

China's Defense Modernization: Aspirations and Capabilities

by Paul H. B. Godwin

Assessing Beijing's defense modernization programs in the midst of increasing apprehension over the growth of China's military power is a daunting task. During the Cold War, despite some concern over the long-term implications for the United States, assessments were viewed through the prism of China's role in containing the Soviet Union. Improvements (however marginal) in Beijing's military power were seen as serving U.S. interests by requiring Moscow to divert resources from the possible confrontation with the North Atlantic Treaty Organization (NATO) alliance. By the mid-1990s, this perspective had shifted. Many observers perceived Beijing's confrontation with Taiwan and its aggressive, nationalistic approaches to territorial claims in the South China Sea as indicators of the belligerent policies China will pursue as economic enrichment and improvements in indigenous science and technology capabilities enhance its military power. Swelling defense budgets and military technology links with Russia, Israel, and Europe are viewed as giving China the potential to destabilize East Asia and challenge U.S. military preeminence.

A divide among analysts of Beijing's progress in defense modernization is accompanying this changing perception. Although observers have followed the pattern and progress of Chinese defense modernization programs in detail since reforms were initiated in the

late 1970s, their assessments of that progress have diverged in the past few years. On one side stand those who interpret much of the writing coming out of China as indicating the aspirations of the People's Liberation Army (PLA).¹ Although recognizing the importance of the weapons and technologies being acquired, these analysts tend to be skeptical of the extent to which China is achieving the capabilities to meet these aspirations. On the other side of the divide are those whose research demonstrates to them that major improvements in China's military capabilities are closer at hand than the skeptics recognize.²

This divide in assessments is created by two factors: the changed perspective from which China's defense modernization is now viewed, and the differing estimates of the speed with which China can develop and produce weapons and technologies associated with the revolution in military affairs (RMA). Whatever the source of the rift, the issues dividing the skeptics and the optimists,³ as I shall refer to them, are clear. The purpose of this essay, however, is not to resolve these differences or bridge this divide. Rather, the differences will be identified to underscore the difficulties in assessing the progress China has made in two decades of defense modernization.

The Debilitating Legacy of the Past

Despite differing assessments, both camps agree that the defense reforms and modernization programs

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Beijing has undertaken since 1978 encompass far more than its armed forces. After Soviet assistance ended in 1959–1960, the Chinese defense industrial base and research and development (R&D) infrastructure eroded into obsolescence. By the mid-1970s, with the possible exception of the nuclear weapons programs, Chinese defense industries were only capable of producing weapons and equipment based on Soviet technologies from the 1950s. Defense R&D also was weakened and was incapable of developing arms to meet the demands of late 20th century warfare.

Extensive involvement in Mao Zedong's radical domestic campaigns, especially the Great Proletarian Cultural Revolution of 1966–1976, had done equal harm to the armed forces. As Chairman Mao's successor Deng Xiaoping critically observed in the summer of 1975, the PLA had degenerated into an aging, overstaffed, obsolescent, arrogant giant incapable of conducting modern warfare.⁴ The poor performance of the PLA against Vietnamese forces in 1979 verified Deng's critique.⁵ The PLA may have been capable of conducting a 1930s-style protracted war of attrition against a massive Soviet assault designed to defeat and occupy China, but that was an improbable scenario.

Even if Deng Xiaoping had placed the highest priority on reforming and modernizing the defense establishment, overcoming the extensive constraints developed over the previous two decades would have been difficult. Deng, however, made modernization of national defense his lowest priority. Deng's approach to defense modernization was long term and part of a broader strategy to bring China into the ranks of the world's strongest powers. Rebuilding the defense establishment would occur not at the expense of Deng's broader strategic objectives for China's future but in balance with the reform and modernization of civil industry and science and technology. A self-reliant (to the extent possible) defense industrial capability was to be derived from the modernization of China's civil industries and science and technology infrastructure.

The armed forces themselves had to be reconstructed and reformed before the PLA could move forward. A new, younger officer corps capable of planning and conducting contemporary and future warfare had to be created. The armed forces' organization and training had to be revised before modern weaponry and equipment could be integrated into

strategy and concepts of operations. Logistics, sustainment, and maintenance procedures had to be prepared for the complexity of more modern arms. In short, defense modernization was to be incremental and based on a long-term development process. Leaders clearly recognized that no quick fix could overcome the two decades of neglect and deterioration that had eroded the PLA ability to conduct modern warfare.

Defense Modernization and Threat Perception

Changing threat perceptions in the first decade of reform added to the preexisting constraints on building the PLA into a more capable defense force. In 1978, the national military strategy was one of continental defense against the Soviet Union. The military objective for this strategy was to defeat a major Soviet assault as close to China's borders as possible. Before this objective was fully integrated into planning, concepts of operations, force deployments, and training, Beijing's threat perception changed. In 1985, Deng Xiaoping concluded that a major, possibly nuclear, war with the Soviet Union was no longer probable. Future wars—including a potential military confrontation with the Soviet Union—were more likely to be limited, local wars on the periphery of China. PLA planners therefore shifted their focus to contingency planning for short, high-intensity wars in which the adversary's political objective would be limited and the combat confined to localized theaters of operations.⁶

The Persian Gulf War of 1991 came as the PLA was getting more comfortable with the new national military strategy. In many ways, this war was a model of the type of military conflict PLA researchers had been assessing since 1985. It was a high-intensity war fought for limited political objectives within a confined geographic area. Nonetheless, Operation *Desert Storm* stunned the PLA. Military analysts observed the effectiveness of high-technology weaponry and equipment implemented with joint service operations and saw this war as demonstrating that an RMA was under way. Senior Chinese military leaders concluded that their armed forces were incapable of conducting military operations at this level of sophistication and intensity. Chinese forces lacked more than just the weaponry and critical support systems so central to the coalition's overwhelming military success in the Gulf; the basic PLA military doctrine and concepts of operations had not kept pace with late 20th century

warfare. This conclusion led to the modification of the guiding principle for PLA modernization from local, limited war to limited war under high-tech conditions.

Even as China pressed forward with two decades of reform and modernization of its defense establishment, Beijing found that military technologies, doctrines, and concepts of operations for contemporary and future warfare were outpacing the progress the PLA was clearly making. Confounding this problem, these two decades also saw the quasi-alliance that once linked China and the United States transformed into mutual suspicion and, in Beijing's eyes, hostility.⁷ This perception became evident in years following the American response to the Tiananmen slaughter of 1989. The exultation that swept over the United States with the end of the Cold War, the brilliant military victory over Iraq, and the disintegration of the Soviet Union led Beijing to conclude that as the remaining superpower, the United States would seek to dominate the post-Cold War world.

