Dissuasion Strategy

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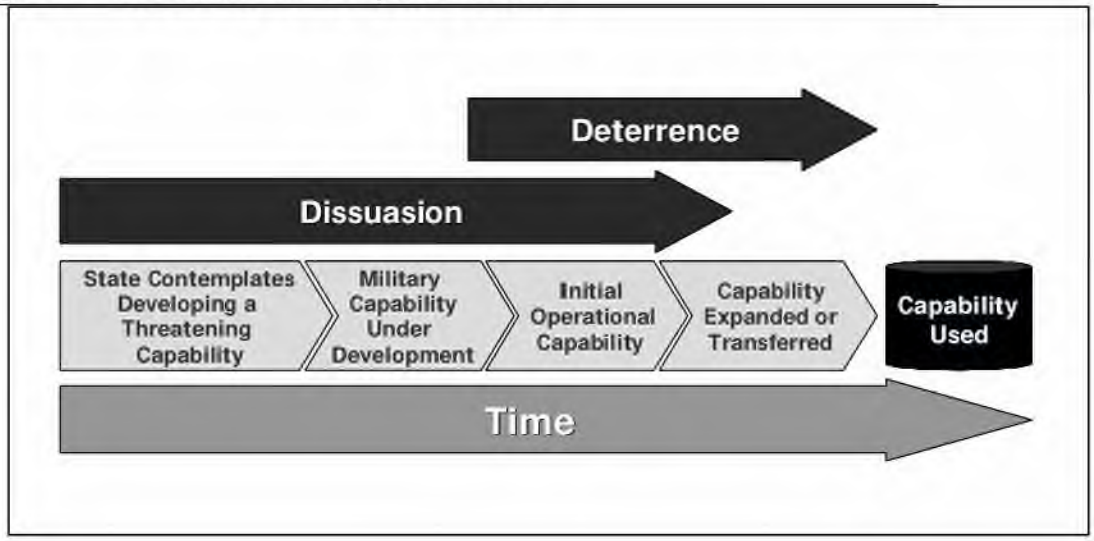
I. INTRODUCTION

This report develops a framework for thinking about dissuasion strategy; explores how instruments of dissuasion might be applied in real-world situations (e.g., strategic competition with China); outlines how the Office of the Secretary of Defense (OSD) might organize to support the crafting and execution of dissuasion strategies; and identifies important questions that merit additional research and analysis.

WHAT IS DISSUASION?

This report defines dissuasion as "*actions taken to increase the target's perception of the anticipated cost and/or decrease its perception of the likely benefits from developing, expanding, or transferring a military capability that would be threatening or otherwise undesirable from the US perspective.*" In simpler terms, dissuasion can be viewed as a kind of "pre-deterrence" in which the target is discouraged, not from employing the military capabilities it possesses, but from creating such capabilities in the first place (see Figure 1 below).[1] If a targeted rival acquired an initial operational capability, despite early dissuasion efforts, the goal would be to deter the target from using the capability while also dissuading it from expanding (or transferring) the capability. By definition, dissuasion would no longer be applicable once the target fielded a robust capability.

Figure 1 — Dissuasion in a Temporal Context



[1] The definition includes transferring military capabilities because, under some circumstances, it can have the net effect of "creating" military capabilities for the recipient. For example, the transfer of existing Soviet-built SS-4/5 ballistic missiles to Cuba in October 1962 would have created an important new military capability for the Soviet Union—short-notice, rapid nuclear strikes against the US homeland. In that case, it could be said that the United States dissuaded the Soviet Union from building up its missile forces in Cuba and deterred the use of the SS-4 medium-range ballistic missile (MRBM) launchers that actually became operational in Cuba during the crisis.

Dissuasion, like deterrence, is a means of shaping the behavior of prospective adversaries. Unlike deterrence, however, allies can also be targets of dissuasion. For example, during the Cold War the United States vigorously pursued dissuasion strategies to discourage a number of its allies from developing nuclear weapons. Indeed, while it has gained increased attention in recent years, dissuasion is not a new strategic concept. The Cold War era was also characterized by thinking about how the United States might shape Soviet behavior. Such thinking was central to US defense strategy, at least implicitly. Channeling the ongoing competition with the Soviet Union into more stable and less threatening areas than those in which they might otherwise be inclined to engage (e.g., forcing them to concentrate more on defenses, at the expense of improving their offensive capabilities), or into areas where they functioned relatively ineffectively, was an explicit goal of US defense strategy in the mid- to late-1980s.[2] Referred to at the time as "competitive strategy," this way of thinking about long-term strategic competition with the Soviet Union was formally adopted by Secretary of Defense Casper Weinberger in 1986, and later reaffirmed by Secretary of Defense Frank Carlucci.[3] The Cold War ended, however, before it could be firmly institutionalized within the Department of Defense (DoD)[4].

The term "dissuasion" was introduced (some might say "reintroduced") into US defense planning in the 2001 Quadrennial Defense Review (QDR), produced by the incoming administration of President George W. Bush. In the QDR, defense secretary Donald Rumsfeld cited dissuasion as one of the "four key goals that will guide the development of US forces and capabilities, their deployment and use."[5] The other three, "*assuring* friends and allies of the United States' steadiness of purpose and its capability to fulfill its commitments;" "*deterring* aggression and coercion;" and "decisively *defeating* any adversary if deterrence fails" had long been part of the US military posture.[6]

During the Cold War, a cottage industry had sprung up to examine "assurance" and "deterrence" from nearly every conceivable perspective. Alliance "fault lines," "extended deterrence," "steady-state deterrence," and "crisis stability" were just a few of the terms developed in attempting to provide a better understanding of these two important strategic concepts. Of course, thinking on how to "defeat any adversary," or wage war, is nearly as old as recorded history.

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[2] See David J. Andre, *New Competitive Strategies Tools and Methodologies—Volume 1: Review of the Department of Defense Competitive Strategies Initiative 1986–1990* (McLean, VA: SAIC, November 1990).

[3] See, for example: Casper W. Weinberger, *Report of the Secretary of Defense Casper W. Weinberger to the Congress on the FY 1987 Budget, FY 1988 Authorization Request and FY 1987–1991 Defense Programs* (Washington, DC: GPO, 1986), pp. 85–88; Frank C. Carlucci, *Report of the Secretary of Defense Frank C. Carlucci to the Congress on the Amended FY 1988 / FY 1989 Biennial Budget* (Washington, DC: GPO, 1988), pp. 115–118.

[4] The conceptual roots of competitive strategy extend back to at least the early 1970s. See A.W. Marshall, *Long-Term Competition with the Soviets: A Framework for Strategic Analysis* (Santa Monica, CA: RAND, April 1972). According to Marshall, most of this report was actually written between 1969 and 1970.

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[5] Department of Defense, *Quadrennial Defense Review Report*, September 30, 2001, p. iii. Hereafter referred to as *2001 QDR*.

[6] *2001 QDR*, pp. iii-iv.

Dissuasion, however, seemed a newcomer. Little had been written about dissuasion; certainly nothing comparable to deterrence, with which it was often linked.[7] Interestingly, Secretary Rumsfeld did not define dissuasion. Rather, he stated that a key US goal would involve "dissuading adversaries from *undertaking* programs or operations that could threaten US interests or those of our allies and friends."[8] [Author's emphasis] However, this leads to confusion, as dissuasion, so described, seems to embody aspects of deterrence.

But there is more. In an attempt to clarify what is meant by dissuasion, the QDR elaborated that:

> Through its strategy and actions, the United States influences the nature of future military competitions, channels threats in certain directions, and complicates military planning for potential adversaries in the future. Well targeted strategy and policy can therefore *dissuade other countries from initiating future military competitions*. The United States can exert influence through the conduct of its research, development, test, and demonstration programs. It can do so by maintaining or enhancing advantages in key areas of military capability. Given the availability of advanced technology and systems to potential adversaries, dissuasion will also require the United States to experiment with revolutionary concepts, capabilities, and organizational arrangements and to encourage the development of a culture within the military that embraces innovation and risk-taking. To have this dissuasive effect, this combination of technical, experimental, and operational activity has to have a clear focus. New processes and organizations are needed within the defense establishment to provide this focus.[9] [Author's emphasis]

Thus the QDR describes dissuasion as something that is intended to block rivals from "initiating future competitions." This description is consistent with efforts extending back at least to the latter stages of the Cold War.

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The idea, in part, was to encourage the Soviets to pursue military competitions in areas that were favorable to the United States, thus dissuading Moscow from pursuing more promising (and, from the US perspective, potentially threatening) capabilities. Another aspect of competitive strategies involved pursuing areas of the competition that could impose disproportionate costs on Moscow, thereby draining resources away from capabilities the United States viewed as more threatening. These cost-imposing strategies were designed to pursue dissuasion indirectly.

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[7] To cite but one example, in his classic work, *Arms and Influence*, Thomas C. Schelling writes extensively on the issue of deterrence, but does not directly address dissuasion. At one point Schelling notes that the term dissuasion—a "nice" noun—has been employed by at least one other scholar, but does not go on to develop the term himself. Thomas C. Schelling, *Arms and Influence* (New Haven: Yale University Press, 1966), p. 71.

[8] *2001 QDR*, p. iv.

[9] *2001 QDR*, p. 12.

The National Defense Panel, formed by Congress in 1997 to examine the long-term challenges to US security, also advanced the idea of dissuasion:

> It is this combination of technology, emerging military systems, new concepts of operation and force restructuring that often produces the discontinuous leap in military effectiveness characteristic of revolutions in military affairs . . . . The end result would find the U.S. military having created strategic "options" on a range of military capabilities. These options could be used . . . to dissuade prospective competitors from undertaking aggressive military competition . . . .[10]

Again, there is a linkage between dissuasion and the idea of discouraging rivals from pursuing military competitions (e.g., an arms race) in the first place. This characteristic of dissuasion was further elaborated upon by Stephen Cambone, one of the principal players in the crafting of the 2001 QDR as the principal deputy undersecretary of defense for policy and a close advisor to Secretary Rumsfeld. Cambone stated:

> We would like to dissuade potential adversaries from undertaking programs or courses of action that could or might threaten the United States, its interests, and those of our allies and friends . . . . [I]t's important that potential adversaries understand . . . there are things that you may wish to do, there are efforts you may wish to undertake, but you need to understand from the beginning, before you even start, that these are not going to be winning efforts. So don't bother going down that course. Say out of that area because you cannot succeed there. It's a little different than the deterrent side, which presumes that an adversary has the capability in hand and that we are trying to prevent him from using [it].[11]

Expressed in this manner, dissuasion might be described as "pre-deterrence," in that while deterrence seeks to stop a rival from employing or threatening to employ *existing* capabilities, dissuasion focuses on discouraging a rival from *developing* threatening capabilities to begin with. This view of dissuasion is reconfirmed four years later, in 2005, in *The National Defense Strategy of the United States of America*, which states that:

> Would-be opponents seek to offset our advantages. In response, we seek to limit their strategic options and dissuade them from adopting threatening capabilities, methods, and ambitions. We will work to dissuade potential adversaries from adopting threatening capabilities,

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[10] National Defense Panel, *Transforming Defense: National Security in the 21st Century*, December 1997, p. 57.

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[11] Stephen Cambone, "Developing the National Military Strategy in a New Security Era," DFI International Air and Space Seminar Series, December 12, 2001. Cited in Brad Roberts, *Operationalizing Dissuasion of China: Practicalities and Pitfalls* (Alexandria, VA: Institute for Defense Analyses, April 2005), p. 4.

> methods, and ambitions, particularly by sustaining and developing our own key military advantages.[12]

This view of dissuasion is sustained in the most recent QDR, published in February 2006, which declares "The foundation of this QDR is the *National Defense Strategy* published in March 2005."[13] In the 2006 QDR, operationalizing the *National Defense Strategy* involves meeting four priorities:

- Defeating terrorist networks;
- Defending the homeland in depth;
- Shaping the choices of countries at strategic crossroads; and
- Preventing hostile states and non-state actors from acquiring or using WMD.[14]

The work of "defeating terrorist networks" and "defending the homeland in depth" most closely resemble the "defeating aggression" pillar in the 2001 QDR. "Shaping the choices of countries at strategic crossroads," and "preventing hostile states . . . from acquiring . . . WMD" appear to correspond to the discussion of dissuasion presented in the 2001 QDR. The 2006 QDR goes on to state that the United States "will attempt to dissuade any military competitor from developing disruptive or other capabilities that could enable regional hegemony or hostile action against the United States or other friendly countries, and it will seek to deter aggression or coercion."[15]

This is all very consistent with the descriptions of dissuasion as a kind of "pre-deterrence" strategy. The QDR restates the concept in discussing the purpose of the US basing posture: "To dissuade major and emerging powers from developing capabilities that could threaten regional stability, to deter conflict, and to defeat aggression should deterrence fail, the United States is further diversifying its basing posture."[16] And the QDR does so again in a manner that harkens back to the concept of competitive strategies in declaring that:

> The United States will develop capabilities that would present any adversary with complex and multidimensional challenges and complicate its offensive planning efforts. These include the pursuit of investments that capitalize on enduring U.S. advantages in key strategic and operational areas, such as persistent surveillance and long-range strike,

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[12] Department of Defense, *The National Defense Strategy of the United States of America*, March 2005, p. 7.

