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	Views & Features
The Chinese Aircraft Carrier Program and Its Influence in the Chinese Naval Strategy 3 Alejandro A. Vilches Alarcón	
Southeast Asian Hedging and Indo-Japanese Strat Managing China's Rise 23 Dr. Bibek Chand Dr. Zenel Garcia Mr. Kevin Modlin	regies for Regional Balance:
Artificial Intelligence in Weapons: The Moral Imperative for Minimally-Just Autonomy Jai Galliott and Jason Scholz	57
Air Intelligence at the Edge: Lessons of the Fourteenth Air Force in World War II Lt Col Kyle Bressette, USAF	68
In China's Shadow:	
The Strategic Situation in the Western Pacific 85 Lt Col Thomas R. McCabe, USAFR, retired	Book Reviews
Great Powers, Grand Strategies	
The New Game in the South China Sea 101 Maj Daniel W. McLaughlin, USAF, Reviewer	
Why Vietnam Matters: An Eyewitness Account of Lessons Not Learned 102 Dr. Martin Loicano, Reviewer	
Human Rights in Thailand 103 Mark S. Cogan, Reviewer	

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Winter 2018 | 2

The Chinese Aircraft Carrier Program and Its Influence in the Chinese Naval Strategy

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For two decades, the People's Liberation Army Navy (PLAN) immersed itself in an incomparable naval construction program. China is one of the world's biggest economic powers—its firm decisions impacting at a global level, and its wishes aimed at reaching superpower status in the military realm.

China is a terrestrial power—which is true of from historical, present, and future perspectives—with all that this entails when it comes to making decisions about its armed forces. Until the advent of its Strategic Rocket Forces, the People's Liberation Army (PLA) and the People's Liberation Army Air Force (PLAAF) have always been the greatest recipients of China's financial, technical, and human resources. After a series of political changes and overcoming technological thresholds, this trend has changed to favor its naval forces, as this article will try to show in the following pages—with special emphasis on the country's recent development of aircraft carriers.

There is a significant historical parallel between the development of the PLAN and that of the Soviet Union's (USSR) fleet (Voyenno-Morskoy Flot, VMF). These examples are terrestrial world powers that suffer from geographical problems in the development of their naval strategy, and therefore, the ships that comprise their fleets. The VMF designed a nuclear aircraft carrier (CVN) program with the strategic objective of protecting its nuclear-powered ballistic missile submarine (SSBN) sanctuaries, denying Soviet adversaries freedom of movement north of the GIUK gap and preventing access to the Barents and Kara seas.¹ However, the collapse of the USSR forestalled the realization of that program. Still there exists an ongoing discussion regarding the need for CVN for continental terrestrial powers, which consistently argues counter to the carrier battle group (CVBG) concept of the US Navy as something expensive and highly vulnerable to certain offensive weapons. Reality and history show us the error of that thought, since currently, a CVBG is the only existing naval group capable of projecting force at any point within the reach of its deployed fleet.

The PLAN has reacted to this concept differently from the VMF, having accepted the strategic need to equip itself with these platforms and adapt the doctrine of its fleet to this concept, which increases the versatility of its naval capabilities. It is true that its concept of aircraft carrier is yet to be defined and remains in the implementation phase; however, such conceptualization and implementation have the advantage of the very important technological heritage of the aircraft carrier model of the VMF.

The existence of aircraft carriers in a fleet does not provide, per se, the ability to project forces to an ideal point. The US Navy and the French Marine Nationale operate, at a high cost, groupings worldwide with the political and strategic objectives of maintaining the capacity to press the interests of their countries. The United Kingdom has had to sacrifice its amphibious capabilities to regain these capabilities. The training and deployment of these groups pose huge costs for national defense budgets, so they should not be neglected—or one runs the risk of losing them. Case in point, although fulfilling its military and political objectives, the performance of the Russian carrier *Admiral Kuznetsov* in Syria at the end of 2017 showed how a poorly equipped and maintained aircraft carrier, with a deployed wing lacking sufficient training, can lead to unnecessary losses in an uncontested scenario. Let us extrapolate this action to a confrontation against trained and equipped groups and draw our own conclusions.

Brief Summary of the Evolution of Chinese Naval Strategy

After Chairman Mao Tse-tung's rise to power, strategic and military priorities would concentrate on strengthening and consolidating continental power, as well as on internal economic programs. China's nuclear program was embryonic but would grow in the following decades, absorbing the best resources that the country could produce. Concerning naval power, Mao would focus the objectives of the PLAN on a coastal defense under the umbrella of land-based aviation. Said decision, incongruous with the primary objective of taking over Taiwan, were based on three main factors at that time.

- Chinese economy not able to support a large platform fleet.
- Chinese industry, very behind in comparison to its neighbors, was not in a
 position to produce the amount of ships and equipment needed, nor prepared
 to design them. However, for a short period, the assistance provided by the
 USSR would allow China to make a small qualitative leap in the construction
 of submarines and initiate its own capabilities in that field.
- The Chinese strategic mentality was completely focused on the consolidation of continental power, with intense border conflicts in Korea and Vietnam in the following years, thus not lending special importance to the naval aspect, which in turn could not be covered by its industry.

The subsequent Korean War and crises in the Strait of Taiwan, Quemoy, and Matsu would demonstrate to Chinese leaders that the lack of a robust naval fleet with the power to deter the positive dominance of the sea by adversaries presented a national priority. In the 1950s and 1960s, China's fleet was comprised of small coastal units with the primary function of repelling external aggressions and conventional submarines garnered through the Soviet support program, which would try to isolate the US reinforcements to Taiwan in the event of a conflict and theoretically make an advance defense of China's coasts.

Thereafter, Beijing was aware of the very limited naval capabilities of the PLAN and began to develop an industrial and operational program to extend the reach of its naval forces, which continued to operate always under the support of ground aviation.

A key date is January of 1974, when in a naval operation the PLAN disembarked military troops in the Paracel Islands, the ownership of which is disputed with South Vietnam. After such confrontations, the Chinese presence would remain in these islands, initiating a way toward the consolidation of Chinese occupation of small islands and reefs all over the South China Sea. We can take the PLAN's order of battle (OOB) of 1979 as reference of its main concerns and future growth trends. Its main ships were:

- 75 conventional submarines
- 11 destroyers
- 12 frigates

- 53 corvettes
- 140 missile patrol boats
- 430 patrollers

It can be inferred that the PLAN was a coastal fleet with scarce oceanic projection capabilities, but China maintained a small nucleus of units in order to grow and train future generations of officers. Likewise, the Chinese nuclear program would further influence the development of the PLAN.

China's decision to arm itself with strategic nuclear weapons, initially with intercontinental ballistic missiles, would involve the PLAN in the development of nuclear propulsion for submarines, both ballistic and attack, as well as allocating an important part of research and development funds to the Chinese SSBN program. This program, which would be one of the longest, most-expensive, and chaotic ventures in recent history, implied China's main and most-fundamental naval strategy would be the deployment and defense of its SSBN, which represented the nation's capacity for a second nuclear response.

In changing the PLAN's mission from a coastal defensive role to the defense of the national strategic armament, China's first decision was to create SSBN sanctuaries near the Chinese coasts, increasing the operating range of its fleet, and thereby building and developing a fleet with advanced capabilities. This new strategic mission would converge in time and represent the beginning of the expansion of Chinese influence in its bordering maritime regions, which would give rise to clashes with neighboring nations that perceived the Chinese expansion as a threat to their own maritime and national interests.

Chinese geography hinders the PLAN's free access to the oceans in a safe, fast, and discreet fashion. The Korean peninsula borders the Bohai Gulf, which is the only maritime access route to the north of China. Shanghai faces the Japanese island of Kyushu, which makes Chinese operations difficult without being noticed by its neighbors. Only Hainan, an island in the south of the country, has a freer access to the ocean, but the proximity to the Vietnamese coast poses a problem even there. This geographic situation forces the PLAN to distribute itself in three different fleets along its coast, in breach of the Mahanian precept of never dividing one's fleet. It was the same situation that the fleets of the Soviet Union, and its successor the Russian Federation, suffered, although in a less severe fashion. The big problem for China lies in the latent threat that its neighbors, which suffer from Chinese expansionism, potentially represent to Chinese sea lines of communication (SLOC). Beijing considers this very threatening and worrisome.

In 1975, a state commission determined the PLAN to be poorly equipped, badly trained, and poorly led. The subsequent conflict with Vietnam served to confirm these concerns. It was about this same time that the Chinese shipbuilding industry began to receive strong state support. Thanks to strong state investment, a cheap labor force, and a more accepting attitude toward foreign construction requests—as well as the transfer of technology, overt and covert—Chinese shipyards began to emerge as global players in terms of annual production capabilities, although some with more than questionable quality. For years, and until now, Chinese shipyards have maintained their position as first in terms of tonnage built and orders for new construction received.

This powerful industrial network, which was not easily established, will be the main support for the current PLAN, as China has now managed to address two of the three main points that Mao lacked to start the construction of a blue-water navy, since the Chinese economy of his day was improving but budgets were still diverted to other programs.

In the mid-1980s, there were strategic changes in the Chinese periphery that drastically changed the PLAN's future function and strategy. Likewise, the effects of the presence of the first Naval High Command at the peak of Chinese power would be alter matters.

Deng Xiaoping' government strategic assessment in 1985 established that China's state of permanent alert due to the threat of Soviet land invasion from the North had ceased. The world situation and the balance of powers between NATO and the Warsaw Pact created a sphere of tranquility for China with respect to the Soviet threat. This allowed Beijing to focus on slowing the growth of its armed forces, turning its attention instead to the technological modernization of its armament, doctrinal and operational development, and improved training for crews.

The PLAN's focus on the defense of the nearby maritime flank of the PLA would now change towards an inland approach. The new naval mission focused on advanced defense until the First Island Chain.² For this mission, the PLAN's platforms and doctrines were inadequate. One figure within the Chinese Communist Party, the PLA, and the PLAN would be the driving force of the strategy to be followed in the coming decades. Liu Huaqing was a general in the PLA, who also held the rank of commander in chief of the PLAN. His naval career was unconventional. Although he never held important operational commands of the fleet, he did hold positions in the Naval Research Institute from the beginning of the 1960s and, with it, control over the Chinese naval industry. He had trained in the USSR at the Voroshilov Naval Academy. From 1982 to 1987, he was commander in chief of the PLAN and later a member of the Central Military Commission and the Chinese Politburo Committee, which were institutions that governed all the decisions of the Chinese state. Additionally, he had a personal relationship with Deng Xiaoping.

All of these factors served Huaqing well when the need for a new strategic concept of advanced defense was raised within the PLAN. His personal opinion of this idea was completely favorable, knowing that the PLAN had to rejuvenate and completely modernize its fleet. He defined the PLAN's need for aircraft carriers, and based on that, he supported and defined the need for the carriers as an absolute need that the country had to fulfill.

In 1986, the PLAN officially implemented forward defense as its main strategic objective in the short term, framed within a general scheme that would culminate, theoretically, in the middle of the twenty-first century with the Chinese fleet as a global naval power. This strategy went through a series of phases that can be summarized as follows:

- By the year 2000, the PLAN should be able to exercise a positive command of the maritime area lying between the First Island Chain and its coast, including Taiwan. Although the PLAN has achieved important objectives, it is still debatable, as we will see later, that the PLAN enjoys positive command of this space. What is certain and undeniable is the growth of Chinese naval power in this space, although it is still disputed whether it begins to approach levels close to its objective.
- By 2020 the previous objective was to extend to the Second Island Chain, which reaches Guam and includes Japan, for example.³ Although the islets taken by Beijing and converted into anti-air warfare (AAW) forward bases and for AsuW and ASW aviation support, the PLAN is decades away from achieving that goal.
- By 2050, the PLAN would like to be able to operate on a global scale in a fashion similar to how the US Navy currently operates. The need for a series of alliances, which currently are non-existent, to logistically support such deployment and other technological factors and number of ships, leads us to leave this objective as a strategic desire for the moment.

The PLAN is at a moment of absolute transition. By building a powerful oceanic fleet, China has found itself in the eternal historical dilemma whether to equip that fleet with aircraft carriers. This time, Beijing's decision has been to follow in the footsteps of the Western powers: to be able to execute the projection of naval force wherever it is required.

Of growing importance to China has been the Indian Ocean, where during the past few years it has deployed more units with few logistical bases outside of its immediate area of influence. Additionally, the importance of the Strait of Malacca for the Chinese economy cannot be overstated. However, India, another power immersed in its own naval program, has the capability to close to commercial navigation, thus threatening Chinese industry and economy.

Currently, the Chinese government has managed to reach agreements with various nations for the use of foreign ports in the Indian Ocean for the PLAN's logistical benefit, although only in Djibouti has China established a naval base. Given this scenario, the CVBG represents the only and most-effective solution when projecting the naval power of China.

Implementation of Carriers within the Chinese Naval Strategy

After this brief historical introduction of Chinese naval strategy, we turn now to focus on those points that require the use of aircraft carriers and explore which platform would be most appropriate in terms of the operational requirements. Liu Huaqing's premises entailed two specific scenarios where the use of aircraft carriers was essential to achieve success—on one hand, Taiwan, and on the other, the dispute over the sovereignty of the archipelago of the Spratly Islands.

In terms of performance in the area of the Formosa Strait or Taiwan, China could face the need of conducting combat actions either to disembark on the island or to carry out a maritime or air blockade in case Taiwan declared its independence. In both cases, a positive command of the sea would be required. The PLAAF could deploy aviation from the continent, but because of the limited operating range of its air-refueling capabilities, the amount of time that air units could stay on target would not be optimal. The best way to exercise continuous and reliable air coverage would be through a combination of PLAAF units and fixed-wing air units from air-craft carriers, allowing the latter to spend more time on target. Additionally, it would allow Beijing to confront, ahead of time, any reinforcement that the United States would send to support Taiwan—not by destroying those reinforcements, but delaying them enough to consolidate a landing by the PLAN on the island.

Vilches Alarcón

The dispute over the sovereignty of the Spratly Islands, very distant from the reach of most of units of the PLAAF, requires an aircraft carrier group to be able to project Chinese naval and air power.

Both cases are clear examples of the needs of the PLAN in case it wants to exercise its power beyond its littoral waters. However, the 1996 Formosa crisis and the removal of Huaqing from his executive and military posts in 1997 halted the aircraft carrier program—although not permanently.

By the early 2000s, China encountered new strategic needs complementary to those detected in previous decades. Chinese naval strategists outlined new requirements, derived from vulnerabilities identified either through direct conflict or through coercion, which China would need to satisfy if it were to sustain its powerful economic growth on an international scale.

In 2004, after years of seemingly unstoppable economic growth, China realized the important economic and societal dependence it had on its fleet of merchant ships to export its goods worldwide, and the fleet of oil tankers that supplied it with crude oil from other parts of the globe. Therefore, Chinese naval forces would need to exercise control of SLOCs far from the nation's territory. The Strait of Malacca is a case in point, as through it Chinese exports flow to the West and crude oil flows from the Persian Gulf, with the Indian fleet easily able to block access in times of crisis.

Likewise, the area of the western Pacific, beyond the First Island Chain, also grew in strategic importance. The PLAN needed to project its power, in a timely manner and with positive command, through the access points or chokepoints, which delimit the first line of the SLOCs with more distant seas.

Both strategic requirements are aircraft carrier scenarios. The distances to be covered and the lack of logistics bases for China's aviation and surface ships finally confirmed to the PLAN the need for a definitive aircraft carrier construction program. Additionally, China's geographical characteristics demanded these aircraft carriers be of the heavy category (CATOBAR) and preferably of nuclear propulsion to augment its deployed air wing and its offensive capabilities during takeoff.

The number of aircraft CVBGs required to fulfill these requirements is another matter of extreme importance. Ideally, the PLAN at all times should be able to maintain one CVBG in the Indian Ocean or close to the Strait of Malacca, another one in the Formosa area, and a third in the western Pacific. Theoretically, if for every deployed carrier China were to keep a recurring cycle of one carrier with its crews in training providing a surge capability, plus another undergoing repair

and modernization, the PLAN would need close to nine aircraft carriers. Or, under this theoretical assumption, at a minimum of six, if China were to deploy only one carrier in the Strait of Malacca and the South China Sea, and another in the First Island Chain and the western Pacific.

The Platforms

Given the PLAN's theoretical strategic needs, it is important to examine China's current aircraft carrier platforms and their development.

In the 1990s, China searched the international market for foreign aircraft carriers or related engineering. Spain and France made interesting proposals. Spain, which at that time was building the HTMS *Chakri Naruebet* for Thailand—the flagship of the Thai navy and its only aircraft carrier, offered to build China a conventional aircraft carrier. France offered instead the retired carrier *Clemenceau*, free of charge, with the condition of re-equipping it in Gallic shipyards and using French technology.

In the end, China found access to old aircraft carriers from other nations: the Soviet aircraft carriers *Kiev* and *Minsk* from the scrap market, as well as the Australian *Canberra*. From all of these acquisitions, experimental techniques and knowledge were obtained that would make their way into the Chinese program. Some of these ships then ended in museums or tourist attractions in China.

Finally, China selected the hull of the *Varyag*, the Soviets' second *Kuznetsov*-class aircraft carrier, which had been at the Ukrainian shipyards of Nikolayev since 1992, when its construction was canceled after originally being laid down in 1985 and launched in 1988. The Chinese government had tried to buy it directly from Kiev but did not receive a direct response to its proposal.

In 1998, a Chinese shell company in Macao bought the hull under the pretense of using it for "tourism." Despite having managed to buy the ship for \$30 million, its transfer to Asia was complicated by the required permits from Turkey to cross the Dardanelles. It took a Chinese vice-minister, with a \$350 million investment package and other perks, to unlock permits in Ankara and start the 18-month tow to China, not Macao, where it arrived in 2002. Besides the ship, the representative from the Macao company sent to Beijing 40 tons of drawings and studies of the Soviet aircraft carrier program (of note, in the same abandoned shipyard was the first Soviet CVN aircraft carrier, the *Ulyanovsk*, with all its documentation—a very interesting information base that today may be bearing fruit in China).

Vilches Alarcón



Figure 1. A long journey. Varyag under tow in Istanbul. (Photo courtesy US Naval War College)

Its arrival into the Dalian shipyards would take a long time. Their first trials at sea would not take place until 2011, and they would continue for another year until it was commissioned by the PLAN on September 25, 2012 (a long period for a ship, even for China). China hired many Ukrainian technicians for this program, who comprise the more than 5,000 current technicians involved in the aircraft carrier program today.

A land replica of the flight deck and the island was built in Huludao, where pilots and airplanes would make their first flight and landing tests. The *Varyag* was renamed *Liaoning*, and it has some of the characteristics and flaws of the *Kuznetsov* of the fleet of the Russian Federation. Its propulsion plant is based on eight steam boilers that provide 200,000 HP on four axes with fixed pitch shovels, which propel the ship up to a maximum speed of 32 knots. There is a ramp in the bow of the flight deck with a 14° incline that helps the takeoff of fixed-wing aircraft, although with a strong limitation on the maximum takeoff weight that limits the fuel and the weapons to be carried by the aircraft, limiting, in turn, its radius of action.

Although the *Liaoning*'s propulsion plant is more modern and has had the support of the Ukrainian industry, specializing in steam propulsion of boilers and turbines, the comparison with its older brother *Kuznetsov* raises many questions about

its operation. The famous smoke from the propulsion of the Russian vessel should make us question either the quality of the propulsion plant or the quality of Russian maintenance without Ukrainian support. The truth is that so far there are no known reports on the *Liaoning* about these problems. The crew for this vessel is approximately 2,000 crewmembers and 500 personnel attached to the deployed wing.

The *Liaoning*, known as CV-16 or Type 001, is operational and very active in the PLAN, but it should be considered as a technology demonstrator vessel as well as a training platform. With this vessel, the PLAN has managed to start operating fixed-wing aircraft and has the ability to select and train its own naval pilots, independently of the PLAAF. The process of consolidating procedures as well as doctrines could take many years.

TYPE 001 LIAONING CV-16 (ex VARYAG)		
Displacement (tons)	46.600	
Length, Beam, Strut (meters)	281, 38, 10.50	
Propulsion	8 boilers, 4 turbines, 4 axis, 9 turbo generators and 4 diesel generators	
Autonomy	3.850 nm @ 29 knots 8.500 nm @ 18 knots	
Crew	Approx. 2.500	
Weapons	3 x CIWS Type 1-130 3 x HQ-18 (18 VLS) 2 x RBU-600	
Deployed Wing	26 x J-15 6 x Z-18F (ASW) 6 x Z-18J (AEW) 2 x Z-9 (ASW/SAR)	

The Liaoning has the following technical characteristics:

The naval power projection capability of an aircraft carrier is based on its deployed wing. In the case of the USA or France, the wing has been specifically designed according to their national needs and their industrial capabilities. In comparison, the configuration of the PLAN's deployed wing shows reduced capabilities aimed at closing a capability gap with other countries. The deployed aircraft is the locally designed Shengyang J-15 based on the Sukhoy SU-33 of Russian design, and from which they acquired a prototype in Ukraine in 2001. Electronics and weapons are locally developed as well. This aircraft is the only one currently in Liaoning and it suffers a heavy penalty in its combat range when using a sloped ramp, instead of steam catapults, which limit its military capabilities.