This perception of the United States was paralleled by the emergence of democracy in Taiwan and its quest for greater international recognition. As the image of China became ever more blemished in the United States, Taiwan's grew ever more attractive. The U.S. sale of advanced military technologies to Taiwan, especially the sale of 150 F-16s in 1992, increased Chinese suspicion that the United States was covertly committed to an independent Taiwan. President Lee Teng-hui's "private" visit to his alma mater, Cornell University, in 1995 served to enhance Beijing's perception of a hostile, duplicitous United States. From the Chinese perspective, this hostility was confirmed in 1996 when the United States dispatched two aircraft carrier battlegroups (CVBGs) to the Taiwan area in response to the Chinese use of tactical ballistic missiles in so-called exercises off Taiwan. Beijing's blatant use of coercive diplomacy focused both China and the United States on the distinct possibility that they could confront each other in a military conflict over the future of Taiwan.

The United States as Probable Adversary

Identifying the United States as its most dangerous potential opponent and focusing on the Taiwan Strait as the most likely arena for confrontation were to have a critical influence on Chinese defense modernization programs. Whereas the programs followed after 1985 promised to transform the PLA into a more capable and flexible defense force, a possible military

confrontation with the United States raised more complex and difficult issues for the PLA to contemplate. Before the early 1990s, preparing for a local, limited war was actually considered contingency planning. A number of potential threats existed, but with the Soviet Union's implosion in 1991, none would likely require large-scale use of force. Identifying the United States as a potential adversary, however, demanded careful assessment of what was required to prevail against the world's most advanced military power in a high-intensity limited war.⁸

Chinese military analysts' focus on Taiwan and on a potential conflict with the United States did not escape the attention of American observers.⁹ Cold War terms began to enter the lexicon of American analysts, who began asking when China would become a peer competitor and develop sufficient force projection capabilities to threaten U.S. interests in East Asia.¹⁰ Thus, by the late 1990s, both the United States and China viewed each other with increasing apprehension. The exchange of summit meetings in 1997 and 1998 improved the climate of bilateral relations, but the potential for a military confrontation over Taiwan was recognized as a continuing hazard to Sino-American relations. That such a confrontation would be between two nuclear powers only added to the underlying tensions.

The Nuclear Dimension¹¹

Allegations that China had acquired detailed specifications of U.S. nuclear weaponry, including warhead design and missile technology, through espionage activities heightened the apprehension shared by Beijing and Washington. These allegations led some to believe such information could dramatically increase the accuracy, reliability, and lethality of China's nuclear forces, thereby enhancing the threat they posed to the United States.¹²

Despite the conclusions of the congressionally appointed Cox Committee,¹³ specialists in Chinese defense modernization programs have not split into skeptical and optimistic camps in their assessments of Chinese nuclear forces and strategy. There is consensus that, until recently, Beijing has sought the capability known in Western analyses as minimum deterrence: relying on a small number of warheads capable of threatening what is hoped will be unacceptable damage in a second strike after receiving a nuclear first strike from an adversary. Analysts generally accept that beyond seeking the status of being a

nuclear power, China is trying to prevent nuclear blackmail. From Beijing's point of view, if an adversary believes it will receive a punitive retaliatory strike, it will not seek to deter or threaten China with nuclear forces.

China's inventory of weapons reflects this minimum deterrence logic. It contains some 20 DF-5 intercontinental ballistic missiles (ICBMs) capable of striking targets across the United States. Augmenting these are 20 DF-4 limited-range ICBMs capable of striking targets in the U.S. northwest and the northern Pacific. Neither weapon can be maintained at high levels of readiness because they are liquid-fueled, prohibiting the rocket launchers from staying on extended alert. The warheads are stored separately from the launchers, and loading the liquid fuels and warheads can take 2 to 4 hours. This extended preparation time, together with the inherent inaccuracy of the weapons, limits their role to a retaliatory "city-busting" strike. Beijing's declared policy of no first use probably reflects the deficiencies of its weapons as much as it does the intent behind their employment.

The second component of China's nuclear forces consists of around 100 intermediate-range ballistic missiles (IRBMs) capable of striking targets in the central and western Pacific. With the exception of the 48 DF-21As, these missiles are liquid-fueled and suffer the same constraints as the DF-4/5. Some suggest that the latest Chinese short-range ballistic missile (SRBM), the DF-11/15, may be nuclear-capable. The final missile component is formed by Beijing's single nuclear-powered ballistic missile submarine (SSBN) carrying 12 missiles of 1,000-mile range. Following a long and difficult development life, this ship entered service in the early 1980s. Because it rarely if ever goes on patrol, China's SSBN is not considered operational.

Joining the missile forces are approximately 100 B-6 (Tu-16) and A-5 (modified MiG-19) nuclear-capable bombers. Although updated with a variety of more advanced imported and Chinese-developed improvements, these aircraft were originally designed and built with 1950s-era Soviet technologies. Consequently, their ability to penetrate contemporary air defenses is minimal, limiting their utility as a regional and tactical nuclear bomber force.

The U.S. Arsenal

Although China definitely has a menacing capability, it confronts approximately 8,000 U.S. strategic weapons deployed on 575 ICBMs, 102 strategic

bombers, and 17 SSBNs. A single Trident-armed U.S. SSBN carries 24 multiple-warhead missiles capable of delivering 144 extremely accurate weapons. Just one American SSBN can carry more than seven times the total number of warheads carried on all of China's D-5 ICBMs—and at a much higher degree of readiness. These conditions seem to assure deterrence. Future Chinese nuclear strategy and force structure may well change. The aging, slow-reacting, inaccurate liquid-fueled weapons constituting most of China's deterrent are to be replaced by far more capable systems. The solid-fueled, tactically mobile, and presumably more accurate DF-31 and DF-41 will replace the DF-4 and DF-5. Solid fuel provides quicker and more reliable reaction time than liquid fuel, and tactical mobility makes the DF-31 and DF-41 less susceptible to the counterforce capability found in the extreme accuracy of U.S. and Russian weapons.

A Minimal Deterrence Strategy

A possible review of the strategy guiding China's nuclear deterrent may be as important as its system upgrades. For the past decade, some Chinese military strategists have been questioning the future viability of a minimum deterrence strategy.¹⁴ The incentive to revise its core nuclear strategy stems from a variety of conditions that Beijing considers threatening to the credibility of its deterrent posture.

First, with ballistic missile defenses on the horizon, the size of China's strategic forces becomes an issue. Should the United States deploy even a thin national missile defense (NMD), the current number of ICBMs would not satisfy Beijing's requirement for an assured second strike. China is therefore under considerable pressure to increase the number of deployed weapons. India's nuclear and ballistic missile tests add to the pressure for increased deployments. A sizeable increase could well occur.