[13] Department of Defense, *Quadrennial Defense Review Report*, February 6, 2006, p. 3. Hereafter referred to as *2006 QDR*.

[14] *2006 QDR*, p. 30.

[15] *2006 QDR*, p. 30.

[16] *2006 QDR*, p. 30.

> stealth, operational maneuver and sustainment of air, sea and ground forces at strategic distances, air dominance and undersea warfare.[17]

Why a recent resurgence of dissuasion, especially as it relates to forestalling the development of WMD by prospective US adversaries? The reason may be found in growing concerns over the reliability of deterrence against stateless terrorists groups and rogue regimes; the elevated sense of homeland vulnerability after the dramatic attacks of September 11th; the difficulty and costs involved in attempting to defend against WMD attacks; and the increased strategic maneuvering room afforded to the United States by the collapse of the Soviet Union. With regard to the last point, the United States finds itself in an unusual position. It has achieved a level of military dominance that is rare in history, arguably approached only by the Roman and British empires in their heyday. Indeed, as the following discussion demonstrates, these powers used their dominant position to pursue effective dissuasion strategies.

DOMINANT POWERS AND DISSUASION

Historically, dominant powers have been in the best position to dissuade competition. For example, Rome practiced dissuasion not only through its overwhelming power, but also in the manner in which it was employed. States that even appeared as though they might create military capabilities to challenge the Empire could be dispatched through preventive war. The Third Punic War initiated by Rome against Carthage is a classic example of the use of preventive war as a means of dissuading competition. The Romans and Carthaginians had fought two previous Punic Wars, in which each side suffered great losses. Carthage, led by the famed general Hannibal Barca, nearly destroyed Rome in the Second Punic War. Consequently, although Rome won both the First and Second Punic Wars, it retained both a healthy respect and a strong suspicion of Carthage. Sentiments ran so strong that the powerful Roman statesman Cato usually finished his speeches on any subject in the Senate with the phrase *ceterum censeo Carthaginem esse delendam*: "Furthermore, it is my opinion that Carthage must be destroyed." Meanwhile, Carthage, despite being greatly weakened and bearing the burden of paying enormous reparations to Rome as a consequence of its defeat in the Second Punic War, was again growing in power. This only increased its potential danger in the Romans' eyes.

In 151 BC, the Carthaginian reparations to Rome were completed. From Carthage's perspective, it was no longer subordinate to Rome.[18] The Romans disagreed, declaring the treaty was a permanent declaration of Carthaginian subordinance to Rome. When Numidia launched a raid on Carthaginian territory, Carthage went to war. Not only did Carthage suffer defeat, it was now confronting Rome itself. In 149 BC, Rome declared war against Carthage. Despite a series of Carthaginian attempts to negotiate, the Romans persisted in their decision to wage war in the

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[17] *2006 QDR*, p. 31.

[18] The peace treaty at the end of the Second Punic War required that all border disputes involving Carthage be arbitrated by the Roman Senate. It also required Carthage to get Rome's approval before rearming or hiring a mercenary force. As a result, in the fifty intervening years between the Second and Third Wars, Carthage had to submit all its border disputes with Rome's ally, Numidia, to the Roman Senate, where they were decided almost exclusively in Numidia's favor. See Nigel Bagnall, *The Punic Wars: 264-146 BC* (Oxford, UK: Osprey Publishing, 2002), pp. 68-75.

spirit of Cato's oft-repeated phrase. Carthage was besieged by the Romans, and the city taken in the spring of 146 BC. After its capture, the city was totally destroyed by the Romans, its ground sown with salt, and its citizens sold into slavery. Carthage simply ceased to exist.

A Solid "Track Record"

The Romans' combination of effectiveness and ruthlessness could not help but make an impression upon those who might oppose them. Just as one's ability to deter a rival's actions are based on the "track record" established in the target's mind regarding one's willingness to act, so, too, is establishing a similar track record important in matters of dissuasion. The Romans would employ this approach to maintaining their dominance again and again, as a means of intimidating others from even contemplating any challenge to their power. As Edward Luttwak notes:

> Above all, the Romans clearly realized that the dominant dimension of power was not physical but psychological—the product of others' perceptions of Roman strength rather than the use of this strength. And this realization alone can best explain the sophistication of Roman strategy at its best.[19]

A classic example of this approach is the siege of Masada from 70-73 AD during the Jewish revolt, in which an entire Roman legion spent several years reducing the mountain stronghold of a handful of Jewish zealots in the middle of a desert of no significant economic or strategic importance to the empire. Again, as Luttwak notes:

> This was a vast and seemingly irrational commitment of scarce military manpower—or was it? The entire three-year operation, and the very insignificance of its objective, must have made an ominous impression on all those in the East who might otherwise have been tempted to contemplate revolt: the lesson of Masada was that the Romans would pursue rebellion even to the mountain tops in remote deserts to destroy its last vestiges, regardless of cost. And as if to ensure that the message was duly heard, and duly remembered, Josephus was installed in Rome where he wrote a detailed account of the siege, which was published in Greek, the acquired language of Josephus, and that of the Roman East.[20]

While the Roman willingness to wage preventive war against Carthage and to continue waging war against the Jewish zealots after their rebellion had been crushed no doubt served to deter those who might be contemplating challenging the empire's authority, it also may have dissuaded those who might contemplate even thinking about creating the capability for such a challenge.

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[19] Edward N. Luttwak, *The Grand Strategy of the Roman Empire* (Baltimore, MD: Johns Hopkins University Press, 1976), p. 3.

[20] Luttwak, *The Grand Strategy of the Roman Empire*, p. 4.

Britain and Dissuasion

Preventive Action

The transfer of military capabilities can also tip the military balance sharply, and within a short period of time. Thus the ability to dissuade those who might provide these capabilities from doing so can be an important factor in maintaining a favorable military balance and a nation's security. Two examples help demonstrate why.

Great Britain, whose relative dominance during its heyday as the world's dominant power in the mid-19th century was perhaps the greatest since the time of Rome, also employed preventive action as a means of dissuading enemies, both existential and prospective. On at least two occasions Britain undertook preventive action to dissuade the transfer of military capabilities to its rivals.

In June 1940, France had succumbed to a six-week onslaught by Germany, whose forces waged a new form of warfare that came to be known as *Blitzkrieg*. With France's surrender late that month, her erstwhile ally, Great Britain, was left alone to face Germany, whose military now occupied the better part of the Continent. Naval dominance was key to Britain's defense against an invasion, and to its ability to maintain links with its empire overseas and to its principal supplier, the United States. Fortunately, the Royal Navy had clear dominance over the German fleet. However, this circumstance would change radically if Britain's recent ally, France, were to permit its fleet—the second most powerful in Europe after Britain's—to fall into German hands or into the possession of Germany's ally, Italy. Had this occurred, the Axis powers would have "unchallengeable control" in the Mediterranean.[21] To prevent this, Britain's Prime Minister, Winston Churchill, directed British naval commanders to demand of their French counterparts that they join the British and fight against Germany; sail their ships to a British port and be interned; or sail to a French port in the West Indies, where the Germans could not seize them. When the French refused, a Royal Navy task force, Force H, under Admiral James Summerville, executed Operation Catapult, opening fire on French naval forces at Mers-el-Kabir in Algeria, destroying much of the French fleet. Following the attack, Admiral Summerville said, "We all felt deeply ashamed." Churchill recalled his decision to order the attack as "heartbreaking."[22]

But, in a sense, that was the point. Britain, deemed to be one of the "soft" western democracies, showed itself willing to be ruthless in the pursuit of its security, even to the point of attacking the forces of a defeated ally. The result, as Churchill observed, was that "the measures we had taken had removed the French Navy from major German calculations."[23] Moreover, the action demonstrated Britain's resolve to its friends and its determination to its enemies, of its willingness to defend itself against all comers. In this latter regard, those contemplating aligning

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[21] Arthur Herman, *To Rule the Waves* (New York: Harper Collins, 2004), p. 530.

[22] Martin Stephen, *The Fighting Admirals: British Admirals of the Second World War* (Annapolis, MD: Naval Institute Press, 1991), p. 180.

[23] Winston S. Churchill, *Their Finest Hour* (New York: Houghton Mifflin Co, 1949), p. 205.

with (or transferring military capabilities to) Germany would have to think twice. As Churchill noted:

> The elimination of the French Navy as an important factor almost at a single stroke by violent action produced a profound impression in every country. Here was this Britain which so many had counted down and out, which strangers had supposed to be quivering on the brink of surrender to the mighty power arrayed against her, striking ruthlessly at her dearest friends of yesterday and securing for a while to herself the undisputed command of the sea. It was made plain that the British War Cabinet feared nothing and would stop at nothing. This was true.[24]

Indeed, judging by the impression it made on Mussolini's son-in-law, Count Galeazzo Ciano, the British strike achieved its desired effect. Ciano wrote in his diary that this demonstrated "the fighting spirit of His Majesty's fleet is still quite alive, and still has the aggressive ruthlessness of the captains and pirates of the seventeenth century."[25]

In the second case, during the Napoleonic Wars, Great Britain was confronted with the most formidable threat it would face in the 19th century: a French Empire that had achieved dominance over much of the European continent. The Baltic Sea was an important element of the maritime competition between Britain and France. Russia provided Britain with iron ore, and Sweden provided iron ore and timber used in warship construction. The British Admiralty was concerned that if the Swedish and Danish fleets combined with the French, the combination of additional naval power and the interruption of Baltic trade could undermine Britain's maritime supremacy.

London engaged in negotiations with Denmark to convince it not to align with France. However, the Danes refused to commit themselves one way or the other. Unwilling to run the risk that the Danes might choose "wrong," on March 30, 1800, a British fleet under Admiral Horatio Nelson entered Copenhagen harbor, where 20 Danish men-of-war were berthed. On April 2, the British opened fire, sinking or severely damaging 16 Danish ships. Nelson's fleet, though substantially damaged itself, was still confronted the Danish shore batteries, which continued to barrage the British ships. Nelson's solution was simple and stark: he notified the Danish commander that, unless the shore bombardment ceased, he would set fire to those Danish ships he had captured—with the Danish sailors aboard. The Danish commander agreed to a truce. As in the case of the French fleet in 1940, the British were prepared to take preventive action in a most ruthless way to dissuade others from "transferring" their military strength to their rivals, this time in the form of an alliance or coalition.[26]

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[24] Winston S. Churchill, *Their Finest Hour* (New York: Houghton Mifflin Co, 1949), p. 205.

[25] Cited in John Lukas, *The Duel* (New York: Ticknor and Fields, 1990), p. 162.

[26] For a general overview of this engagement, see Herman, *To Rule the Waves*, pp. 366-67.

The "Second-Move Advantage" and "Plunging"

Great Britain dissuaded maritime competition through its dominant economic position, command of financial markets, superior industrial base, advanced technology and ability to compete based on time. These advantages were used to effect dissuasion in several ways:

- First, by establishing a track record of the "second move advantage;"—i.e., being able to more than match a rival's efforts to employ technology to create a military advantage, and to do so quickly; and

- Second, by "plunging" into a new area of the military competition in such a way as to impose costs on a rival as an indirect means of dissuasion.

The Second Move Advantage

Britain's maritime competition with France in the mid-19th century offers a good example of the value of pursuing a second-move advantage. In March 1858, the French Navy laid down four warships with iron plates bolted over their timber sides, marking the beginning of the revolution that displaced the wooden ship-of-the-line. These ships were not the first ironclads, but they were the first ocean-going ironclads—a deliberate effort by the French to leap over the British superiority in conventional wooden ships-of-the-line. Moreover, ironclads represented the only logical way to build ships which could cope with the introduction of rifled shell guns, which greatly increased both the accuracy and the penetrating power of a warship's guns. 27

News of the French initiative reached England in May. It elicited this response from the Surveyor of the Navy, Sir Baldwin Walker:

> Although I have frequently stated it is not in the interest of Great Britain, possessing as she does so large a navy, to adopt any important change in the construction of ships of war which might have the effect of rendering necessary the introduction of a new class of very costly vessels until such a course is forced upon her by the adoption by Foreign Powers of formidable ships of a novel character requiring similar ships to cope with them, yet it then becomes a matter not only of expediency but of absolute necessity.[28]

Once the French challenge became clear, the British moved to begin constructing ironclads, quickly outstripping their rival both in the number and the quality of these warships. This "Strategy of the Second-Move Advantage" was characteristic of the Boards of Admiralty throughout this period of British maritime dominance. As Peter Padfield notes, the desire to wait until a rival had moved first:

> … accorded with all natural instincts to preserve a familiar and if not physically comfortable at least comforting and highly successful way of life, and it kept costs down by preserving existing dockyards, ships and

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[27] Peter Padfield, *Battleship* (Edinburg, UK: Birlinn Press, 2000), p. 11.

