CHAPTER FOURTEEN

ADVERSARIES AND PLANNING ASSUMPTIONS

CHINA'S NAVY AND THE POST–COLD WAR WORLD

Andrew S. Erickson

This chapter explains how and why the People's Republic of China (PRC)'s People's Liberation Army Navy (PLAN) has responded to changing circumstances—mainly its perception of foreign threats and technology—in the post–Cold War era.[1] It probes the assumptions about the nature of the adversary and the required tasks that have shaped PLAN fleet design and development. China studies the U.S. military assiduously for both lessons for its own development and insights into how to counter in furtherance of key strategic goals, with unification over Taiwan long the ultimate objective.[2] Here paramount leader Xi Jinping's determination to both develop a world-class navy and to make historic achievements across the Taiwan Strait, his preoccupation with the United States as his most formidable enemy in the latter regard, and his perception of a limited window of opportunity are raising the risks of conflict.

CHANGING CIRCUMSTANCES AND STRATEGY

Specifics of Beijing's maritime strategy and development can be challenging to glean. As a Peking University scholar explains,

> China's national government has never set forth a comprehensive list of its maritime interests, especially its core maritime interests. One reason for this is that China is developing too rapidly, so it is quite difficult to be certain of its interests, which are changing. Being intentionally vague will allow policy leeway in dealing with future uncertainties. Furthermore, vagueness also has some benefits of its own. Maintaining a vague position on the major issues of the East China Sea and the South China Sea is not only advantageous for flexibly handling maritime disputes with other countries, but helps to ease potential pressure from domestic public opinion and reduces unnecessary policy risk.[3]

Nevertheless, carefully examining pedigreed sources reveals the broader outlines of China's maritime trajectory.

PLAN thought is rooted in mid-twentieth-century history,[4] but it has evolved considerably over the ensuing decades. Sino-American rapprochement in the 1970s ended the most difficult and threatening period of the Cold War for Beijing by removing American threats, affording support in deterring Soviet threats, and allowing for Beijing's first naval efforts beyond its coastal waters. The People's Republic's unprecedented seaward turn was springboarded by the relatively intact and significant potential of its shipbuilding industry, which had been saved from the worst of Maoist malpractice by its physical unsuitability for relocation into China's remote interior during the disastrous Third Front movement. As part of his modernization drive in the early 1980s, Deng prioritized shipbuilding industrial development to facilitate the export of manufactures around the world. In 1985, he assigned the PLAN its first-ever independent strategy: "Near Seas Active Defense," focused on the Yellow, East, and South China Seas. There Beijing has the world's most numerous and extensive disputed island and feature claims, with the largest number of other parties; none looms larger than Taiwan. The 1995–96 Taiwan Strait Crisis and 1999 Belgrade Embassy Bombing catalyzed a concerted People's Liberation Army (PLA) and PLAN buildup that has already yielded dramatic results.[5]

Xi, the PRC's first navalist leader, now seeks to transform China into a "maritime great power." Two years after assuming office, in 2015, he added "Far Seas Protection"—a more modest version of U.S. and Western allied-style sea-lane security—to the PLAN's strategy. Subsequently, as two researchers explain, "on April 12, 2018, Xi Jinping attended the naval parade in the South China Sea, during which he called for [the service to] 'strive to comprehensively build the People's Navy into a world-class navy.'" They elaborate, "The only way to consider oneself a world-class navy is to have the power to match, contend with, and square off against any opponent; deter and win possible maritime conflicts; and forcefully support the country's status as a world-class great power."[6]

Circa 2018, as part of this effort, Xi extended the PLAN's strategic and operational writ to all the world's oceans, adding a third layer of PLAN strategy to include "near seas defense, far seas protection, [global] oceanic presence, and expansion into the two poles."[7] This latest, largest layer of PRC naval strategy and its operationalization remains a work in progress. A China Central Television Reporter's interview of Yin Zhongqing, deputy chairman of the Finance and Economy Committee at the Thirteenth National People's Congress, reveals similar language: "China must . . . do a better job protecting our territorial sea and controlling the near seas, enter the deep ocean, and move toward distant oceans until we reach Antarctica and the Arctic."[8]

Thus prioritized, funded, and tasked, the PLAN is charged with leading the maritime component of Xi's timeline for the "Great Rejuvenation of the Chinese Nation." By 2027, the timeline calls for achieving the "Centennial Military Building Goal" of capabilities to realize the PLA's "founding mission" of vanquishing the Kuomintang (KMT), now on Taiwan. By 2035, it calls for completing military modernization. By 2049, it calls for becoming a strong country with world-class armed forces. There is a strong maritime component to national strategy throughout. As two researchers contend, "Threats to China's national security primarily come from the sea, the focus of military struggle is at sea, and the center of gravity of China's expanding national interests is also at sea."[9]

Even approaching Xi's ambitious goals would require eroding, and in some cases overturning, formidable Western advantages. The PLAN's efforts to do so include (1) working increasingly jointly with other forces, including China's land-based, missile-heavy "anti-Navy" forces; (2) attempting to impose risk by maximizing the numbers of PLAN vessels and the numbers of antiship missiles deployed on them, while accepting risk in battle damage survivability to reduce costs; and (3) pursuing new technologies and ways of war, such as unmanned systems and autonomous operations enhanced through artificial intelligence, that may disproportionately advantage China or target adversary vulnerabilities.

