (1954; reprint, New York: Meridian, 1991), p. 353; Alfred Thayer Mahan, *Retrospect & Prospect* (Boston: Little, Brown, 1902), p. 246.