[28] Padfield, *Battleship*, p. 11.

> naval skills which were known to be superior. And, most important, it worked—because concealed beneath its bland surface was a riot of practical inventiveness which equalled (sic) the French or Americans, who were also prolific in ideas for devaluing British battle superiority; and because the country had engineering and industrial potential which exceeded anything elsewhere.[29]

In sum, the British strategy of the Second-Move Advantage rested greatly on its technical superiority, its advanced industrial base, and its ability to compete based on time. This enabled the Admiralty to maintain its dominant position in the existing form of competition (e.g., wooden ships-of-the-line) without the need to engage in self-obsolescence by advancing to the next competitive regime any sooner than was absolutely necessary. Competitors could make the first move, as the French did in 1858, but the British were able to quickly follow and—this is most important—surpass the efforts of any competitor before they were able to achieve a meaningful advantage in the new war-fighting regime.

Unlike the British, other powers were unable to respond as vigorously to the French challenge, let alone overwhelm it. Russia proved slow to enter the iron age of ship construction. The United States, stimulated as well by the ongoing civil war between the Union and Confederacy, constructed some ironclads, which were inferior to their British counterparts in design and capability, owing to their wide steaming radius, smooth bore guns, and low freeboard.[30]

It is interesting that during this period of naval revolution the Royal Navy did not possess a large advantage in numbers over the French fleet. For example, by the 1870s Great Britain had only a 40-35 advantage in the number of ironclads built and under construction. However, the British fleet was still, by "all rational calculation," more than a match for its French counterpart. The more important point, however, in this period of rapid technological progression and hence, rapid obsolescence of warships, remained Britain's ability to compete based on time. For in addition to the deployed fleet, the Royal Navy's Constructors' Department had detailed plans for armor-plating existing timber ships to swell the number of ironclads quickly in the event any serious threat should develop.[31]

This combination of maintaining the most powerful fleet-in-being, combined with being able to expand it—or adapt it—more rapidly than any of its adversaries, exerted a strong dissuasive effect on Britain's maritime rivals. But the potential inherent in Britain's Second-Move Advantage was "perhaps the deciding factor [sustaining British maritime superiority] throughout the century."[32]

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[29] Padfield, *Battleship*, pp. 11-12.

[30] Freeboard is the side of a vessel between the water line and the main deck.

[31] Padfield, *Battleship*, pp. 61-62.

[32] Padfield, *Battleship*, p. 12.

Plunging

During the early 20th century Britain's Royal Navy enjoyed a dominant position comparable to that of the United States Navy today. When Admiral John "Jackie" Fisher assumed his post as First Sea Lord in 1905, Britain still possessed the largest, best-equipped and most technically advanced warship-building industry in the world. This meant Britain could build warships of cutting-edge design, and build them faster and in greater numbers than her rivals. As noted above, it was this ability that had enabled the Admiralty to pursue a strategy of the Second-Move Advantage during the periodic disruptions in the naval competition during the 19th century.

It was this ability that Fisher sought to exploit, but in a *different way and under new circumstances*, to maintain the Royal Navy's dominance in the maritime competition. His approach has been referred to as "plunging." As with the Second-Move Advantage, plunging looked to exploit the Royal Navy's ability to compete based on time to impose major costs on a rival maritime power. By this time, Britain's principal rival was Germany. Plunging differed from the Second-Move Advantage in that it embraced a willingness to move first to *shape* the maritime competition, and to set its pace (and, if possible, its direction), rather than react to rival initiatives.[33] The classic example of plunging is found in Fisher's decision to build the first modern battleship, *HMS Dreadnought*, in 1905.

Dreadnought was Fisher's test case. He wanted to build the ship in half the time it typically took to construct a battleship. In approving its construction, the Board of the Admiralty was determined to exploit Britain's comparative advantage in rapid construction "to the utmost."[34] Through reforming labor practices in the dockyards, and ordering critical path components, such as big-gun mounting and turbine engines, several months before placing the contract for the hull, the Admiralty dramatically reduced construction time. The keel plates for the *Dreadnought* were laid on October 2, 1905, and she was launched on February 10, 1906. A year and a day after her start, the *Dreadnought* began her sea trials. Fisher succeeded in cutting the normal building time for a battleship—in this case, a radically different and more powerful battleship—by more than half.[35]

The new battleship was in a class all its own, and in more ways than one. While earlier battleships steamed at a maximum of 18 knots, the *Dreadnought*, incorporating new turbine engines in lieu of the then-standard reciprocating engines, steamed at 21 knots, and sustained high speeds over much longer distances than her counterparts.[36] Remarkably, the price of the *Dreadnought* was only slightly higher than that of earlier battleships. Yet her all-big gun armament—she boasted ten 12-inch guns to her nearest competitor's four—gave her a long-

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[33] Holger H. Herwig, "The German Reaction to the Dreadnought Revolution," *The International History Review*, XIII, 2, May 1991, p. 282.

[34] Nicholas A. Lambert, *Sir John Fisher's Naval Revolution* (Columbia: University of South Carolina Press, 2002), p. 146.

[35] Padfield, *Battleship*, p. 189.

[36] Fairbanks, "Choosing Among Technologies," p. 127; and Ronald H. Spector, *At War At Sea* (New York: Viking, 2001), p. 27.

range striking capability equal to two or three other battleships.[37] So advanced was *Dreadnought* that her name became a generic term for modern battleships, whilst the ships she made obsolete became known as "pre-dreadnoughts."

Fisher's coup realized two advantages. First, it gave the Royal Navy a near-term monopoly in this revolutionary new capital ship. Second, and even more important from Fisher's perspective, and for the purposes of an indirect dissuasion strategy, it disrupted the shipbuilding efforts of Britain's principal rivals, the Germans, both delaying their fielding of new capabilities, and diverting resources from that effort as well.

A new supplementary navy bill, just approved by Kaiser Wilhelm II, was about to be submitted to the Reichstag in November 1905. The appearance of the *Dreadnought* tossed the German naval program into utter disarray. As the *Dreadnought* was emerging from the drawing board, Germany was launching the *Deutschland*, the first of five planned new German battleships. These ships, with their four 11-inch and fourteen 6.7-inch guns, and 18-knot speed, would be inferior even to some of the Royal Navy's pre-dreadnought battleships. To follow the *Deutschland* class, the Kaiser's admirals were planning two larger ships of sixteen thousand tons with mixed armament (eight 11-inch guns and twelve 7.6-inch guns). The Germans, confronted with this new, powerful warship, faced a dilemma: continue with their plans to build battleships that were now clearly inferior to the *Dreadnought*, or drastically reorient their shipbuilding plans.

Dreadnought also exploited an enduring German weakness, geography, to impose costs. The Kiel Canal, which provided the Imperial German Navy with a critical shortcut between the North Sea and the Baltic Sea, was too small for ships the size of the *Dreadnought*. If Germany wanted to match the *Dreadnought*, the canal would have to be enlarged. This would require years of effort and enormous expense. Consequently, as news of the planned size, speed, and armament of the *Dreadnought* reached Fisher's German counterpart, Admiral Alfred von Tripitz from his naval attaché in London, Captain Carl von Coerper, "something close to panic ensued."[38]

Tirpitz secluded himself for months with his most trusted advisors to discuss how to respond to the *Dreadnought* challenge. The consensus was that Germany should meet the British challenge, even if this required expanding all existing canal and dock facilities. Fisher's strategy was thus a "cost-imposing strategy," in that it exploited an enduring source of German competitive weakness—the limitations imposed on ship design by the Kiel Canal—to impose substantial cost penalties should Germany decide to meet the British initiative. Fisher's gambit also imposed a penalty in terms of time. By moving the naval competition in a dramatic new direction, Fisher

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[37] Herman, *To Rule the Waves*, p. 483.

[38] Massie, *Dreadnought: Britain, Germany and the Coming of the Great War* (New York: Random House, 1991), p. 485; and Herwig, "The German Reaction to the Dreadnought Revolution," pp. 277, 279-80.

cost the Imperial German Navy roughly a year's time as Tirpitz was forced to reassess his position.[39]

To Fisher, this seizing of the "first-move advantage" to disrupt the naval plans of his rivals was not intended to be a one-time affair, but an ongoing practice, as long as technology continued to progress at a rate that would supply him with ever-new options. For example, Fisher also hoped that his revolutionary new class of battle cruisers, which he planned to build as the successor to the *Dreadnought*, would once again toss his adversaries' schemes into disarray. As he wrote to an associate in 1909:

> Do you know that the ships we have just laid down are as far beyond the Dreadnought as the Dreadnought was beyond all before her! And they will say again, D---n that blackguard [i.e., Fisher]! Again a new era of Dreadnoughts! But imagine the German "wake-up" when these new ships [the fast battlecruisers] by and by burst on them![40]

Later, Fisher would summarize his thinking on plunging to Winston Churchill, who assumed the position of First Lord of the Admiralty in 1911, shortly after Fisher retired from the Navy. By launching ships that were substantially superior in quality to anything then afloat, Fisher declared, the Admiralty could compel other navies to reconsider their own ship-building plans. If the Admiralty's plans were not revealed until the last possible moment, the disarray produced among Britain's rivals could enable the Admiralty to slow its own naval construction program for a year and perhaps longer, providing economies to the naval estimates. The "whole secret" of successful naval administration, Fisher concluded, "is 'plunging'—it stupefies foreign Admiralties."

> . . . [P]ut off to the very last hour the ship (big or little) that you mean to build (or perhaps not build her at all!). You see all your rival's plans fully developed, their vessels started beyond recall, and then in each individual answer to each such rival vessel you PLUNGE with a design 50 per cent. better! knowing that your rapid shipbuilding and command of money will enable you to have your vessel fit to fight as soon if not sooner than the rival vessel.[41]

In retrospect, for the purposes of dissuading competition, the "Second-Move Advantage" strategy was well-suited for a dominant power that could compete effectively based on time. By the time Fisher arrived on the scene, however, Britain's material dominance was rapidly fading. The Royal Navy could no longer vastly out-build its rivals. The competition, especially the Germans, now had the resources to compete. Thus Fisher sought to practice dissuasion through

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[39] Massie, *Dreadnought: Britain, Germany and the Coming of the Great War,* p. 486; and Herwig, "The German Reaction to the Dreadnought Revolution," p. 278.

[40] Jon Tetsuro Sumida, "British Capital Ship Design Fire Control in the Dreadnought Era: Sir John Fisher, Arthur Hungerford, and the Battle Cruiser," *Journal of History*, Vol. 51, No. 2, June 1979, p. 221.

[41] Nicholas A. Lambert, *Sir John Fisher's Naval Revolution* (Columbia: University of South Carolina Press, 2002), p. 246.

more indirect means, by imposing costs on his competitors and creating uncertainty in the minds of his rivals.[42]

Following in Anglo-Roman Footsteps?

Interestingly, the United States seems to have adopted (or seeks to adopt) some of Rome and Britain's strategic dissuasion techniques. The Bush Administration has embraced the concept of preventive war and what some might arguably consider disproportionate retaliation (e.g., overthrowing the Taliban regime). The US command over money (a $400 billion defense program) and the world's most sophisticated defense industrial base recalls Britain's use of the same to dissuade maritime competition. The United States would appear to be well placed to dissuade competition because of the following advantages:

- Scale (i.e., the magnitude of its defense spending and the sheer size of its standing air, ground, and naval forces);

- Technical diversity (i.e., the capacity to produce a greater range of capabilities than its competitors);

- Alliances (i.e., the United States has most of the world's advanced industrial states as allies, effectively precluding efforts by rivals to form coalitions that might challenge the US advantage in scale and diversity);

- Trust (i.e., the United States is thus far a widely trusted keeper of the global commons; e.g., freedom of access to the seas and space)[43]; and

- Performance (i.e., the US military has, for over a decade now, crushed all opposition attempting to challenge its dominance in traditional areas of military competition).