The J-15 has the ability to provide powerful air coverage in proximity to the CVBG, but is unable to project it much further, very much in the Soviet doctrine of the 70s of the Kiev class and its Yak-38 Forger, although somewhat improved. However, the greatest shortcoming of the PLAN's deployed wing at this time is the lack of fixed-wing support mission aircraft, such as AEW or ASW.

So far, the production of J-15 is estimated at two dozen units, with reports that the PLAN and the PLAAF are not entirely satisfied with the final capabilities demonstrated. Even high-ranking Russian industry officials have spoken openly of Beijing's interest in acquiring the newly built SU-33, or some units and the license to build locally. This is very significant for the future of the program, because if it were true, it would demonstrate a root problem in the entire design and production of the aircraft carrier force.

In the case of a fixed-wing AEW aircraft, for example the E-2 Hawkeye, replaced by helicopters by the Chinese, British and Spanish (which have early warning capabilities with much shorter coverage as well as reduced loitering time). These reduced capabilities, in the case of an oceanic deployment, are a great disadvantage for a CVBG since China lacks a network of logistical bases that can replace these platforms. Specifically, in the Indian Ocean or Western Pacific the *Liaoning* CVBG would have a very limited detection radius and very little chance of receiving support from aviation based on land. It is assumed that currently in China is working on an embarked version of an AEW aircraft, having shown a scale model of the plane, although not much more is known. The development of an aircraft of this type is long and expensive, as well as extremely complicated technologically.

The ASW defense, apart from the escort's own ships, would be based on a few ASW helicopter units. As in the case of the AEWs, their limited scope and patrol time severely limit the ability of the PLAN to protect its most powerful vessel from the most latent and effective threat that its adversaries are capable of presenting. This is not new; ASW capabilities have never received much attention in Chinese doctrine, which is why it is one of the most dangerous fields, and in the best of cases do not fulfill the new ASW function that a CVBG in oceanic deployment would require.

We can infer, therefore, that the current capabilities of the PLAN's CVBG are limited and focused more specifically on the training of the fleet and its deployed Naval Aviation, thus taking important risks in case of conflict and advanced deployment, but providing an embryonic capability.

Type 001A

If the program had been stuck, at this point we could be talking about a national experiment or even a strategic national objective to be achieved in future decades. However, the peculiarity of the Chinese program lies in the development speed it currently has. A fact that makes us ask many questions with few clear answers, and that keeps many analysts continually searching for the minutest evolutions of the PLAN.

In November 2013, the China Shipbuilding Industry Corporation (CSIC), the corporation that owns the Dalian shipyards, would begin the sheet metal cutting of a new aircraft carrier in the greatest of secrecy, or at least not making it public.4 The keel would be placed in March of 2015 and in December of that year a spokesperson of the PLAN would officially confirm that it was in the process of being built. It would be launched on April 26, 2017.

The vessel, whose official name is not yet known, is the first fully Chinese-built aircraft carrier. Based on the experience and design of the *Varyag*, slight structural and layout improvements are assumed comparable to the first unit. Its length reaches 315 meters and the island is significantly smaller than the *Liaoning*. It is also important to note the reduction of construction periods in the shipyard. The deployed wing of the new aircraft carrier would be increased by eight units, although of the same type and with the same limitations during takeoff. It is important to note that the construction of both ships cannot be directly compared, since one was a project from another country and the other a new ship since its inception.

The first sea trials of the Type 001A took place on April 23, 2018. It is expected that the experience gathered in the first vessel will reduce the time needed to complete them, but it is not expected that these will end before mid-2019, at best. The CSIC itself has announced that it expects to be able to deliver the vessel to the PLAN in 2018, which would mark a milestone in shipbuilding. The most important difference from the *Liaoning* is that the Type 001A is a military operational vessel in all aspects, while its predecessor was a technological demonstration-train-

ing vessel, with limited military capabilities. However, the PLAN would continue to face the situation of owning two aircraft operational carriers in the fleet, while continuing to develop and test all the operational doctrines associated with these types of vessels.

Type 002

Since 2015, there have been convincing reports and news from the Asian media regarding the start of the construction of a new aircraft carrier by the PLAN. In this case, it would be of a new design and by a new shipyard. According to different sources, the construction of this new aircraft carrier, called Type 002, should have started between 2015 and 2016. The shipyard designated for its construction was Jiangnan Changxinghao, in the Shanghai area.

The news about this project is diverse and confusing, due to the secrecy that the PLAN imposes on its entire aircraft carrier program. The estimates speak of a conventional aircraft carrier (CATOBAR) although following the hull lines of the *Kuznetsov* class, of which the CSIC already has enough information and experience to develop without major inconveniences. It should be considered at this point that the Ulyanovsk project is also leaving its mark on said vessel.

Another of the key points that creates controversy is the propulsion plant. Since China is the nation that has probably had the most complex, expensive and longest naval nuclear propulsion program in history, this third aircraft carrier seems to be at a good technical, political and economic moment to apply the technologies developed in the SSN and SSBN in a surface vessel, specifically in a CVN. As we have seen, the operational needs that derive from the Western Pacific and Indian Ocean scenarios require a CVN. The new EMALS launch catapults also require a nuclear plant, of which China appears to have a very advanced technology, and which require a high electrical consumption for its operation, not to mention the power requirements of its new laser weaponry, which is another one of the PLAN's open research programs. It is curious that in 2018 the CSIC website published, as one of its immediate priorities, to equip new aircraft carriers with nuclear reactors. This information was subsequently deleted from the web.

The Central Military Commission demanded the inclusion of the EMALS in these Type 002 vessels, since they provide deployed aviation with a range much higher than the one provided by sloping takeoff ramp. Likewise, the problems it has suffered in its development, at the Huludao test site, seem to be the main reason why the construction of Type 002 was stopped in the summer of 2017, same date when the Commander in Chief of the PLAN, Vice Admiral Shen Jinlong, visited the shipyard.

However, the propulsion plant remains an open and interesting subject of debate. One of the most important naval engineers of China, Ma Weiming, recently received a state award for what seems to be the application of a new electric transmission network in ships, which would allow the Type 002 to comply with the energy needs of the EMALS without the need to resort to a nuclear plant. This leaves open to speculation which propulsion plant will be on the ship.

In any case, the Type 002 can be considered the first aircraft carrier of Chinese design, concept and construction. It is true that if the technologies mentioned are applied, it will be a very risky technological bet for the PLAN. Only time will tell.

It is expected that the deployed wing of the Type 002 will accommodate up to 40 aircraft and will have a displacement in the order of 90 to 100,000 tons. Its launch is expected in 2020 and its commissioning with the fleet will be three years later, in 2023.



Figure 2. New capability. Shenyang J-15 Flanker-X-2 carrier-based multirole fighter with a catapult launch bar (CATOBAR) on its front wheel, which is used to couple the aircraft to the catapult during takeoff. Given this new development, it is presumed that China's third aircraft carrier, planned to be built at the Jiangnan Shipyard, will employ a catapult system.

The short deadlines between the deliveries of the Type 001A and the Type 002 also force us to address their deployed Naval Aviation requirements. So far, the units produced by J-15 are estimated at 24, two batches of 12 and some proto-types. This production allows equipping the *Liaoning*, although without possibilities of rotation or maintenance. Therefore, equipping the Type 001A, the Type 002 and the ground-based training units will require at least 80 newly built aircraft. This is a very important program for Chinese strategic objectives and we will

see if it enjoys a national solution, or one from its northern neighbor. Some of the prototypes of the J-15 have been equipped with the necessary equipment to operate with CATOBAR aircraft carriers.

Since 2010, the existence of a scale model of the prototype of a fixed-wing deployed aircraft AEW, known as Xi'an Y-7, has been known. Said prototype was photographed in 2017 at the Huludao polygon, which shows the PLAN's interest in operating this type of aircraft. The Type 002 and its characteristics would allow the PLAN to operate these essential aircraft in the current naval warfare. However, apart from this model, nothing else is known about this project.

The training of naval aviators has also been reinforced with the creation of naval institutions under the command of the PLAN to accelerate their training, making it more specific and less dependent on the PLAAF, although they do not yet have advanced trainers specifically designed for this function.

The PLAN's OOB in the Coming Years

The PLAN can be proud of the achievements made in its aircraft carrier program and, in general, in the construction of the modern ocean fleet that it is beginning to forge and build. However, the PLAN's main problem for the future is not in which aircraft or aircraft carriers it will operate, but in achieving an ocean fleet, without neglecting its other maritime responsibilities, and at the same time being able to cover the costs of all these units, crews, logistics, training and maintenance.

We must never forget where the once world superpower, the Soviet Union, ended, despite its technological achievements in the naval field. The costs of all these programs, plus those of the other military branches, were the slab that would end up on the grave of a country and a system that was not able to maintain the economic rhythm for its voracious appetite for new weapons and technologies. Vessels and programs such as the Alfa, Typhoon or Papa submarines, and ships such as the Kiev, Kirov and Ulyanovsk, would not be noted if not for the economic ballast they caused in the nation as a whole.

The PLAN's CVBG is still to be clearly defined, although we can estimate some of the ships that will become part of its escort. The new Type 055 Destroyers will be part of the escort of the CV, but it is a program with few finished units and in the process of construction.

To be conservative, and knowing that the PLAN is reflective to a large extent of the experiences of the US Navy, adapting them to their particular situation, the escort of a CV could be constituted by the following units: 2 DDG (Type 055,

052C or 052D) for ASuW and AAW, 1 to 2 FFG Type 054A for ASW and at least 1 SSN for ASW, in addition to the logistics ships required to keep all the CVBG supplied. At this moment the PLAN is in the process of building 2 CV / CVN and we have to assume that they will at least reach a quantity of 4 to 6 vessels, with the objective of standardizing the fleet and creating synergies of the construction process, assuming that the Type 002 is the fleet's standard.

If the program were stopped with the three known units, surface units assigned to aircraft carrier escorts would be in the following order: 6 DDG, 3 to 6 FFG and 3 SSN. According to the current composition of the fleet, these vessels assigned to escort functions would be 23% of the available destroyers of all types in the PLAN, 12% of the total FFG, and 50% of the available SSNs. They are abysmal numbers for a fleet in the process of transition, mainly in the underwater field. Although they would not be the most effective, this function could be fulfilled, with a significant reduction in effectiveness, by conventional submarines of which the PLAN has a large number. However, they would not effectively accomplish this mission, even if the Type 002 had nuclear propulsion.

The aircraft carrier program in the coming years will represent that a significant percentage of the fleet, both in surface and submarine units as well as logistics used for escort functions, instead of naval operations. To solve this situation the number of units in the fleet would need to be increased, with the respective economic, maintenance and personnel costs, or the rest of operations of the PLAN would need to be reduced for the benefit of the CVBG. Both are solutions involving compromise, and place the PLAN at a critical moment in its history, just as they begin to realize naval projection capabilities beyond their regional maritime influence zone.

On the economic side, since China is one of the world's leading economies, this issue should not represent a bigger problem than a state budget adjustment. However, the volatility of Chinese growth, as well as the important defense budget assigned to other programs such as the Strategic Forces, SSBN, SSN, PLAAF, compels us to rationalize or reduce units and costs at some point in the future.

We can try to put gross figures at the cost of the program, taking into account that the three units under construction are in each case prototypes and, therefore, expensive units to build, despite the lower cost of Chinese hand labor. Each air-craft carrier can be estimated at \$3 to 4 billion dollars. The deployed wing, taking as a reference a Su-33 at \$50 million dollars per unit, and a total of 30 units per vessel plus support aircraft, AEW and ASW, would give us a total cost of another

\$3 billion dollars. Escorts and logistic vessels, excluding submarines, will exceed \$4 billion dollars. All this gives us a necessary amount to build the combat units of a CVBG that would exceed \$10 billion dollars in the construction period, which can range between 6 to 10 years.

The operational factors of maintenance, training, fuel and repairs, can be estimated at 10% of the cost of construction, according to experiences of the US Navy, which would be more than \$1B per year for CVBG. However, we must bear in mind that this is a factor that in the early years and with prototype ships, become more expensive exponentially and cannot be assessed a priori. The necessary personnel for 3 CVBG, several tens of thousands of officers, naval aviators and crewmembers, also represent an important cost for the PLAN's budget. The experiences of the US Navy are not directly applicable to bring decades of experience applied to the global operation of CVBG. In the Chinese case these estimates, being their first experiences, can double or triple the costs.

Although they are very important figures, if the Chinese economy maintains its growth rate and the CMC continues to support the CVBG development policy for the PLAN, it is a feasible objective to achieve and maintain over time. However, as the PLAN begins to absorb a quantity of resources to its brothers PLA and PLAAF, the unlimited growth of the naval forces of a nation, against limited budgets and variable to external factors, is something very difficult to maintain over time.

Neighbors and Threats

The biggest problem facing China in its naval strategy is its geographical position with respect to the oceanic SLOCs and their exit to deep waters. Around China, its neighbors are hostile or maintain border disputes in different archipelagos. The truth is that the naval forces of China are the PLAN, while that of its adversaries is the sum of the different organizations of Defense and Allies of the United States.

Regardless of the Fleets it may face, the greatest threat that a CVBG of the PLAN should face is, precisely, the Achilles heel of the PLAN: submarine warfare. It is no coincidence that the nations bordering China have modern submarine units in significant numbers.

Let us see a quick summary of the submarine threat in the Asian continent:

Japan	9 Soryu submarines and 3 more in Construction, 11 Ohashio submarines and 1 Asahio submarine.
South Korea	9 Type 209/1200, 7 Type 214 plus 2 in Construction, 2 class DSX 3000 authorized and they are studying the possibility of a new class based on the French SSN Barracuda.
Taiwan	2 Zwaarvdis and 2 Guppy II. For decades, Taiwan has tried to increase the number of submarines, either purchasing them abroad or through local construction.
Singapore	2 Västergötland and 2 Sjöormen. At the present time 2 type 218SG are being built in Germany.
Vietnam	6 Kilo Project 636MV. Considered excellent and very capable submarines.
Malaysia	2 Scorpene.
Indonesia	2 Type 209/1300 and 3 Type 209/1400 being built.

Other nations, such as India, Canada and Australia, are currently undergoing programs to renew their submarine fleet in large numbers with some of the most numerous and advanced SSK programs in the world. To all this we must add the units that the US Navy can get to deploy in an area of interest.

As we can see in a simple arithmetic operation, the sum of the border submarine threat against the PLAN is very high. To this, we must add that the PLAN has always relegated ASW training as secondary, so the risk faced by a CVBG in a hypothetical combat is high. The lack of on-board aviation ASW or logistical bases for ASW support with aviation based on land in more distant scenarios puts check on the Chinese naval strategy of CVBG in remote seas.

As we have seen, the aircraft carrier program is expensive and takes a long time, if not decades, to reach optimal operational capabilities. However, the PLAN if the tried to correct their shortcomings in ASW, it would also face a new problem of cost and time, since it is another aspect of the Naval warfare that is expensive and difficult to maintain in a fleet, and we cannot stop investing in it at the risk of los-ing capabilities. It is the PLAN's great Achilles heel.

Conclusions

China has demonstrated the political, economic, and technological ability to develop and build aircraft carriers. In addition, the number of aircraft carriers currently in operation, in tests or under construction, shows strong political support for the program. It is currently in the process of developing operational doctrine for the use of the CVBGs framed within the rest of the PLAN and within its own national strategy. The great doubts are mainly framed in its deployed wing, with the J-15 fighters in question, and with fixed-wing support aviation, AEW and ASW, still pending to be developed. The CV platforms themselves have yet to define the standard that China wants as a definitive for its fleet. The possibilities of improvements in these aspects in the coming years are very great, depending on continuing economic and political support. If the SLBM, SSBN and SSN programs are an example, they will continue with them regardless of cost or time.

Another aspect to be evaluated is the impact that the CVBGs will have on the OOB of the PLAN, since it will require a large percentage of the surface, submarine and logistic units that the PLAN currently enjoys. Therefore, the PLAN will have to increase the construction of more escort units and SSN, or reduce the missions of the PLAN outside of the CVBG.

Thus, the next few years will need an intense follow-up to the PLAN in order to elucidate where the future composition of the fleet is going and how the CVBGs will fit in.

Notes

1. The GIUK gap is an area in the northern Atlantic Ocean that forms a naval choke point. The acronym is derived from Greenland, Iceland, and the United Kingdom, with the gap representing the open sea located between these three landmasses.

2. The First Island Chain is considered those made up by the Japanese archipelago, the Ryukyu, Taiwan, the Philippines and Borneo. Basically from the Kamchatka peninsula to the Malaya peninsula.

3. The Second Island Chain extends from the Japanese archipelago to Guam and Eastern Australia.

4. The CSIC is the Chinese macro corporation that controls the main military and civilian shipyards in the country and carries out all of the PLAN's naval programs.



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Southeast Asian Hedging and Indo-Japanese Strategies for Regional Balance

Managing China's Rise

Dr. Bibek Chand, Dr. Zenel Garcia, and Mr. Kevin Modlin

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The disruptive forces resulting from China's reemergence as a global power has challenged the existing order in the Indo-Pacific. As its political, economic, and military capabilities have developed, China has become increasingly assertive along its maritime periphery in the East and South China Seas. Furthermore, it has begun to project power into the Indian Ocean and the Western Pacific. This study demonstrates how these developments have resulted in hedging behavior from key Southeast Asian states, which has facilitated the emergence of an Indo-Japanese nexus in the region implicitly aimed at managing China's rise. In other words, the behavior of small and middle powers in Southeast Asia has been crucial to the increased presence of extra-regional powers like India and Japan in the region. Additionally, this study aims to make a theoretical contribution by refining the concept of *hedging* as an optimal strategic behavior during periods where immediate existential threats are not present and incorporates components of soft balancing and engagement.

The strategic environment in the Indo-Pacific is changing at a rapid pace. China has not only become the second-largest spender in military defense¹ but is also increasingly capable of projecting power into the Indian and Pacific Oceans.² This has been particularly worrisome for India, which has witnessed China become an emergent maritime power in the Indian Ocean region (IOR)—an area India considers vital to its strategic interests. Furthermore, China's political and economic partnerships with India's neighbors in the IOR have prompted concerns of encirclement in the form of a "string of pearls."³ As a result, India has become increas-

ingly engaged in Southeast Asia to demonstrate its power-projection capabilities and increase its influence in China's backyard.⁴ In East Asia, Japan finds itself in a more precarious position. Despite being a close ally of the United States and still possessing a qualitatively superior self-defense force, Japan is cognizant that China is the ascendant power in East Asia and that the strategic window to establish Japan as a political and military actor in the region is quickly fading.⁵ Consequently, coupled with the ongoing disputes in the East and the South China Seas and the inability of the Southeast Asian littoral states to present a unified challenge to China's growing assertiveness,⁶ Japan has become more politically proactive in the security affairs of the region.⁷

It is in this context that an Indo-Japanese strategic partnership has emerged. Both countries share similar threat perceptions of China's growing political and economic influence in the Indo-Pacific. This is particularly true for China's assertive foreign policy in the East and South China Sea which is perceived as contravening international norms, such as the freedom of navigation.⁸ Additionally, India and Japan have territorial disputes with China and see Beijing's efforts to unilaterally change the status quo in those disputes as a threat to their national interests as well as a cause of regional instability.⁹ Lastly, the two countries have a mutual interest in expanding economic ties. For Japan, increased economic ties with India provides access to the second-largest emerging market;¹⁰ for India, closer ties to Japan provides access to much-needed technology transfers.¹¹

Their common interests and shared concerns have not only prompted Japan and India to seek strategic partnerships between themselves but also with small and middle powers in Southeast Asia. For several Southeast Asian states, this represents an opportunity to establish durable partnerships with emerging or established powers. Although Southeast Asian states have been traditionally wary of outside power involvement in regional affairs, the tensions in the South China Sea (SCS) and China's dominance of regional economic power have been a galvanizing issue for key states in the region that now seek to establish and strengthen partnerships with extra-regional powers.¹² In other words, intensified Japanese and Indian interests in Southeast Asia provide the states of the region with capable partners in their efforts to build their deterrence capabilities as a contingency to what they perceive as growing Chinese assertiveness. Much like the lenses of a bifocal pair of glasses can provide clarity, this article can be read through the lenses of agency and structure to illuminate the strategic dynamics in this competitive region. Thus, we can see there is a convergence of structural economic and security conditions in the Indo-Pacific region and how it is understood by middle and major actors. As a result, we notice an intersection of Indo-Japanese interests in Southeast Asia, while the states of the region are utilizing their agency to enhance this partnership through their use of hedging strategies.

This article argues that Southeast Asia is becoming the pivot through which the Indo-Pacific order is being contested as a result of the strategic behavior of key regional states. Southeast Asia's pivotal position in this contestation is not only the result of congruent Indo-Japanese interests in the region. It is also the agency exercised by key states in the region that has facilitated the emergence of an Indo-Japanese nexus in Southeast Asia. In other words, by internationalizing the local process of a shifting balance of power (BoP) through their hedging strategies, Southeast Asian states simultaneously exercise their agency, facilitate the emergence of an Indo-Japanese nexus, and consequently situate their region as the pivot of the contestation for Indo-Pacific order.

In addition to its empirical contribution, this study aims to refine BoP theory by operationalizing the concept of hedging as a distinct behavior that incorporates characteristics of soft balancing and engagement. It is argued that hedging is a distinct and the most-optimal option for small states wherein the factor of immediacy is absent. Furthermore, it contends that hedging is best understood in relation to a state's deterrence capabilities and its perception of threat. In other words, rather than seemingly ad-hoc strategic behaviors available for statecraft, hedging is a preferred option relative to alternatives given the power competition of the region.