STRONG SHIPBUILDING SURGE

Beijing has gone to sea with scale, sophistication, and superlatives that no continental power previously sustained in the modern era.[10] By around 2020, China had built and deployed the world's largest navy, coast guard, and maritime militia by number of ships—the ultimate manifestation of strategy at sea.[11] The development of China's three major sea forces, with the navy by far the most sophisticated and demanding to produce and operate, has been fueled by strong, consistent national political and military prioritization, and formidable funding. Propelled by the world's largest shipbuilding industry, it has been guided by a succession of naval strategies that are radiating increasingly further outward globally, connected to military capabilities and operations in every domain, while increasingly intense in their focus on addressing "core" security interests along China's maritime periphery—foremost among them, resolving Taiwan's status on Beijing's terms.

Several factors in particular have enabled China's historically impressive warship modernization and production rate: the largest, fastest shipbuilding capacity expansion since World War II, and part of the largest postwar military buildup. Supported by the world's second-largest economy and defense budget, and what until very recently was indisputably the world's largest population and

fastest-growing multi-trillion-dollar economy, coherent, stable national political, military, and maritime strategies maintain high prioritization. Formidable, consistent funding is provided through all-encompassing Five-Year Plans. China's shipbuilding facilities, the world's largest in aggregate, are prioritized as national assets and accordingly receive great investment. Additionally, Beijing employs the world's largest human-organizational technology acquisition and application infrastructure to ingest foreign technology and shipbuilding practices, which allows China to skip much research and focus on development. Specifically, through a process of imitative innovation, China seeks, obtains, evaluates, and adapts technologies, systems, and processes on a scale approached by no other nation. The results are design and production processes, systems, and platforms firmly entrenched in the spiral development concept: an iterative process for developing a weapon system's capabilities in which the developer, tester, and user interact with one another so as to refine and improve the system's performance.[12]

PRC civilian and military ship production is highly integrated. China boasts many yards, of large capacity, with newbuild layout efficiency. Most shipyard production has been of merchant ships for foreign customers; China's commercial shipbuilding industry, the world's largest with over 40 percent of oceangoing vessel construction,[13] subsidizes overhead costs for construction of all three sea forces' vessels; an impossibility for America's military-focused shipbuilding industry. China likely uses a hybrid civilian-military production standard that enables it to shift shipbuilding personnel between civilian and military production, resulting in a cost-effective, "good-enough-quality" solution.

China thus enjoys some key advantages over the United States in warship production, and it has made the most of them to maximize its comparative advantages and resulting output.[14] The result is that the PLAN already has substantially more battle force ships than the U.S. Navy, although its heretofore meteoric building rates may finally be slowing down, and it faces mounting maintenance/

overhaul needs.[15] Nevertheless, the PLAN continues to dramatically expand its fleets, in part by adding modern surface combatants.[16]

The China Coast Guard (CCG) has benefited from the transfer of twenty-two "early flight" variant Type 056 *Jiangdao*-class corvettes from the PLAN in 2021. These corvettes lacked the towed-array sonar and hence substantial antisubmarine warfare (ASW) capabilities of their successors, which made them an easily sustained loss for the PLAN but a big boost for the CCG.[17] It speaks to particularly deep, increasing integration between these two PRC sea forces. Despite the resulting dip to a current PLAN battle force of around 340 platforms, China's navy is expected to have 400 ships by 2025 and 440 by 2030.[18]

Superior ship numbers are a comparative advantage that Beijing pursues relentlessly in peacetime competition and preparation for conflict contingencies. When it comes to deployment, even the most advanced vessel simply cannot be in more than one place at once; particularly regarding the growing Sino-American strategic competition where Washington plays a distant away game. U.S. Coast Guard cutters are primarily focused near American waters, far from any international disputes, while the U.S. Navy is dispersed around the world, with many forces separated from maritime East Asia by responsibilities, geography, and time. Meanwhile, all three PRC sea forces remain focused first and foremost on the contested Near Seas and their immediate approaches, close to China's homeland bases, land-based air and missile "anti-navy," and supply lines. There China regularly deploys sea forces far greater numerically than the size of the entire U.S. Navy.

OPERATIONALIZING STRATEGY, NEAR AND FAR

Beijing's threat to Taiwan is mounting toward Xi's key PLA capabilities preparation target year of 2027 and the PLA's growing panoply of weapons and increasingly focused training toward that prioritized goal.[19] PRC military operational options vis-à-vis Taiwan, which might be employed individually or in combination, may be divided primarily into three categories: bombardment, blockade, and invasion. China's sea forces would have role(s) to play in all three operations.

Accordingly, it is hardly surprising that in 2022, the PLA conducted frequent amphibious training, with more than 120 instances in a three-month period.[20] The Pentagon rightly emphasizes China's organization and integration through training of civilian maritime vessels (roll on–roll off, or RO-RO, ships in particular) to help fill remaining gaps in amphibious sealift.[21] The year 2021 also witnessed growing frequency and realism in PLA island-seizure drills; the more than twenty exercises conducted that year representing a large increase over the thirteen witnessed in 2020.[22] For all these efforts, however, Taiwan remains substantially protected against amphibious invasion by complex weather, tides, mudflats, coastal barriers, and a growing array of asymmetric weapons designed to capitalize on this natural moat and its ramparts.