In short, the historically unrivaled predominance of the international system that the United States currently enjoys provides unusually wide opportunities for dissuasion. In this "unipolar" world, second-tier states have a powerful incentive to align their policies with the preferences of

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[42] At the time, some argued Fisher was *encouraging* competition with his *Dreadnought*, rather than dissuading it. The ship was so revolutionary, they argued, that it obsolesced all existing battleships, in which Britain had a substantial numerical superiority. By essentially restarting the battleship competition at zero, the argument went, it became easier for other navies to enter the competition, producing the opposite effect of dissuasion. In reality, however, other navies were already beginning to move toward battleships with *Dreadnought*-like qualities. As Fisher realized he could not overwhelm the competition in terms of his scale of effort, he tried to shape the competition and impose costs where he could by drawing upon his advantages in technology, industrial base, and the capacity to compete based on time.

[43] Great Britain also had a similar reputation during its period of dominance. The Royal Navy took it upon itself to maintain free trade and access to the oceans; to police the slave trade; to combat pirates; and to map the world's oceans.

the sole pole (i.e., to "bandwagon" with the United States) or, at least, to take no action to incur its focused enmity.[44]

Since the collapse of the Soviet Union, no country or alliance of states has been both willing and able to develop the military capabilities needed to challenge the United States in the currently dominant methods of conventional warfare (e.g., mechanized, combined arms land warfare; manned, tactical aviation; and aircraft carrier-centric, "blue-water" maritime operations). Instead, the competition has been driven either to the extremes of the conflict spectrum (e.g., acquisition of WMD, irregular warfare, and terrorism) or to asymmetric competition in the realm of "mainstream" conventional operations (e.g., by pursuing anti-access/area-denial capabilities). Thus, the United States is confronted with the challenge of dissuading competition in areas that might, over time, jeopardize its current dominance of the conventional warfare regime, while also dissuading states and non-state actors alike from investing in WMD and threatening asymmetric capabilities and tactics.

[44] William Wohlforth, "The Stability of a Unipolar World," *International Security*, Vol. 24, No. 1, Summer 1999, pp. 23–28.

II. A Dissuasion Strategy Framework

As noted above, the goal of dissuasion is to increase the target's perception of the anticipated costs and decrease its estimate of the benefits that would likely accrue from developing, expanding, or transferring a military capability considered threatening or otherwise undesirable from the US perspective. It is assumed that if the anticipated costs significantly outweigh the benefits, a rational decision-maker would be dissuaded from engaging in such activity. However, as with deterrence, the way in which senior US decision-makers evaluate costs and benefits may not seem "rational" to America's rivals. Thus understanding how the target perceives the world and evaluates the pros and cons of alternative courses of action is critical to implementing a successful dissuasion strategy. What might appear to be "irrational" to US observers could be entirely logical when viewed through an analytic lens shaped by the target's culture, religious beliefs, personal jealousies, life experiences, and other psychological factors (e.g., the degree of stress to which the target is exposed). Moreover, when the target is a state or an institution rather than an individual (or a small group), decisions may not necessarily be "value maximizing" owing to range of other factors, including bureaucratic biases, institutional rivalries, skewed decision-making processes, and "strategic culture."[45]

Presuming that the target is rational, and that the US intelligence community has some insight into its decision-making processes, a variety of instruments might be used to manipulate its cost-benefit calculus (see Table 1 below). The remainder of this chapter focuses on these instruments and how they might be applied in a generic sense to convince competitor states that, in terms of trying to compete with the United States, "the game is not worth the candle."

[45] See Graham T. Allison, *The Essence of Decision* (Boston: Little, Brown and Company, 1971).

Table 1 – Notional Dissuasion Framework

Elevate the Target's Perception of Probable Costs	Diminish the Target's Anticipated Benefits
Economic Costs • Leverage multilateral export controls • Exploit US scale and diversity advantages • Compel investments in facility security, expanded arsenals, and countermeasures • Threaten to damage/destroy costly infrastructure • Pursue cost-imposing competitive strategies	**Convince the Target that the Capability it Seeks is Not Survivable** • Develop and field the capabilities needed to disable/destroy all relevant classes of targets • Demonstrate US capabilities in field exercises and/or in current operations
Diplomatic Costs • Take advantage of the target's arms control and other diplomatic commitments • Avoid being the "first mover" into contentious areas, legitimating foreign competition	**Develop and/or Field Active and Passive Defenses** • Diminish the anticipated effectiveness of the target's planned offensive capabilities
Military Costs • Increase the perceived probability of detecting covert weapons programs • Maintain capabilities for and convey a willingness to conduct preventive strikes, and if necessary, wage preventive wars	**Change the Nature of the Competition** • Develop and field new capabilities that render the target's systems obsolete • Develop new operational and organizational concepts that reduce the relevance of the target's capability

ELEVATE THE TARGET'S COST PERCEPTIONS

Developing and expanding a military capability not only entails direct economic costs, but also involves diplomatic and military costs and risks. In each area, different levers are potentially available to drive up the target's estimate of prospective costs. Some of these levers may increase costs in two or more areas simultaneously. For instance, the threat of preventive strikes against a target's weapons research, development, and production infrastructure would not only drive up the military costs involved in attempting to develop or expand a given capability, but also the target's perception of the potential economic and political costs involved. Similarly, the diplomatic cost associated with abrogating international agreements to develop a threatening capability could spill over into the other two areas by providing the justification for broad economic sanctions or internationally authorized military operations.

Economic Costs

Fielding a new military capability or augmenting an existing one is often an expensive proposition. Steps taken to increase costs further may tip the scales in favor of those who believe the price has simply become too high to proceed. There are a range of economic tools available to achieve this dissuasive effect. For example, multilateral export controls and supplier regimes can increase the cost and time required to acquire technologies and materials critical for developing a new military capability.

Consider the Nuclear Suppliers' Group, Australia Group, and the Missile Technology Control Regime (MTCR). While all three are far from foolproof in blocking the transfer of sensitive technology, they have unquestionably made it more expensive and time-consuming for states to develop nuclear, chemical, and biological weapons, as well as ballistic and cruise missiles for delivering them. Although determined competitors may acquire the necessary technology through clandestine networks (e.g., setting up ostensibly legitimate "front" companies to procure restricted technologies in foreign countries), or through indigenous development programs, these paths are considerably more costly than unrestrained technology acquisition from abroad. To increase these regimes' dissuasive effects, the United States could elicit the cooperation of additional states capable of producing sensitive technologies; widen the range of restricted technologies; and most importantly, encourage more rigorous enforcement of current export-control guidelines. This last tactic might prove especially important in dissuading countries like North Korea from transferring nuclear weapons or fissile materials to other states or entities. Finally, the United States could establish export control regimes in emerging areas of concern (e.g., radio-frequency weapons, robotics, and information warfare capabilities) as a means for dissuading rivals by putting high acquisition barriers in place before a market develops for these technologies.

Another method for increasing a rival's anticipated economic costs centers on the US military pursuing a vigorous military research and development (R&D) program and continually modernizing its military forces. In so doing, the United States exploits its enduring advantages in the scale of its military effort (i.e., its enormous defense budget) and in the diversity of capabilities it is able to field, thanks to its incomparable defense industrial base. By presenting rivals with the need to address a wide range of military competitions (e.g., air-to-air combat, anti-submarine warfare, and precision attack) and warfare dimensions (e.g., sea, undersea, space, and air) of the battlespace, rivals are confronted with a "barrier to entry" that is already high, and likely to grow higher still. Under these circumstances, states might conclude that the costs involved in competing directly with the United States would be prohibitive. An analogy might be drawn to small companies with limited capital; few would be attracted to compete in a multi-product market in which a massive, vibrant firm already enjoys a monopoly position across a diverse and ever-expanding product line.

The dissuasive effects of the sheer scale of the US military are in evidence today. No competitor seeks to challenge the US for supremacy of the "global commons": space, the sea and the

undersea domains. At best, a few competitors may be pursuing strategies of denial.[46] Nor is any state looking to challenge the United States in traditional warfare areas, such as mechanized warfare or air-to-air combat. The sheet size of the US military in tandem with its ability to combine different warfare elements (e.g., air power in support of mechanized combat) has made the cost of competing prohibitive for any rival, for the foreseeable future.

Nevertheless, although the US defense budget, which is now over $400 billion per year, exceeds that of the next fifteen largest defense budgets combined, it is finite. It is simply impractical for the US military to maintain or enhance its position in every conceivable area of competition. It is important, therefore, for senior defense officials to focus on those areas that are critical to current military effectiveness or that seem likely to yield a high return in the future. Military systems whose utility is declining in the current environment, or in the most important future warfighting scenarios, and those systems that are redundant with other assets performing the same mission as well or better, should be divested. These "divestment savings" can be better invested in rapidly growing "markets" (e.g., unmanned systems, next-generation stealth, advanced sensors, high-speed computing), as well as in long-term, high-payoff R&D initiatives (e.g., directed energy, nanotechnology, and biotechnology).

By creating a wide range of future military options in existing and emerging areas of competition through a vigorous R&D program, the United States could "steal a march" on existing and potential rivals, experimenting with and fielding new capabilities well ahead of them. Moreover, a broad portfolio of capability options from which senior defense decision-makers could pick and choose depending on the character of the future security environment would dramatically complicate the defense planning of would-be competitors. In short, by raising a rival's uncertainty as to how the United States might compete, the risk that the rival might develop a capability that is of marginal utility in the military competition increases. This raises the prospect that a rival may anticipate less benefit than it had hoped from developing a particular military capability. Of course, all other factors being equal, the lower a rival's anticipated benefits are from pursuing a military capability, the greater the chances that it can be dissuaded.

The anticipated economic cost associated with developing, expanding, or transferring a capability targeted for dissuasion can be increased by military means as well. The perceived ability and willingness of the United States (or its allies) to conduct preventive strikes to derail threatening weapons development programs (e.g., Israel's 1981 attack on Iraq's Osirak reactor), for example, could convince states interested in such programs that they must invest in costly defenses and countermeasures. Thus, in addition to the direct expense involved in developing a given military capability, the target would need to add the substantial cost of such measures as dispersing, hardening (e.g., building facilities underground), and defending critical development and production facilities.

Fielding (or threatening to field) defenses against the capability targeted for dissuasion could pose the problem for a rival of having to greatly expand the scale of his efforts to counter or

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[46] The country most often cited as interested in a strategy of denial is China. See Office of the Secretary of Defense, *Annual Report to Congress: Military Power of the People's Republic of China, (2006),* pp. 24-36.

overwhelm those defenses. By so doing, the United States could affect a competitor's perception of the anticipated costs and benefits of developing a given capability. Consider, for example, a country contemplating the decision of whether or not to develop a ballistic missile arsenal. The estimated cost of developing an effective offensive missile capability would increase significantly if the target believed that its principal opponent was in a position to deploy a missile defense system that could only be offset by incorporating expensive countermeasures (e.g., stealth, penetration aids) or amassing an arsenal large enough to saturate the defenses. The cost could be increased further if, along with fielding missile defenses, the United States diversified its forward "footprint" by fielding highly networked, highly distributed forces that prove difficult to target with missile forces.

Competitive Strategies

An adversary's perception of the estimated cost of developing or expanding a threatening capability can also be driven upward by diverting its available resource stream into higher priority areas. This indirect means of dissuasion was a central feature of the "competitive strategies" approach to long-term competition with the Soviet Union during the Cold War.[47] One cost-imposing approach involves developing capabilities that encourage a rival to invest in costly, relatively benign defensive systems. For example, during the latter part of the Cold War the United States had fielded a large land- and sea-based ballistic missile force against which the Soviet Union had no effective defenses. The Soviet Union also had fielded a large ballistic missile force that the United States could not counter effectively by employing antiballistic missile (ABM) defenses. Realizing this, Washington not only declined to deploy the missile defense system it was permitted by the ABM Treaty, but also dismantled the Army Air Defense Command (ARADCOM), the nation's primary defense against attack by Soviet bombers.

The Soviet Union, however, not only deployed the missile defense system allowed them by treaty, but maintained extensive air defenses against attack by American bombers. This puzzled Washington, since from the US perspective it would do the Soviets little good to spend large sums maintaining an air defense system in the absence of an effective antiballistic missile system. It would be akin to trying to keep the flies out of one's home by installing a screen door in a house but leaving the windows open.

Speculation as to why Moscow would pursue such a path ranged from Russia's long experience with foreign invasions that produced a "strategic culture" which gave high priority to any form of defense[48] to PVO Strany, the Soviet military command responsible for air defense (and which, interestingly had no US military counterpart), was highly effective bureaucratically in advocating the need for defenses? Or perhaps something else?

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[47] For a general overview of the competitive strategies approach to defense planning during the Cold War, see David I. Andre, *New Competitive Strategies Tools and Methodologies—Volume I:* (b)(5)
(b)(5)

[48] For an overview of strategic culture, see Alastair Iain Johnston, "Thinking About Strategic Culture," *International Security*, Spring 1995, pp. 32-64.