A Balance of Power Theory

This study argues that BoP strategies can be understood in proximation to each other and to a delineating concept. There is a debate about where balancing (hard and soft), hedging, engagement, bandwagoning, and appeasement rest relative to each other. This study argues that these concepts can be best understood in relation to conventional deterrence. State policies are developed from an understanding of conventional deterrence relative to the power and the threat perception of another state, and as a result, the threatened state faces a spectrum of options in its policy decisions. This may be further influenced by the conditions in a region and the opportunities that other regional actors may or may not capitalize on.

Existing explanations regarding BoP theory and the application in strategy or policy emphasize alliance building and domestic military buildup. Drawing from this literature of traditional BoP, the concept of hedging seeks to explain the behavior of smaller powers in the regional system. Brock Tessman characterizes hedging as a behavior that "helps second-tier states cope with the threats and constraints they are likely to encounter under conditions of unipolarity, while simultaneously preparing them for new threats and opportunities that are likely to emerge as the system leader falls further into relative decline."¹³ In essence, hedging as a state strategy is instrumental for smaller states in the system that seek to bolster their security in the context of a deconcentrating unipolar system as characterized with the beginning of the twenty-first century. Hedging also involves the pursuit of two apparently opposite policies toward another state: soft balancing and engagement.¹⁴ Such a pursuit seeks to insure against uncertainties in the present and future that pertain to state security. Thus, hedging provides the state with greater levels of agency, since it expands the operational range of its diplomatic options.

Several Southeast Asian states, many of which have maritime disputes with Beijing, have increasingly sought hedging as a means of reducing China's influence in the region while maintaining economic linkages with the country. China's rise entails possible changes or disruptions at the regional level as several Southeast Asian states are involved in the maritime disputes in the South China Sea. Traditionally, the United States has been the "go to" partner as a balance against China.¹⁵ However, the end of the Cold War and the rise of China have resulted in Beijing's growing dominance over the region's economic dynamism. Existing literature asserts that hedging in Southeast Asia is motivated by the need for economic stability in the region while at the same time minimizing security risks.¹⁶ Evelyn Goh situates hedging in Southeast Asia as a matter of not overtly choosing sides; Southeast Asian states engage with China to socialize it as a responsible great power, while simultaneously sustaining US military presence in the region.¹⁷ Darren Lim and Zack Cooper, in their own conceptualization of hedging, define it as "an alignment choice involving the signaling of ambiguity over the extent of shared security interests with great powers."18 It entails flexibility in state strategies, which is particularly pertinent for engagement with rising powers.¹⁹ Hence, hedging as a state strategy is characterized as being distinct from the traditional concepts of balancing and bandwagoning. Hedging entails engagement with multiple great powers that may also include strategic rivals. Therefore, existing explanations of hedging highlight approaches where a "state pursues multiple options, mixing confrontation and cooperation in order to spread the risks inherent in achieving a single objective." Additionally, "hedging involves maneuvering, often in unfavorable circumstances, to advance its interests without triggering a decisive response

from its regional cohabitants backed by the hegemon."²⁰ Therefore, as seen in Southeast Asia, hedging can fall into being considered a catchall concept that results in multiple qualities, interactions, and meanings.²¹

Additionally, there is an assumption regarding the temporal perception of threat from the hegemon that does not shift the deterrence assessment and BoP strategy away from hedging.²² In other words, hedging involves no superpower security commitments and is a distinct position within the BoP spectrum, which includes elements of soft balancing and engagement. A state, without an immediate threat, favors this approach to maintain economic and political relations with multiple powers. As a result, hedging becomes a clearer choice for states when it is known what options are taken off the table. To better understand this process of knowing what BoP strategies are taken off the table it is useful to understand its relationship to deterrence.

Deterrence

The concept of deterrence is an inherently multilevel and interactive process of dissuading a potential threat. It is about capabilities, interests, will, and perceptions of one state relative to the other. Therefore, determining the degree of conventional deterrence available to a state helps illuminate likely BoP strategies and deemphasizes less-favorable options across the spectrum.²³ The available choices become more apparent when one sees where states rest in the BoP array as a result of a conventional deterrence assessment. It is anticipated that states will consider the most favorable BoP strategy. However, this policy choice will be made after the state (including allies) has determined if it can deter the hegemon (*see* fig. 1). This is not a choice of a strategy to provide deterrence but of what options are available to the state after determining to what degree a state can dissuade the hegemon. For example, if a state is small and has no available options to deter the hegemon, their deterrence assessment would be weak. Therefore, for the small state, policies resembling bandwagoning would be suggested but certainly would deselect options like hard balancing.

Due to limited capabilities, budgetary constraints, and a desire not to position oneself in an antagonistic position relative to China, hard balancing is a suboptimal choice for small states that do not have major power allies. The exorbitant political and economic costs of traditional hard balancing, particularly in the present international political context, has increasingly made the soft-balancing approach a much more viable state strategy. Furthermore, China's efforts to not present itself as an existential threat to Southeast Asian countries, seen through its "Peaceful



Figure 1: The Balance of Power Approaches

Rise" and "Peaceful Development" narratives, diminishes a sense of urgency, thus optimizing the preference for hedging strategies by key Southeast Asian countries, while undermining the value of hard balancing, appeasement, and bandwagoning. Therefore, the consideration of the more viable option of soft balancing rests on using nonmilitary avenues, such as international institutions, economic statecraft, and diplomatic arrangements is more frequently considered. This is supported by T.V. Paul, who argues against the relevance of hard balancing as a state strategy in the post–Cold War period, especially for the weaker states in the system.²⁴

Soft balancing can also be interpreted as a means for weaker states to challenge stronger states using nonmilitary means.²⁵ Chaka Ferguson defines the concept as "nonmilitary alignments of at least two states that are designed to reduce or remove the military presence and external influence of an outside power from a specific region."²⁶ However, soft balancing can include political-military dimensions, such as the forging of strategic partnerships and capacity-building cooperation— actions that fall short of alliances and arms buildups but can enhance a state's deterrence capability.²⁷ In essence, due to the risks associated with hard balancing, which entails formal alliances and competing arms buildups, soft balancing is a relatively risk-averse alternative.

The usage of the concept of *soft balancing* in this article warrants a clarification of the term to distinguish it from regular use of the term *diplomatic friction*. A gen-

eral reading of these terms finds words like strategy, state making, policy, and longterm objectives associated with soft balancing. On the other hand, diplomatic friction has associated words like periodic, episodic, or a specific matter occurring in the differences between states. Soft balancing is an approach in addressing the means to survive a conflictual world, whereas diplomatic friction occurs through the daily dealings within the same conflictual world. A state adopts a strategy of soft balancing as a consistent policy in its relations with a superpower, while diplomatic friction can and does transpire among neighbors, allies, or enemies for short periods of time.

The existing literature explains the circumstances where hedging strategies are adopted; however, it can be argued that the assessment of deterrence empirically explains why states would consider this approach. Henry Kissinger argues that deterrence can only be tested negatively.²⁸ In other words, it is easier to determine when deterrence fails than knowing, with certainty, when it succeeds. Therefore, it is difficult to use the concept of deterrence (including conventional deterrence) as an intervening variable. However, in the determination of proper BoP strategies through the process of negation, we may be left to see a smaller range of choices. Furthermore, because states (political leaders and societies) are beset with the confounding influence of the unknown, this drives the desire toward producing multiple options. This is because it is assumed that the multiple-options approach provides security.

The practical policy options for leaders will be left with the remainder of the deselected options available for policy decisions, which in part explains the hybrid or hedging approaches states take. This is especially the case if the relations with the hegemon do not force them into a situation to need to parse out a more overt choice, such as balancing, bandwagoning, or appeasement. Since choices are not entirely confirmable concerning the effectiveness of deterrence, it is reasonable to see states take on multiple positions in the BoP spectrum. This choice of a hybrid or hedging seeks to avoid choices. Consequently, for domestic political considerations, it results in seeking to avoid internal and external duress by taking a muchthe-above approach. Therefore, a hedging strategy for states can temper the anxiety and insecurity that choices often create. In summary, hedging is less likely to take place when a state (and its allies) has too little ability to discourage a superpower. Rather, hedging is more likely to occur when a state has some deterrence capability but not enough to effectively dissuade a threat.

Observing Hedging

Whether through markets or international relations, hedging seeks to avoid net costs. However, it does entail specific costs that would not occur in a pure engagement strategy. Hedging entails incurring costs for maintaining flexibility in BoP. This cost of flexibility is akin to that incurred by the hegemon to manage an order. For the hegemon, these system-order costs are part of resolving the collective action problem through the management of alliances and covering free riders. For hedging, it is about settling into the opposite position by seeking to avoid a solution to collective action. In short, the hegemon incurs distinct costs for some degree of order, and the hedging state incurs distinct costs for flexibility. This hedging position can be enhanced during conditions of great-power competition and the absence of global hierarchy. As a result, hedging by a regional actor involves the perpetual choice to not participate in solving the collective-action problem through superpowers, because doing so would likely mean making strategic choices. This choice of flexibility is a distinct behavior, which is like paying a market cost for an option to change a position at a future date. Preserving this option has value, but in a pure market rationale, it is sometimes less efficient than engagement. The costs include the risks involved in not having security guarantees against phenomena that cannot be sufficiently hedged against.²⁹ Therefore, these costs can be revealed for a state in domestic conditions, but most distinctively, hedging involves the absence of an alliance with a major power or a superpower. Ultimately, while hedging incurs the cost of less efficiency and a lack of concrete security guarantees, the flexibility accorded by it ensures greater levels of state agency as it provides a wider range of options. In other words, by relying on hedging strategies, states can ensure greater levels of agency as they mediate their position vis-à-vis changing structural conditions at the regional and systemic levels.

These BoP policy selections may or may not be effective, due to outcomes that are not testable before the approach on the spectrum is selected. Due to the selection of deterrence as an intervening variable that is confirmed in the negative, there will be a wider range of choices. In other words, the vagaries of the negative do not usually call for a direct prescriptive policy line. Therefore, hedging approaches adopted in Asia are more reasonable than the deselected choices, but their effectiveness will be tested relative to the future, including China's growth, its power projection designs, its domestic national sentiments, and systemic competition. This explanation confounds theoretical models and complicates empirical understanding but may rest closer to developments in a region where states are increasingly moving toward this choice.

The bifurcation of BoP into soft and hard balancing has encouraged the development of literature based on the former and its application to regional security contexts. Additionally, the refinement of balancing into soft and hard approaches opens new avenues for defining hedging. Rather than distinguish hedging as an inherently separate state strategy, its very definition as a policy of ambiguity allows the incorporation of other state strategies, namely soft balancing and engagement. Soft balancing, which seeks to limit the influence of a great power, is pertinent in Southeast Asia given the increasing interests of China in the region, which maintains a strong economic presence in the region but is also involved in maritime disputes in the SCS. Additionally, several states in the region maintain close strategic partnerships with the United States, showcasing the pursuit of hedging as a state strategy. While many Southeast Asian states have signaled ambiguous great power alignment, which is a prominent characteristic of hedging, they still maintain engagement with China given its extensive economic presence in the region. Therefore, hedging by small states is about strategic engagement and curtailment of the regional hegemon in the context of a deterrence assessment in an environment of changing polarities. While the strategic choice of hedging seems to incorporate contradictory objectives, it is preferable for these states over choices like hard balancing or appeasement that are in agreement theoretically but are suboptimal for these states.

Rather than contextualize it as a separate alignment strategy along with bandwagoning and balancing, this article proposes that hedging incorporates the softbalancing aspect of the larger framework of balancing and engagement. In fact, the proposed conception of hedging contextualizes it within the larger framework of the small states' perceptions of their ability to deter. Ultimately, hedging is optimal when urgency is not a factor. As such, hedging is operationalized in this article as incorporating engagement coupled with soft balancing. Southeast Asian states seek to curtail or, at the very least, contain China's presence in the region. Simultaneously, the extensive economic engagement with the People's Republic of China (PRC) requires the Southeast Asian states to maintain relations with the country, i.e., maintain engagement. Soft balancing, given its lower domestic and international political costs, when compared to hard balancing, presents itself as an attractive state strategy. The refinement of the concept of balancing into soft and hard balancing allows soft balancing to be included as part of hedging. As hedging entails contradictory and ambiguous state policies, soft balancing is the most riskaverse form of resisting a bigger power without extensive fear of severing of any form of engagement. Due to its function as a means used by weaker powers to curtail the influence of stronger powers sans complete dissociation with them, soft balancing is a characteristic of hedging. For Southeast Asia, the United States has been the traditional hedging partner against China. In essence, hedging is observed when soft balancing and engagement operate simultaneously. Hedging behavior also entails the absence of overt alignment or clear-cut positioning, as characterized by bandwagoning, appeasement, and hard balancing. Figure 1 illustrates this operationalization of hedging.

The rhetorical change from the "China threat" to that of the "China challenge" in Southeast Asia showcases the strong emphasis on hedging in the region.³⁰ Almost all the states in the region showcase security concerns regarding China's territorial claims in the SCS. Simultaneously, many of these states maintain strategic partnerships with the United States, which clearly showcases the usage of hedging as a state strategy.³¹ Furthermore, while still maintaining ties with United States and China, Southeast Asian states have increasingly sought ties with other extraregional powers, such as India and Japan. As part of their hedging strategies, most Southeast Asian states showcase soft balancing, including increasing strategic and economic partnerships with Japan and India. The convergence of political and economic interests among Southeast Asian states, Japan, and India provides a fertile ground for a hedging nexus vis-à-vis China. Indian and Japanese efforts in Southeast Asia have converged in three core areas: political, military, and economic. Political efforts include signed strategic partnerships; military efforts include capacity building and military exercises, which, despite having a military dimension, are "softer;" and finally, economic efforts include diversification of economic linkages and lessening of dependency on China.

Southeast Asian Hedging Behavior

This study focuses on Indonesia and Vietnam as they present the two mostcompelling case studies in the region to assess the propensity for hedging behavior. Both countries are engaged in several political and economic disputes with China, while becoming increasingly dependent on trade with the PRC. Furthermore, both possess the benefit of geography, since some of the world's most important sea lines of communications (SLOC) traverse their respective exclusive economic zones (EEZ). Nevertheless, there are key differences. Indonesia is an emerging middle power with greater material and discursive capabilities than Vietnam. It

also has a measure of geographical distance from China and is only a party to the EEZ demarcation dimension of the SCS disputes. Vietnam, on the other hand, is the only SCS contestant to share a land border with China, while possessing more limited material and discursive power in relation to China. Nevertheless, its national narrative is shaped by the historical tensions with China as well as a revolutionary tradition that prides itself for having cowed its former French colonial master, American military power, and even Chinese might, over the span of three consecutive Indochinese wars. Consequently, while Indonesia and Vietnam demonstrate characteristics of hedging behavior, their motivations for pursuing this strategy differ due to the different material and discursive capabilities vis-à-vis China and their interpretation of their geopolitical environment. In the following two subsections, it is illustrated, through a process of elimination, why hedging has emerged as the optimal strategic choice for Vietnam and Indonesia, over appeasement, bandwagoning, and hard balancing. With the complex dynamics in politics, it is not always possible to confirm mixed behavior through empirical methods without first eliminating unlikely explanations. Otherwise, in almost all circumstances, engagement will be confirmed, because much of the time, the economies of states are engaging with each other. These engagements are especially true for China, which has extensive economic ties with the countries in the Indo-Pacific. This follows Arthur Conan Doyle's famous quote, "When you have eliminated the impossible, whatever remains, however improbable, must be the truth."32

Indonesia

Indonesia has maintained a relatively stable relationship with China even though tensions exist regarding overlapping claims surrounding the EEZ of the Natuna Islands in the SCS. These overlapping claims have resulted in numerous high seas confrontations between fishermen and coast guard vessels from both countries.³³ Consequently, despite Indonesia's repeated assertions that it is not a party to the SCS territorial disputes, there is no denying that it is a party to the maritime disputes at large. As Ian Storey, a senior fellow at the Institute for Southeast Asian Studies in Singapore has stated, Indonesia "is already a party to the disputes—and the sooner it acknowledges this reality the better."³⁴ In other words, while China's *nine-dash map* does not make territorial claims on Indonesia's Natunas Islands, it stakes claims on the islands' EEZ, thus making Indonesia a *de facto* party to the maritime component of the SCS disputes.³⁵

These maritime tensions exist in the context of historical rivalries between Chinese-Indonesians and other ethnic groups in Indonesia; rivalries that have only heightened as Beijing pursues greater economic ties with Jakarta.³⁶ Notwithstanding these legitimate issues, Sino-Indonesian trade has flourished to the point that by early 2018, China had overtaken Japan as Indonesia's main investor, trailing only Singapore.³⁷ In essence, like many Southeast Asian countries, Indonesia finds itself increasingly reliant on Chinese trade during a period of increased political tensions. Ultimately, these are symptoms of the disruptive forces, positive and negative, resulting from China's rise. However, despite growing concerns regarding these tensions, there continues to be lack of a perceived existential threat in Indonesia that would validate resorting to politically and economically costly hard-balancing strategies. Likewise, appeasement and bandwagoning would likely entail political and economic concessions that would ultimately undermine the legitimacy of the government and cause significant anti-Chinese sentiment that, in the past, have resulted in the persecution of ethnic Chinese-Indonesians and their businesses.³⁸ Consequently, hedging has emerged as the optimal strategic choice in the current environment as it entails the natural processes of soft balancing, such as domestic capacity building and forging strategic partnerships with extra-regional powers, as well as engagement that allows Indonesia to continue to reap the benefits of Chinese investment. Furthermore, a hedging strategy provides Indonesian leaders a greater operational range of diplomatic options and, thus, the capacity to act on their preferred policy choices.

There are several factors that increase the appeal of hedging strategies and facilitate their application. Indonesia, by function of its geography, has until recently, been a peripheral and unwilling participant in the SCS disputes. Due to its distance from the Chinese mainland, Indonesia has not borne the brunt of China's assertiveness in the disputes, thus mitigating a sense of immediate threat. Additionally, Indonesia's geographic position makes it a gateway into and out of the SCS through the Malacca, Sunda, and Lombok Straits. As a result, numerous powers have vested interests in the political and economic stability of Indonesia; thus, allowing Jakarta to exercise this leverage when attempting to hedge against the influence of different regional and extra-regional powers. Furthermore, despite the asymmetric power relationship between China and Indonesia, Indonesia's growing status as a middle power signifies that it possesses material and discursive capabilities that many of its neighbors' lack. This is evident in the growth of its indigenous military-industrial complex, its leadership position within Association of Southeast Asian Nations (ASEAN), its efforts to increase its regional and international profile through its participation and leadership in several international organizations, and its narrative as an honest broker in the SCS disputes.³⁹ In other words, there is a structure-agent interplay in the Sino-Indonesian dyad, where China's rise and growing assertiveness, filtered through the variable of geography, has caused a shift in the regional security dynamics that directly affects their bilateral relationship (the structural component). However, Indonesia's emergence as a middle power and expanding range of strategic partnerships provides it the means to manage the effects of this shift and ensure its capacity to act on its interests (the agential component).



Figure 2. US–Indonesia Airmen talks enhance interoperability. Indonesian Air Vice Marshal Umar Sugeng Haryono (left) and US Air Force Maj Gen Russell Mack (right) Pacific Air Forces (PACAF) deputy commander, receive a briefing during the Airman-to-Airman (A2A) talks with Indonesia at Joint Base Pearl Harbor-Hickam, Hawaii, 11 April 2018. PACAF senior leaders hosted Indonesian air force leaders to discuss common regional security challenges. The A2A talks are intended to increase cooperation with our allies and partners. (US Air Force Photo by SSgt Daniel Robles)

Vietnam

The rise of China is a contentious political development for Vietnam. Historically, Sino-Vietnamese relations have been fraught with conflict and distrust. Although China and Vietnam have settled their EEZ disputes along the Gulf of Tonkin, unresolved claims in the SCS compound historical tensions by adding yet another irritant in their relations. Despite competing claims in the SCS and a legal blow to the legitimacy of China's claims by the Permanent Court of Arbitration in 2016, Beijing's assertive maritime policies have continued, heightening tensions.⁴⁰ This is evident from several maritime encounters in which Vietnamese fishermen and oil exploration vessels have been harassed. Vietnam has claimed that since 2005 the Chinese have seized 63 fishing boats along with 725 crew members. These fishermen are then required to pay exorbitant fines for their release.⁴¹ In similar fashion, Vietnam has accused China of obstructing Vietnamese energy companies from conducting oil and natural gas exploration in its waters. For example, in 2012, Chinese vessels cut the seismic cables of a ship belonging to Vietnam's state-owned energy company, PetroVietnam.⁴² Tensions have also flared since China began its island-reclamation program in the Spratly archipelago in 2013 and temporarily deployed an oil rig into contested waters Vietnam deems to be part of its EEZ.⁴³

China's economic and demographic enormity overshadow those of Vietnam. As such, hard balancing is not a feasible option due to significant power asymmetry between the two states. Furthermore, Vietnam is the only claimant in the SCS disputes that shares a land border and has fought a war with China; thus, hard balancing is a risky strategy given Vietnam's limited material capacity vis-à-vis China and their shared land border. Lastly, given the important economic role that China plays in Vietnam's economy, a hard-balancing strategy would result in significant dislocations of the country's economy.⁴⁴ Appeasement is a politically risky choice for Hanoi as it would entail concessions. Given Vietnam's historic rivalry with China, any form of concession would signal weakness within the central government, especially one with a revolutionary tradition and whose legitimacy is tied to its ability to maintain and protect the sovereignty and territorial integrity of the country. Concessions regarding territorial claims would likely trigger a legitimacy crisis and popular unrest. Similarly, bandwagoning is out of the question given the historical rivalry between the two states. Any overtures toward Beijing would likely set-off domestic instability and undermine the control of the Communist Party of Vietnam.