Beyond Taiwan and its other disputed sovereignty claims in the Near Seas, Beijing's maritime interests and efforts to secure them are increasingly global in nature. With its long land borders, difficult neighbors, and hemming in by "island chains" fortified with American and allied military bases,[23] China has undeniable challenges to overcome. One group of researchers goes so far as to argue that "China should go eastward first, recover Taiwan's deep-water ports, and open a gap in America's oceanic blockade. First, China's aircraft carriers and nuclear submarine forces can use this to approach Guam, Hawaii, and even the West Coast of the U.S. The U.S. military will lose the vast depth of the Western Pacific Ocean, and the situation of offense and defense in the Western Pacific will change."[24]

For combat scenarios vis-à-vis the Near Seas, the PLAN remains the first responder and first line of defense; but the CCG is an increasingly capable second line that can backfill lower intensity missions in the Near Seas and additionally offer some capacity beyond. Sea-lane and energy/resource import security has long been a driver of the expansion of the PLAN's force structure and capabilities. Xi's signature Belt and Road Initiative, a catch-all framework for much of his ambitious foreign policy, requires growing overseas protection efforts, led by the PLAN. Increasing PRC polar resource pursuits and related activities likewise call for PLAN participation first and foremost.[25]

Here as elsewhere, submarine forces have a special role to play. As three researchers at the PLAN Submarine Academy in Qingdao envision, "Our submarine forces must not only advance to the Pacific Ocean. They must also advance towards the Indian Ocean. Indeed, in the future they must also advance towards the Atlantic Ocean and the Arctic Ocean. This will effectively ameliorate the difficulties of our submarine force operating in waters facing China; it can also provide vast maritime strategic space for China's rise as a great power."[26]

Characteristically, China proceeds in layers. Beyond a global network of more than ninety-five PRC-invested ports,[27] and a more constrained pursuit of "strategic support points,"[28] widespread efforts to develop overseas access and basing appear underway. China's first overseas military support base, in Djibouti, has now received PLAN ships at a new 450-meter pier large enough to accommodate PLAN carriers. Beyond that, Beijing has apparently established its first Indo-Pacific overseas base in Ream, Cambodia;[29] and has courted the Solomon Islands and Vanuatu, in addition to Namibia (where China's PLA Strategic Support Force, or SSF, already operates one of its eight or more tracking, telemetry, and control (TT & C), ground stations to support space missions).

The Pentagon specifies: China's "military facility at Ream Naval Base in Cambodia will be the first PRC overseas base in the Indo-Pacific.... If the PRC is able to leverage such assistance into a presence at Ream Naval Base, it suggests that the PRC's overseas basing strategy has diversified to include military capacity-building efforts." More broadly, the PLA "has likely considered Cambodia, Myanmar, Thailand, Singapore, Indonesia, Pakistan, Sri Lanka, United Arab Emirates, Kenya, Seychelles, Equatorial Guinea, Tanzania, Angola, and Tajikistan among other places as locations for PLA military logistics facilities. *The PRC has probably already made overtures to Namibia, Vanuatu, and the Solomon Islands. The PLA is most interested in military access along SLOCs from China to the Strait of Hormuz, Africa, and the Pacific Islands*" (emphasis added).[30]

POTENTIAL FOR INTERSERVICE RIVALRY

The increasingly global, all-domain orientation and operations of China's armed forces brings new challenges that will convulse the PLAN. Increasing emphasis on the roles, missions, and capabilities of the PLAN (as well as the PLA Air Force [PLAAF] and PLA Rocket Force [PLARF], in particular), enhances potential for another challenge long-plaguing advanced militaries: interservice rivalry. Growing PRC external interests have eroded the ground forces' formerly dominant power. As the ground forces continually diminish in relative clout, competition among the PLAN and its fellow services will likely intensify. If defense spending increases slow down or reverse, this will be accentuated. Each pursues development frontiers; each boasts cutting-edge capabilities. With the most external geopolitical orientation and operations, the PLAN may claim a growing budgetary portion. Moving from its current Near Seas–centered three-fleet structure, as some PRC analysts have suggested, toward a bifurcated Pacific and Indian Ocean navy, and beyond, would demand more, better vessels. It may generate further PLAN-PLAAF competition as both services maintain land-based air forces with overlapping Near Seas missions, even as PLAN carriers bring more aircraft to distant seas. The PLARF, similarly, seeks space responsibilities: China's burgeoning orbital assets are a circum-global capability vital to supporting, and disrupting, information-age warfare. Growth of China's nuclear ballistic-missile submarine (SSBN) force—already patrolling and fielding a PLAN-based element of China's nuclear triad—and ongoing PLAAF development of its own leg may both generate further friction.

THE MOUNTING COST OF CHINESE SEA POWER

One of the greatest challenges facing Xi and his ambitions ashore and at sea is that even as comprehensive implementation remains challenging over the next few years, larger structural factors are already beginning to slow China's economic growth overall. PRC national power growth faces dissipation and disruption.