No matter what the reason, for the Soviets, fielding, maintaining and upgrading a modern air defense system against the world's most formidable air force was an expensive proposition. Made all the more so by the Soviet Union's long borders. Although the United States could not understand the strategic logic behind the Soviet's actions, it became determined to exploit it for the purpose of dissuasion. Consequently, the US continued upgrading its bomber force, first with the B-1B Lancer and then with the B-2 Spirit stealth bomber. By continuing to field new bombers, the United States gave voice to those in the Soviet Union who argued for sustaining the air defense system. Huge sums of money that could have been invested in far more threatening capabilities—for example, nuclear strike systems, advanced submarines, or next generation armor—were instead funneled into Soviet air defenses, a relatively benign (and easily defeated) capability.

Similarly, American advantages in anti-submarine warfare (ASW) capabilities convinced the Soviets to devote extensive resources to counter-ASW capabilities and reinforced the Soviet Navy's defensive orientation, which found its ballistic missile submarines huddled in bastions near the USSR. The logic here again centers on exploiting sources of enduring US competitive advantage aligned with a rival's enduring weakness. The United States possessed a significant and longstanding advantage over the Soviet Union in the technologies and systems associated with ASW. The Soviets, meanwhile, had to confront an enduring weakness: owing to geography, Soviet submarines were forced to transit well defined chokepoints to reach the open ocean, dramatically reducing US search requirements. Confronted with the enormous costs associated with even attempting to overcome this problem, Moscow opted to keep its nuclear ballistic missile fleet in bastions close to home. This prevented them from locating to more advantageous locations—ones that would have reduced US warning time, complicated US defenses and allowed the Soviets to field submarine-launched ballistic missiles with reduced ranges.

Another cost-imposing strategy involves developing capabilities to render obsolete an adversary's existing military forces and doctrine. For example, the application of stealth technology to American aircraft threatened to obsolesce the Soviet Union's massive investment in radar-guided air defenses. Again, as long as the Soviets were determined to persist in fielding air defenses, the United States' fielding of ever more capable bomber aircraft would exacerbate their problem. By developing the stealthy B-2 bomber, Washington confronted Moscow with the prospect of having to increase dramatically the density of its air defense network (to cover the radar coverage gaps arising from the B-2's stealthy characteristics), or develop and field new radar systems capable of detecting stealthy aircraft at a level of effectiveness comparable to the ability of existing air defenses against non-stealthy aircraft. Either way, the Soviets were confronted with a very expensive proposition.

Diplomatic Costs

Arms Control

In theory, one means for increasing the diplomatic costs attached to the development, expansion, or transfer of a threatening capability involves persuading competitors to commit publicly to formal arms control and nonproliferation agreements. For example, while the Nuclear Nonproliferation Treaty (NPT), Chemical Weapons Convention (CWC), and Biological

Weapons Convention (CWC) all have clear shortcomings (e.g., inadequate verification and poor enforcement), they do provide a basis for rebuking diplomatically those states that are caught violating them. Abrogation of these international commitments could also be used to justify economic penalties, or perhaps even military action.

There are many historical precedents for pursuing self-serving arms control agreements to dissuade rivals from competing in certain areas. The Royal Navy, for example, used the Washington Naval Treaty of 1922 to extend the life of its waning maritime supremacy. At that time London was the beneficiary of a major buildup of its naval capabilities that had extended from roughly 1905 to the end of World War I. Post-war economics made it all but impossible to modernize the Royal Navy, even though naval-related technologies continued to progress at a rapid rate. The British Admiralty therefore sought to lock in its advantageous position by dissuading other maritime powers—the United States and Japan in particular—from building up their naval forces. The Washington Treaty, which forbade, among other things, the construction of new battleships, and placed strict limits on aircraft carriers, served Britain's interests admirably.[49]

Arms control agreements that initially seem promising, however, sometimes have unintended long-term consequences. For instance, the United States is currently prevented by the Intermediate-Range Nuclear Forces (INF) Treaty from developing or flight testing any ground-launched ballistic or cruise missile system, regardless of the type of payload (e.g., nuclear or conventional), with a range between 500 and 5,500 kilometers.[50] With a maximum range in excess of 300 kilometers, the Army Tactical Missile System (ATACMS) is not far from that threshold. Given current trends, the Army's ability to increase the range of its precision striking power will probably bump up against INF limitations. Similarly, developing certain biotechnologies that could be militarily valuable in the future may be constrained by the Biological Warfare Convention (BWC) signed in 1972, or well before the "revolution in biotechnology" that is now beginning to blossom. Until its abrogation recently, the Anti-Ballistic Missile (ABM) Treaty signed by President Nixon and General Secretary Brezhnev during the height of the Cold War was a major impediment to the development of effective defenses against emerging ballistic missile threats, such as the one posed by North Korea. In short, while the United States should consider how international arms control and nonproliferation agreements might be used to dissuade states from entering particularly sensitive areas of future competition (e.g., the fielding of anti-satellite (ASAT) weapons or radio-frequency (RF) weapons), equal consideration must be given to avoid constraining US development of capabilities that might prove important to its overall future military effectiveness.

As it possesses far and away the world's most formidable military, the United States should look to exploit this premier status for the purpose of dissuasion. Other militaries could "ape" US

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[49] "Treaty Between the United States of America, the British Empire, France, Italy, and Japan, Signed at Washington, February 6, 1922," http://www.ibiblio.org/pha/pre-war/1922/nav_lim.html, accessed on November 28, 2006.

[50] Thomas Risse-Kappen, "Did Peace Through Strength End the Cold War?," *International Security*, Vol. 16, No.1, Summer 1991, pg. 165.

military developments for two reasons. First, they may want to field advanced capabilities similar to those fielded by US forces as a sign of prestige. Second, by demonstrating that a new capability is both *possible* to field, and *effective* as well, competitors are able to reduce the costs associated with its development by simply "following-the-leader" and avoiding any dead ends or false starts encountered by the Americans in the course of their development process. To be sure, there may be cases where America's rivals will want to pursue new capabilities irrespective of whether the United States has fielded them. However, US defense planners should not lose sight of the dissuasive effect that their inaction may have on the competition.

The United States should generally avoid being the first country to field military capabilities which, if other countries followed suit, would undermine America's overall (or "net") strategic position. By openly fielding such capabilities, the United States not only reveals that it considers them to be worthwhile investments, encouraging others to develop them, but also provides valuable political and diplomatic cover to its competitors.[51] Although they may develop and field disruptive capabilities regardless of what America does, adversaries should be forced to shoulder the full diplomatic and economic burden of their actions.

For example, during the last few decades of the 19th century, the Royal Navy intentionally conveyed a "studied disinterest" in torpedoes and submarines to discourage competitors from investing in them and potentially obsolescing British investments in state-of-the-art capital ships.

Disruptive technologies that the United States might officially downplay for similar reasons could include, for example, Directed Energy (DE) weapons, RF weapons, space-denial capabilities, and low-yield nuclear weapons. Just as the British secretly funneled significant resources into submarine and torpedo R&D while feigning disinterest in them, the United States might quietly pursue the R&D necessary to respond quickly if and when the capabilities are needed. This response, however, need not be symmetrical. As a competitive strategy, the United States could intentionally wait until an adversary had sunk significant funding into the development and fielding of an offensive capability before revealing a new American capability that neutralized or offset it, thereby "wrecking" an adversary's investment flow and dissuading him, and others, from trying to compete.

Military Costs

Were the United States to develop a track record of dealing effectively with rivals that sought to develop proscribed capabilities (e.g., by conducting preventive strikes, waging preventive wars, or responding massively when dissuasion had failed), this could preclude competitors from fielding threatening capabilities by increasing the economic and temporal costs associated with such endeavors, and the targeted state's perception of military risk as well.

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[51] The United States might find it useful, however, to feign interest in a new technology that it has already determined to be a "dead end" in order to induce competitors to waste resources trying to develop it. For example, there have been a number of military capabilities that, in the eyes of their advocates, were embued with the potential to affect a dramatic change in the competitive balance but which never panned out. Among them are air ships, flying-deck cruisers, and atomic powered aircraft.

Even if a rival employed extensive (and expensive) cover, camouflage, concealment, denial, and deception (C3D2) techniques, it could not wholly eliminate the possibility that its program would eventually be discovered. There would be a risk, therefore, of inviting a US preventive strike or providing the justification for a preventive war to block the development of the proscribed capability, or even unseat the regime in power. If foreign leaders perceive that the probable military cost is sufficiently high (e.g., destruction of expensive research installations, key defenses, fielded forces, and security infrastructure critical to regime survival), they may be unwilling to hazard the development of a proscribed capability, even if the risk of detection is low. Steps taken by the United States to increase the probability of detection (e.g., fielding new types of sensor systems or expanding its human intelligence capabilities) would, of course, make this dissuasive effect all the more potent, as would a US "track record" of dealing promptly and effectively with the perpetrator. Unfortunately, the US Intelligence Community's track record in detecting an adversary's development of proscribed capabilities (e.g., WMD) has been generally unimpressive in recent years. For example, US intelligence greatly underestimated the state of Iraq's nuclear weapons program prior to the First Gulf War, and greatly overestimated it prior to the Second. It was North Korean officials, not US intelligence who revealed that their country had broken the agreement not to produce weapons grade fissile material.[52]

The effectiveness of this instrument of dissuasion depends critically upon the perceived willingness and ability of the United States (or its allies) to initiate preventive strikes/wars to derail the development of threatening capabilities by prospective adversaries, and to see these efforts through to successful conclusions. Following the 9/11 attacks the American public proved willing to sanction preventive war. This was demonstrated in Operation Iraqi Freedom, which the Bush Administration embarked upon despite significant international political opposition. The US military's ability to bring about regime change at a relatively low cost in terms of collateral damage and friendly casualties has been repeatedly demonstrated over the past two decades, beginning with the removal from power of Manuel Noriega in Panama in 1989, the forced abdication of Serbian President Slobodan Milosevic in 2000, the overthrow of the Taliban regime in Afghanistan in 2001, and most recently, the destruction of the Ba'athist regime of Saddam Hussein in 2003. Following the US invasion of Iraq in 2003, Libya decided to abandon its WMD program, which some linked to the Bush Administration's determination to block Iraq's efforts to develop WMD.

Yet it is far from clear that the United States overall track record is sufficiently robust for the purpose of dissuasion. Detracting from this track record is the US withdrawal from Somalia in 1993 after 18 American soldiers were killed and 84 wounded during a 17-hour urban battle in Mogadishu, leaving Somali warlord General Mohamed Farah Aideed in power. Given mounting American casualties during the stability and reconstruction phase of ongoing US operations in Afghanistan and Iraq, as well as the financial cost of rebuilding their dilapidated infrastructures, the political willingness of the United States to wage additional preventive wars, especially anytime soon, is uncertain. The uncertain manner in which the United States is responding to the threat posed by North Korea's openly declared nuclear weapons development program and Iran's

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[52] James Brooke, "A Nuclear North Korea: Japan and South Korea; North Korea's Revelations Could Derail Normalization, Its Neighbors Say," *The New York Times,* October 18, 2002, p. 8.

ongoing efforts to enrich uranium will likely have a significant impact on how other would-be proliferators perceive the credibility of the American commitment to prevent such programs from reaching maturity. The US Intelligence community's poor track record in detecting and evaluating rival efforts to develop nuclear weapons, combined with the absence of progress in stabilizing the situation in Iraq, has greatly eroded the American public's willingness to support preventive action. Yet if North Korea and Iran are allowed to continue their nuclear development programs, other states with WMD aspirations may view the threat of US preventive action as less credible, further diminishing its dissuasive effect.

Diminish the Target's Perception of Anticipated Benefits

In addition to increasing the projected costs involved in developing or expanding threatening capabilities, an effective dissuasion strategy should also seek to reduce the benefits that the target believes would flow from such actions. This side of the cost-versus-benefit equation can be influenced by, among other things, holding adversarial capabilities at risk, fielding active and passive defenses, and by threatening to change the character of the competition.

Hold Adversarial Capabilities at Risk

Prospective adversaries may decide to forego developing or expanding a capability if they believe that it would ultimately not be survivable, and thus not employable for its intended purpose. The goal is to make rival decision-makers question the wisdom of expending resources on capabilities that could be easily neutralized in the event of future hostilities. The vulnerability of critical enabling systems might be conveyed through diplomatic channels, highlighted in military field exercises and wargames, or demonstrated in ongoing US military operations in other theaters.

During the Cold War, for instance, the United States was dissuaded from continuing to invest in developing and fielding active ballistic missile defenses because there was no practical way to preserve their effectiveness against Soviet nuclear strikes, including high-altitude detonations that threatened to generate highly disruptive electromagnetic pulse (EMP) effects over the American homeland. The vulnerability of US ABM battle management radars to Soviet strikes was of particular concern, as was Moscow's ability to saturate any US defensive system simply by deploying more nuclear-armed ballistic missiles.