Hedging has emerged as the optimal strategy for Vietnam for several reasons. While Hanoi is increasingly concerned with Beijing's assertive policies in the region, tensions have not resulted in an existential threat perception. In fact, despite the asymmetric power relation between the two countries and the long legacy of rivalry, Vietnam has demonstrated its ability to defend its territory from invasion on several occasions, as it did against China during the Third Indochinese War, where Hanoi taught Beijing a lesson.⁴⁵ More importantly, Vietnam's success in establishing a capable deterrent force through its military modernization program and develop-
ment of an indigenous military-industrial complex allows it to safeguard its territory and current holdings in the SCS.⁴⁶ Additionally, as in Indonesia's case, geography plays a role, albeit in a different manner. Although Vietnam's border with China can pose a direct threat in the event of an armed conflict, its growing coastal missile defense systems run parallel to China's most important SLOCs, making any open hostilities costly for Beijing. Lastly, Vietnam's efforts to establish strategic partnerships with extra-regional powers like India and Japan facilitate its capacity-building efforts and allow it to increase economic diversification.



Figure 3. Friendly farewell. Members of the Vietnam People's Navy wave goodbye to the littoral combat ship USS *Coronado* after an exchange during Naval Engagement Activity Vietnam 2017. The engagement provides an opportunity for Sailors from the US Navy and Vietnam People's Navy to interact and share knowledge to enhance mutual capabilities and strengthen solid partnerships. (US Navy photo by Mass Communication Specialist 3rd Class Deven Leigh Ellis)

Here again, there is a structure-agent interplay in the Sino-Vietnamese dyad, where Vietnam has borne the brunt of China's rise and growing regional assertiveness, essentially making it the canary in the coal mine for the region. Filtered through the variable of geographic proximity and historical rivalry, this has caused a shift in the regional security dynamics and, especially, Vietnamese threat perception (the structural component). However, Vietnam's success in establishing a minimum credible deterrence vis-à-vis China, despite existing asymmetry, in addition to its growing strategic and economic partnerships with extra-regional powers, provides it the means to manage the effects of the structural pressures of China's rise and ensure its capacity to act on its interests (the agential component).

As indicated above, hedging has emerged as the optimal strategic choice for key Southeast Asian states since hard balancing, appeasement, and bandwagoning entail costs that are detrimental to their domestic and international interests. More importantly, domestic factors, such as credible deterrence capabilities and national narratives, make hedging an optimal choice since it accords these states with greater levels of flexibility and opportunity to act on their preferred policy choices. The emergence of hedging as an optimal strategic choice for key Southeast Asian countries has had important spillover effects. The most important of these have been the internationalization of the SCS territorial disputes and the increasing alarm regarding the region's growing dependence on Chinese trade. This has facilitated the emergence of an Indo-Japanese nexus in Southeast Asia, implicitly aimed at managing China's rise. In other words, the hedging of key Southeast Asian states has allowed extra-regional countries like India and Japan to play a greater role in Southeast Asian affairs, which consequently provides Southeast Asian countries with greater political and economic diversification.

Country	Strategy	Costs/Benefits		
Vietnam	Hard balancing	Highly asymmetric relationship with China; impossible to hard balance given China's overwhelming material capabilities		
	Appeasement	High likelihood of internal instability and turmoil for the Communist Party of Vietnam; concessions seen as weakness		
	Bandwagoning	Impossible given Vietnam's historical rivalry with China; likely triggering of mass discontent		
	Hedging	Engagement due to Vietnam's strong economic ties with China; soft balancing to ensure that China is not the only preponderant power in the region and increase its costs of engagement in case of conflictual situations; hedging offers greater operation range of diplomatic options		

Table 1.	Illustration	of hedging a	as the optima	l strategic choice	for Vietnam	and Indonesia
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Indonesia	Hard balancing	Asymmetric relationship with China; hard balancing possible given its material capabilities and geographic position; however, currently unnecessary and undesirable due to the political and economic costs as well as the absence of urgency	
	Appeasement	High likelihood of internal instability given historical domestic and international rivalries with ethnic Chinese and China; undermine Indonesia's position as a leader in Southeast Asia	
	Bandwagoning	Unlikely due to Indonesia's geographic position, self-perception as a middle power, and lack of urgency	
	Hedging	Engagement due to Indonesia's growing economic ties with China; soft balancing to ensure political and economic autonomy; hedging also helps cement Indonesia's leadership position in Southeast Asia and its emergence as a middle power and offers greater operation range of diplomatic options	

India's Southeast Asia Strategy

India's engagement with Southeast Asia is a recent one. The opening up of the Indian economy under the stewardship of Prime Minister Narasimha Rao and Finance Minister Manmohan Singh, beginning in 1991, resulted in a more outwardlooking policy orientation.⁴⁷ India's growing engagement with ASEAN, which later became subsumed under the umbrella term of New Delhi's Look East policy, was primarily driven by economic concerns. For Southeast Asian states, this policy provided a strategic breakthrough given China's burgeoning economic and political clout in the region. In other words, India could provide some economic diversification and, thus, strategic leverage to the Southeast Asian states vis-à-vis China. Given India's tumultuous relationship with China since the border war of 1962, New Delhi would be a natural choice as a strategic leverage with China.

Overall, the partnership between India and ASEAN since the initiation of India's economic liberalization showcases the country's willingness to build confidence in Southeast Asia. It further alleviates concerns of the ASEAN states regarding India's naval capabilities and its Cold War allegiance to the Soviet Union, which were perceived as threatening the security of Southeast Asian states.⁴⁸ In essence, while economic concerns were part of the increasing institutionalization of linkages between India and Southeast Asia, security concerns regarding China bolstered India's importance for the region.

Further developing India's Look East policy, the Narendra Modi administration, elected in 2014, initiated a new set of policies regarding India's role in the Pacific

Ocean. Termed the Act East policy, India seeks to further strengthen its strategic presence in Southeast Asia and parts of East Asia as a net security provider.⁴⁹ This new policy sought to remedy the symbolic nature of the Look East policy through increased bilateral engagement, particularly with regards to China's growing influence in the greater Asian region. The new administration sought to bolster its Act East policy through further pushing into the strategically important SCS. To do this more effectively, the Indian Navy revised its maritime security strategy. Titled *Ensuring Secure Seas: Indian Maritime Security Strategy*, the revised doctrine addresses India's concerns regarding freedom of navigation and security of the Indo-Pacific SLOCs. One of the primary objectives of the new naval doctrine is to "provide freedom to use the seas," which is directly linked to India's national interests.⁵⁰ The new naval strategy paves the way for consolidating India's Look East policy and adding on to it through the Act East policy.

The strategy's references to freedom of the seas, United Nations Convention on the Law of the Sea (UNCLOS), and multilateral cooperation signal India's increasing willingness to assert its influence in the IOR and make headway into the Pacific Ocean through engagement in the SCS. As for the states of Southeast Asia, India's increased strategic interest in the region opens an avenue to hedge against China. Since India does not have any territorial claims in Southeast Asia and no history of conflict with states in the region, it has emerged as a prospective security provider for smaller states in the region.

Indian strategic interests in Southeast Asia are congruent with Vietnam's and Indonesia's overtures toward India. Specifically, Indonesia is a pivotal state in India's security calculations because of the former's size and its geographic position as the gateway between the Indian and Pacific Oceans.⁵¹ The Malacca Straits are a strategically important choke point for India, as 55 percent of its trade passes through the region.⁵² Unlike China, India does not have territorial ambitions in the region. In fact, it has the capability to become a security provider in the larger IOR in light of Indonesia's limited force projection capability.⁵³

The initiation of a new era of security collaboration between India and Indonesia began in 1994, with a joint naval exercise in the Andaman and Nicobar Islands.⁵⁴ Geopolitical considerations played a significant role in Indonesia's strategic calculations, as Indonesia's westernmost province of Aceh is only 80 nautical miles from India's Great Nicobar Island, which hosts India's forward air base.⁵⁵ In 2001, both states signed the Defense Cooperation Agreement, which was to prop up the Indonesian defense industry by establishing a Joint Defense Cooperation Committee to identify possible areas of cooperation in the defense sector. The 2001 agreement further allowed the Indonesian Air Force to utilize training facilities of the Indian Air Force along with loan, sale, or exchange of aircraft parts.⁵⁶ Additionally, both states have maintained naval patrols in Six-Degree Channel at the northern entrance to the Malacca Strait since 2002, called the India-Indonesia Coordinate Patrols.⁵⁷ Overall, the Indonesian government realizes India's technological capabilities and seeks their potential transfer. As for India, its engagement with Indonesia is rooted in propping up Indonesia's capability to further constrain China's strategic space in Southeast Asia.⁵⁸

The Indian government under PM Modi has extended bilateral summits with Indonesia that were normally extended to important strategic partners like Japan and Russia.⁵⁹ Additionally, Japan's increasing involvement with India since Prime Minister Shinzo Abe's return to power in 2012 helped alleviate Indonesian concerns regarding India's involvement in Southeast Asia. Furthermore, during Indian PM Modi's official visit to Indonesia in 29-30 May 2018, Indonesia signaled its willingness to provide India access to the island of Sabang, close to the Malacca Straits.⁶⁰ The joint statement on India-Indonesia Maritime Cooperation in the Indo-Pacific released during this visit iterated adherence to UNCLOS and the importance of a "free, open, transparent, rules-based, peaceful, prosperous and inclusive Indo-Pacific region, where sovereignty and territorial integrity, international law, in particular UNCLOS, freedom of navigation and overflight, sustainable development and an open, free, fair and mutually beneficial trade and investment system are respected."61 Thus, India has sought to approach Indonesia within the wider framework of New Delhi's Act East policy but recognizes its strategic importance for the Malacca Straits and the wider Indo-Pacific region, particularly with regards to India's growing involvement in the SCS disputes.

Apart from Indonesia, the other major Southeast Asian player that India has forged strong strategic ties with is Vietnam. The Indo-Vietnamese relationship dates to the Cold War period, defined by anti-imperialism and India's vehement support for Vietnamese independence.⁶² A breakthrough in modern strategic relations between India and Vietnam occurred in 2000, initiated by Indian Defense Minister George Fernandes's visit to Vietnam. A Defense Protocol signed between the two states paved way for Vietnam's modernization of its armed forces.⁶³ Because both states were recipients of Soviet technology, Vietnam increasingly sought Indian technological and logistical support—especially given the latter's extensive home-grown defense industry. Apart from military modernization, both states agreed on joint defense training, naval exercises, and joint patrols.⁶⁴

India has actively sought to support Vietnamese endeavors in the SCS. For example, the Indian Navy consistently helps its Vietnamese counterpart by supplying spare parts of the Russian made Petya and OSA-11 class missile boats.⁶⁵ Furthermore, since the two countries operate similar weapons systems, India is providing training for Vietnam's newly created *Kilo*-class submarine force and Sukhoi fighter wings.⁶⁶ Vietnam's military buildup is directly tied to its territorial contestation in the SCS with the Chinese government. This is an issue that is further exacerbated by the construction of China's Yulin Naval Base in Sanya, Hainan, an administrative city in the Paracel Islands that Vietnam claims in its entirety and which China effectively controls. China has stationed surface warships and nuclear submarines at this base, giving it a tactical edge in its efforts to enforce its maritime claims in the SCS. Because of these developments, Vietnam has sought to reciprocate through strategic signaling that India could serve as an alternative security provider in the region and that Vietnam would allow such maneuvers to extend within its geopolitical space—a message that raises concerns for China.

In 2011, India and Vietnam signed a deal on oil exploration in Blocks 127 and 128 of the SCS, areas that are claimed by China. India's state-owned ONGC Videsh was given the task, and Vietnam invoked UNCLOS to emphasize its rights for resource exploration within 200 nautical miles from its shore.⁶⁷ Coincidentally, strengthening of the UNCLOS remains a core objective of the new Indian naval doctrine, *Ensuring Secure Seas*.⁶⁸ Despite the initial enthusiasm, India retracted exploration rights for block 128, and China directly countered India's and Vietnam's moves by putting up several contested sectors of the SCS for international bidding. Notwithstanding the setback involving oil exploration, Vietnam continued its efforts to facilitate greater Indian participation in the affairs of Southeast and East Asia, a fact bolstered by both states' perception of China's intentions in the region.

Overall, Vietnam and India have mutually expressed their concern with China's rise because of its assertive policies, particularly in the SCS dispute. Vietnam continues to court India for its technological and logistical support. India seeks Vietnamese support in the region given the two states' long withstanding partnership and mutual distrust of Chinese endeavors in the region. Vietnam also provides India with an opportunity to press China strategically in a tit-for-tat fashion because of China's maneuvering in South Asian states. Vietnam continues to receive Indian support; beginning January 2016, India agreed to set up a satellite tracking system in Vietnam. The state-run Indian Space Research Organization is projected to fund and set up the system in Ho Chi Minh City, which would allow Vietnam (as well as India) to receive imagery of the SCS and China.⁶⁹ The satellite tracking system will allow Hanoi and New Delhi further access to imagery dealing with naval movements in China's regions of interest.

India's overtures toward Indonesia and Vietnam showcase parallels. There is a commitment to maintaining the openness of the Indo-Pacific through multilateral means and upholding of international norms: i.e., UNCLOS. For India, the strategic importance rests on the vitality of the Malacca Straits for trade; as for Indonesia and Vietnam, India's entry into the region aids in their hedging strategies vis-à-vis China. Furthermore, joint naval exercises and collaborations in technology bolster strategic confidence for all three countries. Overall, India's strategy toward Southeast Asia has been largely under the auspices of the Act East policy. Regardless of strong economic undertones in these overtures, India has increasingly intertwined itself in Southeast Asian affairs given its own strategic concerns regarding China.

Japan's Southeast Asian Strategy

In the early stages of engagement with the region, particularly during the Fukuda Doctrine (1977) and the following decades, Japan was primarily preoccupied with economic investment and helping regional coast guards in their efforts to safeguard the SLOCs in the region.⁷⁰ However, as China became more assertive with its neighbors, Japan achieved greater security presence in the region by facilitating internal balancing efforts in Southeast Asia through personnel training and hardware transfers. It has also begun to participate in naval exercises with Southeast Asian states to improve operational and tactical level performance of the regional coast guards and navies.

Japan has been particularly active in the provision of training and hardware to Southeast Asian coast guards.⁷¹ For example, "the Japan International Cooperation Agency (JICA) funds the Coast Guard's seminars to train maritime authorities in Southeast Asia, and Japan's aid is critical in helping to create maritime patrol authority where local capacity is lacking."⁷² The purpose of this aid has been to strengthen the maritime capabilities of Southeast Asian countries to improve the safety of the SCS due to the chronic issues of piracy that plague the area. To that end, Japan provided the seed money for the Anti-Piracy Center located in Kuala Lumpur, Malaysia. Japan has also been providing coast guard ships to countries in the region for several years now. In 2006, it gave Indonesia three patrol vessels. Tokyo also has begun to deliver on its promise to provide the Philippines ten coast guard vessels and has committed itself to providing Vietnam with six vessels.⁷³ Both of these commitments have been wholly funded by Japan through its official development-assistance programs.⁷⁴

In addition to promoting maritime safety in Southeast Asia, in recent years Japan has begun to participate in several naval exercises in the region, largely motivated by its concerns with China's assertive policies in its maritime periphery. Since 2011, Japan has conducted naval exercises with nearly every key state in the Indo-Pacific region. These include the United States, Australia, India, Indonesia, Vietnam, Singapore, the Philippines, and South Korea.⁷⁵ This is an important development because, until China became more assertive in its maritime policies after 2009, Japan continued to adhere to a self-imposed isolationist policy. Consequently, it is China's assertiveness that has become the catalyst for greater Japanese presence not only in the East China Sea but, just as importantly, the SCS. Furthermore, tensions with China have allowed Japan to achieve greater security presence in the region largely uncontested. In other words, most states in Southeast Asia have welcomed Japan's greater security roles in the region.

Like many Southeast Asian countries, Vietnam endured Imperial Japanese occupation during WWII. However, since 1973 when the Japanese officially recognized the Democratic Republic of Vietnam (DRVN), the government that would eventually reunify the country in 1976, the two sides have enjoyed relatively stable relations. Japan has been a top trading partner with Vietnam since the 1970s. By 1976 Japan had become Vietnam's second-largest trading partner after the Soviet Union.⁷⁶ Japan became the largest contributor of foreign aid to the new Vietnamese government outside of the communist bloc; this aid took the form of grants that were essentially war reparations to Vietnam.⁷⁷

Japan continues to be a major trading partner of Vietnam. In 2009, the two countries signed the Agreement between Japan and the Socialist Republic of Viet Nam for an Economic Partnership.⁷⁸ This trade agreement was expected to lower tariffs and promote economic cooperation between the two countries.⁷⁹ This economic cooperation has since expanded to the energy field. To increase liquefied natural gas (LNG) imports, Vietnam has sought assistance from the Tokyo Gas Company "to develop the Thi Vai LNG terminal in the Vung Tau province."⁸⁰ Japan has also agreed to aid Vietnam in developing a nuclear-energy industry. In 2011 the Japan-Vietnam Nuclear Cooperation Agreement came into force, paving

the way for a mutually beneficial venture in which Japan can profit from exporting its technical expertise in nuclear energy, thereby allowing Vietnam to export more of its oil and natural gas resources to increase its GDP.⁸¹

In addition to the growing economic ties, much progress has also been achieved in the security sphere. Mutual concerns over China's assertive posture on the East and South China Seas have brought both countries closer in discussions over the security of the SLOCs and the territorial disputes they have with China in their respective areas. In a 2011 meeting between former Japanese Defense Minister Yasuo Ichikawa and his Vietnamese counterpart, Phung Quang Thanh, the two sides signed a memorandum on defense cooperation and exchange. During the summit, Ichikawa told Thanh, "The relationship between Japan and Vietnam [has] entered a new stage of development" and Vietnam was a "strategic partner for peace and stability in Asia, and we want to deepen our partnership." Under the provisions of this memorandum, the Japan Self-Defense Forces (JSDF) and the Vietnamese People's Army will conduct military exchanges and vice-minister-level officials from each country will have regular dialogue.⁸²

As with the Philippines and Indonesia, the Japanese have committed themselves to providing Vietnam coast guard patrol vessels to increase its maritime capabilities. In a 2013 summit, Japanese Prime Minister Abe and Vietnamese Prime Minister Nguyen Tan Dung discussed their concerns over maritime peace and stability, particularly the SCS.⁸³ Prime Minister Abe chose Vietnam as his first destination after taking office, indicating the importance of Vietnam as a strategic partner for Japan in the region. In a sign of reciprocity, the Vietnamese invited Japanese Defense Minister Itsunori Onodera to visit the naval facilities in Cam Ranh Bay. According to the Vietnamese, Onodera was the first foreign defense- or military-related official to ever be invited to the base. During a press conference after his visit to the naval base, Onodera indicated that the two countries had been performing field exercises in diving medicine. In addition to this, the two states scheduled future exercises that would concentrate on submarine rescue.⁸⁴ Since the *Kilo*-class submarines that Vietnam purchased from Russia are the first significant submarines that the former has operated, Japan's assistance in this area is considered vital.

As Vietnam's military modernizes, Hanoi may look increasingly to Japan as a source of hardware and training. China's substantial marine-mine inventory could prompt the Vietnamese to purchase mine countermeasure (MCM) vessels from Japan, while simultaneously securing training from one of the most-capable MCM forces in the world. Although seemingly unimportant, capable MCM capabilities may prove useful considering the expansive mine capabilities posed by China.⁸⁵ In a more challenging prospect, former Japanese Defense Minister Toshimi Kitazawa pointed out that Vietnam may be among the countries to which Japan would allow the sale of its state-of-the-art diesel submarines.⁸⁶ Although no further official statements have been made in regards to this subject, should conditions in Southeast Asia continue to deteriorate, Japan could be prompted to remove even more restrictions on its military-transfer guidelines.