The economic model that propelled China through three-plus decades of meteoric growth is taking on water. China already suffers from acute domestic problems, including resource constraints, environmental degradation, corruption, urban-rural division, and ethnic and religious unrest. All these, combined with looming demographic and gender imbalances, may strain both China's economic development and internal stability. An additional risk factor is the global economy's potential to change (e.g., restructuring supply chains) faster than China can adjust. These problems could combine with rising nationalism to motivate Xi to adopt more confrontational military approaches, particularly concerning unresolved claims in the Near Seas. Rather than portending an impending "collapse," however, these factors may herald China's version of the same slowdown in national trajectory that has afflicted great powers throughout history. This has direct implications for PLA/PLAN development.

History suggests that great powers tend to follow an "S-curved" trajectory in which the very process of growth and development sows the seeds for its eventual plateauing. In fact, the unleashing of PRC society in 1978 followed a century of foreign predation and internal turmoil, and three subsequent decades of abnormally constricted individual and economic possibilities. This terrible past may have disguised China's post-1978 economic boom—facilitated though it was by pragmatic policies and globalization—as a "new normal." In fact, it is more likely an exceptionally well-managed but unsustainable catch-up period. Beijing's one-time opportunity to funnel this pent-up national potential has produced the seeds of peaking: urbanization of unprecedented scale and rapidity, tragically exacerbated by history's greatest artificial demographic restriction. These factors are slowing China faster than any other major power previously. Recent relaxation of the "one-child policy" comes too little, too late: demographic decline is already unstoppable. Already a labor-shortage economy, China may be further along the "S-curve" than many realize.

Moreover, even if implemented with the greatest success conceivable, some of the key reforms Xi proposes—and many of those most

likely to garner popular support sufficient for their successful implementation—can themselves strengthen potent "S-curve" headwinds, and will even accelerate and deepen their impact. Some challenges stem from societal patterns that the United States and other Western nations are already suffering from, and which even China cannot escape—and may well narrow the gap quickly, before China is well prepared. A rapidly aging society with rising expectations, burdened with rates of chronic diseases exacerbated by sedentary lifestyles, will probably divert spending from both military development and the economic growth that sustains it. Expanding China's welfare state, in particular, will crowd out other forms of spending, yet the floodgates appear already to be opening.

One of China's greatest strengths in recent years has been its ability to allocate tremendous resources rapidly to programs for security, infrastructure, and technology development. Many of these programs are seen as extremely inefficient. As competition for resources intensifies, the leadership's ability to allocate increasingly scarce funds effectively will face unprecedented tests.

Domestic challenges may place increasing demands on, and funding claims by, China's internal security forces, whose official budget already exceeds the PLA's if funding for the paramilitary People's Armed Police is counted as internal (in keeping with China's own budget structure). Potential drivers include unrest in ethno-religiously restive borderlands (e.g., Xinjiang, Tibet) as well as disaster relief, exacerbated by environmental degradation and climate change. Rising living costs and societal expectations may greatly increase the expense of current security approaches, which rely in part on large numbers of relatively low-paid individuals to provide physical security, surveillance, and monitoring of data from security cameras and other sources.

This has a special significance for China's ability to continue developing external military capabilities, particularly its massive, maintenance-hungry naval buildup. For two-plus decades, Beijing has funded multiple overlapping megaprojects simultaneously. China's

shipbuilding industry—which, aside from its missile, space, and electronics industries, produces China's most advanced indigenous defense products—has long proven able to do this through simultaneous construction of multiple modern submarine and warship classes, together with a profusion of prototypes. China's military aviation industry, traditionally laggard, is catching up. In many key areas, China's number of multiple simultaneous programs is now unrivaled. But how long such dynamic investment can be sustained is unclear.

Within this larger context, manifold factors will likely increase costs and technological requirements and hence reduce the purchasing power of each yuan allocated to defense spending and restrain further budget growth and focus. These include

- Weapons systems and associated infrastructure, which are more expensive to build, operate, and maintain than their less advanced predecessors
- Investments in structural and organizational reform and associated demobilization costs
- Rising salaries and benefits to attract, educate, train, and retain technologically capable professionals
- Growing entitlements, particularly as more retirees draw benefits over longer lifespans

The closer the PLA/PLAN approaches leading-edge capabilities, the more expensive and difficult it will be for it to advance further, or even to pace the general increase in global capabilities. China's cost advantages decrease as military equipment becomes less labor-intensive and more technology- and materials-intensive. The more sophisticated PLA/PLAN systems become, the less relative benefit China can derive from acquiring and indigenizing foreign technologies, and the less cost advantage it will have in producing and maintaining them.

Here China, its navy, and Commander in Chief Xi are on a demanding treadmill that has long bedeviled advanced militaries. Maintaining a leading navy or air force, for instance, is increasingly expensive. Military shipbuilding cost escalation approximates that

of other weapons systems, such as military aircraft, making this a revealing example.[31] Cost control is complicated by relatively small production numbers (in the *best* of cases) and rising standards—today's ships and the conditions under which they are produced and operated are far more complex than their predecessors. In his classic treatise, Philip Pugh marshals considerable historical data to suggest that while countries tend to spend a constant percentage of their economy on defense over time, the cost of ships and weapons increases faster than inflation—typically at 9 percent. At 2 percent inflation, this would compound to costs doubling each decade. Pugh finds that even 2 percent per annum naval budget growth—excessively optimistic for most developed Western nations—would tend to require an annual average 3.5 percent reduction in fleet numbers. In practice, navies find ways to save costs and innovate (e.g., by shifting given missions to smaller platforms).[32] In an example of its emphasis on civil-military integration, China is accomplishing just such a mission shift by strengthening its coast guard (and, to a lesser extent, its maritime militia) and assigning them missions PLAN forces previously fulfilled. Eventually, however, the cost-growth challenge proves overwhelming, forcing relentless numbers reductions.