This raises the question: What lessons about military system vulnerability have prospective adversaries gleaned from US military operations over the last decade? One could speculate, for instance, that their confidence in the survivability of surface ships, tactical aircraft, and mechanized ground forces has been badly shaken.

During Operation Desert Storm in 1991, 143 out of the 178 vessels in the Iraqi navy were damaged or destroyed, most of them within the first weeks of the war.[53] Since then, no adversary has attempted to engage the US Navy with its surface combatants.[54]

During the First Gulf War, Coalition air forces shot down 33 fixed-wing Iraqi aircraft, 14 of them in the first week of the war, while losing, at most, one aircraft to air-to-air fire.[55] Scores of Iraqi aircraft were destroyed on the ground. Similarly, in Operation Allied Force in 1999, Serbia discontinued air operations after six aircraft were shot down and roughly another 100 destroyed on the ground in the opening phase of the campaign.[56] Since then, no enemy fighters have risen to challenge American air superiority.

The survivability of mechanized ground forces, including heavily armored vehicles, has been significantly reduced by increasingly sophisticated US intelligence, surveillance, and reconnaissance (ISR) systems combined with an ever-expanding array of precision-guided munitions (PGMs). The "tank plinking" capability of US forces, first demonstrated in Operation Desert Storm, has improved dramatically over the past decade. Within the first two weeks of Operation Iraqi Freedom, two reinforced Iraqi divisions defending Baghdad were reduced to substantially less than 50 percent of their original combat strength by precision air power.[57] The Medina Division, located southwest of Baghdad, was reportedly reduced to less than 20 percent strength.[58] Of the 800-plus tanks that the Republican Guard fielded at the start of the war, "all but a couple of dozen" were destroyed by air strikes or abandoned in place by the third week of the war.[59]

In short, given the US military's enormous preponderance in traditional military capabilities, it is easy to see why both existing and potential rivals, to include major powers at what the Pentagon calls "strategic crossroads," are dissuaded from developing similar capabilities of their own.

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[53] See Thomas Keaney and Eliot Cohen, *Gulf War Air Power Survey—Summary Report* (Washington, DC: GPO, 1993), pp. 99–101.

[54] Al Qaeda did, however, use a small powerboat to target the USS *Cole* while in the port of Aden.

[55] Keaney and Cohen, *Gulf War Air Power Survey—Summary Report*, pp. 13, 58.

[56] DoD, *Kosovo/Operation Allied Force After-Action Report to Congress* (Washington, DC: DoD, January 2000), p. 69.

[57] Most of this destruction took place over the course of four days. General Richard Myers, DoD News Briefing, April 1, 2003. See also: Bradley Graham, "U.S. Air Attacks Turn More Aggressive," *Washington Post*, April 2, 2003, p. 24; and John Diamond and Dave Moniz, "Air Campaign Shifts Aim to Guard," *USA Today*, April 2, 2003, p. 4.

[58] Rick Atkinson, Peter Baker, and Thomas E. Ricks, "Confused Start, Swift Conclusion," *Washington Post*, April 13, 2003, p. 1.

[59] General Richard Myers, DoD News Briefing, April 7, 2003. Reflecting on the rapid destruction of Iraqi tanks, armored personnel carriers, tracked vehicles and enemy positions by precision air power, Colonel Michael Longoria, commander of the Air Force's 484th Air Expeditionary Wing, commented: "when you can destroy over three divisions worth of heavy armor in a period of about a week and reduce each of these Iraqi divisions down to even 15, 20 percent of their strength, it's going to have an effect." Stephen Hedges, "Air War Credited in Baghdad's Fall," *Chicago Tribune*, April 22, 2003.

A similar phenomenon occurred in the mid-19th century, albeit on a more limited scale. The period coincided with the *Pax Britannica*, when Great Britain's relative economic advantage was at its greatest. The sheer size of Britain's economy, combined with its government's superior ability to tap the world's financial markets, its technologically advanced shipbuilding industry, and its ability to build warships of high quality more rapidly than any rival dissuaded the other European powers from attempting a direct challenge to the Royal Navy's mastery of the seas. Rather, they were consigned for decades to pursue the maritime version of guerrilla warfare: *guerre de course*, or commerce raiding, and other novel forms of warfare, such as the naval operations espoused by France's *Jeane Ecole*.[60]

The demonstrations of military capability in peacetime can also exert a dissuasive effect. For instance, future US field exercises and wargames could be intentionally scripted to demonstrate, as vividly as possible, the supposed vulnerability of worrisome capabilities that prospective adversaries are believed to be interested in developing or expanding. If necessary, these events could intentionally exaggerate the effectiveness of US capabilities.[61] To help dissuade states from developing chemical and biological weapons, for example, the US military might conduct a series of well-publicized "successful" demonstrations of earth-penetrator munitions armed with specially designed warheads for neutralizing chemical and biological agents. Similarly, exercises showcasing new US capabilities for hunting down and destroying mobile, time-critical targets

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[60] The *Jeune Ecole* (Young School) was the brainchild of Admiral Hyacinthe-Laurent-Theophile Aube, who became France's Minister of Marine in 1886. Aube was the leader of a school of naval thought that was radically different from the rest of the world's major navies at that time. Aube's vision comprised several main elements. Among them were his emphasis on "ruthless commerce-destroying on the high seas" against France's naval rival, Great Britain, and the use of dispersed naval forces that, when concentrated, would provide momentary superiority over the Royal Navy. Finally, Aube advocated the use of torpedo boats armed with guns, torpedoes or rams, as circumstances required, to defeat battle ships-of-the-line. Theodore Ropp, *The Development of a Modern Navy*, Stephen S. Roberts, ed. (Annapolis, MD: Naval Institute Press, 1987), pp. 155-61. Aube's response to the Royal Navy's dominance is instructive. Dissuaded from building a fleet that could challenge the Royal Navy directly (or symmetrically), France sought to alter the character of the competition. Thus the British Admiralty's success in dissuading direct competition induced a "second-order" effect. France did not cease competing; rather, it sought to compete differently. The problem of second-order effects will be addressed later in this report.

[61] Examples of one country's exaggerated view of the threat posed by a rival's military are numerous in history. Take the case of the 1950s "bomber gap." During the 1954 May Day parade in Moscow, the Soviets unveiled their first long-range bomber, the M-4 Bison. The following year, in July 1955, at the Red Air Force Day review, twice as many Bisons were observed as were seen in a review earlier that year. But this was a hoax designed to mask the Soviet Air Force's weakness. The ten Bisons that initially flew by the reviewing stand took a wide turn beyond visual range and were joined by eight others, whereupon together they made a second pass. The effect was to create the impression that the Red Air Force had a much larger bomber force than actually existed. Talk of a "bomber gap" between the Soviets and the Americans soon developed, and US Air Force intelligence reported that the Soviets would have between 600-700 bombers by decade's end. Fortunately, President Eisenhower discounted the intelligence estimates and refused to believe in the "bomber gap." However, the intelligence estimates on which the erroneous gap was based were leaked to the press. In the end the Congress increased the Air Force budget by nearly $1 billion to address the problem, and Eisenhower was forced to buy more B-52 bombers than he felt was necessary. This example raises several interesting issues related to dissuasion. First, it seems the Soviets may have been trying to deter any American thoughts of preventive war by building up the image of a formidable Red Air Force bomber arm. However, far from dissuading the United States from competing, the result produced a major buildup in the US strategic bomber fleet. John Newhouse, *War and Peace in the Nuclear Age* (New York: Vintage Books, 1990), pp. 110-11; and McGeorge Bundy, *Danger and Survival* (New York: Random House, 1988), pp. 337-39. Thus the key question is: How can an exaggeration of US capabilities best be used to one's advantage for the purposes of dissuasion? Any answer will rely, once again, on intelligence that provides a keen understanding of the way in which the intended target (or targets) calculate cost and advantage, what it fears, etc.

(e.g., mobile surface-to-air missile (SAM) systems and transporter-erector-launcher (TEL) vehicles for ballistic and cruise missiles) might reduce their attractiveness to rivals for serving as an effective means of evading American precision air power.

Field Active and Passive Defenses

Active and passive defenses can reduce a target state's estimation of the benefits that would likely flow from developing or expanding an offensive system. The attractiveness of any given offensive system very much rises and falls based upon how the target perceives the effectiveness (and affordability) of defensive counters to that system. Moreover, as long as the threat to deploy a defensive system is credible, it may not be necessary to actually field it on a large-scale in order to have the desired dissuasive effect.

For example, several prospective US adversaries are currently investing substantial resources into the development of ballistic and cruise missiles. They are motivated in part by the fact that missiles continue to be difficult to defend against, especially if they incorporate low-observable design features, decoys, and other penetration aids. If the United States managed to develop and test effective ballistic and cruise missile defense systems that could not be easily countered or saturated, then the attractiveness of missiles to obtain a military advantage against the United States would likely plummet. Thus, for example, if the United States vigorously pursues developing directed-energy weapons (DEW), which have the potential to yield a quantum leap in antimissile defense effectiveness, it could lead prospective rivals to shy away from emphasizing missile forces in their military arsenals. Of course, if the United States tests a DEW system successfully, or deploys such a system, the dissuasion effect would likely be far greater.

Change the Character of the Competition

Another way to reduce the benefits of developing or expanding a new military capability is to threaten to change the character of the military competition between the United States and its rivals. Developing new US capabilities, operational concepts and organizational structures for executing those concepts, or a combination of the three might reduce the prospective attractiveness of capabilities that competitors are currently interested in developing or expanding upon. If they can be convinced that the United States has the potential to alter the military competition in dramatic ways, rivals will confront a substantially higher level of uncertainty in their planning, which will likely reduce the prospective attractiveness of many military capabilities.

Again, an example helps to illustrate the point. Today, the diffusion of anti-access and area-denial (A2/AD) capabilities (e.g., land-attack missiles, anti-ship cruise missiles, sea mines, submarines, and surface-to-air missiles) is of growing concern to the US military because of its reliance upon in-theater ports, airfields, and littoral operating areas for projecting power.[62] If the

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[62] As used in this report, anti-access capabilities are those whose purpose is to prevent the entry of rival power-projection forces into a theater of operations (e.g., threatening fixed, forward bases with destruction by missile attack), while area-denial capabilities are focused on preventing rival forces' freedom of action in the littoral, which extends 200 miles from the shoreline.

US military signals its intention (or, better still, its ability) to adopt a new operational concept for extended-range power projection that obviated the need to operate from such areas, A2/AD capabilities would lose much of their prospective value—and thus, investment in them would become less attractive. Or if the United States were able to convince its rivals that it had mastered the ability to exploit information networks in such a way as to enable US forces to operate effectively while highly dispersed, it could also reduce the attractiveness of A2/AD capabilities, which are more suited to dealing with highly concentrated targets. To be credible, however, this prospective conceptual shift would have to be accompanied by developing and fielding the capabilities necessary for implementing it.

III. DISSUASION AND CHINA

How might a dissuasion strategy be applied in practice, as opposed to in theory? This chapter addresses the question with respect to the People's Republic of China (PRC), which is described by the most recent QDR as a country at a "strategic crossroads" with the capability to pose "disruptive" challenges to the United States. How might the PRC's leadership be dissuaded from competing with the United States at the geo-political level (i.e., seeking to diminish America's influence in East Asia)? More specifically, how might Beijing be dissuaded from developing "niche" military capabilities (i.e., anti-access/area-denial capabilities) that could jeopardize the US military's current predominance?

THE CHALLENGE

The United States confronts a potentially large-scale challenge to its security as a consequence of the rise of China to great regional power status and, perhaps, over time, to global power status. To date, discussions about the disposition of China often describe it as either an existential threat along the lines of the Soviet Union, or as a state that simply needs to be engaged and brought more fully into the global economy to ensure it will remain a member in good standing of the international community.

The truth probably lies somewhere in between these poles. China does not represent the type of threat posed by the Soviet Union. For example, unlike Soviet Russia, China is not wedded to an aggressive, expansionist ideology. However, this does not mean that China will not pose challenges to the United States. If it does, these challenges are likely to be advanced in different forms, with the Chinese employing different means to achieve them.

In the near- and mid-term future (that is to say, over the next decade or two), China and the United States are more likely to find themselves engaged in a conflict stemming from Beijing's weakness and insecurity, as much as from its rising power. China is beset by questions of political legitimacy; growing ecological problems; an economy that, while enjoying remarkable growth, may be entering a more mature period characterized by slower growth; an aging population with no social "safety net" to protect it; a demographic imbalance favoring males that could induce societal instabilities; problems with internal discontent; and a rapidly growing need for foreign energy supplies. These factors, combined with Beijing's outstanding security issues in the form of Taiwan, the Spratly Islands, Tibet, and perhaps portions of the Russian Far East, could yield high levels of friction and even conflict.