Indonesia shares Southeast Asia's grievance of historical Japanese invasion and occupation. However, like many of its Southeast Asian neighbors, Indonesia has successfully lowered its threat perceptions of Japan. This change, largely motivated by generous Japanese investment and developmental aid, has allowed the two countries to forge a closer relationship—one that has seen increased activity in recent years because of changed perceptions of the rise of China. The Japanese foreign ministry identified Indonesia as a priority strategic partner in the region.⁸⁷ As with Vietnam, Japan is a major trading partner for Indonesia. This economic relationship was strengthened in 2006 when the two archipelagic states signed the Indonesia-Japan Economic Partnership Agreement.⁸⁸

More important has been the two countries' signing of the Strategic Partnership for Peaceful and Prosperous Future.⁸⁹ This agreement paved the way for Japan's transfer of three coast guard vessels to Indonesia in 2006.⁹⁰ Since 2011, Japan and Indonesia have hosted annual defense ministerial consultations to enhance their strategic partnership.⁹¹ These meetings led to the first two-plus-two talks between the two countries in 2015, marking the first time Japan conducted such a summit with a Southeast Asian country. During this meeting Japanese Defense Minister Gen Nakatani described Indonesia as "a major power in ASEAN," illustrating the importance of Indonesia for Japan's strategy in Southeast Asia and providing legitimacy to Indonesia's emergence as a middle power.⁹²

Like Vietnam, the Indonesian armed forces are modernizing, and Japan is poised to play an active role in this process. In fact, Indonesia became the first Southeast Asian country to which Japan has agreed to transfer defense technologies. During the two-plus-two talks, Nakatani stated that Japan wanted to strengthen the two countries' relationship in the defense sector, particularly in air and maritime defense, arguing that such cooperation was "indispensable for peace, stability, and prosperity in the whole region, including Southeast Asia."⁹³ During the talks, Nakatani's counterpart, Indonesian Defense Minister Ryamizard Ryacudu "reiterated Indonesia's interest in acquiring the US-2i" amphibious aircraft, which would greatly expand Indonesia's surveillance and security capability over its waters. $^{\rm 94}$

During Indonesian President Jokowi Widodo's 2015 visit to Japan, his first international visit outside of Southeast Asia, agreement was reached with Prime Minister Abe to set up a Japan-Indonesia Maritime Forum as soon as possible.⁹⁵ The establishment of this forum would help "accelerate maritime cooperation inter alia in maritime safety and security, promotion of maritime industries, as one of the important pillars toward enhancing bilateral cooperative relationship."⁹⁶ Speaking after the summit, President Widodo stated that he believed the forum would help "enhance competence of coast guard capabilities and infrastructure, as well as the marine industry."⁹⁷ The joint Indonesian-Japanese emphasis on naval security resonates with India's endeavors with Indonesia; such cooperative measures showcase the changing perceptions of Chinese maneuvers in the SCS, which threaten movement of naval vessels.

The enhancement of air and maritime capabilities comes at a time when Indonesia, despite continued efforts to play the role of neutral broker in the SCS disputes, finds itself increasingly concerned with China due to Beijing's assertive policies in the region. During their summit, Prime Minister Abe and President Widodo agreed to a joint statement that referenced the "importance of freedom of navigation and overflight on the high seas, unimpeded lawful commerce, as well as resolving maritime disputes by peaceful means" and recognized the issue of the SCS is directly related to the peace and stability in the region.⁹⁸ As a result, both parties reaffirmed the "importance of the full implementation of the Declaration of the Conduct of Parties in the South China Sea and the early realization of a regional Code of Conduct in the South China Sea."⁹⁹ While coated in the language of diplomacy, these statements reveal serious concerns for China's policies in the region, particularly toward its maritime periphery.

Ultimately, Japan's strategy for Vietnam and Indonesia is centered on a policy of facilitating the capacity-building efforts of these states as they seek to balance China's assertiveness in the region. Japan, having mutually changed the security perception of China among key regional actors, has found a strategic opening that has allowed it the possibility to play a greater security role in the region. This is an important development because, while traditionally an economic power that was a source of investment and developmental aid, Japan has emerged as a potential hedging option vis-à-vis China in Southeast Asia.

The Indo-Japanese Nexus

As indicated above, there has been a convergence of interests on the part of India and Japan in Southeast Asia. Both countries have sought greater political and economic presence in the region to manage what they perceive as an increasingly assertive China. The nexus is characterized by mutual interests that bilaterally link India and Japan, while simultaneously prompting proactivity in Southeast Asia, a region in which Indo-Pacific regional order is increasingly challenged. The bilateral component is in part motivated by India's need for greater technology transfers and Japan's need for greater market access in the second-largest emerging economy. Furthermore, these two nations' shared democratic values and mutual suspicion of China's rise also serve as unifying factors in the budding relationship. The Southeast Asian component demonstrates a concerted effort to provide countries of that region with much-needed political and economic diversification in light of their growing dependence on China's trade and Beijing's assertiveness in the East and South China Seas.¹⁰⁰ While India and Japan have not coordinated their Southeast Asian strategies, they demonstrate surprisingly similar approaches to the region. In essence, both powers have tacitly recognized that Southeast Asia is vital not only to their respective political and economic interests but also to the theater in which the management of China's rise will be most crucial.

Furthermore, while India and Japan recognize their increasing congruence of interests in Southeast Asia, the emergence of this nexus rests on the willingness of the states in the region to strategically engage with outside powers. This is important since leading Southeast Asian countries have regularly demonstrated wariness toward the involvement of extra-regional powers in regional affairs, as demonstrated by the failure of the Southeast Asia Treaty Organization (SEATO). In fact, participation in the Non-Aligned Movement and especially the Bangkok Declaration of 1967, which serves as the founding document of ASEAN, demonstrates long-running efforts to limit external influences in the region by several Southeast Asian countries.¹⁰¹ The willingness of Indonesia and Vietnam to strengthen their ties with Japan and India showcases their usage of agency through hedging. While maintaining economic engagement with China, both states have sought closer ties with India and Japan to increase the opportunity cost of continued Chinese unilateralism and assertiveness in the region—something that is increasingly perceived as an effort to establish hegemony in the region. In other words, it is the efforts of small and middle powers in Southeast Asia, like Indonesia and Vietnam, to internationalize the local process of a shifting balance of power, through their hedging

strategies, that has facilitated the emergence of an Indo-Japanese Nexus in the region. Thus, it is the state agency of Indonesia and Vietnam as each interacts with the structural security and economic conditions in the region that currently serves as the driving force of counterhegemonic processes in Southeast Asia.

Conclusion

This study provides an empirical and theoretical analysis of why states like Indonesia and Vietnam incorporate the strategy of hedging. This is due in part to links and improved relations with states like Japan and India as well as the deselected options available to these states to hedge against the challenges and prospects with a rising power of global scope. Specifically, this paper asserts that because of the inability of a state to fully confirm the effectiveness (only the failure) it seems likely, when possible, there would be circumstances where incorporating elements of multiple approaches would be optimal. Considering the security concerns, increased regional ties, and the inability to validate effective conventional deterrence choices it is not surprising that Indonesia and Vietnam pursue hedging strategies. Continued power competition provides challenges to states and scholars of the region to discern trends without falling prey to the vagaries of complexity in relations. When shining a light on specific places and choices, the space that is illuminated shows the limited options states generally have.

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Artificial Intelligence in Weapons The Moral Imperative for Minimally-Just Autonomy

Jai Galliott and Jason Scholz

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For military power to be lawful and morally just, future autonomous artificial intelligence (AI) systems must not commit humanitarian errors or acts of fratricide. To achieve this, a preventative form of minimally-just autonomy using artificial intelligence (MinAI) to avert attacks on protected symbols, sites, and signals of surrender is required. MinAI compares favorably to other maximally-just forms proposed to date. This article will examine how fears of speculative AI have distracted from making current weapons more compliant with international humanitarian law. Of particular focus is the Protocol Additional to the Geneva Conventions of 12 August 1949, Article 36.¹ Critics of our approach may argue that machine learning can be fooled, that combatants can commit perfidy to protect themselves, and so forth. This article confronts this issue, including recent research on the subversion of AI, and concludes that the moral imperative for MinAI in weapons remains undiminished.

Introduction

As part of the Campaign to Stop Killer Robots, popular actors, famous business leaders, prominent scientists, lawyers, and humanitarians have called for a ban on autonomous weapons.² On 2 November 2017, the campaign sent a letter to Australia's prime minister, Malcolm Turnbull, stating, "Australia's AI research community is calling on you and your government to make Australia the 20th country in the world to take a firm global stand against weaponizing AI." Fearing inaction, these advocates pointed out that the development of autonomous weapons systems would have dire ramifications: "The deadly consequence of this is that machines—*not people*—will determine who lives and dies."³ It appears that they advocate a

complete ban on AI in weapons—an interpretation consistent with their future vision of a world inundated with miniature "slaughterbots."⁴

A ban on AI in weapons may prevent the development of solutions to current humanitarian crises. Every day, the international news media reports incidents with conventional weapons. Consider situations like the following: a handgun stolen from a police officer is subsequently used to kill innocent persons, rifles are used for mass shootings in US schools, vehicles are employed to mow down pedestrians in public places, bombs are deployed to strike religious sites, a guided-bomb is used to strike a train bridge as an unsuspecting passenger train passes, a missile is fired to strike a Red Cross facility, and so forth. With the development of AI weapons, preventing these types of incidents might be possible. These are real situations where an autonomous weapon system equipped with AI might intervene to save lives.

Confusion about the means needed to achieve a desired state of nonviolence is not new. A general disdain for simple technological solutions aimed at a better state of peace was prevalent in the antinuclear campaign—spanning the whole confrontation period with the Soviet Union and recently renewed with the invention of miniaturized warheads and the campaign to ban land mines in the late nineties.⁵ It does not seem unreasonable to ask why weapons with advanced seekers could not embed AI to identify a symbol of the Red Cross and abort an ordered strike. Additionally, the location of protected sites of religious significance, schools, and hospitals could be programmed into weapons to constrain their actions. Preventing weapons from firing at humans by an unauthorized user could also be specified. Why should we not begin to test such innovations so that they might be ensconced in international weapons review standards?

This article asserts that autonomous systems are not likely to be capable of action leading to the attribution of moral responsibility in the near term. However, these systems might today autonomously execute value-laden decisions embedded in their design and code, so they can perform actions to meet enhanced ethical and legal standards.⁶

The Ethical Machine Spectrum

A distinction between the two ends of the spectrum of ethical capability needs to be made. A maximally-just autonomy using artificial intelligence (MaxAI) guided by acceptable and nonacceptable actions has the benefit of ensuring ethically obligatory lethal action—even when system engineers of a subordinate system may not have recognized the need or possibility of the relevant lethal action. However, a maximally-just ethical robot requires extensive ethical engineering. Ronald Arkin's *ethical governor* represents the most advanced prototype effort toward a maximally-just system.⁷ The ethical governor provides an assessment on proposed lethal actions consistent with the laws of war and the rules of engagement. The maximally-just position is apparent from the explanation of the operation of the constraint interpreter, which is a key part of the governor: "The constraint application process is responsible for reasoning about the active ethical constraints and ensuring that the resulting behavior of the robot is ethically permissible."⁸ The constraint system—based on complex deontic and predicate logic—evaluates the proposed actions generated by the tactical reasoning engine of the system based on an equally complex data structure. Reasoning about the full scope of what is ethically permissible—including notions of proportionality and rules of engagement as Arkin describes—is prone to difficulty.



Figure 1. A MinAI ethical weapon. Such a weapon has the ability to disobey a target order in favor of a failsafe specification if an unexpected legally- or ethically-protected object or behavior is perceived in the effected target area. Target data is sourced externally to the weapon.

In contrast, a MinAI ethical robot, while still a constraint-driven system, could operate without a proper ethical governor, possessing only an elementary suppressor of human-generated lethal action that would activate in accordance with a much narrower set of constraints (hard-coded rather than soft-coded)—meaning less system interpretation would be required. MinAI deals with what is *ethically impermissible*, basing constraints on the need to identify and avoid protected objects and behaviors. Specifically avoided are lawfully protected symbols and locations, signs of surrender (including beacons), and sites that are hors de combat. It is important to note that these AI constraints range in scale of difficulty and will continue to improve as AI technologies advance. The conceptual model for a MinAI ethical weapon is illustrated in figure 1.

While MinAI will be more limited in a technical nature, it may be more morally desirable in outcomes than MaxAI in a range of specific circumstances. The former will not take active lethal or nonlethal action against protected persons or infrastructure. In contrast, MaxAI involves the codification of normative values into rule sets and the interpretation of a wide range of inputs through the application of complex and potentially imperfect machine logic. This more-complex algorithmic morality—while potentially desirable in some circumstances—involves a greater possibility of actively introducing fatal errors, particularly in terms of managing conflicts between interests.

Cognizant of the above dilemma, this article suggests that to meet fundamental moral obligations to humanity, we are ethically justified to develop MinAI systems. The ethical agency embedded in the machine and, thus, technologically mediated by the design, engineering, and operational environment, is less removed from the human moral agency than it is in a MaxAI system. MaxAI development is supererogatory in the sense that it may be morally beneficial in particular circumstances but is not necessarily morally required—and may even be demonstrated to be unethical.

Minimally-Just AI as "Hedging One's Bets"

To the distaste of some, one might argue that the moral desirability of MinAI will decrease in the near future as the AI underpinning MaxAI becomes more robust and as we move away from rule-based and basic neural network systems toward artificial general intelligence (AGI). Furthermore, the argument is that resources should be dedicated to the development of maximal ethical robots. To be clear, there have been a number of algorithm success stories announced in recent years, across all the cognate disciplines. The ongoing development of algorithms as a basis for the success of AlphaGo and LibratusMuch has garnered much attention.⁹ These systems compete against the best human Go and Poker players, winning against players who have made acquiring deep knowledge of these games their life's work. The result of these preliminary successes has been a dramatic increase in media reporting and interest in the potential opportunities and pitfalls associated with the development of AI. Not all of these reports are accurate, and some have

negatively impacted public perception of AI, fueling the kind of dystopian visions advanced by the Campaign to Stop Killer Robots, as mentioned earlier.

The speculation that superintelligence is on the foreseeable horizon—with AGI realization timelines predicted in 20–30 years—reflects the success stories, while omitting discussions of the recent failures in AI. Many failures are unreported due to commercial and classification reasons. One example is Microsoft's Tay AI Bot, a machine learning chatbot that learns from interactions with digital users. After a short period of operation, Tay developed an ego or character that was strongly sexual and racialized, and ultimately Microsoft had to withdraw the bot from service.¹⁰ Facebook had similar problems with its AI message chatbots assuming undesirable characteristics.¹¹ Additionally, a number of autonomous road vehicles have been involved in motor vehicle accidents where the relevant systems were incapable of handling the scenario and quality-assurance practices failed to factor for such events.

There are currently irresolvable problems with the complex neural networks on which the successes in AI are based. These bottom-up systems can learn well in controlled environments and easily outperform humans in these scenarios based on data structures and their correlations, but these systems cannot match the top-down rationalizing power of human beings in more open environments, such as road systems and conflict zones. Such systems are risky in these environments because they require strict compliance with laws and regulations. It would be difficult to question, interpret, explain, supervise, and control these systems because deep-learning systems cannot easily track their own "reasoning."¹²

Just as importantly, when more-intuitive and, therefore, less-explainable systems come into wide operation, it may not be so easy to revert to earlier-stage systems, as human operators become reliant on the system to make difficult decisions. The danger becomes that operators' own moral decision-making skills may have deteriorated over time.¹³ In the event of failure, total system collapse could occur, with devastating consequences if such systems were committed to a mission-critical operation required in armed conflict.

There are, moreover, issues associated with functional complexity and the practical computational limits imposed on mobile systems that need to be capable of independent operation in the event of a communications failure. The computers required for AGI-level systems may not be subject to miniaturization or simply may not be sufficiently powerful or cost-effective for the intended purpose, especially in a military context in which autonomous weapons are sometimes considered disposable platforms.¹⁴ The hope for advocates of AGI is that computer processing power and other system components will continue to become dramatically smaller, cheaper, and powerful, but there is no guarantee that Moore's law, which supports such expectations, will continue to reign true without extensive progress in the field of quantum computing.

MaxAI at this point in time, whether or not AGI should eventuate, appears a distant goal to deliver a potential result that unguaranteed. A MinAI system, on the other hand, seeks to ensure that the obvious and uncontroversial benefits of AI are harnessed, while the associated risks are kept under control by normal military targeting processes. Decision makers need to take action now to stave off grandiose visions that may not eventuate and instead deliver a positive result with technology that already exists.

Implementation

International Humanitarian Law Article 36 states, "In the study, development, acquisition or adoption of a new weapon, means or method of warfare, a High Contracting Party is under an obligation to determine whether its employment would, in some or all circumstances, be prohibited by this Protocol or by any other rule of international law applicable to the High Contracting Party."¹⁵ The Commentary of 1987 to the Article further indicates that a state must review not only new weapons but also any existing weapon that is modified in a way that alters its function—or a weapon that has already passed a legal review that is subsequently modified.¹⁶ Thus, the insertion of MinAI in a weapon would require Article 36 review.

The customary approach to assessment to comply with Article 36 covers the technical description and performance of the weapon and assumes humans assess and decide weapons use.¹⁷ AI poses challenges for assessment under Article 36 in situations where there was once human-decision functions were clearly separated from weapon technical function assessment. Assessment approaches need to extend to embedded decision making and acting capability for MinAI.

Although Article 36 deliberately avoids imposing how such a determination made, it might be in the interests of the International Committee of the Red Cross—and humanity as a whole—to do so in this specific case. Consider the first reference in international treaties to the need to conduct legal reviews of new weapons.¹⁸ As a precursor to Article 36, the Saint Petersburg Declaration has a broader scope: "The Contracting or Acceding Parties reserve to themselves to come

hereafter to an understanding whenever a precise proposition shall be drawn up in view of future improvements which science may effect in the armament of troops, in order to maintain the principles which they have established, and to conciliate the necessities of war with the laws of humanity."¹⁹ MinAI in weapons and autonomous systems is precisely such a proposition. The ability to improve humanitarian outcomes through embedded weapon capability to identify and prevent attack on protected objects might form a recommended standard.

The sharing of technical data and algorithms for achieving this standard through Article 36 would drive down the cost of implementation and expose systems to countermeasures that improve their security.

Humanitarian Counter-Countermeasures

Critics may argue that combatants will develop countermeasures aimed at spoiling the intended humanitarian effects of MinAI in weapons and autonomous systems. However, it is antihumanitarian and potentially illegal to field countermeasures to MinAI. Yet, many actors do not comply with the rule of law. Therefore, it is necessary to consider countermeasures to MinAI that may seek to degrade, damage, destroy, or deceive the capability so as to secure the targeted system.

Degradation, Damage, or Destruction

It is expected that lawfully targeted enemies will attempt to destroy or degrade weapon performance to prevent MinAI from achieving its intended mission. Such countermeasures could include attack against the weapon seeker or other means. Such an attack may degrade, damage, or destroy the MinAI capability. If the act is in self-defense, this is not a behavior expected of a humanitarian object and, thus, the function of the MinAI is not required anyway.

If the degradation, damage, or destruction is targeted against the MinAI in order to cause a humanitarian disaster, it would be a criminal act. However, for this to occur, the legal status of the target would have had to have been neglected as a precursor, prior to this act, which ought to be the primary cause for concern.

Deception

Combatants might simply seek to deceive the MinAI capability by using something akin to a Red Cross or Red Crescent symbol to protect themselves, thereby averting an otherwise lawful attack. This is an act of perfidy covered under IHL Article 37. Yet, such an act may serve to improve distinction, by crosschecking perfidious sites with the Red Cross to identify anomalies. Furthermore, the Red Cross symbol is an distinctive marker, so wide-area surveillance might be sensitive to subsequent attempts at such deception. Further, it is for this reason that we distinguish that MinAI ethical weapons respond only to the *unexpected* presence of a protected object or behavior. This response is a decision made in the targeting process and is external to the ethical weapon, as illustrated in figure 1. A log for accountability and subsequent review of the action will be generated.



Figure 2. (Top) Adversarial 2D camouflage to a stop sign imitating wear and tear, using a convolutional neural network—a class of deep, feed-forward artificial neural networks, most commonly applied to analyzing visual imagery—on the Laboratory for Intelligent and Safe Automobiles road-signs database, achieves 100-percent success classifying each of these as 45-mph-speed signs. (Kevin Eykholt et al., "Robust Physical-World Attacks on Deep Learning Visual Classification" (paper, 2018 Conference on Computer Vision and Pattern Recognition, Salt Lake City, UT, 18–22 June 2018), https://arxiv.org/pdf/1707.08945.pdf.) (Bottom) For a detector followed by a classifier—a mapping from unlabeled instances to discrete classes—achieves 100-percent failure, correctly identifying these as stop signs every time. (Jiajun Lu et al., "Standard Detectors Aren't (Currently) Fooled by Physical Adversarial Stop Signs," 26 October 2017, https://arxiv.org/pdf/1710.03337.pdf.)

The highest-performing object-recognition systems are neural networks; yet, the high dimensionality that gives them that performance level may in itself be a vulnerability. Researchers have discovered a phenomenon related to stability given small perturbations to inputs, where a non-random perturbation imperceptible to humans could be applied to a test image and result in an arbitrary change to its estimate.²⁰ A significant body of work has since emerged on these "adversarial examples."²¹ Of the many and varied forms of attack, there exists a range of countermeasures. A subclass of adversarial examples of relevance to MinAI are those that can be applied to two- and three-dimensional physical objects to change their appearance to the machine. Recently adversarial algorithms have been used to generate *camouflage paint* and even 3-D printed objects resulting in errors for standard deep network classifiers.²² Concerns include the possibility to paint a Red Cross

symbol on an object that is recognizable by a weapon seeker yet invisible to humans and the dual case illustrated in figure 2 of painting over a protection symbol with marking resembling weathered patterns unnoticeable to humans yet resulting in an algorithm being rendered unable to recognize the sign—in this case a traffic stop sign symbol, which is of course similar to a Red Cross symbol.