Second, ensuring survivability may result in China's current SSBN program coming to fruition. A missile has already been derived to fill the launch tubes of the DF-31. Although tactically mobile ground-launched missiles could ease Beijing's apprehension over the survivability of its deterrent force, building several SSBNs may add to its confidence that China's deterrent force is viewed as credible.

The final issue influencing the future of China's nuclear forces is whether minimum deterrence will be replaced by what Beijing's strategists refer to as

limited deterrence (*you xian hewei she*). Some Chinese strategists consider relying on a single counter-value punitive strike to deter a nuclear adversary to be passive and incapable of fulfilling what they see as a future requirement for a more flexible nuclear response. As conceived by analysts in Beijing, a strategy of limited deterrence would significantly increase the number of weapons available in order to enable Beijing to respond to any level of attack, from tactical to strategic. Increasing the number of weapons would permit some degree of escalation control, because China could retain sufficient forces for extended exchanges.

These same analysts, however, also recognize that China lacks much of the supporting infrastructure required for such a strategy. For example, China does not have the space-based reconnaissance and early warning systems required to determine in near-real-time the size and origin of the attack. Strategists in Beijing are well aware of this and numerous other deficiencies constraining the implementation of a limited deterrence strategy. Thus, although programs to correct these constraints are very expensive and complex to build, it would be wise to assume that they are under way. Prudence probably will lead the United States to assume that over the next two decades the size and capabilities of China's missile forces will increase, despite some disagreement over the extent of the enlargement.¹⁵ The number of ICBMs capable of targeting the United States could substantially increase, together with the number of IRBMs capable of targeting U.S. territories and bases in the Pacific. Some of these weapons will likely be armed with multiple independently targetable reentry vehicles (MIRVs) to ensure that their warheads penetrate ballistic missile defenses.¹⁶ The number of conventional and nuclear-armed SRBMs also will increase as Beijing anticipates the introduction of theater missile defense (TMD).

Without a major change in the mutual suspicions and the dynamic driving the military strategies and objectives of both Beijing and Washington, in the next two decades, China probably will increase the number of deployed weapons and possibly alter the strategy directing their use. At the very least, the number of weapons will be increased to offset anticipated TMDs and NMDs.

China's Aspirations

As the PLA focuses more and more directly on the United States, China's defense modernization programs—including the growing arms and military technology linkage with Russia and Israel—have been observed and analyzed in detail.¹⁷ Indeed, since the mid-1970s, U.S. analysts have continuously scrutinized Beijing's efforts to bring its defense establishment into the late 20th century, including the acquisition of foreign arms and military technology from multiple sources.¹⁸ The Chinese defense industrial base has received particular attention.¹⁹ With very few exceptions, these two decades of assessments provide the skeptics with their evidence to question whether the aspirations so clearly expounded in Chinese military journals can be achieved in the next decade or even further in the future.

The skeptic's conclusion is based upon a number of variables encompassing factors beyond the acquisition of arms and military technology. Skeptics do not question that, at least within the PLA's preeminent research center, the Academy of Military Science, there is now clear recognition of the demands of 21st century warfare. Nor do they disagree with the proposition that since the Gulf War, PLA researchers have analyzed at great length a combat environment in which information technologies allow space, air, sea, and land to be integrated into a single operational environment.

The RMA has made this battlespace increasingly transparent, allowing extremely accurate targeting for over-the-horizon land-, air-, and sea-launched precision-strike munitions. Information technologies not only guide the ordnance but also are equally valuable for near-real-time command, control, and intelligence, allowing dispersed forces and weapons to exploit battlefield opportunities. Because information technologies are critical for the prosecution of contemporary and future military operations, these analysts conclude that the forces achieving electromagnetic dominance would hold the initiative. Forces losing this aspect of modern warfare will be rendered operationally deaf and blind. Consequently, the hard damage inflicted by munitions is intensified by the soft damage made possible by information warfare (IW).

Doctrine and Operations

Chinese assessments of future warfare have created a basic pattern in the doctrinal and operational aspirations filling the pages of its military journals.

First, gaining battlespace initiative is viewed as essential in defeating an adversary distinctly superior in the arms and technologies of warfare. That adversary is clearly the United States—“our new rivals.”²⁰ Such operations will require offensive and possibly preemptive operations. This approach to military operations fits the PLA’s traditions and experience. Mao Zedong placed the highest emphasis on gaining battlefield initiative, directing his field commanders to set this as a primary military objective. In particular, his commanders were to win the first battle of an operation, for this gave them great flexibility. Mao saw flexibility in employing his forces as the clearest indicator of a commander’s dominance of the battlefield.²¹

These operational analyses have folded IW into their focus on offensive and preemptive operations. Assessing U.S. military doctrine and operations, current PLA analyses identify the growing dependence of advanced technology forces on information technologies as a potential critical weakness. In this assessment, dependence on information technologies has led to nodes linking together systems for acquiring, processing, and disseminating information. Offensive or preemptive operations attacking command, control, communications, computers, and intelligence nodes are seen as eroding if not disrupting U.S. hard attack and joint operational capabilities. Attacking these critical information nodes is perceived as a force multiplier—reducing an opponent’s ability to conduct operations will effectively increase the PLA’s offensive strength.²²

Weapons of choice for the hard attack component of offensive or preemptive operations are standoff, precision-guided munitions (PGMs). Such munitions are air-, land-, and sea-launched and are directed to their targets by various means, including terminal guidance, satellite guidance, and other information-based technologies. Of critical importance, these munitions can be launched outside the adversary’s defenses. The range and accuracy of cruise missiles has convinced many Chinese analysts that offensive operations can now be initiated at any time and in any weather, granting distinct advantage and quite possibly battlespace initiative to the forces that attack first.

As PLA analysts now view a possible confrontation with the United States, the operational preference seen in their analyses is clear:

First, the PLA’s core operational doctrine from the 1930s remains central to its assessments: Defeating a superior adversary requires gaining the initiative in the opening phase of a campaign.