Strategic Culture

If the United States is to dissuade Beijing from developing particularly threatening military capabilities, it must shape, to the maximum extent possible, China's decision-making in productive ways. This requires a high level of understanding about China's leaders and their personal goals, key military and military-related institutions and their organizational imperatives, and the Chinese military establishment's decision-making processes.

Moreover, Chinese decision-making will likely be influenced in enduring ways by China's strategic culture. For example, the Chinese, relatively speaking, tend to take a long view of things. While the United States has existed for only two centuries, China can draw upon several millennia of history as a nation. While US history is generally characterized by an ever-upward progression toward greater wealth and power, China's experience is far more mixed, with periods of greatness intermixed with periods of foreign exploitation. Thus, whereas Americans tend to think in linear terms about the future (e.g., things always get better; the future is a straight-line extrapolation of today), the Chinese tend to think in terms of waves or cycles associated with the rise and decline of great powers and of power relationships. There is also considerable evidence that Chinese strategic thought is quite different from that of the Clauswitzian and Jominion West. For a country like the United States, whose principle rivals over the last century have been of European (Western) origin, the challenge of coming to grips with a rival that does not think in "traditional" Western ways may be acute indeed.

This strategic cultural gap may explain why some in the United States view China's future as one in which Beijing will become ever more powerful (and threatening). It may also explain the Chinese leadership's relative patience, assuming they view the United States' current dominance as part of a cycle that will inevitably witness its decline, in either relative or absolute terms. The question is: How can these characteristics be employed by the United States in crafting effective dissuasion strategies that achieve its security objectives?

One leverage point may be the high premium the Chinese traditionally place on maintaining internal order. China is a large country marked by considerable geographic, social, and demographic diversity. It is also a country that over its long history has been beset by waves of internal disorder. One of the reasons that Mao Zedong continues to be admired by Chinese despite his murderous regime is that he imposed order on China after a long period of instability marked by foreign intervention in China's affairs—China's "century of humiliation."

It should not, therefore, come as a surprise that the Chinese government places great emphasis on its ability to maintain order, and to hold China together. There is a fear that China could be broken up again, with Taiwan and Tibet separatist efforts precipitating a return to the period of warlordism and foreign intrigue. Hence the current regime's willingness to resort to repressive measures against its citizens' freedoms and its hard-line stance on any move by Taiwan toward "independence."

Another potential point of leverage is Beijing's reaction to its growing energy dependence. Unlike the United States and other western powers, China seems very uncomfortable with its growing dependence on foreign energy sources, and on relying on market forces to insure it has acceptable access to future supplies. Beijing seems intent on devoting substantial resources toward mitigating this problem. Hence China's efforts to develop strong relationships with oil-producing states like Iran and Venezuela, and its dispatching of 4,000 troops to protect its interest in an energy development project in Sudan.[63]

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[63] William Mellor, "China Drills Where Others Dare Not Seek Oil," *International Herald Tribune*, October 2, 2006.

Chinese Military Transformation

Where is the Chinese military headed? How would the United States like to see it evolve? Are there strategies that might be employed to shape the PLA's future in ways that are relatively favorable to US interests? Focusing first on China's military, we find that the People's Liberation Army (PLA) is engaged in a process of transforming itself to meet the demands of China's new position in the world, and the advent of a new era in warfare. This process benefits from the increased resources China's rapid economic growth has made available for military purposes, and from the relative internal stability the regime currently enjoys as a consequence of the country's prosperity.

The process (like the US military's "transformation" process) seems an uneven one. One significant barrier to PLA transformation is China's long tradition of relying heavily on labor, as opposed to capital, to generate military power. This takes form in such Chinese war-fighting concepts as "people's war." However, the PLA's drive to adapt to "local war under modern high-technology conditions" received considerable stimulus from the lessons drawn by the Chinese military from the two Gulf Wars. A key element of Chinese military transformation appears to be oriented toward generating anti-access/area-denial capabilities. In particular, attention has been focused on PLA discussions of "Assassin's Mace" forces.

Chinese Military Transformation and "Assassin's Mace"

Among the capabilities associated with Assassin's Mace are advanced air defenses, information warfare, ballistic and cruise missiles, advanced fighter aircraft, attack submarines, and counter-space capabilities.[64] The use of limited nuclear strikes (perhaps with electromagnetic pulse, or EMP warheads) is also discussed as a means of achieving information advantage. Assassin's Mace forces are designed to enable the "inferior" to defeat the "superior." However, only a small fraction of modern weaponry is seen by the Chinese as supporting its Assassin's Mace concept.[65] The concept appears to be centered around information warfare, or achieving an information advantage over the enemy, and extended-range strikes. The PLA's transformation represents a "great leap forward" in that it deviates sharply from the military's strategic culture, which had long been centered on Mao Zedong's concept of people's war. If the PLA succeeds in transforming itself around Assassin's Mace capabilities, it will be able to pose a formidable challenge to its neighbors, and to US interests in the region.

Interestingly, the Chinese appear to be taking steps to deflect US intelligence from identifying its development of Assassin's Mace and related capabilities. A report by the Director of National

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[64] For a discussion of the concept of "assassin's mace," see Jason E. Bruzdzinski, "Demystifying *Shashoujian*: China's "Assassin's Mace" Concept," in *Civil–Military Change in China: Elites, Institutes, and Ideas After the 16th Party Congress*, Larry Wortzel and Andrew Scobell, eds. (Carlisle, PA: U.S. Army War College, 2004), pp. 309–364.

[65] It is worth noting that militaries have succeeded in effecting a dramatic shift in the military balance by transforming a relatively small portion of their force. Examples of this can be found in Germany's mechanized ("*blitzkrieg*") forces in World War II, the US Navy's carrier forces in that war's Pacific theater, and the Imperial German Navy's submarine force in World War I.

Intelligence concludes that US intelligence has been slow to detect Chinese military developments of:

- A new long-range missile;
- A new attack submarine;
- Precision-guided munitions; and
- Advanced surface-to-air missiles.[66]

A key factor in the United States' ability to craft shaping strategies with respect to China will be its ability to understand the extent to which the PLA can effect this dramatic change in its strategic culture, or whether its efforts are likely to prove relatively ineffective. Adopting "local war under modern high-technology conditions" will stress the PLA. It will require a much higher level of integration among various PLA force elements. Advanced A2/AD operations, in particular, would almost certainly require large numbers of highly skilled personnel to execute comparatively complex operations. An example of this is in the area of air and missile defense operations, which stress even the most technologically sophisticated military organizations.

If one understands how the Chinese make decisions with respect to competing militarily, and the capabilities they develop to support their efforts, then it becomes easier to fashion strategies for dissuading them from pursuing what, from a US perspective, are unattractive paths. The Chinese have studied the lessons of recent US military operations intently. This stems from the PLA's admiration of the US military as the standard against which all first-class militaries must be measured. Many senior Chinese military and security officials believe the US military simply does not make significant mistakes at the operational and tactical levels of warfare. This, along with inherent US competitive advantage (economic scale, defense industrial base, "black" program track record) should facilitate some promising dissuasion strategies.

The first and second Gulf Wars and the 1999 Balkan conflict provided much support to those Chinese who argued that the PLA must transform itself to a force capable of fighting a hi-tech, limited war. However, in the wake of the US military's ongoing struggle to suppress insurgencies in Afghanistan and Iraq, it will be interesting to see if those Chinese who prefer a version of the tried-and-true "people's war" military doctrine enjoy a renaissance. In any event, owing to its recent difficulties, the US military may experience a decline in prestige in the eyes of Chinese military leaders. It is worth contemplating which Chinese vision of future warfare the United States would prefer to see dominate, and what might be done to dissuade the PLA from pursuing particularly worrisome (from Washington's perspective) paths.

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[66] Bill Gertz, "Analysts Missed Chinese Build-up," *Washington Times*, June 9, 2005.

Chinese Challenge to US Command of the Seas

China has embarked on a significant effort to expand the size and capabilities of its submarine fleet. Submarines appear to represent an important element of China's Assassin's Mace capabilities, which are designed to support "local war under modern high-technology conditions." Submarines can play an important role in sea-denial operations in East Asia, combining with other Assassin's Mace elements (e.g., over the horizon radars, advanced ballistic missiles and anti-ship cruise missiles, advanced nuclear warhead designs) to push US surface naval forces further out from the littoral region, and enhancing the prospects for Chinese control of the Taiwan Strait in support of an "Operation Sea Lion"-style invasion of Taiwan.[67] Alternatively, a Chinese sea-denial capability could, along with extended-range ISR and targeting (e.g., employing space-based systems, UAVs, and covert operatives) and various strike means (e.g., ballistic and cruise missiles; advanced underwater mines; imbedded PLA special operations forces), be critical elements in Chinese blockade operations against Taiwan, South Korea, or even Japan. If the PLA were successful in fielding such capabilities could lead to China's "Finlandization" of East Asia.[68]

By giving priority to its submarine fleet as it has, over time China could also acquire a serious sea-denial capability that could enable it to pose a threat to regional shipping. This could have substantial extra-regional effects within the framework of the global economy. For example, this sea-denial capability could be employed to disrupt or destroy critical undersea economic infrastructure, such as that associated with offshore energy production and the global fiber optic grid, or to interdict cargo that is central to the global economy's "just-in-time" supply network. Addressing this potential challenge should be a high priority for the US military.

Chinese Challenge to US Space Control

Over the past fifteen years, the United States has come to rely increasingly on access to capabilities in space for critical information, to include surveillance, reconnaissance, intelligence, targeting and positioning. While other states may not aspire to deploy the kind of space architecture the United States enjoys, some, including China, can and do aspire to develop effective space-denial capabilities. In particular, China is reported to be developing a range of ASAT capabilities, to include ground-based laser ASATs and satellite jamming systems.

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[67] Operation Sea Lion was the German plan for invading England during World War II. It called for a rapid movement across the English Channel to negate Great Britain's advantage in naval forces. The invasion would be enabled by the German Air Force, whose mission was to establish air superiority over the channel, thus making British naval operations to disrupt the seaborne assault impractical.

[68] Finlandization refers to the influence that one neighboring powerful country can have on the policies of a smaller nearby country. It refers to the process of turning into a neutral country one which, although maintaining national sovereignty, in foreign politics resolves not to challenge a more powerful neighbor. The term is drawn from Finland's policies vis-à-vis the Soviet Union during the Cold War. During World War II, Germany was Finland's chief supporter against the Soviet Union. Once Germany was defeated, Finland confronted the Soviet Union without any greater power's protection. Finland chose not to challenge the Soviet Union's foreign policy, if it could maintain its independence and control of domestic matters. Finland cut such a deal with Stalin's government in the late 1940s, and it was largely respected by both parties until the fall of the Soviet Union in 1991.

China is also exploiting opportunities to employ space-based assets to enhance its military capabilities, to include ISR and targeting. For example, Beijing's involvement in the European-led Galileo global positioning system could provide China with extended-range precision-targeting capabilities that currently are the exclusive preserve of the US military. These capabilities could prove invaluable should China move against US allies and partners (e.g., Taiwan) in the region or against the United States itself. Given its great reliance on space-based systems for the effective operation of terrestrial-based forces, the United States needs to develop counters to this capability.

China's Strategic Depth

Unlike the United States' immediate post-Cold War rivals, such as Iraq, Iran and North Korea, China possesses great strategic depth. In the past, China has used this to its advantage as, for example, in its war with Japan from 1937-45, and in developing its nuclear capability in the 1950s and 60s.[69]

Several Assassin's Mace assets (e.g., ballistic missiles, ground-based ASATs, command and control centers, leadership facilities) can exploit China's strategic depth to advantage. Specifically, by positioning these assets deep in the country's interior Beijing can either drive up the cost to hold them at risk, or create a semi-sanctuary for them. This presents the United States with a challenge reminiscent of that posed by the Soviet Union's great strategic depth during the two countries' Cold War rivalry.

DISSUADING GEO-POLITICAL COMPETITION

Several prospective options exist for dissuading the PRC from competing at the geo-political level. They include enhancing America's "scale advantage" through alliances, turning Beijing's security focus inward, and leveraging other, military-related cost-imposing competitive strategies. The reader will recall that, with respect to competitive strategies, the idea is that by siphoning off resources that might otherwise be used to field particularly worrisome capabilities, dissuasion can be accomplished through an indirect approach.

Alliances and Dissuasion

Given the level of economic, military, and diplomatic power currently wielded by the United States, less powerful countries have a strong incentive to "bandwagon." with it, rather than organizing in opposition to "balance" against the United States.[70] A significant inducement for states to bandwagon with the United States, rather than organize against it, is that America is generally perceived to be a benign, trusted power by many East Asian states. Perhaps more

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[69] The Chinese positioned much of their nuclear development assets and missile forces deep in the country's interior.