In contrast to these results popularized by online media, researchers have demonstrated *no errors* on the same experimental setup as the stop-sign scenario above and in live trials. These researchers explained that the original team had confused *detectors*—a class of deep, feed-forward artificial neural networks, most commonly applied to analyzing visual imagery—(like Faster region-based convolutional neural networks [R-CNN]) with *classifiers*—a mapping from unlabeled instances to discrete classes.²³ Methods used in the first of these experiments appear to be at fault due to pipeline problems, including perfect manual cropping (a proxy for a detector that has been assumed away) and rescaling before applying to a classifier. Outside of the lab environment, it remains difficult to conceive of a universal defeat for a detector under various real-world angle, range, and light conditions, but further research is required.

Global open access to MinAI code and data, for example Red Cross imagery and video scenes in "the wild," would have the significant advantage of ensuring these techniques continue to be tested and hardened under realistic conditions and architectures. Global access to MinAI algorithms and data sets would speed implementation, offering low-cost solutions for nations that might not otherwise afford such innovations, and exert moral pressure on defense companies that do not use this resource.

International protections against countermeasures targeting MinAI might be mandated. If such protections were accepted, it would strengthen the case for the employment of MinAI, but in the absence of such protections, the moral imperative for MinAI in weapons remains undiminished in light of countermeasures.

Conclusion

This article presented a case MinAI that could make life-saving decisions in the world today. The hope is that the significant resources spent on reacting to specu-

lative fears of campaigners might one day be spent mitigating the suffering of people caused by weapons that lack MinAI. JIPA

Notes

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Air Intelligence at the Edge Lessons of Fourteenth Air Force in World War II

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I do not think that there is an A-2 section in our Air Forces more capable than the one with the Fourteenth Air Force.

—Maj Joseph McGee, 24 May 1943

At the beginning of World War II, the Army Air Corps found itself without practical, operational, or tactical level air intelligence capability. Each numbered Air Force was principally left to independently organize and develop methods to collect, analyze, and disseminate the intelligence necessary to conduct effective air operations. Among the different numbered air forces' efforts to organize intelligence activities during World War II, one of the most important occurred in the China, Burma, India (CBI) theater under the Fourteenth Air Force. Led by Gen Claire Chennault, Fourteenth Air Force intelligence developed as one of the most successful, original, and resourceful intelligence organizations during World War II. With a staff of less than ten Air Corps officers for most of the war, the Fourteenth Air Force intelligence developed a decentralized, forward-focused network which generated a level of effectiveness well above the sum of its parts. The Fourteenth Air Force model remains ingrained in the foundational concepts guiding the organization and execution of Air Force intelligence operations at flying wings in nearly every theater of operation. It is a blueprint for the necessity of integration, decentralized execution, and timeliness in air operations. The lessons developed by Gen Chennault and the intelligence Airmen of the Fourteenth Air Force remain as relevant to air operations in the Indo-Pacific today as they did over 70 years ago.



Figure 1. Maj Gen Claire L. Chennault (USAF photo)

History of the Fourteenth Air Force

On 11 March 1943, Tenth Air Force China Air Task Force (CATF) became Fourteenth Air Force.¹ The purpose of creating a new numbered Air Force was primarily political.² The relationship between Chiang Kai-shek and Gen Joseph Stilwell soured to the point that providing Chiang his own personal airman—in the form of the former leader of the 1st American Volunteer Group, Claire Chennault—was viewed as a way to appease the Chinese leader and demonstrate the US resolve in China.³ Free from the overwatch and restrictions imposed by Tenth Air Force Commander Clayton Bissell, Chennault directed his leaders to conduct the operations he deemed necessary to defeat Japan in China. Intelligence was immediately highlighted as an essential element in how the Fourteenth Air Force would fight.

As early as 1931, during his time at the Air Corps Tactical School, Chennault demonstrated an interest in integrating intelligence with air operations. Chennault believed intelligence in a continuous and timely manner was critical to the effectiveness of fighters to intercept bombers.⁴ This belief pushed Chennault to promote an "intelligence net" designed to get information immediately to fighters.

Chennault put his ideas to the test during an Air Corps exercise in 1933 in which he used a net of observation posts to identify and direct fighters to intercept ingression bombers.⁵ Between 1933 and 1934, Coast Artillery Journal published three articles authored by Chennault titled, "The Role of Defensive Pursuit." Citing observations from the 1933 Air Corps exercise, Chennault listed "the provision of means for the timely collection and transmission of accurate, continuing information of the hostile force" as a principal factor in conducting successful air intercept of a bombardment force.⁶ Chennault also recommended "the establishment of an efficient ground information or intelligence net" as the first essential feature of an air defense system.⁷ Chennault's experience and writings in the 1930s significantly shaped Fourteenth Air Force intelligence operations. After returning from retirement in 1941, Chennault rejoined the military as Tenth Air Force, CATF commander and communicated the establishment and maintenance of an air warning system in China as his top priority.⁸ The creation of the Fourteenth Air Force accelerated the concept of connecting radio intelligence to aircraft and expanded the speed at which intelligence reached the cockpit.

At the close of 1942, Chennault issued a memorandum to the US CBI theater commander, Gen Joseph "Vinegar Joe" Stilwell, and the CBI theater G-2 recommending three tasks for intelligence in China.⁹ The first task was expediting the flow of intelligence between Chinese sources and the CATF.¹⁰ Chennault sought target information to direct the limited combat sorties he had available.¹¹ Specifically, Chennault wanted a US officer attached with Chinese divisions to validate and promulgate target intelligence.¹² Chennault's second recommendation was to increase coordination between ground and air intelligence activities.¹³ Chennault valued technical intelligence and was concerned that the looting of downed aircraft by Chinese troops was destroying valuable intelligence on Japanese aircraft performance.¹⁴ The third and final recommendation was the establishment of a liaison with Chinese guerrilla forces to support US operations.¹⁵ Each recommendation demonstrated the expansive role Chennault envisioned for intelligence and the building blocks of an air intelligence network in China. Timely intelligence was valuable and Chennault sought to seize it wherever available.

Chennault emphasized intelligence to the point that Gen Henry Arnold commented to Lt Gen George Stratemeyer that Chennault was his G-2 and G-3 (operations).¹⁶ While the statement was not entirely false, it missed the mark. Although Chennault took a personal role in shaping intelligence in the Fourteenth Air Force, he never ran the day-to-day intelligence operations of his organization.

Chennault's intelligence activities most often aimed at managing the tangled politics of intelligence collection in China. For many reasons, it was unlikely that an A-2 could have effectively conducted the negotiations and agreements necessary to establish reliable air intelligence collection in China.¹⁷ On an international level, Chinese fears regarding post-war interests of the French and British prevented the sharing of intelligence among allies.¹⁸ The political sensitivity associated with collecting information required Chennault to refuse British funding for intelligence operations to maintain the United States' image as an impartial ally.¹⁹ At the American level, Stilwell was against the establishment of US human intelligence collection operations in China, choosing instead to rely on the Chinese War Ministry for information on Japanese movements.²⁰ Stilwell went as far as expressly prohibiting the Fourteenth Air Force from conducting intelligence collection operations.²¹ Despite Stilwell's order, throughout the war, Chennault's personality and thirst for intelligence enabled the Fourteenth Air Force to artfully disobey the spirit of Stilwell's order to gain necessary intelligence to support air operations.²² More than Stilwell's A-2, Chennault was a leader who managed the political challenges necessary for others to improve air intelligence operations.

Building a Diverse Intelligence Team

The men Chennault selected to lead the daily activities of the Fourteenth Air Force intelligence reflect the leader's emphasis on integration and understanding of the operational environment. Intelligence officers were hand-picked for their knowledge of Chinese culture and language.²³ Local knowledge was important to all intelligence activities in the Fourteenth Air Force and essential to gathering intelligence from the field. Chennault's focus on local expertise resulted in the hiring of a unique blend of missionaries, oilmen, and even a cosmetic salesman. This diverse collection of men would come to lead air intelligence gathering in China.²⁴ The absence of intelligence experience was a problem pervasive throughout the Army Air Forces; however, by focusing on language and culture skills, Chennault cultivated the attributes of an experienced intelligence force almost overnight. Local expertise provided an innate ability for the men to collect intelligence in China that would be nearly impossible to replicate using stateside officers. Chennault's investment in shaping the political environment and personnel resources provided the necessary foundation to build the Fourteenth Air Force's intelligence network quickly.

Bressette



Figure 2. American trainer explains a tactical situation to Chinese soldiers (US Army Military History Institute)

Establishing Leadership

The man charged to lead intelligence operations for the Fourteenth Air Force was Col Jesse C. Williams. Williams took over intelligence operations at the beginning of 1943, replacing Lt John Birch, who was standing in as the A-2 after the departure of Col Merian C. Cooper on 30 November 1942.²⁵ An oilman with the Texas Oil Company before the war, Williams, like most of the A-2 staff, had firsthand experience working in China before entering the war.²⁶ An Air Staff officer who met with Williams a few months after he became the Fourteenth Air Force A-2 described him as a leader with a "keen imagination" who "knows how to handle men to good advantage."²⁷ In his memoirs, Chennault evaluated Williams as one of the few staff officers he respected.²⁸ Williams likely gained Chennault's esteem by working quickly to build and expand an air intelligence network in China.

Upon arriving at CATF headquarters, Williams focused on improving the organization and communication of intelligence. In the first line of a 31 December 1942 memorandum, Williams identified the sources and transmission of information in the Fourteenth Air Force as "unsatisfactory."²⁹ Williams's assessment matched the assessment made nine days earlier by Brig Gen Francis M. Brady who communicated to Tenth Air Force Commander Clayton Bissell the improper organization of the CATF A-2 section.³⁰ Williams found the development of objective folders nearly nonexistent. He immediately began building objective folders for fu-
ture Fourteenth Air Force operating areas and creating methods to ensure intelligence materials could reach the flying squadrons quickly.³¹ Furthermore, a system of rotating intelligence officers from flying units to the A-2 staff was established to promote an understanding of intelligence activities at all levels of the Fourteenth Air Force. Williams's leadership and focus on quickly fixing material deficiencies was critical to ensuring effective air intelligence within the Fourteenth Air Force.

Williams's priorities as A-2 matched Chennault's recommendations for intelligence activities.³² In the three months between January and March 1943, Williams organized the five officers and four enlisted members who comprised the A-2 staff into an effective organization. After an initial focus on the basics, Williams prioritized extending the reach and speed of intelligence within the Fourteenth Air Force. Throughout the war, gathering intelligence in any manner and quickly disseminating it to aircrew was a crucial part of Williams's intelligence strategy. As the Fourteenth Air Force matured, Williams became critical to the coordination and development of the Fourteenth Air Force's distributed intelligence network. Like Chennault, he worked to empower his men with the freedom to deliver results without burdensome interference from headquarters.³³

The emphasis Chennault placed on finding the best people for his command produced unlikely intelligence leaders. One of Chennault's most important hires was Capt John Birch. Birch started the war as a Baptist missionary serving in China. In April 1942, a chance encounter led Birch to connect with Lt Col Jimmy Doolittle and several crew members of the famed Doolittle Raid and aid in their evasion from Japanese forces.³⁴ Birch's assistance to Doolittle placed him in contact with Chennault, who later commissioned him as second lieutenant and assigned him to work intelligence for CATF.³⁵ Birch's talents as an intelligence officer later led Chennault to evaluate the missionary turned intelligence officer as "more valuable than any pilot I had in my entire force."³⁶

In the spring of 1943, Williams selected Birch to conduct fieldwork and gather intelligence for the Fourteenth Air Force. The success of Birch's initial fieldwork led to his assignment as ground liaison to Chinese general Xue Yue's Nationalist's Ninth War Area.³⁷ Soon Birch was leading the creation of a system to report ground intelligence to the Fourteenth Air Force headquarters for immediate relay to fighter and bomber units for targeting.³⁸ In a little over a year, the missionary who stumbled upon the Doolittle Raiders created the first intelligence station in the Fourteenth Air Force's air intelligence network. The success of Birch's effort to establish liaison teams with Chinese forces earned Birch the Legion of Merit and

led to a rapid expansion of field collection within the Fourteenth Air Force and later the Office of Strategic Services (OSS). Birch is best remembered in the words of one Fourteenth Air Force officer, as "the eyes of Fourteenth Air Force."³⁹ Intelligence leadership in the Fourteenth Air Force started with Chennault. The men he selected and the expectations he set created a powerful intelligence engine which powered all of the Fourteenth Air Force. From start to finish, Chennault demanded, guided, and supported an effective intelligence organization. Although often characterized as a "one-man show," the reality was Chennault relied extensively on others to execute his vision and provided the freedom necessary for his Airmen to shape operations.⁴⁰

Challenges to Leadership

Empowered leadership at all levels was essential to overcome the physical and political resource restraints imposed on the Fourteenth Air Force. Physically, the Himalaya Mountains restricted the movement of supplies. This included fuel and limited the number of available sorties. Politically, Stilwell's order prohibiting Chennault from conducting intelligence operations and the emphasis on opening the Burma Road limited the resources allocated to the Fourteenth Air Force. Throughout the war, to satisfy Chennault's demand for a constant stream of intelligence, the Fourteenth Air Force accepted nearly any source capable of intelligence collection. However, the relationship between the Fourteenth Air Force and external organizations was not purely transactional. Each organization which operated with the Fourteenth Air Force became in some way part of Chennault's organization. Despite Chennault's desperate need for resources, working with the Fourteenth Air Force required operating within Chennault's concept of operations.

Before the formation of the Fourteenth Air Force, Chennault determined that a minimum of six long-range reconnaissance aircraft would be required to defend the India-China Ferry Command and support air operations in China.⁴¹ Throughout most of the war, a detachment of only three F-4s from the 9th Photo Reconnaissance Squadron served as the Fourteenth Air Force's core photo reconnaissance capability.⁴² The limited number of photo reconnaissance aircraft is stark, but even a more robust photo reconnaissance force was unlikely to add significant capability as fuel shortages continually plagued the Fourteenth Air Force. In this environment, each sortie was precious and sustaining large photo reconnaissance aircraft

and plans for intelligence activities suggest he realized the sortie limitation and quickly focused on developing other collection capabilities.

Even with limited photo reconnaissance collection resources, the Fourteenth Air Force accomplished impressive results. A May 1943 trip report from Maj Joseph McGee, an Air Staff intelligence officer, described Williams's photo laboratory as "the hardest working unit" he had ever seen."⁴⁴ McGee's notes also documented that the Fourteenth Air Force A-2 shop was not properly equipped to produce objective or target folders which would make the photos usable for combat missions. However, sitting on empty packing crates, Williams's men produced work which amazed the War Department officer.⁴⁵ Although the Fourteenth Air Force accomplished a great deal with limited photo capability, the collection and processing of photos would never be quick enough to satisfy Chennault's demands for rapid intelligence.

Instead, the radio net concept, consisting of multiple observers, which Chennault had envisioned during his time at the Air Corps Tactical School, became the Fourteenth Air Force's foundational intelligence resource. The arrival of additional intelligence personnel in the spring of 1943, combined with Chennault's decisionmaking—to either develop a loophole or ignore Stilwell's order—led to the creation of the Fourteenth Air Force's human intelligence collection operation. At the beginning of 1943, Williams sent Birch to survey the damage at several airfields the Japanese attacked in the fall of 1942.⁴⁶ Birch returned with valuable intelligence which the Fourteenth Air Force's limited photo reconnaissance had been unable to provide. After Birch's first successful mission, Williams began to send Birch on more collection operations and used the quality of Birch's reports to request more officers like Birch.⁴⁷

In late 1943, Chennault found the workforce he needed to expand his intelligence network. The OSS was struggling to gain a foothold in China. Instead of further pursuing a relationship with Chinese intelligence, the OSS approached Chennault and Williams in late December 1943. The OSS offered to support Fourteenth Air Force operations.⁴⁸ Chennault enthusiastically accepted.⁴⁹ However, as in numbered air forces around the world, bureaucratic requirements required OSS agent participation with the Fourteenth Air Force to occur under Chennault's command.⁵⁰ Despite fears within the OSS of losing their unique identity, in the spring of 1944 the OSS combined operations with the Fourteenth Air Force.⁵¹ The 5329th Air and Ground Forces Resources and Technical Staff (AGFRTS) Provisional was created as the organization responsible for the Fourteenth Air Force's human intelligence operations. Chennault assigned Lt Col Wilfred Smith—a former professor of Oriental history at Ohio University—as commander of AGFRTS. Chennault then assigned 14 of his existing pool of intelligence officers to work along with 22 OSS agents in the new organization.⁵²



Figure 3. Intelligence unit. American officers of OSS Detachment 101 with Gen Daniel Isom Sultan at an advanced ranger base in Burma, June 1945. Col William R. Peers, detachment commander, is third from left. (National Archives photo)

The relationship between the Fourteenth Air Force and the OSS typified how Chennault managed resources. He was happy to accept help, but the leader desired to incorporate the additional personnel and operations as an integrated part of the Fourteenth Air Force. For nearly a year, the majority of OSS personnel in China were assigned and operated as part of the Fourteenth Air Force.⁵³ The OSS was one of several organizations who sought out a partnership with the Fourteenth Air Force and then found their personnel integrated into it. At its height, AGFRTS operated six liaison teams—some with as many as 17 members—and conducted joint OSS and Fourteenth Air Force operations from shared offices in Kunming.⁵⁴ Chennault's vision of an air intelligence network came to fruition partially due to the addition of OSS agents. AGFRTS formalized the Fourteenth Air Force's air intelligence network and was Chennault's timeliest and accurate intelligence resource during the war.

Chinese Intelligence Sources

Chinese intelligence was the primary external intelligence source for nearly every American organization operating in China. The primary factor which determined the utility of Chinese intelligence was the credibility of the source. China nationals were replete with information, but often the quality and amount of information was unreliable or dependent on the American organization who dealt with the Chinese. Additionally, Chinese trust did not apply evenly to each American organization.⁵⁵ Early in the war, Pres. Franklin D. Roosevelt assigned the US Navy as the lead American intelligence organization in China.⁵⁶ Led by Cmdre Milton "Mary" Miles, the US Navy group in China failed to have an impact in theater due to Roosevelt's decree on the number of personnel Miles commanded. However, Miles possessed a personal relationship with Tai Li, the head of the Chinese Secret Police which made his organization invaluable to Chennault's design.⁵⁷

Commodore Miles and the 14th Naval Unit

Chennault's desire to improve intelligence and his strong relationship and trust in the Chinese drove him to seek a working relationship with Miles. For his part, Miles respected Chennault's appreciation of the Chinese people and his sources. Additionally, Miles later wrote Chennault "was not jealous of the US Navy" for its tactics with the Chinese Secret Police.⁵⁸ Through regular conversations, Chennault and Miles found ways to improve each other's intelligence operations. For example, after noticing targeting errors on bombing runs by the Fourteenth Air Force near Hong Kong in the winter of 1942, Miles offered to send two Navy photo interpreters to Kunming to support Fourteenth Air Force operations.⁵⁹ By May 1944, Miles sent over 98 Navy photo reconnaissance, interpretation, and radio intelligence personnel to support the Fourteenth Air Force as part of the new 14th Naval unit.⁶⁰

How Miles and Chennault each viewed the dynamics of the personnel exchange was likely the key to the program's success. In his memoirs, Miles described the 14th Naval unit as a part of the Navy Task Group, working within the Fourteenth Air Force. The mission of the unit in Miles's eyes was to send the intelligence collected by the Fourteenth Air Force to support US Navy operations.⁶¹ Chennault wrote of the same personnel in his memoir briefly as "a sizable group of Miles" Navy officers who operated in Fourteenth Air Force headquarters under my command."⁶² Although different command perceptions existed at the top, the influx of intelligence expertise enhanced Fourteenth Air Force operations. Williams pushed some of Miles's men out to the flying units—operating at forward operating airfields—where they achieved impressive results.⁶³ Col Clinton "Casey" Vincent, commander of the 668th Composite Wing, praised the naval radio unit assigned to his command for "supplying intelligence in advance of that from other sources."⁶⁴ As with the incorporation of OSS agents, Chennault and Williams demonstrated with Miles's Navy unit a willingness to integrate outside organizations with Fourteenth Air Force intelligence operations.

The intelligence capability Miles's men provided Chennault significantly improved Chennault's ability to strike Japanese shipping along the Chinese coast. By the summer of 1943, the Fourteenth Air Force routinely received real-time observations of Japanese shipping via radio from Miles's sources. The newly assigned Navy personnel then fused the data at the Fourteenth Air Force headquarters to produce actionable intelligence. Between May and October 1944, using intelligence sourced from Miles's group and B-24s with sea-search radar, the Fourteenth Air Force sank over 248,000 tons of shipping—an amount significantly more than low-altitude bombing campaigns in both the Fifth and Thirteenth Air Forces.⁶⁵

Expanding the Fourteenth Air Force Intelligence Network

In the Fourteenth Air Force, the divide between internal and external intelligence resources was often nonexistent. The manner in which both the OSS and US Navy provided external resources to the Fourteenth Air Force is an example of the unique way Chennault grew intelligence capability despite limited resources. By integrating outside resources, Chennault built the Fourteenth Air Force intelligence into an organization three times as large as the number described in official Army Air Forces (AAF) documents. However, for most of the war, intelligence operations followed the Fourteenth Air Force's concept of operation because Chennault demanded that intelligence support from external organizations be more than purely transactional. Backed by his position as the primary American fighting unit in China, Chennault built the Fourteenth Air Force into the intelligence network he envisioned through detailed integration with joint and other government partners. Chennault's personality and leverage as the primary American combat force in China led to the assignment of over 100 OSS and US Navy personnel who worked directly for the Fourteenth Air Force. Joint and intergovernmental support provided the Fourteenth Air Force intelligence expertise and capacity it would not otherwise be able to produce.