Second, because technology has greatly enhanced the speed, accuracy, and lethality of military operations, gaining the initiative in current and future battlespaces requires offensive and possibly preemptive operations. Hence, PLA planners must consider “gaining the initiative by striking first” (*xianfa zhiren*).²³

Fulfilling the Vision

The skeptics and optimists begin to diverge in their assessments of when and if the PLA will achieve the capabilities required to fulfill its vision. Most observers agree on the doctrinal and operational focus found in China’s military journals. They do not all agree on whether or when China’s defense industrial and R&D capabilities can fulfill the vision, even when they consider imported technologies and technical assistance in their assessments.²⁴ The skeptics are equally doubtful that the PLA can develop the joint operational skills required to implement the vision any time in the foreseeable future. The optimists argue that the skeptics focus too closely on the more conventional means of warfare. They agree with the skeptics that “conventional PLA ground, air and naval forces are woefully inadequate, and it is difficult to believe that they will be able to overcome these shortcomings in the short to mid-term.”²⁵

The optimists insist, however, that the skeptics’ myopic focus on conventional forces leads them to overlook what may well prove to be the most significant aspect of China’s defense modernization programs—the quest to achieve information dominance (*zhixinxiquan*), which they argue²⁶ forms the core of the PLA’s emerging doctrine.²⁷ The optimists therefore focus their attention on new and emerging aspects of China’s military R&D priorities, which primarily involve developing a spectrum of capabilities to enable the PLA to locate and destroy critical targets ranging from satellites to military bases and CVBGs. Beijing’s defense R&D and industries concentrate on developing ground-, air-, and space-based sensors to give the PLA information dominance around China’s periphery. Information collection is paralleled by R&D that focuses on information attack by targeting command and control nodes, computers, and air and space assets. Hard attack programs are focused on developing a long-range precision attack capability.

Both cruise and ballistic missiles are being developed with the ability to penetrate TMDs and NMDs, allowing no critical target to avoid attack.

These programs are joined by development projects that seek to defend China's information infrastructure. Major Mark Stokes has detailed the extensive research and development under way to defend China's critical assets against low-visibility (stealth) aircraft and cruise missiles. During the opening phase of the Gulf War, China observed that the U.S. military objective was to destroy or degrade Iraq's air defenses and command and control centers. Accordingly, countering air and missile attacks with an integrated air defense system has extremely high priority in China's R&D programs. Ideally, however, the People's Liberation Army Air Force (PLAAF) would seek to destroy the adversary's weapons before they are launched from the ground, ships, or aircraft carrier decks. Counterspace and ballistic missile defenses form yet another priority.

The great value in Stokes' work is the detailed listing of China's defense R&D projects and the particular institutions having priority and joint responsibility for these programs. Further, he reveals that each program is designed to counter a specific capability employed primarily by the United States. Nonetheless, Stokes notes that with such a diverse and demanding set of R&D programs, success is far from certain. He cautions, however, that even modest success in a few areas over the next decade or two "could significantly hamper U.S. operations in the region."²⁸

Wendy Frieman,²⁹ Director of the Asia Technology Program at Science Applications International Corporation, joins Stokes in suggesting that specific high-priority sectors of China's science and technology program are more advanced and capable than skeptics have assessed. She emphasizes that over the past 15 years, China has undergone a technological revolution. Frieman recognizes there is little evidence that this revolution has thus far had a major effect on China's defense industries, but she suggests the capability is present, especially in those areas closely associated with the RMA. "Spectacular progress," she explains, has been made in such areas as "computer sciences and artificial intelligence, electrical engineering, telecommunications, physics, and certain branches of mathematics."³⁰

Citing Western analysts, Frieman maintains that the essential discriminators of future battlefields "involve the 'soft' side of military capability: the telecommunications, sensors, and the entire information technology infrastructure available to the military forces in question."³¹ Under these conditions, size and capability of ships and aircraft will be far less significant than they are today. The ability to destroy or inflict serious damage to an adversary's information infrastructure could well be more important than holding an overwhelming advantage in firepower. Further, Frieman suggests that the important technological innovations associated with the RMA are not derived from deliberately focused defense R&D, as were Cold War innovations, but from commercial R&D.³² Thus, Frieman argues, overlooking China's potential for placing these achievements at the service of the defense R&D and industries would be unwise.

The skeptics' differences with the optimists are partly found in interpretations of the force structure the Chinese military leadership seeks. Although not disagreeing with the RMA focus found in China's military journals, the skeptics perceive that Beijing will, over the next 20 to 40 years, seek a multidimensional force structure capable of conducting joint military operations across a battlespace spectrum embracing the electromagnetic, space, atmospheric, land, and sea environments. This therefore requires them to assess China's defense R&D and industrial capabilities within a broader framework. They assess the wide range of Beijing's weapons and technology imports as demonstrating that China's defense industrial base and R&D infrastructure are unable to provide such a force structure. Beijing has had to import not only major combatants such as ships, submarines, and aircraft, but also the weapons, target acquisition suites, and powerplants that make these platforms effective combat systems. China's indigenous programs for major conventional weapons programs also depend on technology imports, with the domestic content derived largely from reverse engineering.³³ Some skeptics are particularly doubtful that China can achieve its objectives in such critical technology areas as space systems, sensors, lasers, guidance, navigation and vehicle control, and information system technologies.³⁴ Thus, the skeptics insist that with the single exception of China's ballistic missile and nuclear weapons programs, the PLA's most advanced military capabilities either have been acquired through purchases or have originated in imported technologies.

Given the divergence between the optimists and skeptics, how should one approach the question of assessing China's military capabilities in the next decade? The skeptics and optimists agree that Beijing does not anticipate transforming the entire PLA into a 21st century defense force any time in the foreseeable future. Nor is Beijing seeking to replicate the U.S. armed forces, especially the force projection capabilities that drive so much of the American force structure. Skeptics and optimists agree that Chinese concerns are focused on their periphery and maritime claims. Of greater concern to both skeptics and optimists is the distinct possibility that selected advanced technology programs and air, naval, ground, and missile force units have been given priority based upon potential near-term needs.

Focused Acquisitions and Development Programs

The most problematic contingency the PLA anticipates is a potential confrontation with the United States over Taiwan. In this scenario, the entire range of technological disadvantages the PLA faces becomes part of the scenario. In addition to opposing the world's most advanced conventional and strategic forces, Chinese military planners have to integrate the consequences of future U.S. TMD and NMD into their planning. Furthermore, whereas Yugoslavia's ability to withstand NATO's precision-guided munitions during the Kosovo intervention may give some comfort to planners assessing China's defensive capabilities, it also indicates that Taiwan's ability to resist air and missile attack is greater than Beijing would hope.³⁵

If the single most dangerous potential military confrontation for China is with the United States over Taiwan, secondary priority is given to possible conflicts over Chinese maritime and territorial claims in the South China Sea. Nevertheless, China's naval and air power deficiencies would only come into play should the PLA confront either the combined forces of states in the Association of Southeast Asian Nations (ASEAN) or the United States. Although there is no resolution in sight, the participation of ASEAN in seeking to minimize the likelihood of a major clash suggests this probability is extremely low. A third priority would be China's inner Asian borders. Because Beijing continues diplomatic work to minimize the potential for large-scale conflict on these borders, the prospect for major confrontations is very small.