A RAND study similarly concludes that the cost-growth rate for U.S. Navy vessels over the past half century is 7–11 percent, with economy-related factors approximating inflation and customer-driven demands accounting for the remaining majority. Of these, ship weight, power density, and sophistication are the largest cost drivers.[33] In Pugh's analysis, such dynamics make it essential to avoid the "Everest syndrome"—constant selection of the most advanced ship possible over a more conservative approach based on competition with actual adversary capabilities.[34] Mass production of the Type 056 *Jiangdao*-class corvette and Type 022 *Houbei*-class fast-attack craft suggests PRC avoidance of the "Everest syndrome" in pursuing proximate priorities thus far. China's ongoing buildup of destroyers, cruisers, aircraft carriers, and other large vessels, by contrast, risks changing that dynamic to Beijing's detriment.

A combination of rapid GDP growth and shipbuilding prowess puts a country in an enviable sweet spot. Between the world wars, for instance, Japan's rapid economic growth enabled it to bear ever-increasing ship development costs at a constant defense burden.[35] World naval powers, including Holland, the United Kingdom, and the United States, have likewise enjoyed such conditions in their rapid-growth years. Today China enjoys a similar confluence but may finally be nearing the end of one of history's great runs.

By developing and deploying advanced technologies, Beijing is raising the bar for regional capabilities competition. An action-reaction cycle forces it to spend ever more on more-advanced systems to narrow the gap with the United States and key allies like Japan and Australia, while staying ahead of other regional rivals. Political scientist Minxin Pei warns that by pursuing incomplete reforms Beijing risks a "trapped transition" instead of transformation into a full market economy. An analogous "trap" may also emerge for the PLA/PLAN as it strives to transition from a homeland and periphery-focused, people-intensive, mechanized force into a broader-ranging, technology-intensive, information-enabled force. A slowdown in the PLA/PLAN's recently rapid progress looms as fewer easy improvements remain available and the costs of advancement rise even as objectives grow more ambitious than ever.

Here, China may partially fall back on its continentalist approach of "using the land to control the sea" with an "anti-Navy" of long-range, land-based missiles, delivery systems, and related "counter-intervention" weapons.[36] However, by wielding asymmetric weapons, China suggests their efficacy and writes potential adversaries a potent playbook. This portends a new era in counter-intervention systems, which PRC forces themselves may face increasingly. The United States, Japan, Taiwan, and Vietnam in particular may attempt to deploy missiles, naval mines, and torpedoes to complicate potential PRC predations. While China can already exploit its geographical proximity to nearby conflict zones by deploying many overlapping forces to attempt to overwhelm and defeat such approaches, it is far

from being able to defend its forces effectively if they face such challenges from a capable power farther afield (e.g., India in the Indian Ocean, and the United States there and beyond). The likelihood that the PLA will get "trapped" in its region with respect to high-end warfighting capabilities will increase still further if China's growing military power and assertiveness leads its neighbors to accelerate countermeasures against it.

Certainly, there are important caveats to this larger analysis. First, there is a lag effect. Ships purchased on favorable terms today can benefit Beijing for years to come. China currently lacks the unstable business and vendor base of its Western shipbuilding counterparts, factors that increase costs. No other major shipbuilder appears poised to overtake China as the world's foremost civil shipbuilder by volume, and it is working up the value chain in both military and civil domains.

Second, slowdown could stimulate innovation. Today's massive R&D coupled with tomorrow's slowdown could generate revolutionary PRC military capabilities that both surprise and challenge U.S. and allied forces.[37] China is presently investing in military R&D supported by an economy that grows fast enough to afford the faster-than-inflation growth of military technology. "S-curve" factors are likely to render this unsustainable, however, eventually leaving China with an increased sense of its own capabilities, perhaps some form of overseas commitments (protecting citizens, property, and critical resource access), and all of the problems maintaining forward military progress that presently plague the U.S. and allied militaries. At that point, China, seeking relief from the cost-compounding treadmill, may strive to field radical, disruptive new capabilities to achieve its goals more efficiently. Such an approach already emerged at a lower level of PRC capacity, when the 1999 Belgrade Embassy Bombing persuaded Beijing's leaders to fund "assassin's mace" megaprojects to develop weapons of disproportionate effect like the land-based, antiship ballistic missile (ASBM). More than two decades later, the Type 055 cruiser is projected to take ASBMs of its own to sea.[38]

In conclusion, history suggests that Beijing will face difficult choices in the future, particularly as China's overall national growth slows. Lower economic growth rates tend to tighten shipbuilding and operational budgets. The PLAN's trajectory will ultimately depend on China's trajectory.

XI'S TIME AND TIDES

However these structural dynamics play out in China, a particularly concerning prospect involves thinking about adversaries, particularly the most powerful. Xi may well perceive China's strategic window of opportunity to be closing during the 2020s, a dynamic further accentuated by traversing his own eighth decade and facing undeniable human limits on his otherwise domestically unrivaled power. Meanwhile, Xi may well perceive the primary enemy and obstacle to his making historical achievements regarding Taiwan and other sovereignty claims—the United States—to be presently in disarray and slow to rally, yet nevertheless favored by longer-term trends.