A Lean Headquarters Serving Operations at the Edge

Although resourced with significant external support, Chennault's vision of air operations, supported by a "continuous stream of accurate information," unequivocally shaped the design and processes within the Fourteenth Air Force."⁶⁶ The necessity and importance of expediting the communication of the flow of intelligence throughout the Fourteenth Air Force could not be overstated.⁶⁷ Williams's A-2 headquarters in Kunming served as a central resource not only for Chennault but also for the combat units and intelligence personnel in the field. Despite the headquarters' important role in Fourteenth Air Force operations, intelligence was often collected and immediately communicated to combat aircrew. This combination of centralizing key functions to maximize efficiency while distributing time sensitive collection operations forward to the edge of the battlespace is a critical element of the Fourteenth Air Force's success.

The primary focus of Williams and the A-2 headquarters throughout the war was improving the combat capability of the flying units. Placing his focus on the operations of the flying units matched Chennault's leadership style. He was sometimes criticized by members of the Fourteenth Air Force as overly focused on operations versus taking care of administrative functions.⁶⁸ In May 1943, the Fourteenth Air Force consisted of eight intelligence officers.⁶⁹ Comprising the staff, except for Williams, were captains and lieutenants, and only three had any formal intelligence training.⁷⁰ Throughout 1943, the A-2 headquarters staff conducted the majority of intelligence work and coordination of intelligence collection activities. Their work focused on developing an appropriate list of targets in China and distributing them effectively to flying units. By the spring of 1943, the A-2 staff was able to build effective objective folders and develop and disseminate photographs within 24 hours.⁷¹ In describing his visit to observe Fourteenth Air Force intelligence, McGee assessed Williams's operation as "more than 100 percent efficient" and described "their willingness to work 24 hours a day as nothing short of inspirational."⁷² Mc-

Gee's outside observation of the Fourteenth Air Force is important to understand the driving sense of purpose which existed at the A-2 headquarters.

Intelligence Operations in the Chinese Ninth War Area

In the field, Birch's assignment to the Chinese Ninth War Area in April 1943 represented a crucial step in establishing the Fourteenth Air Force's intelligence network.⁷³ Later in 1943, additional intelligence officers were assigned to expand the network.⁷⁴ Paul Frillmann, a former American Volunteer Group chaplain turned intelligence officer, was assigned to the Sixth War Area near Changteh and several other stations along the Yangtze River to report ship and troop movement.⁷⁵ Each station typically consisted of one or two members of the Fourteenth Air Force who spoke Chinese, who had experience with the Chinese culture, and who were responsible for reporting daily via radio intelligence to Fourteenth Air Force bases.⁷⁶ The intelligence supplied from the intelligence network became critical to build intelligence products and plan future operations. The networked and integrated intelligence activities of headquarters and forward locations was essential to maximizing the Fourteenth Air Force's combat ability to inflict damage on the Japanese using limited sorties.

The Battle of Changteh and the Intelligence Network

The Battle of Changteh in the fall of 1943 best illustrates how the Fourteenth Air Force's intelligence network operated. In August 1943, the Fourteenth Air Force weekly intelligence summaries began noting the possibility of a Japanese offensive in central China.⁷⁷ On 14 October 1943, Birch's station began reporting the movement of Japanese troops and cited Chinese sources who assessed that the Japanese plan was to capture the city of Changteh.⁷⁸ Two weeks later, a Japanese force of 40,000 troops began an assault on Changteh.⁷⁹ The first American reporting on the Japanese offensive came from Birch's station. Birch's prompt reporting highlighted a genuine difference in the quality of American intelligence in China. It was not until eight days after Birch radioed an intelligence report about the Japanese sources to the Fourteenth Air Force reporting a Japanese attack.⁸⁰

The Fourteenth Air Force intelligence network hit high gear as the Battle of Changteh developed. The size of the battle engulfed both Birch's and Frillmann's stations. Throughout the battle, both Frillmann and Birch relayed intelligence and target positions to the Fourteenth Air Force fighter groups for action.⁸¹ The realtime reports from Birch and Frillmann were not the only source of intelligence during the Battle of Changteh. Of the 1,278 sorties flown by the Fourteenth Air Force during the battle, approximately 12 percent were reconnaissance.⁸² Augmented by Miles's Navy group personnel, Williams's photo interpretation capability helped direct B-25s from the 11th Bombardment Squadron to destroy Japanese supply areas.⁸³ In his memoirs, Chennault praised the work of his field intelligence officers in the Battle of Changteh.⁸⁴ However, Williams's entire organization was involved in the battle. The success of real-time intelligence reporting was the result of months of preparations—operations and assessments—which helped the Fourteenth Air Force deliver Chinese forces a crucial victory.

Conclusion

Despite resource constraints and a challenging environment and adversary, the placement of intelligence operations at the edge of the Fourteenth Air Force's operations with a target-centric focus produced timely and effective air operations against the Japanese. The organizational design of the Fourteenth Air Force's intelligence was the deliberate manifestation of Chennault's radio net concept; however, it was Williams and the intelligence personnel he led who accomplished the nearly impossible task of organizing and implementing Chennault's vision. With motivated men like Birch, Williams established effective field intelligence operations less than four months after his arrival. A unique aspect of Fourteenth Air Force intelligence is that the majority of intelligence personnel were not members of the AAF; yet, they were all instilled with the concepts necessary to support air operations. The value Chennault placed on intelligence and the target-centric, operations-focused culture his intelligence force embraced ensured each Fourteenth Air Force sortie had the best intelligence support available.

The intelligence lessons and principles developed and practiced by the Fourteenth Air Force remain relevant to air operations in the Indo-Pacific theater today. The timeliness of intelligence production and dissemination across vast geographic area remains a challenge. Similarly, the principles of decentralized and distributed intelligence operations, centered on the objective are as essential to increasing the lethality and survivability of air operations as they were during World War II. Chennault led a revolution in air intelligence and developed the Fourteenth Air Force as one of the most intelligence-driven organizations in the war. Chennault's vision and leadership paired with the drive of men like Williams and Birch maximized the utility of every Fourteenth Air Force combat sortie and set a standard for intelligence-driven air operations, which should remain the goal for air power leaders today. JIPA

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In China's Shadow

The Strategic Situation in the Western Pacific

Lt Col Thomas R. McCabe, USAFR, retired

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East Asia and the Western Pacific (WestPac) are undergoing what amounts to China (PRC) from the wheelbarrow age into an age where they are becoming a modernized superpower. China intends to change its security architecture—traditionally having been a land power, Beijing is now building a major Navy—and other major maritime powers should consider it a strategic warning. China also intends to establish itself as the dominant military power in the region. While Beijing's current posture on totally excluding the United States is at least somewhat ambiguous,¹ the Chinese would undoubtedly like our military presence there to cease and to reconstitute what amounts to a Chinese empire in the region.² As with the Russians and various other non-Western countries, the Chinese objection to past Western and Japanese imperialism was not that it was imperialism but that such imperialism was at their expense. Beijing does not have an objection to imperialism if China is the imperial power. Meanwhile, the United States does not intend to leave, and as a rule, the rest of the region wants the United States to remain as a counterweight to China. Therein hangs a tale.

The Danger of War

Unfortunately, several scenarios for the start of a WestPac war have at least some measure of plausibility. First, the possibility exists for parallel or competitive interventions in North Korea in the event of a war or a collapse in North Korea.³ An example of a parallel intervention would be North Korea starting a war, with the United States and China having somehow agreed on the need for regime change in North Korea. Both the United States and China are intervening, but the interventions are not necessarily hostile to each other and may even be coordinated. A

competitive intervention example would be the 1950–53 Korean War, where the Chinese were intervening to support the North Koreans.

A second scenario involves a theoretical Chinese attempt to annex Taiwan forcibly, from Taiwan moving toward official independence or if Taiwan continuing to refuse annexation.⁴ Both the Chinese and the Taiwanese consider the question of the independence of Taiwan to be an existential conflict where an ultimate compromise is impossible.⁵ Beijing has said the PRC will not tolerate the current situation indefinitely, and in 2013, the Taiwanese ministry of defense reported that China had a plan to invade Taiwan by 2020.⁶ Beijing, not surprisingly, denies the veracity of that report. More recently, China has threatened to invade if a US Navy ship visits Taiwan.⁷

The third possibility involves an accident (or skirmish) in the South China Sea (SCS) that escalates—especially under pressure of public opinion—in China.⁸ This could happen if Beijing attempts to enforce its interpretation of international law, such as not allowing foreign military operations in its exclusive economic zone without its permission. The most extreme variant would be Chinese declaration that the SCS, or most of it, is Chinese internal waters and subsequently attempt to prevent any American operations there by force. Beijing sometimes defines the waters inside the First Island Chain (FIC)—the Japanese archipelago, the Ryukyus, Taiwan, and the Philippines—as China's "Blue Territories," and Chinese policies are intended to define these waters as Chinese territory eventually.⁹ Furthermore, Pres. Xi Jinping claims that reclamation of SCS islands is one of his greatest accomplishments.¹⁰ Therefore, he may take more of a proprietary interest in what happens there—with greater sensitivity to events and especially affronts—than one might otherwise expect.

A fourth situation deals with war resulting from a third party's action. One of the more likely of these would be a Sino-Japanese skirmish over the Senkaku Islands that escalates.¹¹

Yet a fifth scenario involves war developing from an economic crisis. As the Trump administration moves against the massive Chinese trade surplus with the United States and what is widely considered predatory Chinese practices—such as Beijing's theft of intellectual property—the United States and the PRC may well be in the opening phases of a trade war.¹² While that one factor may not cause a war, it can be expected to strain relations. Furthermore, some major Chinese banks are continuing to work with North Korea, and American sanctions against those banks might cause a major economic crisis for China and the rest of the world.¹³ Further poisoning the well is widespread Chinese suspicion that Trump's recent moves are part of an overall effort to strategically contain and block the rise of China.¹⁴

However, overshadowing these scenarios are what might be considered three systemic factors. First, among these is the consolidation of power by President Xi. The days when China had a degree of collective leadership—with at least some potential for diversity of views and checks on rash actions—are ending. The PRC's leadership now answers to Xi.¹⁵ Politburo members will now be evaluated yearly on their performance and "loyalty to the Party," which will undoubtedly be interpreted as loyalty to Xi.¹⁶ Since he is now China's supreme leader, Xi is in a position to decide policy largely on his authority.

Second, an additional potential source of danger may be what some suggest is a quirk of Chinese strategic culture that believes that a sudden, sharp attack on an enemy will coerce that enemy to deal with China on the terms Beijing sets.¹⁷ The most extreme case of this would be the Chinese leadership believing it could decisively solve major problems through military force. With any luck, the Chinese will notice these tactics have not worked well for them in the past: i.e., the border war with India in 1962. Also, they should remember that the United States has a term for such an attack—a *Pearl Harbor attack*—and a track record for responses to such attacks.

Finally, there is the question of the Thucydides Trap, described by Graham Allison as the conflict between an existing hegemon (the United States) and an aspiring one (China).¹⁸ Beijing expects current favorable trends to continue and ultimately to preside over a unipolar world with itself as the dominant power.¹⁹ In particular, the PRC sees its efforts to revise the current WestPac regional order by means just short of war as successful. Would the PRC change its strategy and tactics if its current "salami slicing" stopped working? Alternatively, might China's contempt for or annoyance at America—and the regional or world order America supports—cause China to accelerate the process or upend the system by force? It seems unlikely now, but in 1931 few would have foreseen Japan's air and naval blitzkrieg of 1941–42. In any case, China would undoubtedly perceive the balance of interest—and therefore will—in a crisis as strongly favorable to its side.

With hope, the Chinese will not take the enormous risks and inevitable costs of such a dangerous policy. The United States can be expected to treat China as a systemic and existential threat whatever the aftermath, to repudiate its debt to China as part of the war, and to deny China access to the US market—among other punMcCabe

ishments. Unfortunately, the bottom line is that one cannot rule out the possibility of a great power war in the WestPac. Furthermore, it may be a war that the United States and its allies could conceivably lose.

The Military Situation in the Western Pacific

If a major war should break out in the foreseeable future, it is all too likely to have many parallels to the opening stages of World War II in the Pacific, with the Chinese in the position of the Japanese. The major differences will be that, unlike the Japanese, the Chinese will have neither a massive surface naval superiority over Beijing's antagonists nor the ability or, necessarily the desire to overrun and occupy major territories of its enemies, including Taiwan.²⁰

Whatever their war aims, the PRC can be expected, like imperial Japan in World War II, to aim to avoid a long war by rapidly presenting its enemies with a fait accompli. Beijing's expectation (or hope) will be that the United States will be unwilling or unable to undertake the effort and expense of fighting its way back into WestPac, or, failing that, China will be able to prevent the United States from doing so.

Due to geography and the ongoing Chinese military buildup, the United States will not be able to count on its historic advantages of air, naval, and technological superiority. Instead, the United States is all too likely to be facing not only a peer competitor but also what may be a more-than-peer competitor. This competition will have a massive impact at all levels of war.

US leaders must expect the Chinese will have the strategic, operational, and tactical initiative at the opening of the war, and the United States will be reacting. Washington may be surprised and likely reluctant to believe that war is imminent. Militarily, this means that the US administration cannot expect to be permitted to amass overwhelming power as was the case during Desert Shield, and US leaders must expect to fight a war with little preparation. Depending on the circumstances, such as American involvement in major military action in another part of the world, the US military may not have overwhelming power to amass.

Depending on the circumstances, some or all of our allies may choose not to join the fight. This decision may be true even if a clear case of Chinese aggression triggers the war, unless allies are directly attacked. This may be due partially to the great distance from the relevant crisis. The southern tip of the Republic of Korea (ROK) mainland is more than 800 miles from northern Taiwan. Other factors include the perception that it is not a matter of concern to America's allies, intimidation by China, and the possibility of Chinese bribes or concessions to the leaders of US allies.

Due to the geographic proximity of the PRC, Beijing will likely outmatch us in combat power, especially in aircraft, throughout the war. This is especially likely to be the case at the beginning of the war. The Chinese have the option of exploiting their internal lines of communications to concentrate their military power on areas adjacent to the planned theater of operations, possibly under cover of exercises. Meanwhile, American military power is deployed worldwide and will need time to relocate to the WestPac to reinforce.

We must expect to be operating against an increasingly mature Chinese precision-strike system.²¹ In particular, American and allied bases in the WestPac (and possibly the rest of the Pacific) will *not* be sanctuaries. For the foreseeable future, the American and allied ability to deter and defeat a Chinese air-and-missile attack against our bases by China's steadily improving military is increasingly uncertain. As the Chinese increasingly integrate intelligence, surveillance, and reconnaissance systems with precision-guided munitions, it will be a steadily increasing challenge for the United States and its allies to defeat China.²² US leaders must expect China to attempt to neutralize hostile forward bases and forward naval units in the FIC immediately. This will be accomplished by using a combination of ballistic and cruise missile and air attacks against forward bases and ships—possibly far from the Asian mainland, including areas such as Guam and the Marianas. Such an attack will have two major aims:

- To establish and maintain air supremacy over the targeted areas of the FIC, and
- To establish sea control within at least the FIC and to convert those waters into a bastion by disarming and dominating the FIC, in particular, Taiwan, and making it too dangerous for American and allied surface ships to operate on the waters between the FIC and the Chinese mainland. This control will be combined with and reinforced by what might be called "hemispheric denial" by using land-based tactical missiles and long-range aircraft with cruise missiles, probably supplemented by People's Liberation Army Navy (PLAN) surface ships and submarines, to control access to the WestPac theater.

Planners can expect Beijing to supplement and reinforce these attacks with swarm attacks, using mini unmanned aircraft systems (UAS) on friendly air bases throughout the Pacific.²³ The intention is to disrupt the movement of replacement equipment and reinforcements. US leaders must also expect such attacks against military facilities in the United States that support US Indo-Pacific Command (INDOPACOM), although the UASs used in rear areas may be unarmed to minimize the chance of escalation.²⁴ In a war where the United States is fighting to restore the prewar geopolitical status quo while avoiding escalation to a larger war, the United States, as in the Korean and Vietnam Wars, may not have a choice except to permit the enemy at least a partial geographic sanctuary. US forces may not be allowed to attack some categories of targets. This result could be due to a variety of factors. The PLA Rocket Force controls China's conventional tactical missiles and its strategic nuclear missiles.²⁵ If conventional missiles use the same facilities or deployment sites in China as nuclear systems, attacking those facilities is potentially escalatory. In particular, attacking command-and-control targets, especially systematic attacks on the Chinese national command structure, would carry grave risks of escalation to an even larger, perhaps nuclear, war. This situation means Beijing is likely to think it may have escalation dominance.



Figure 1. A USAF B-52H Stratofortress bomber is refueled over the Pacific Ocean during a routine training mission. This mission was flown in support of US Indo-Pacific Command's Continuous Bomber Presence operations, which are a key component to improving combined and joint service interoperability. (Photo by Airman 1st Class Gerald Willis)

American forces will not be in a permissive environment. US planners must assume that Beijing will contest everything US forces attempt. The PRC will strive to keep American and allied bases suppressed with follow-up air-and-missile attacks. There may be a limited number of access points for American entry, and US leaders must presume that these will be serious targets and expect the mining of seaports and naval bases, including American bases.²⁶ Planners should assume US logistics ships to be high-priority targets.²⁷ Reinforcement and resupply efforts must anticipate attacks en route, and such efforts may have to fight their way into the region. We must presume that the Chinese will make a comprehensive attempt to disrupt our command, control, communications, computer, intelligence, surveillance, and reconnaissance (C4ISR), using a combination of kinetic, directed energy, special operations, and cyberattacks. In particular, the Chinese consider US space systems to be key to our center of gravity. US leaders should anticipate that attacks against our satellites by antisatellite systems, of which the Chinese have several potential systems, will occur. We should also suppose missile-and-air attacks against our airborne intelligence, surveillance, and reconnaissance (ISR) systems and jamming of our communication satellites and systems, GPS, and radars.²⁸ Another likelihood is the breaking of the oceanic cables linking the region to the rest of the world. Beyond targeting C4ISR, US leaders should presume attacks, especially cyberattacks, against a wide variety of other targets. In Taiwan, planners should expect comprehensive attacks against all portions of the military, the government, and the economy, especially its infrastructure. Attacks against the United States and other allied states might be more selective, at least at first, concentrating especially against weapons, combat support, and combat service-support systems.²⁹ Chinese forces may even be able to hack into and attack individual components within our equipment.³⁰ However, they may not immediately make massive and indiscriminate attacks against American infrastructure, since they believe Chinese infrastructure to be equally vulnerable.³¹ This fear means that a degree of mutual deterrence may exist, at least in the beginning. Also, the United States has reserved the right to retaliate with nuclear weapons against major conventional attacks, including cyberattacks, against American infrastructure.³²

American military readiness may be in short supply as a result of wars and conflicts in recent decades. Detracting from readiness is the fact we will not have the cushion of supplies that US forces had available in Operations Desert Shield and Desert Storm or Operation Iraqi Freedom. Further, once US forces use up their stockpiles of munitions, they may not have the industrial capability to replace them quickly or in the massive amounts needed for a war with China.³³

US planners should expect comprehensive adversarial information and disinformation campaigns, attempting to create and exploit any political discord from the war while countering our information efforts against China. The United States cannot assume friendly ISR supremacy. As mentioned, US leaders must assume the Chinese will do everything possible to degrade friendly ISR systems. Meanwhile, the Chinese have built or are building a variety of systems, which planners must expect to be available for military use. When these systems' data is integrated (likely an early priority for application of artificial intelligence), they will be able to provide resilient coverage of the Chinese mainland and the bordering seas. These systems include:

- *Satellites.* The Chinese have developed and are rapidly deploying constellations of dual-use and military satellite reconnaissance systems. Of special interest are the Yaogan ("China remote-sensing satellite") satellites, which includes both electro-optical imagery reconnaissance satellites and synthetic aperture radar satellites. Both rely on data downlinking, not film return, which means the Chinese can access and exploit their data rapidly.³⁴ Recently, Beijing has started deploying military electronic intelligence satellite systems,³⁵ and many Yaogan satellites are reported to be such satellites, intended to track and locate foreign warships by their optical and electronic signatures.³⁶ In addition, the PRC is starting to deploy a series of nominally civilian satellites—under the Chinese Academy of Sciences—to maintain a real-time watch on the SCS. Beijing has announced its intention to launch large constellations of optical microsatellites.³⁷
- Unmanned air systems. The Chinese are making an extensive effort in ISR UASs. These include at least two reported clones of the American high-altitude, long-endurance Global Hawk—the Divine Eagle and the Xianglong/Soaring Dragon—both of which have entered production.³⁸ In addition, a large unmanned airship and several systems for the medium-altitude, long-endurance (MALE) UAV role are in production.³⁹ The most-widely reported MALE systems are the Yilong/Wing-loong and the BZK-005, roughly similar to or maybe larger than the American Predator,⁴⁰ and the CH-5, which is roughly equivalent to the American Reaper.⁴¹ The MALE systems, like their American counterparts, can also carry bombs and missiles.⁴²

- *ISR aircraft.* While China has historically deployed a modest force of ISR aircraft,⁴³ it has recently started to mass-produce the KJ-500 airborne early warning and control aircraft with an active electronically scanned array radar.⁴⁴
- Ships. On a humbler note, US planners should expect the PRC to deploy less-sophisticated, early warning and surveillance vessels in-depth by keeping their fishing boats and sea traffic deployed as potentially expendable warning systems and munitions sinks to detect movements of hostile surface warships. The USCG did something similar on the American East Coast in the early days of World War II with the Coastal Picket Patrol, composed of yachts, motorboats, and converted fishing boats.⁴⁵



Figure 2. The Cloud Shadow high-altitude, long-endurance (HALE) unmanned aerial system. This UAS was unveiled at the Airshow China 2016 exhibition held in Zhuhai, China.