Should a conflict break out, these borders can be defended with the current force structure. Assuming the PLA did not contemplate force projection beyond 50 miles and applied appropriate strategy and operational concepts to the evaluation, the kinds of reforms and limited modernization of weapons and equipment implemented and under way since the mid-1980s are sufficient for a defensive land war. Under these conditions, quantity can compensate for any qualitative advantages the PLA may face.

Taiwan: The Troubling Scenario

Conflict across the Taiwan Strait is the most disturbing potential scenario. Although agreeing that Taiwan has top priority in PLA contingency planning, skeptics and optimists diverge in their assessments of PLA capability to conduct the strategy and military operations implied in China's military journals and supported by its operational traditions. The greatest obstacle to Beijing being able to subdue Taiwan by military force is the almost certain participation of the United States in the island's defense.³⁶ Certainly, PLA contingency planning has to assume a decision by the United States to intervene militarily.

Planning for a probable U.S. involvement appears to drive the PLA quest for a quick, decisive neutralization of Taiwan's ability to defend itself before the United States can intervene. Blockades, low-level harassment of Taiwan's shipping lanes, and frequent crossing of the Taiwan Strait's imaginary center line with air and naval combatants would alert the United States to possible escalation and provide time for a buildup of deployed forces and concentrated intelligence collection. Such low-intensity military activities would provide strategic warning to both Taiwan and the United States.

A military strategy designed to present the United States with a fait accompli has a specific political objective. Assuming the strategy was successful, the United States would be required to roll back the military success China had already achieved rather than assisting in Taiwan's defense. This scenario would almost certainly require the United States to attack PLA command and control centers, missile sites, air defenses, air bases, and naval facilities. Such actions present the possibility of a wider war than would a military confrontation confined to the defense of Taiwan. If the United States did not take

military action, Beijing could well anticipate Taipei's capitulation. Seeking rapid suppression of Taiwan's defenses would therefore in part be designed to deter the United States by raising the political and military cost of intervention.

A Potential Taiwan Scenario for 2010

The U.S. Department of Defense (DOD) has already assessed the dimensions of a potential PLA campaign in a report to Congress.³⁷ The DOD appraisal of security in the Taiwan Strait states is that over the next decade, China's SRBM force is expected to "grow substantially" and that land attack cruise missiles (LACMs) will enter the PLA inventory. Although expressing doubt that the PLA could coordinate missile attacks with concurrent military operations, the DOD report states that these weapons would be most effective when used in "high-volume, precision strikes against priority military and political targets, including air defense facilities, airfields, Taiwan's C2 [command and control] infrastructure and naval facilities." Furthermore, it assesses that missile defenses "will not sufficiently offset the overwhelming advantage in offensive missiles which Beijing is projected to possess in 2005."³⁸

DOD's assessment, however, raises a more complex problem for the PLA to counter. Although China's SRBM and future LACM forces will play a central role in quickly subduing Taiwanese defenses, their function is to open the way for follow-on operations. Accomplishing Beijing's military objective depends upon the success of these operations in exploiting the suppression of Taiwanese defensive capabilities. Consequently, the campaign's success ultimately depends on the cumulative result of sequential military operations.

With so much depending on missile forces to suppress Taiwan's defenses in the critical opening phase of a campaign, three issues become central: (1) target acquisition, (2) missile accuracy, and (3) the PLA ability to coordinate missile attack with other concurrent military operations. A fourth issue to be addressed is the potential role to be played by IW.

Target Acquisitions

Obtaining detection and tracking sensors is high among PLA priorities.³⁹ Space-based and airborne sensors are being developed, with Beijing working on reconnaissance satellites and long-range drones. Airborne early warning (AEW) capabilities are entering

the PLAAF with the acquisition of the Israeli Phalcon AEW system mounted on Russian Il-76 aircraft. The Navy is acquiring the British Skymaster radar system for surface surveillance. These emerging capabilities must be joined with China's access to commercial satellite imagery, with resolution down to 2.5 meters. Taken collectively, the PLA will soon be able to detect and track targets and to develop digital maps for mission planning, target identification, and missile guidance.

Missile Accuracy

China has sought to improve the accuracy of its strategic, theater, tactical, and cruise missiles for many years. Presumably, the PLA is hoping to achieve the capability to pinpoint a target⁴⁰ within 50 meters for its tactical and cruise missiles. The degree of its accuracy significantly affects the missile's mission. Extremely accurate missiles can be used to cut runways and damage specific port facilities, air defense radar sites, surface-to-air missile sites, and other targets. The less accurate the warhead, the more missiles will have to be assigned to the target, thereby significantly increasing the numbers of weapons required for the operation. Less accuracy also increases potential collateral damage, which Beijing may wish to avoid for political reasons.

Joint Military Operations, Logistics, and Sustainability

Reports in Chinese military journals reflect the difficulties the PLA is facing as it attempts to prepare for joint operations. Updating and reorganizing logistics to sustain joint warfare has proven equally difficult.⁴¹ Nonetheless, the fact that the PLA considers joint operations and logistics to be a requirement for current and future warfare is significant. Units assigned to the Taiwan contingency plausibly could receive priority in terms of weapons, equipment, training, logistics, and sustainability in preparation for a possible military confrontation. Further, the DOD report notes that the PLA is considering implementing a joint command structure at the theater level that would exercise operational command over all forces assigned to the theater.⁴² This concept has been discussed since the late 1980s; thus, the theater responsible for Taiwan (Nanjing Military Region) probably would be the most likely location for setting up and exercising a joint command.

Information Operations

Over the past decade, China's military researchers have spent considerable effort investigating the various facets of IW. Speculating on IW has developed into a veritable cottage industry in PLA research centers, especially the Academy of Military Science.⁴³ In the process, Chinese authors have incorporated the principles found in U.S. concepts for the role of information operations (IO) in future warfare in their publications. Consequently, much of the language and terminology that Chinese analysts use reflects the influence of American concepts. However, grasping the fundamental principles that could be used to implement IO does not equal having the capability to do so. Nonetheless, China is investigating both defensive and offensive information operations.

The DOD report states that China's primary effort is focused on defensive measures, including electronic countermeasures. Chinese technological capabilities augmented by the procurement of Western technology make offensive operations plausible in the future. These operations could include computer warfare, electronic warfare, and antisatellite (ASAT) programs. Ground-based stations can be used to jam and interfere with satellite communications, and China now has the ability to track satellites with accuracy sufficient for targeting. A nuclear-armed ballistic missile can damage a satellite, but China also is researching lasers as an ASAT weapon. The report suggests that China may even now have the capability to damage a satellite's optical sensor.⁴⁴ These developments strongly indicate that by 2010, the PLA's ability to conduct IW as a component of a cross-Strait scenario may be quite robust.