While accidental great power wars are arguably unlikely, particularly since the advent of nuclear weapons, miscalculation may well remain the significant risk factor that it has proven in the past. Consider Stephen Van Evera's research on "windows of opportunity and vulnerability," which he judges "a potent cause of war. They create incentives for war and for war-risking belligerence by declining states. . . . Windows impose haste. Cooperation is undercut by expectations of war, which windows create."[39] Among many historical examples of this phenomenon, Van Evera highlights Germany's policies from 1933–45 and Japan's in 1940–41. Geographical, military, and maritime analogues to today's worst scenarios make imperial Japan's case loom particularly large. "In 1941 Japan perceived a window of enormous size," Van Evera explains. "The caprice of world politics had raised Japan momentarily to a historic pinnacle of power. Ahead, Japan's leaders believed, lay a rapid descent to helpless weakness unless Japan acted."[40] Obfuscation widened the window: "Japan cloaked its 1937–41 naval buildup in dark secrecy to avoid provoking a U.S.

reaction. As a result the U.S. response lagged until 1940, giving Japan a window of opportunity in 1941–42 that helped move it to war."

Such a temporary window, at least in his own perception thereof, might heighten Xi's determination to push for progress vis-à-vis Taiwan and his resolve not to be deterred by any means. For their part, a U.S. president thus confronted might well see America's credibility and values; regional security and alliances; and vital strategic technological interests threatened fundamentally. This, in turn, could set the stage for tremendous tensions and crises, if not a far more frightening prospect: the first-ever kinetic conflict between two nuclear-armed great powers. Time and tides waiteth not for Xi, and now the United States is more determined than ever to convince him that the time and tides will *never* be right for him to move militarily against Taiwan.

The rising PLAN has set its sights on becoming at least a leading fleet, and perhaps even ultimately the preeminent sea service in the world. The strong and consistent support of PRC leaders over the past two-plus decades; and particularly Xi, China's first navalist leader; explains why the PLAN has continued to receive such a high level of investment, over time making the funding leap gradually at first, then seemingly all at once. That growth's real nature is cloaked in social and political opacity, however, and for a variety of reasons cited in this chapter may not continue at anywhere near its present pace. Whatever contingencies ultimately come to pass, however, the PLAN will play an important role.[41] Facing naval history's latest version of age-old problems, China under Xi will attempt its own solutions. The results will shape the future of the world, for good or for ill, both at sea and on land.

NOTES

1. The views expressed here are mine alone. I thank many anonymous reviewers for helpful inputs.
2. See, for example, 师小芹, 刘晓博 [Shi Xiaoqin and Liu Xiaobo], 中美全方位海上竞争的序幕即将拉开—美最新海上战略评析 [The prelude to all-encompassing maritime competition between China and the U.S. is about to begin—an appraisal of America's newest maritime strategy], 中国南海研究院 [website of the

National Institute for South China Sea Studies], December 29, 2020, http://www.nanhai.org.cn/review_c/506.html (CMSI translation). Shi is a researcher in the National Institute for South China Sea Studies' World Naval Research Institute. A retired PLA Senior Colonel, Shi has worked at the PLA Academy of Military Science, Central Military Commission Department of Strategic Planning, and the Office of the National Security Council. She researches sea power, maritime security, and naval strategy; see https://rwsk.zju.edu.cn/rwskdj/2018/0522/c30587a1260995/page.htm. Liu is director of the World Naval Research Institute. A former naval officer, Liu worked at the PLAN Naval Research Institute from 2007 to 2017. From 1993 to 2007 he was assigned to the first destroyer detachment of the PLAN's North Sea Fleet; see http://www.nanhai.org.cn/team_c/193.html.

3. 胡波 [Hu Bo], 论中国的重要海洋利益 [On China's important maritime interests], 亚太安全与海洋研究 [*Asia-Pacific Security and Maritime Affairs*], no. 3 (2015) (CMSI translation). Dr. Hu is director of the Center for Maritime Strategy Studies and Research Professor at the Institute of Ocean Research, Peking University, and director of the South China Sea Strategic Situation Probing Initiative. His books include *China's Sea Power in the Post-Mahan Era* (Beijing, Ocean Press, 2018) and *Chinese Maritime Power in the 21st Century* (London: Routledge, 2019).
4. Toshi Yoshihara, *Mao's Army Goes to Sea* (Washington, DC: Georgetown University Press, 2022).
5. Andrew S. Erickson, *Chinese Anti-Ship Ballistic Missile Development: Drivers, Trajectories, and Strategic Implications* (Washington, DC: Jamestown Foundation/Brookings Institution Press, 2013).
6. 刘丽娇, 陈文华 [Liu Lijiao and Chen Wenhua], 改革开放以来海军战略理论的发展及经验启示 [Theoretical development of naval strategy since reform and opening up and implications for today], 中国军事科学 [*China Military Science*], no. 6 (2018): 59–65 (CMSI translation). Senior Captain Liu is a researcher at the Naval Research Institute. Lieutenant Chen is a master's student at the PLA Navy Command Academy, studying military strategy.
7. Yu Wenbing, 乘势而上建设一流军事指挥学院 [Take advantage of the situation to build a world-class military command college]

人民海军 [*People's Navy*] July 13, 2018, 3; Ryan D. Martinson, "The Role of the Arctic in Chinese Naval Strategy," *Jamestown China Brief* 19, no. 22 (2019), https://jamestown.org/program/the-role-of-the-arctic-in-chinese-naval-strategy/. See also Andrew S. Erickson, "The Ryan Martinson Bookshelf: Illuminating Xi/China's Maritime Policies, Forces and Ops, Including Latest re Whitsun Reef/Spratlys," *China Analysis from Original Sources*, June 14, 2021, https://www.andrewerickson.com/2021/06/the-ryan-martinson-bookshelf-illuminating-xi-chinas-maritime-policies-forces-ops-including-latest-re-whitsun-reef-spratlys/.