McCabe

US leaders cannot assume the air superiority they have largely come to take for granted since the end of the Cold War. There are at least three reasons for this in addition to attacks on our bases and aircraft carriers: 1) Beijing is deploying large numbers of sophisticated combat aircraft; 2) the Chinese are developing extreme long-range air-to-air missiles, and 3) Chinese forces are deploying a sophisticated integrated air defense system (IADS). The Chinese Air Force (PLAAF) and Naval Air Force (PLANAF) possess large numbers of modern fighter aircraft and are steadily deploying more. The technical sophistication of many or most of these aircraft and aircraft weapons may be comparable to American models. US planners must assume that China will have largely reequipped the PLAAF and PLANAF with J-10s, J-11s, J-16s, and next-generation J-20s. These are at least roughly equivalent, if not better than, the United States' F-15s, F-16s, and F-18s that will predominate in the USAF, USN, USMC, and allied inventories for the near future. Ominously, this sophistication may include air-to-air missiles (AAM).⁴⁶ As part of rebuilding, the Chinese are working to develop extremely long-range AAMs. The PL-15 may have a maximum range of up to 200 kilometers,⁴⁷ especially against large nonmaneuvering targets, such as tankers and airborne early warning and control aircraft (AEW&C). Beijing may be developing an AAM with a range of up to 400 kilometers.⁴⁸ Chinese forces are deploying an IADS, based specifically on modern, long-range surface-to-air missiles (SAM). Once deployed along the coast, this system has the potential to reach well beyond the PRC's coastlines. Along with being one of the major buyers of advanced Russian SAMs-including SA-20s⁴⁹ and S-400s/SA-21s⁵⁰—China is currently producing at least four domestic advanced long-range SAMs: the HQ-9 (Chinese-built SA-10),⁵¹ the HHQ-9 (naval version of the HQ-9),⁵² the HQ-15 (upgraded SA-10),⁵³ and the HQ-18 (Chinese-built SA-12).⁵⁴ The PLAAF has claimed the HQ-9 has a range of 200 kilometers and a speed over Mach 4.55 Beijing is also building the FT-2000 missile system, which uses a modified HQ-9 missile with an antiradar seeker intended to target AEW&C and electronic warfare aircraft.⁵⁶ Reportedly, this system can intercept tactical ballistic missiles. Additionally, US planners should note that the PLAN is steadily deploying modern ships carrying advanced SAMs, including a class of at least six Type 055 Renhai-class guided missile cruisers, with 112 vertical launch tubes for HHQ-9s each.⁵⁷ In addition, their Type 052 Luyang II-class air defense frigates carry 48 HHQ-9 missiles in vertical launch tubes.⁵⁸ Assuming that the Chinese can integrate the SAM systems of these ships with the IADSadmittedly a major assumption—it will potentially extend the reach of the IADS

even further offshore. At least at the tactical level of air combat, US planners should not assume qualitative superiority in the level of training. The PLAAF is making a major effort to improve the tactical training of its aircrews.⁵⁹ Over the long term, planners should expect this to have an impact on the balance of quality between aircrews.

Finally, US leaders cannot assume overall technological superiority—the technical sophistication of many Chinese weapons and aircraft may be at least as good as American counterparts. Further, the Chinese science-and-technology base may be surpassing that of America in at least some areas.⁶⁰ For example, hypersonics is an area of possible Chinese superiority that US planners cannot rule out in the arena of technological surprises. Beyond that, we should remember that even a developing nation could develop and launch unpleasant technological surprises, as the Japanese did with the Mitsubishi A6M "Zero" long-range fighter and the Type 93 "Long-Lance" torpedo at the start of World War II.

Chinese forces have ample potential to wage a very big and very grim war—unfortunately, one with very uncertain prospects for US success. Moreover, US leaders should not expect such a war to end quickly. Even if the Chinese do not risk an attack as outlined earlier in this article, military power casts a political shadow. Beijing, with a perception of military superiority, is all too likely to be more assertive and less likely to be deterred in situations short of war, such as a blockade of Taiwan. The United States may be entering an era in which deterrence of China may result less from Beijing's perception of our strength than introspective knowledge of its own weaknesses.

Conclusions and Implications

The strategic situation in the WestPac has changed, and not for the better for America and its allies. The United States must anticipate further change in the future. The implications are ominous; clearly, US forces cannot expect to have the naval, air, and technological superiority they have taken for granted for decades, and American leaders cannot assume US bases and ships will be sanctuaries.

American and allied strategy, tactics, and deployments need to transform to adapt to the altered situation. The bottom line is that the United States needs to rebuild its capability to fight a high-tech war that will only be, at best, one step short of a world war. Above all, since US planners must assume they will be on the wrong end of the first salvo, an urgent priority is hardening and defending US bases, facilities, and ships to survive, fight through, and recover from such an at-

McCabe

tack. US leaders must stress survivability in our C4ISR systems. The United States and its allies need to deploy their own antiaccess/area denial systems against China. Finally, US forces will need to be able to wage effective joint operations; long past are the days where each service can fight independently.

This is not the first time the United States has faced a massive threat to the survivability and operation of its forward bases and forward-deployed forces. During the Cold War, US bases in the Federal Republic of Germany faced such a threat from Soviet forces in Eastern Europe and the western Soviet Union.⁶¹ American naval forces faced the threat of massive attack from Soviet air and naval forces, and our US bases in the ROK have assumed they are vulnerable to attack for decades. American efforts to counteract these threats relied on a combination of active and passive defenses and rapid repair and reconstitution. The United States and its allies need to duplicate these measures at its WestPac bases and, more selectively, at other facilities in the Pacific or those that support the INDOPACOM.

For decades, American bases in the ROK have operated on the assumption that they are on the front line.⁶² The time has come for other bases in the region, ships in the area, and US regional allies to start thinking of themselves as being in the forward area. The front line is not just Korea, and US air and naval facilities in the region should not function as typical peacetime bases.

The possibility of a war in the WestPac today is probably unlikely. However, the same could be said about the threats of a Soviet attack on Western Europe and a nuclear attack on the United States during the Cold War. In the interest of prudence, America invested immense resources in preparing against those possibilities. If the United States wants to remain a power in the Pacific, it will need to repeat those efforts.

Notes

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McCabe

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Great Powers, Grand Strategies: The New Game in the South China Sea edited by Anders Corr.

Naval Institute Press, 2018, 327 pp.

With a series of well-researched and heavily supported chapters written by regional, political, and military experts, Anders Corr has put together a volume of work that brings together all of the important facts about the challenges in the South China Sea. As a recognized expert in Asian security issues, Corr and his assembled writers paint a clear picture of the situation that has developed in the Indo-Pacific. The confrontations unfolding now are 80 years in the making, but Great Powers, Grand Strategies demonstrates how the pace of events is increasing rapidly, in line with China's similar rise in diplomatic, economic, and military strength.

The book's introduction takes the time to lay out the pertinent facts to the reader, aware that despite the constant stream of current events flowing out of the South China Sea region, many readers may not be familiar with what is at stake. The seven claimants to the islands, reefs, water, and resources of the region are introduced—the People's Republic of China (PRC), the Republic of China (Taiwan), Vietnam, the Philippines, Malaysia, Brunei, and Indonesia—as are the other major powers in the region: the United States, Russia, Japan, India, the European Union (EU), and the Association of South East Asian Nations (ASEAN). The overarching themes of nationalism, sovereignty, freedom of navigation, force projection, and resources are introduced early on, with the scale and importance of each laid out. Additionally, the basics of each player in this geopolitical drama. Crucially, the book takes efforts to explain in depth what China's views, priorities, and concerns are throughout each chapter. Even when arguing against the Chinese process, the authors minimize their overall bias in this regard.

The overarching theme in this book is the need for action to counteract China if leaders believe that their current path is indeed inappropriate, though depending on the specific power or institution, that action differs. China is extremely dedicated to its goals and is willing to expend the political and economic capital required to achieve them. As Capt James E. Fanell, USN, retired, explains in one chapter, "While PRC leaders proclaim China's global aspirations will follow a path of 'peaceful development,' its actions across the South China Sea demonstrate a single-minded commitment to 'restore' the country to its rightful place in history, no matter the cost, no matter the location, and no matter the issue."¹

The interplay of localized strategies (bilateral relationships), regional strategies (across the South China Sea), and grand strategy (China's efforts to minimize American military presence in the Western Pacific) are well explained by each of the writers within the context of their chapter's great power. Perhaps most refreshing in this book are the chapters that deal with the great powers beyond the immediate sphere of the South China Sea and who are rarely discussed in the American news articles in which the disputed area is written about. India, Russia, and the European Union are each provided a chapter, and the broader geopolitical consequences of their involvement adds a fascinating layer to the strategic balance in the region.

India's fears of the Chinese "strategic encirclement theory"² weigh heavily on their international relations views, and recent adaptation of the concept of "Indo-Pacific" reflects their expanding understanding of the interconnectedness of the region.³ Russia's desire to be seen as a "great power" is handcuffed by its simultaneous desire to appeal to both China and the Southeast Asian nations and Moscow's unwillingness to offend either by taking a side, stifling its diplomatic clout.⁴ Meanwhile, the strong diplomatic leverage that the European Union can bring to bear in the dispute is heavily pushed in its chapter, both as a body that is not currently challenging China the way the United States is and as an example for ASEAN to build its political unity.⁵ All of these are novel viewpoints on the conflict, and the writers and editor go to great lengths to expand the American-centric views and knowledge of their target audience.

Altogether this book is remarkably well researched and put together; the expertise of the various authors shines through each chapter. It is a very easy read, with each chapter being well compartmentalized and roughly 10–20 pages in length. The short chapters are deceiving in their simplicity, however, as each is heavily researched and the end notes of each chapter are an additional four to seven pages in length, replete with primary sources, news reports, and scholarly articles.

This book is recommended for anyone interested in seeing how regional issues can entangle global affairs, those interested in China's views and motives, or those simply interested in the backstory of one of the world's most dynamic contemporary territorial disputes. The problems in the South China Sea are not going away because China is not going away. China's "peaceful rise" is quickly giving way to more assertive actions as it makes clear its desire to be a global player diplomatically, economically, and militarily. As the South China Sea is one of the locations most likely to spark a great power conflict, this book is an excellent primer on why great powers are taking their current courses of action, what they might do in the future, and the likely strategies that rivals, allies, and currently nonaligned powers might follow through with if pressed to make a decisive decision.

Notes:

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Why Vietnam Matters: An Eyewitness Account of Lessons Not Learned by Rufus Phillips. U.S. Naval Institute Press. 2008, 398 pp.

In a crowded field of Vietnam War memoirs, Rufus Phillip's contribution stands out in several important ways. First, Phillips, a long-time advisor on rural affairs and governance, served as one of the first Americans to advise the Ngo Dinh Diem government in August 1954. Second, he continued to work at the highest levels of both the American and Vietnamese governments until 1968. His memoir is rich with important firsthand accounts of major events as well as detailed assessments of key players in both successive US and South Vietnamese administrations. Why Vietnam Matters also offers enduring lessons about American military intervention abroad, though only briefly. The real value here is Phillips knowledge of South Vietnamese leaders that transcends stereotypical and shallow accounts often found in American accounts of the war.

A critical message for today's military and political advisors in Iraq and Afghanistan comes at the outset; Phillips declares, "At the highest levels we approached the Vietnam conflict with excessive hubris, convinced we knew best how to win, with little understanding of the enemy or of our South Vietnamese allies."(xii) His principal themes are familiar when it comes to the core issues-Vietnam was primarily a political contest that American leaders viewed overwhelmingly in military terms; that US leaders, especially military ones, did not understand their Vietnamese counterparts; and that American advisory efforts must send the best and most expert people available to advise and then trust them to do their work.

Phillips began his time in Vietnam working for Edward Lansdale, whose success working with Ramon Magsaysay garnered him a role as a top advisor to the new South Vietnamese president, Ngo Dinh Diem. Lansdale's unique value as an advisor to South Vietnam becomes a prominent story throughout the book—so much so that it becomes a minor distraction to the issues at hand. Phillips presents Lansdale as something of a silver bullet—according to Phillips, Lansdale's "main weapons were imaginative but practical ideas about how to make democratic self-government work and how to create conditions that fostered the emergence of effective national leadership."(13) The first third of the book documents early US pessimism about Diem, noting that in 1954 "most Americans seemed to accept the French view that the Vietnamese were incapable of running a government and lacked the will to fight." (15) In Philips view, French bitterness and interference were behind General Nguyen Van Hinh's 1954 attempted coup and many other problems that followed for South Vietnamese leaders in the 1950s.

Phillips formed a relationship with Ngo Dinh Diem that continued until shortly before Diem's murder; he presents a more nuanced and balanced portrayal of South Vietnam's first president. This is one of the most important aspects of the book—its presents political complexity in the South and presents Diem in a balanced light. We are left with a picture of a leader embattled on all sides, who faced some early challenges with determination but squandered his early successes such as operation Giai Phong and his defeat of the Binh Xuyen by giving his infamous brother, Ngo Dinh Nhu, too much influence. The American response was to tell Diem to remove his brother from power and from the country.

Phillips observes that throughout the Diem era, Americans, especially Amb. Henry Cabot Lodge, attempted to give the South Vietnamese president orders, often in front of other people, with predictable consequences. This relationship was typical of overbearing American leaders who consistently failed to build relationships with their South Vietnamese counterparts. Why Vietnam Matters is a valuable contribution to the literature on the Vietnam War precisely for this

reason—it depicts Vietnamese leaders with agency, who are forced to manage their international partners to the maximum extent because they need their resources, if not their advice. Phillips does however carry his argument too far in the other direction, making Lansdale into a uniquely talented hero who could have saved the war if given the chance.

The core chapters on Vietnam document the US rural affairs and pacification efforts in remarkable detail. Philips narrative of the evolutions of the program from Rural Affairs to the United States Operational Mission to Civil Operations and Revolutionary Development Support, its rationale, and the descriptions of the key players involved are of significance to the historical record. Here we see how a growing U.S. military and political bureaucracy created obstacles that kept ground truth from the provinces from reaching policy makers in Saigon and Washington. The result was an ill-informed top-down approach where American leaders suffered from "a fixation on making American, rather than Vietnamese, concepts work." (263) Pacification was a critical effort, but as with Lansdale's role, the program is overemphasized here. No political change would last if South Vietnam could not field effective military forces.

Another major obstacle was the US leadership's preoccupation with using vast military resources to push North Vietnam to abandon its effort to take the South, a method that alienated South Vietnamese people and left them wondering why Americans had come to Vietnam. Phillips notes that the communications breakdown between the allies was so bad that South Vietnamese leaders only discovered that the United States was inserting ground troops in 1965 at the very last minute, without any substantive consultation with South Vietnamese leaders.(247) Another problem was the impact of American military spending on the South Vietnamese economy—funds that drove inflation to the point soldiers and political leaders pay was worth almost nothing. Phillips notes that US direct military expenditures in Vietnam equaled the entire South Vietnamese government's budget for the 1965–1966 fiscal year. (251) America went to Vietnam's ultimate defeat by fundamentally failing to listen and to learn; he summarizes this view by stating that Secretary of Defense "McNamara's attitude, lack of understanding, and managerial approach symbolized the disconnect between our top leadership in Washington and Saigon and reality on the ground." (xiii)

For those who have already read Edward Miller's *Misalliance: Ngo Dinh Diem, the United States, and the Fate of South Vietnam,* Phillips themes will ring familiar. However, his extensive firsthand knowledge of personalities and events make *Why Vietnam Matters* an important work for anyone interested in understanding the Vietnam War and the broader issue of American military intervention abroad. He skillfully captures an all too familiar formula where, "Our lack of understanding and miscalculations at the top led us to justify a massive commitment of American troops as the best way to achieve a quick military victory. When victory failed to materialize and stalemate seemed to set in, public support was lost. The image of American boys sacrificing their lives while, it seemed, the South Vietnamese were profiteers, refusing to fight, was corrosive. Our complicity in creating this situation by failing to mitigate the adverse impact of our overwhelming presence on the cohesion of Vietnamese society was easy to overlook." (306) Both historians and contemporary practitioners of military assistance would do well to take note of these lessons.

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Human Rights in Thailand by Don F. Selby, University of Pennsylvania Press, 2018.

In May 1992, more than 20,000 people protested the Suchinda Kraprayoon military government, which was formed after a military coup. The resulting military crackdown on unarmed civilian demonstrators has left an indelible mark on Thailand's tumultuous flirtation with democracy. "Black May", as it would soon be called, had the same hallmarks as past brushes with autocratic violence. When more than half a million people marched down Ratchadamnern Nok to Democracy Monument in 1973 to demand the release of political activists who demanded a more democratic constitution, the Thai military began firing on students and the general public, resulting in the deaths of more than seventy. These seminal democratic struggles form the narrative of Don Selby's anthropological examination of human rights in Thailand. The book is an ethnographic study of human rights in Thailand, using social actors as a gauge of their implementation. The book details prominent lawyers at Thailand's National Human Rights Commission (NHRC) as they engage in client-patron relationships; preserving and maintaining "face", and providing legal services to disadvantaged migrant workers. More broadly, Selby argues that human rights in Thailand are not the product of political machinations, but they are granted status and authority through social norms.

While the five main chapters provide significant empirical evidence to support Selby's exploration of social stratification, the first four chapters provide the strongest linkages. Theravada Buddhism, developed during the Sukhothai era is exalted in Thai society, and has become a symbol of national unity and is firmly intertwined in Thai politics. Buddhist politics and human rights politics "transfigure" one another, resulting in reactionary and progressive versions. In the opening chapter, Selby explores how the official state religion of Thailand figures in the formulation and implementation of human rights. A number of teachings are unpacked drawing on the work of the late monk progressive Buddhadasa Bhikkhu, and the more reactionary Phra Kittiwuttho. While Buddhist politics can often be diametrically opposed, the teachings of Kittiwuttho are not given proper attention. In an interview with Jaturat magazine, he responds,

"Thai, even though we are Buddhist, should do it, but it should not be regarded as killing persons, because whoever harms the nation, religion, and monarchy is not a whole person."

Kittiwuttho's justification, according to Jerryson (2009) was based on ideas that antagonism toward the State is a manifestation of Mara, the embodiment of moral depravity. (52) Killing a deprivity is not the same as killing a human being. Thus, Kittiwuttho suggested that killing leftists was a meritorious act. These teachings gave nationalists and farright extremist groups the rationalization for killing, which was a major justification for Buddhist violence during the anti-Communist scare of the 1970s. While the two are presented at odds, Kittiwuttho believed that a strong central, but well-governed State would be in the best position to promote the economic and social welfare of the people. Despite his conservative, reactionary leanings, he was also active in supporting local communities and farmers with labor struggles.

One of the more intricate aspects of Thai culture and sociality are the complicated mechanisms of social rank and status. Social status is determined by kamma (merit), and among Buddhists, one is expected to put in face-work as an expression of rank in the Thai social hierarchy. Social norms are organized primarily along client-patron relationships, and social classes are partitioned into among social cliques. Small acts of face-saving or loss, Selby demonstrates, can have demonstrable impacts. Selby illustrates face-work with relative ease, from the student who learns to pronounce English better than her teacher, but refrains from using the correct pronunciation to preserve the face of her teacher; the police officer who commits suicide after committing murder to avoid humiliation; or human rights organizations such as Amnesty International or Human Rights Watch shaming the Royal Thai Navy and consecutive Thai governments into dropping charges against Australian journalist Alan Morison.

While the first four chapters fit together seamlessly, the fifth and final chapter appears much less cohesive. After the May 2014, coup d'état removed the Yingluck Shinawatra government, the NHRC became vulnerable to political schemes. In the 2014 Interim Constitution, the NHRC is charged with protecting the junta from unfair reporting on the human rights situation in the country in addition to its normative duties. The maneuverings of the military government are at odds with restoring credibility to an institution that has been downgraded by the International Coordinating Committee on National Human Rights Institutions (ICC) to B status, which restricts participation in human rights enforcement bodies such as the Universal Periodic Review (UPR). Selby's account in this chapter is less an ethnography, rather a political account of events that trace coup politics, lese majesty, the detrimental effects of the interim constitution on the NHRC. Here, the author cannot provide an alternative explanation for the decline of the institution or offer insights into Thai social relationships that explain its swift unraveling. A longer ethnography would have been informative here.

Despite its brevity, Selby's arguments are compelling and his experiences with marginalized Burmese migrants are highly relevant. This is a thoroughly researched book that makes practical and academic contributions to the field of human rights. Human Rights in Thailand would find a welcome place in an undergraduate international development or human rights classroom. It should also find a willing audience with Southeast Asian scholars, particularly those in the sociology and anthropology fields. Selby's extensive fieldwork on Thai human rights in practice is impressive, and should be read by human rights practitioners and lawyers working with disadvantaged or marginalized communities. The book is a worthy and substantive contribution to the growing body of human rights literature.

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