A 2005–2010 Taiwan Scenario

When focused on future PLA capabilities, the elements of a possible Chinese strategy become ominously evident. Although missiles form the central core of the strategy, the follow-on military operations provide potency to the strategy. The most dangerous scenario can be outlined as follows:⁴⁵

- *Initial Attack.* Cruise and ballistic missile attacks would be coordinated with IO to quickly degrade Taiwan's command and control capabilities, air defenses, and early warning radar systems. These attacks would be paralleled by missile strikes on air bases and naval facilities. If successful, this opening phase would temporarily paralyze Taiwan's air force, significantly degrade ground-based air defenses, and damage naval vessels in port.

- *Second Round of Attacks.* The second phase would exploit the paralyzed air defenses, with aircraft striking the same and additional targets using conventional munitions and PGMs. Special operations forces could strike at specific targets, especially command and control centers, radar sites, and other facilities essential for a coordinated defense of the island but that missile attacks could not neutralize. This second set of attacks would make it very difficult for Taiwan's air and naval forces to sustain the operations required to achieve and maintain air superiority and sea control of the Taiwan Strait. Without air superiority, Taiwanese naval forces would be dangerously exposed to standoff antiship cruise missiles, while air-dropped mines would threaten their entrance and exit from port facilities. When these dangers are heightened by aggressive operations by the sizable Chinese submarine force, the ability of Taiwan's navy to control the seas adjacent to the island would be significantly eroded.
- *Final Assault.* Assuming China gains air superiority and sea control, Taiwan would be open to escalating attack, including the insertion of airborne forces. If the shock effect of the previous two phases were effective enough, the airborne assault forces would not face a coordinated defense. Further, if the PLAAF had gained air superiority, then the inserted forces would have the distinct advantage provided by close air support and battlefield interdiction strikes. The lack of effective command and control, together with the inability to defend against air attack, would counteract Taiwan's ground forces manpower advantage.

Assessing the Scenario

Evaluating the probability of success in such a complex scenario is problematic. Even though Stokes recognizes the difficulties involved in such an intricate campaign, he believes that China's military R&D programs and the PLA concepts of operations are sufficiently mature that they could "decisively tip the cross-Strait military balance in Beijing's favor."⁴⁶ Three years ago, Jencks speculated on a similar scenario (among others) and suggested that—although it was very unlikely to succeed—it is "so crazy it just might work."⁴⁷

The simple reality is restricted to unclassified information; it is impossible to judge whether in 10 years the PLA will have the capability to conduct a campaign so dependent on both initial success and the follow-on sequential operations. Beyond the issues of the arms and military technologies required for success, there are questions of training, command and control, logistics, and all the other non-hardware facets of military operations required to transform

concepts of operations into a successful campaign. Equally important is the extent to which Taiwanese forces will have adjusted to the capabilities represented by improvements in the PLA, including the deployment of an effective missile defense system. Ten years is a long time to forecast, and it would be a major error to conjecture a decade ahead based upon principles that apply today.

Similar questions surround American participation in the defense of Taiwan—a definite focus of Beijing's concerns. R&D programs under way in China are almost certainly conceived as preparation for a possible confrontation involving the United States. U.S. dependence on overseas basing and CVBGs for force projection offers specific targets for PLA planners. Space-based sensors capable of tracking U.S. naval forces joined with long-range precision strike munitions are a definite PLA priority and present an emerging threat to U.S. operations in the western Pacific. Looking ahead a decade, if these programs are coupled with improvements in the PLA air and naval forces, as they almost certainly will be, then operating several hundred miles off China's coast could become far more hazardous than it is today. U.S. base facilities would be equally threatened.

This same decade, however, will see significant improvements in U.S. defensive and offensive capabilities. TMD and NMD should be likened to the tip of a technology-driven iceberg. Given the American technological and industrial advantage, defensive and offensive IO could be many times more robust than they are today. China's search for information dominance may well run into an impenetrable American electronic wall, even as the PLA information defenses become easier to penetrate and degrade. U.S. strategic and tactical reconnaissance and strike capabilities will be far more advanced than demonstrated in the Gulf War and after. Chinese naval and air forces could be dangerously exposed from distances far greater than is the norm today.

Nevertheless, a decade hence is just too far for accurate prediction. Rather, when focused on specific scenarios, such prognostications should be viewed as potentially valuable speculations. Here, the optimists have performed a significant service by requiring the skeptics to think more carefully about China's future capabilities, especially the implications of research and development in those areas of technology and warfare associated with the RMA.

Prospects and Implications

The optimists made a valuable contribution by focusing research on Chinese high-technology programs, especially those that could be used to exploit what strategists in Beijing interpret as U.S. weakness. Nonetheless, what must be kept in mind when assessing Chinese military capabilities is the distinction between long-term trends and current or near-term capabilities. A vast gap exists between the *vision* of a future the PLA describes in many journal essays and the *capability* of China's defense industries and armed forces to achieve the vision.

The record of Chinese defense industries in development and innovation supports the skeptics' assessment that bridging the aspirations-capabilities gap will be difficult. Nevertheless, when looking a decade or two into the future, advances in the civil sector of the economy, together with extensive foreign military technology assistance, have the potential to reverse this dismal history. Such potential must be taken into account in assessing the future of China's defense programs.

Although Chinese planners are not even attempting to transform most of the PLA into a late 20th century defense force, they definitely are striving to bring selected units to a higher level of competence and readiness. Acquisitions, indigenous production, and development programs demonstrate that the objective is to build a multidimensional force that is capable of conducting joint operations by integrating air, sea, and land forces. The current focus is on a Taiwan contingency, but the emerging force structure could be employed in the South China Sea and elsewhere on China's maritime periphery.

Chinese acquisitions and development programs provide ample evidence of Beijing's intent. Although currently few in number, procurement and construction of fourth-generation fighter aircraft, aerial refueling, airborne warning and control system aircraft, and advanced surface and subsurface naval combatants demonstrate PLA priorities. China's emphasis on cruise and tactical ballistic missiles, including a long-range reconnaissance strike capability, is part of this overall package. These programs are linked with projects to strengthen capabilities in IW, electronic warfare, imagery reconnaissance, early warning, command and control, surveillance, and sensors for detection and targeting. Concentrating on software deficiencies accompanies enhancing the means to

conduct war. Exercises designed to advance joint operational capabilities together with revisions to its logistics and sustainment management demonstrate that the PLA is seeking to correct these critical defects.

Focused efforts to improve the effectiveness of PLA conventional general-purpose forces are complemented by China's longstanding commitment to building a more robust strategic deterrent. Tactically mobile strategic weapons in greater numbers, some armed with multiple warheads, will constitute a more viable deterrent than China currently possesses.