8. 尹中卿:目前发展海洋经济面临四个突出的问题 [Yin Zhongqing: Development of the marine economy currently faces four major problems], 新华 [*Xinhua*], March 10, 2019, www.xinhuanet.com/politics/2019lh/2019-03/10/c_137883595.htm.
9. 史常勇, 陈炎 [Shi Changyong and Chen Yan], 试论新时代海军战略定位 [On the Navy's strategic positioning in the new era], 国防 [*National Defense*], no. 5 (2018): 34–36 (CMSI translation). Senior Captain Shi is the director of the teaching and research section of the Strategy and Campaign Department at the Naval Command Academy in Nanjing. Senior Captain Chen is an associate professor in the same department.
10. Andrew S. Erickson, Lyle J. Goldstein, and Carnes Lord, eds., *China Goes to Sea: Maritime Transformation in Comparative Historical Perspective* (2009; repr., Annapolis: Naval Institute Press, 2021).
11. For additional PRC maritime superlatives, see Andrew S. Erickson, foreword to Manfred Meyer, *Modern Chinese Maritime Forces*, ed. Larry Bond and Chris Carlson, 2nd ed. (Admiralty Trilogy Group April 1, 2024), 3.
12. Ronald O'Rourke, *Evolutionary Acquisition and Spiral Development in DOD Programs: Policy Issues for Congress* (Washington, DC: Congressional Research Service, 2006), https://www.everycrsreport.com/files/20061211_RS21195_5cd6d2d08c1c17db74e4bb7e3c035f774504ce4f.pdf; Andrew S. Erickson, ed., *Chinese Naval Shipbuilding: An Ambitious and Uncertain Course* (2016; repr., Annapolis: Naval Institute Press, 2023).

13. Secretary of the Navy Carlos Del Toro, "SECNAV Delivers Remarks at Harvard KennedySchool," September 26, 2023, https://www.navy.milPress-Office/Speeches/display-speeches/Article/3538420/secnav-delivers-remarks-at-harvard-kennedy-school/.
14. China does not appear to build naval vessels *faster* than the United States—it is simply building many more ships simultaneously. Building time is carefully managed and minimized, but PLAN vessels spend more time at the fitting-out pier than their American counterparts do; a sample of Type 052C and 052D destroyers and 055 cruisers suggests that production time of PLAN vessels is in fact approximately 25 percent longer.
15. Captain Christopher P. Carlson, USNR (Ret.), *PLAN Force Structure Projection Concept: A Methodology for Looking Down Range*, China Maritime Report 10 (Newport, RI: Naval War College China Maritime Studies Institute, November 2020), https://digital-commons.usnwc.edu/cmsi-maritime-reports/10/.
16. Sam LaGrone, "Pentagon: Chinese Navy to Expand to 400 Ships by 2025, Growth Focused on Surface Combatants," *USNI News*, November 29, 2022, https://news.usni.org/2022/11/29/pentagon-chinese-navy-to-expand-to-400-ships-by-2025-growth-focused-on-surface-combatants.
17. Office of the Secretary of Defense, *Military and Security Developments Involving the People's Republic of China 2022* (Washington, DC: Department of Defense, November 29, 2022) (hereafter CMPR 2022), 53, https://media.defense.gov/2022/Nov/29/2003122279/-1/-1/1/2022-MILITARY-AND-SECURITY-DEVELOPMENTS-INVOLVING-THE-PEOPLES-REPUBLIC-OF-CHINA.PDF.
18. CMPR 2022, 52.
19. Andrew S. Erickson, "PRC Pursuit of 2027 'Centennial Military Building Goal' (建军一百年奋斗目标): Sources and Analysis," *China Analysis from Original Sources*, December 19, 2021, https://www.andrewerickson.com/2021/12/prc-pursuit-of-2027-centennial-military-building-goal-sources-analysis/.
20. CMPR 2022, 129.
21. CMPR 2022, 129.