A decade hence will not see the PLA transformed into a military superpower capable of global power projection. This is not the purpose of the defense modernization programs Beijing has pursued since the late 1970s. China's objective is to be capable of operating much more effectively on its periphery, and this requires a multidimensional force structure. Assuming current trends continue and the diverse advanced technology programs under way have reasonable success, Beijing's armed forces will be approaching such a capability—and under the shield of a more credible strategic deterrent.

Given the current state of Sino-American relations, the improving Chinese military capabilities are troubling. Beijing continues its efforts to intimidate Taipei with the threat of military force. PLA publications continue to assess ways to exploit the weaknesses they see when U.S. forces are engaged in military operations far from home and are dependent on foreign basing rights. For the time being, this stance reflects more a deterrent strategy than a war plan. A decade ahead, will such a conclusion be viable?

Even if the Taiwan dilemma is somehow resolved, Beijing will sustain its defense modernization programs. The Chinese quest for international status and the requirement to defend the country's interests around its extensive maritime periphery require powerful, flexible forces. When China's inner Asian borders are added to this pattern, strong ground forces are also required. Whether these developments will be for good or ill is beyond the scope of this paper. However, if the current hostility and suspicion marking Sino-American relations continues, the future will be covered by an ominous shadow.

Notes

¹ I am grateful to Bates Gill for introducing the “aspirations versus capabilities” concept in his “Chinese Military-Technical Development: The Record of Western Assessments, 1979–1999,” delivered at the 1999 CAPS/RAND Conference, *State of the PLA on the Eve of the Millennium: A Retrospective of the Last Twenty Years*, Radisson-Barcelo Hotel, Washington, DC, July 8–11, 1999.

² See, for example, Michael Pillsbury, “PLA Capabilities in the 21st Century: How Does China Assess Its Future Security Needs,” in Larry M. Wortzel, ed., *The Chinese Armed Forces in the 21st Century* (Carlisle, PA: Strategic Studies Institute, U.S. Army War College, December 1999), 93.

³ This term is used by John Culver, “Session 5: Defense Policy and Posture II,” in Hans Binnendijk and Ronald Montaperto, eds., *Strategic Trends in China* (Washington, DC: Institute for National Security Studies, National Defense University, 1998), 69.

⁴ Deng Xiaoping, “Speech at an Enlarged Meeting of the Military Commission of the Party Central Committee” (July 14, 1975), in *Deng Xiaoping Wenxuan* [Selected Works of Deng Xiaoping] (Beijing, July 1, 1983), in Joint Publications Research Service, *China Report* (hereafter JPRS-*China*), October 31, 1983, 19.

⁵ See Harlan W. Jencks, “China's ‘Punitive’ War on Vietnam: A Military Assessment,” *Asian Survey* 19, no. 8 (August 1979): 801–815.

⁶ See Paul H. B. Godwin, “China's Military Strategy Revised: Local and Limited War,” *The Annals of the American Academy of Political and Social Science* 519 (January 1992): 191–201, for an analysis of the logic behind this shift and the consequences for PLA doctrine and concepts of operations.

⁷ For a current assessment of PLA views of the United States, see David Shambaugh, “China's Military Views the World: Ambivalent Security,” *International Security* 24, no. 3 (Winter 1999–2000): 62–67.

⁸ For a recent discussion of the United States as a military adversary, see Yao Youzhi and Zhao Dexi (both from the PLA Academy of Military Science), “How Will China Handle War in the 21st Century,” *Liaowang*, No. 2 (January 10, 2000), in FBIS-*China*, February 14, 2000.

⁹ See James R. Lilley and Chuck Downs, eds., *Crisis in the Taiwan Strait* (Washington, DC: National Defense University Press, 1997), for assessments of the 1995–1996 confrontation.

¹⁰ Culver, “Session 5: Defense Policy and Posture II,” 71.

¹¹ For a recent appraisal, see Paul H. B. Godwin, “China's Nuclear Forces: An Assessment,” *Current History* 98, no. 629 (Summer 1999): 260–265.

¹² United States House of Representatives, Select Committee on United States National Security and Military/Commercial Concerns with the People's Republic of China, *The Cox Report on Chinese Espionage*, prepared by Representative Christopher Cox (R-CA) (Washington, DC: U.S. Government Printing Office, May 1999) [hereafter cited as the *Cox Committee Report*].

¹³ *Ibid.*

¹⁴ For an illuminating analysis of the ways in which Chinese strategists are approaching the issue of a revised strategy for their country's nuclear forces, see Alastair Iain Johnston, “China's New ‘Old Thinking’: The Concept of Limited Deterrence,” *International Security* 20, no. 3 (Winter 1995–1996): 5–42. Much of the discussion below is drawn from this essay.

¹⁵ See, for example, Tom Woodrow, "Session 6: Nuclear Issues," in Binnendijk and Montaperto, *Strategic Trends in China*, 87.

¹⁶ Although China has had the capability to develop multiple reentry vehicles for some years, it has not yet done so. Western analysts believe Chinese deployment of MIRVs for mobile missiles to be many years in the future. Jeremiah Commission, *The Intelligence Community Damage Assessment on the Implications of China Acquisition of U.S. Nuclear Weapons Information on the Development of Future Chinese Weapons*, Key Findings, April 21, 1999.

¹⁷ For recent analyses, see, John Wilson Lewis and Xue Litai, *Chinas Strategic Seapower: The Politics of Force Modernization in the Nuclear Age* (Stanford, CA: Stanford University Press, 1994); Kenneth W. Allen, Glenn Krumel, and Jonathan D. Pollack, *China's Air Force Enters the 21st Century* (Santa Monica, CA: RAND, 1995); Bates Gill and Taeho Kim, *China's Arms Acquisitions From Abroad: A Quest for 'Superb and Secret Weapons'* (Oxford: Oxford University Press, 1995); Lilley and Downs, eds., *Crisis in the Taiwan Strait*; David S. Shambaugh and Richard Yang, eds., *China's Military in Transition* (Oxford: Clarendon Press, 1997); Andrew J. Nathan and Robert S. Ross, *The Great Wall and the Empty Fortress: China's Search for Security* (New York: W. W. Norton & Co., 1997); James R. Lilley and David Shambaugh, eds., *China's Military Faces the Future* (Armonk, NY: M.E. Sharpe, 1999); James C. Mulvenon and Richard H. Yang, eds., *The People's Liberation Army in the Information Age* (Santa Monica, CA: RAND 1999); Srikanth Kondapalli, *China's Military: The PLA in Transition* (New Delhi: Knowledge World in association with the Institute for Defense Studies and Analysis, 1999); and Wortzel, ed., *The Chinese Armed Forces in the 21st Century*.

¹⁸ See, for example, Paul H. B. Godwin, *Doctrine, Strategy, and Ethic: The Modernization of the Chinese People's Liberation Army* (Maxwell Air Force Base, AL: The Air University Press, 1977); Harlan W. Jencks, *From Muskets to Missiles: Politics and Professionalism in the Chinese Army, 1945–1981* (Boulder, CO: Westview Press, 1982); David G. Muller, *China as a Maritime Power* (Boulder, CO: Westview Press, 1983); Paul H. B. Godwin, ed., *The Chinese Defense Establishment: Continuity and Change in the 1980s* (Boulder, CO: Westview Press, 1983); and Ellis Joffe, *The Chinese Army After Mao* (Cambridge: Harvard University Press, 1987).

¹⁹ In addition to individual chapters in the works cited above, see Paul Humes Folta, *From Swords to Plowshares? Defense Industry Reform in the PRC* (Boulder, CO: Westview Press, 1992), and Jorn Brommelhorster and John Frankenstein, eds., *Mixed Motives, Uncertain Outcomes: Defense Conversion in China* (Boulder, CO: Lynne Rienner Publishers, 1997).

²⁰ See, for example, Senior Colonel Huang Xiang, "Holding the Initiative in Our Hands in Conducting Operations, Giving Full Play to Our Advantages to Defeat Our Enemy: A Study of the Core Idea of the Operational Doctrine of Our Army," *Zhongguo Junshi Kexue*, No. 4 (November 20, 1996), FBIS-China, November 20, 1996.

²¹ Mao Tse-tung (Mao Zedong), "On Protracted War" (May 1938), in *Selected Military Writings of Mao Tse-tung* (Peking: Foreign Languages Press, 1972) [hereafter cited as *Selected Military Writings*], especially 228–254.

²² See, for example, an untitled article presented by Professor Liu Kejun at the September 15, 1997, Defense Modernization Symposium organized by the Chinese Electronics Society, Beijing Yuguangtong S&T Development Center, and *Zhongguo Dianzi*

Bao held at the PLA General Staff Department Research Institute 61, reported in *Zhongguo Dianzi Bao* (October 24, 1997), in FBIS-China, January 14, 1998. For an assessment of PLA information warfare developments, see James Mulvenon, "The PLA and Information Warfare," in Mulvenon and Yang, *The People's Liberation Army in the Information Age*, 175–186.

²³ See Lu Linzhi, "Preemptive Strikes Crucial in Limited High Tech Wars," *Jiefangjun Bao*, February 14, 1996, in FBIS-China, February 14, 1996.

²⁴ For a detailed analysis of this question, see Bates Gill, "Chinese Military-Technical Development: The Record for Western Assessments."

²⁵ Mark A. Stokes, *China's Strategic Modernization: Implications for the United States* (Carlisle, PA: Strategic Studies Institute, U.S. Army War College, September 1999), 5.

²⁶ Michael Pillsbury, ed., *Chinese Views of Future Warfare* (Washington, DC: National Defense University Press, 1997).

²⁷ Stokes, *China's Strategic Modernization*, 9.

²⁸ *Ibid.*, 140.

²⁹ Wendy Frieman, "The Understated Revolution in Chinese Science and Technology: Implications for the PLA in the Twenty-First Century," in Lilley and Shambaugh, *China's Military Faces the Future*, 247–267. Frieman has consistently been an optimist in assessing the development of China's defense industries. See, for example, "Foreign Technology and Chinese Modernization," in Charles D. Lovejoy, Jr., and Bruce W. Watson, eds., *Chinese Military Reforms: International and Domestic Implications* (Boulder, CO: Westview Press, 1986).

³⁰ *Ibid.*

³¹ *Ibid.*, 248.

³² *Ibid.*

³³ For a recent analysis of these issues, see John Frankenstein, "China's Defense Industries: A New Course?" and Rear Admiral Eric A. McVadon, USN (Ret.), "Systems Integration in China's People's Liberation Army," both in Mulvenon and Yang, eds., *The People's Liberation Army in the Information Age*; and Richard A. Bitzinger, "Going Places or Running in Place: China's Efforts to Leverage Advanced Technologies for Military Use," presented at the Conference on the People's Liberation Army, September 10–12, 1999, U.S. Army War College, Carlisle Barracks, Pennsylvania.

³⁴ Bernard D. Cole and Paul H. B. Godwin, "Advanced Military Technologies and the PLA: Priorities and Capabilities for the 21st Century," in Wortzel, ed., *The Chinese Armed Forces in the 21st Century*, especially 176–184.

³⁵ For an interesting assessment that includes but goes beyond the military issues involved, see Arthur Waldron, "The Kosovo War: Implications for Taiwan," presented at the Conference on the People's Liberation Army, September 10–12, 1999, U.S. Army War College, Carlisle Barracks, Pennsylvania.

³⁶ The primary foundation for this expectation is the Taiwan Relations Act (TRA) of 1979 (Public Law 96–8). The TRA stipulates that the United States will "consider any attempt to determine Taiwan's future by other than peaceful means ... a threat to the peace and security of the Western Pacific area and of grave concern to the United States." Further, Congress and the administration will "make available to Taiwan such defense articles and defense services as may be necessary to enable Taiwan to maintain a sufficient self-defense capability."

³⁷ U.S. Department of Defense, *Report to Congress Pursuant to the FY99 Appropriations Bill: The Security Situation in the Taiwan Strait* (DefenseLINK, February 26, 1999). [Hereafter *Report*. Page numbers refer to the version downloaded from <http://www.defenselink.mil/>.

³⁸ *Ibid.*, 18.

³⁹ *Ibid.*

⁴⁰ Circular error probable (CEP) is the radius of a circle within which 50 percent of the warheads fired will achieve impact.

⁴¹ See, for example, Tai Ming Cheung, "Reforming the Dragon's Tail: Chinese Military Logistics in the Era of High-Technology Warfare and Market Economics," in Lilley and Shambaugh, *China's Military Faces The Future*, 228–246.

⁴² *DOD Report*, 15.

⁴³ For a thorough analysis of PLA work on information warfare, see James Mulvenon, "The PLA and Information Warfare," in Mulvenon and Yang, eds., *The People's Liberation Army in the Information Age*, 175–186.

⁴⁴ *DOD Report*, 11.

⁴⁵ This scenario draws from *DOD Report*, 18; Harlan W. Jencks, "Wild Speculations on the Military Balance in the Taiwan Strait," in Lilley and Downs, *Crisis in the Taiwan Strait*, 131–165, and Stokes, *China's Strategic Modernization*, 136–140.

⁴⁶ Stokes, *China's Strategic Modernization*, 140.

⁴⁷ Jencks, "Wild Speculations," 160. Jencks discusses several scenarios in his interesting speculation.