22. CMPR 2022, 107.
23. Andrew S. Erickson and Joel Wuthnow, "Barriers, Springboards and Benchmarks: China Conceptualizes the Pacific 'Island Chains,'" *China Quarterly*, no. 225 (March 2016): 1–22.
24. 孙亮, 张军, 张木, 张典, 卜晓东, 许啸 [Sun Liang, Zhang Jun, Zhang Mu, Zhang Dian, Bu Xiaodong, and Xu Xiao], 我国未来作战方向拓展分析研究 [Analysis and research regarding the future expansion of China's operational direction], 舰船电子工程 [*Ship Electronic Engineering*], no. 5 (May 2020): 4–8 (CMSI translation). Sun, a senior engineer working in the China Academy of Launch Vehicle Technology (Beijing)'s Tactical Weapons Division, primarily researches systems warfare. Zhang Jun, a researcher in the Nanjing University of Aeronautics and Astronautics' School of Aeronautics and Astronautics, primarily researches experimental aerodynamics, computational fluid dynamics, computational heat transfer, and systems warfare. Zhang Mu is a colleague of Sun Liang. Zhang Dian is a colleague of Zhang Jun. Xu works at Jiangsu University of Science and Technology's School of Mechanical and Electrical Engineering.
25. See, for example, 黄加强 [Huang Jiaqiang], 北极航行对潜艇航行性能影响研究 [Research on submarine navigation in the Arctic], 舰船电子工程 [*Ship Electronic Engineering*] 40, no. 9 (September 2020), 62–66 (CMSI translation). The author, a senior engineer at the PLAN's Naval Equipment Department military representative office in Wuhan, Hubei, primarily researches overall ship design. Research for this article was supported by a grant from a PLA key research project titled "XXX Polar Operational Use Design Requirement Study" (serial no. HJ20172A01016).
26. 胡冬英, 黄锐, 蔡广友 [Hu Dongying, Huang Rui, and Cai Guangyou], 推进潜艇兵力走向远洋的几点思考 [Several thoughts on advancing the submarine force to distant oceans], 舰船电子工程 [*Ship Electronic Engineering*], no. 1 (2017), 1–3 (CMSI translation). All three authors are based at the PLA Navy Submarine Academy (Qingdao). Hu, a graduate student and engineer, primarily researches submarine operational command theory and methods. Huang, a staff officer, primarily researches weapon and equipment management and technical support. Cai, an associate

professor, primarily researches submarine operational command theory and methods.

27. Isaac B. Kardon and Wendy Leutert, "Pier Competitor: China's Power Position in Global Ports," *International Security* 46, no. 4 (2022):9–47,https://direct.mit.edu/isec/article-abstract/46/4/9/111175/Pier-Competitor-China-s-Power-Position-in-Global?redirectedFrom=fulltext.
28. 胡中建 [Hu Zhongjian] and 胡欣 [Hu Xin], "布局与破局: 中国的海外战略支撑点" [Making and breaking the status quo: China's overseas strategic support points], 现代军事 [*Contemporary Military*], no. 12 (2015): 34–41 (CMSI translation).
29. Ellen Nakashima and Cate Cadell, "China Secretly Building PLA Naval Facility in Cambodia, Western Officials Say," *Washington Post*, June 6, 2022, https://www.washingtonpost.com/national-security/2022/06/06/cambodia-china-navy-base-ream/.
30. CMPR 2022, 145.
31. Mark V. Arena, Irv Blickstein, Obaid Younossi, and Clifford A. Grammich, *Why Has the Cost of Navy Ships Risen? A Macroscopic Examination of the Trends in U.S. Naval Ship Costs over the Past Several Decades* (Santa Monica, CA: RAND, 2006), 20, http://www.rand.org/content/dam/rand/pubs/monographs/2006/RAND_MG484.pdf.
32. Philip Pugh, *The Cost of Seapower: The Influence of Money on Naval Affairs from 1815 to the Present Day* (London: Conway Maritime, 1986), 143–51, 272–77.
33. Arena et al., *Why Has the Cost of Navy Ships Risen?*, xiv–xv, 22–49.
34. Pugh, *The Cost of Seapower*, 316.
35. Pugh, 294.
36. Andrew S. Erickson and David D. Yang, "Using the Land to Control the Sea? Chinese Analysts Consider the Anti-ship Ballistic Missile," *Naval War College Review* 62, no. 4 (2009): 53–86, https://digital-commons.usnwc.edu/nwc-review/vol62/iss4/6/.
37. Andrew S. Erickson, "China's Approach to Conventional Deterrence," in Roy D. Kamphausen, ed., *Modernizing Deterrence: How China Coerces, Compels, and Deters* (Seattle: National Bureau

of Asian Research, 2023), 12–27, https://www.nbr.org/publication/chinas-approach-to-conventional-deterrence/.

38. Daniel Caldwell, Joseph Freda, and Lyle Goldstein, *China's Dreadnought? The PLA Navy's Type 055 Cruiser and Its Implications for the Future Maritime Security Environment*, *China Maritime Report* 5 (Newport, RI: Naval War College China Maritime Studies Institute, February 2020), https://digital-commons.usnwc.edu/cmsi-maritime-reports/5/.
39. Stephen Van Evera, *Causes of War: Power and the Roots of Conflict* (Ithaca, NY: Cornell University Press, 1999), 73–74.
40. Van Evera, 89.
41. 孙盛智, 裴春宝, 侯妍 [Sun Shengzhi, Pei Chunbao, and Hou Yan], 太空信息在海军远洋精确打击作战中的应用 [The application of space information in distant-ocean precision strike naval operations], 火力与指挥控制 [*Fire Control and Command Control*] 44, no. 12 (2019): 12–15 (CMSI translation). Hou is a professor in the PLA Strategic Support Force Space Engineering University's Aerospace Command College. Sun is a PhD candidate there, and a lecturer in the China Coast Guard Academy's Department of Electronic Technology. Pei is a lecturer at the University of Tibet's School of Information Science and Technology.