[70] William Wohlforth, "The Stability of a Unipolar World," *International Security*, Vol. 24, No. 2, Summer 1999, pp. 23–28. See also: Michael Mastanduno, "Preserving the Unipolar Moment," *International Security*, Vol. 21, No. 4, Spring 1997, pp. 49–88; and Thomas S. Szayna et al, *The Emergence of Peer Competitors: A Framework for Analysis* (Santa Monica, CA: RAND, 2001).

importantly, with the exception of Alaska and Hawaii, it also happens to be located some 8,000 kilometers away from the Asian landmass. Thus America is also a distant power, rather than a close neighbor. Moreover, unlike China, the United States is a relative newcomer to East Asia (the United States itself in barely 200 years old). Consequently, Washington simply has not had the time to build a long, negative history with the region's countries. In contrast, China's burgeoning power and anti-status-quo leanings cause considerable anxiety and trepidation in the region. These misgivings are compounded by fact that China has border demarcation and territorial disputes, as well as a host of policy differences (e.g., water-use policies with respect to cross-border rivers, pollution, human rights issues, and immigration practices), with many of its neighbors including Taiwan, India, Vietnam, Malaysia, the Philippines, Japan, and Russia.

The United States might therefore exploit its status as the world's dominate power and the manifold grievances of China's neighbors to both deepen and diversify America's alliance network in Asia. More specifically, the United States might elevate its existing diplomatic and security ties with Japan, South Korea, and Taiwan, while establishing new and deeper relationships with India, Pakistan, Kazakhstan, Russia, Mongolia, Vietnam, Singapore, Malaysia, and the Philippines. Even if these positive ties do not expand the US alliance network, they will deny Beijing the potential to increase its level of effort by leveraging allies. In this manner, the United States can maintain its advantage in scale of effort, thereby dissuading China from posing a direct challenging to US interests.

Ideally, confronted by an expanding US alliance network, China would have fewer prospective allies to help it shoulder the burden of competing militarily with the United States. Faced with an American-led alliance comprising several other major powers (e.g., India, Russia, and Japan), an isolated Beijing might reasonably conclude that the prospective scale of effort required to compete effectively with the United States is simply beyond its reach, at least at present. Under such circumstances, employing peaceful means to achieve its security objectives would appear relatively more attractive to China than relying upon coercion or aggression.

A more diversified US alliance network would also exploit an enduring Chinese weakness—its long borders—to impose costs on Beijing and complicate the People's Liberation Army's (PLA) defense planning. In addition to its traditional emphasis on coastal defense against attack, China would also have to worry about the possibility of military forces (air forces in particular) staging along its northern, western, and southern borders. Absent a major increase in defense spending, the PLA would be hard-pressed to defend against attacks from all directions.

However, there is also the matter of this strategy's "second-order effects," or downstream consequences. Here the second-order effect might see deeply rooted Chinese fears of encirclement come to dominate Beijing's thinking, making competition and conflict more likely over the long term. Again, this points out the importance of developing superior intelligence to identify what the Chinese leaders value, what they fear, and how they make decisions.

Increase Opportunity Costs Through Competitive Strategies

An indirect means of dissuading China from engaging in geo-political or asymmetric military competition with the United States would be to induce Beijing to channel available resources

into areas that are relatively non-threatening from an American perspective, including internal security activities and developing military capabilities that are primarily defensive in nature. Although the PRC's economy has grown significantly over the past few decades and this trend seems likely to continue, the funds available for defense spending remain relatively limited, especially when compared to those of the United States. Moreover, since the Chinese government has staked its legitimacy upon economic development and improving the standard of living for China's citizens, it might be very reluctant to devote a substantially higher fraction of China's resources or absorb large amounts foreign debt to increase defense spending substantially. Assuming that Chinese defense spending is relatively inelastic, US actions that compel the PRC to increase defense spending, broadly defined, in non-threatening areas necessarily draw resources away from fielding capabilities that are potentially more threatening.

This approach to dissuasion is central to the concept of "competitive (or cost-imposing) strategies" discussed earlier in this report. Well-crafted competitive strategies build upon one's enduring strengths and exploit an opponent's enduring weaknesses or predispositions. They often have a cost-inducing aspect in that they require an opponent to expend relatively more resources (e.g., funds, materials, labor, or political capital) over time.[71] To be effective, they should also be designed with a "multi-move" strategy in mind—similar to the game of chess—that anticipates an opponent's reactions—or the "second-order effects"—several moves in advance.

Whether part of a conscious strategy or not, through its actions the United States is influencing Chinese behavior and affecting the PLA's resources allocations on a daily basis. For the purpose of elaborating on the potential application of competitive, or cost-imposing, strategies two examples are outlined below. Again, their purpose is to support a US dissuasion strategy by creating conditions that lead to the diverting of PRC resources away from areas where the United States would prefer that China not invest heavily. The first example involves efforts to shift the PRC leadership's attention inward, inducing them to increase expenditures for maintaining internal security and stability. The second centers on channeling PLA spending into developing, fielding, operating, and maintaining a blue-water surface fleet, coastal anti-submarine warfare (ASW) systems, and air and missile defense capabilities.

Turn Beijing's Security Focus Inward

The paramount concern of China's leadership is, without question, regime survival. Even low-level threats to China's internal stability and security are taken very seriously. Moreover, the number of mass disturbances in China has increased dramatically in recent years.[72] This could only serve to increase the regime's anxiety over its legitimacy and, by extension, its survival. In fact, the PRC leadership has demonstrated a willingness to overreact to internal security

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[71] See Marshall, "Competitive Strategies – History and Background."

[72] Mass disturbances in China are defined as those involving 15 or more persons. The number of these disturbances has increased dramatically since the early 1990s. For example, in 1993 there were some 8,700 disturbances; the number grew to roughly 25,000 by 1998, and in 2005 reached 83,600, nearly an order of magnitude increase over the figure 12 years earlier. Albert Keidel, "China's Social Unrest: The Story Behind the Stories," *Carnegie Endowment Policy Brief Number 48*, September 2006, p. 3.

challenges (as evidenced by the Tiananmen incident in 1989). Given the leadership's anxiety over its survival, it might be possible to dissuade it from competing with the United States through indirect means; for example by turning Beijing's overall security focus increasingly inward. Several tactics for intensifying Beijing's *existing* internal security and stability challenges suggest themselves. These include exploiting ethnic strife, the growing tensions between the economic "haves" and "have nots," and issues relating to the regime's control over the flow of information into and within China's borders.

Intensify Ethnic Unrest

While Han Chinese comprise roughly 90 percent of the PRC's population, the remainder includes Chinese of Zhuang, Uygur, Hui, Yi, Tibetan, Miao, Manchu, Mongol, Buyi, and Korean extraction.[73] Several of these groups, the Uygurs and Tibetans in particular, consider themselves to be oppressed by the current regime and have demanded varying measures of increased autonomy. For example, the Uygurs, who live primarily in China's northwestern Xinjiang region, ultimately seek to establish a new republic of East Turkistan.

By helping to foster and intensify ethnic unrest within China, the United States could force Beijing to expend a greater fraction of state revenue on internal security relative to its geo-political and military competition with the United States. American involvement might range from verbal and diplomatic support for internal movements espousing improved human rights and self-determination, to covert financial contributions to dissident groups and, at the extreme, to various levels of direct support for insurgents involved in armed rebellions (e.g., separatist/rebel movements in Xinjiang, Tibet, and Inner Mongolia). As a practical matter, this strategy would be difficult to implement (especially in a covert manner) and would be fraught with escalatory risk. However, these risks might be attenuated if US-Chinese relations were to deteriorate precipitously (e.g., in the wake of a crisis over Taiwan that ended badly for either of the great powers). Under these circumstances, exploiting China's internal instabilities could prove very effective in inducing the PLA to maintain a manpower-intensive internal security force that would likely consume a significantly larger slice of the Chinese defense budget.

Exacerbate Growing Economic Tensions

Existing economic disparities (either real or perceived) within China could be exploited to confront Beijing with demands from disadvantaged groups clamoring for relief, or for their "fair share" of the country's economic prosperity, as well as demands from prosperous regions (i.e., China's southeast coast) for increased autonomy and economic freedom. How might this be accomplished? One possibility involves the US Government nurturing the pro-Western, free-market segment of the Chinese economy by redoubling its efforts to promote trade. The banking, legal, and other reforms required by China's entry into the World Trade Organization are a step in the right direction, but still more could be done to encourage Beijing to eliminate the remaining vestiges of China's state-run, command economy.

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[73] CIA, *The World Fact Book: China*, available on-line at: http://ww.cia.gov/cia/publications/factbook/geos/ch.html.

As the Chinese economy gradually opens over the next two decades, the United States could encourage disaffected groups and rising burgeoning entrepreneurs to utilize modern information technologies (e.g. the Internet, cellular/satellite phones, and personal wireless devices) to organize and coordinate their "subversive" activities. As discussed below, the United States should do what it can to ensure that Chinese citizens have access to these technologies and can circumvent the state's monitoring and censorship of electronic information. The United States might be able to ride this wave of circumvention to provide information to both China's "have nots'" as well as its budding middle and entrepreneurial classes. If this produces greater demands for support from the regime, the Chinese government might feel compelled to divert substantial resources to "buying off" the economic discontent of "Have Nots" and addressing the demands of internal movements for increased economic freedoms.

Undermine State Control Over Information

As foreshadowed by the creative use of facsimile machines during and after the uprising in Tiananmen Square in June 1989, the Internet and satellite phones could be used by disaffected groups within China to challenge the central government's authority and legitimacy. The first commercial Internet accounts in China were created in 1995. Since that time, the number of individual Internet users has skyrocketed from about 15,000 to over 110 million.[74] The typical user tends to be urban, male, single, educated, and young—an ideal pool from which to recruit anti-government activists.[75] The Internet could also be used for gathering and sharing intelligence, coordinating anti-government activities across geographically dispersed locations, and gaining domestic and international support.[76] Indeed, this is already occurring. Several dozen websites have been set up to promote the interests and activities of a broad spectrum of Chinese dissident groups.[77] There are also a multitude of foreign websites and electronic newsletter services devoted to their causes.

The United States could conceivably exacerbate Beijing's information control problem in a number of ways. The most direct route, and likely the most risky, would be to conduct clandestine computer network attacks (CNA) designed to corrupt the software used by Chinese government censors.[78] To minimize the political risk associated with discovery, these operations

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[74] China Network Information Center, *17th Statistical Survey Report on The Internet Development in China*, January 2006, p. 4.

[75] Jennifer Lee, "U.S. May Help Chinese Evade Net Censorship," *New York Times*, August 30, 2001.

[76] For more discussion on the implications of information technologies on dissident movements and internal conflict see: Michael S. Chase and James C. Mulvenon, *You've Got Dissent! Chinese Dissident Use of the Internet and Beijing's Counter–Strategies* (Santa Monica, CA: RAND, 2002); and Michael Vickers and Robert Martinage, *The Military Revolution and Intrastate Conflict* (Washington, DC: Center for Strategic and Budgetary Assessments, October 1997), pp. 21–26.

[77] Chase and Mulvenon, *You've Got Dissent! Chinese Dissident Use of the Internet and Beijing's Counter–Strategies*, pp. 93-102.

[78] To avoid attracting the attention of Chinese authorities, these attacks would most likely seek to degrade the performance and overall reliability of computer systems used by government censors, rather than attempt to take them completely "off-line."

could be arranged to have the outward appearance of being conducted by civilian "hackers." Given the activities of various US activists and hacker groups (e.g., Legions of the Underground, Cult of the Dead Cow, and Hacktivismo) angered by Chinese human rights violations and Internet censorship, this cover story would appear entirely credible and would provide the US government with a degree of plausible deniability. In 1998, for example, a young American computer science student hacked into and defaced the official government website on "human rights in China" and subsequently tampered with the filtering software used by the Ministry of Public Security, allowing Internet users to access banned websites temporarily. Other US groups have been responsible for a host of similar attacks in recent years.

Channel PLA Investments into Less Threatening Areas

Above all else, the People's Liberation Army (PLA) views itself as the defender of China's sovereignty. This is hardly surprising, given the Chinese leadership's sense that it has only recently emerged from a "century of humiliation" characterized by repeated violations of China's sovereignty by foreign powers. In a sense, PLA officers are institutionally conditioned to react disproportionately to challenges to China's territorial integrity. For example, during the 1950s the PLA poured an enormous amount of resources into expanding its coastal defenses out of fear that the United States would launch an assault against the Chinese mainland. How might the United States exploit the Chinese leadership's predisposition to accord high priority to defending its borders?

Blue-Water Surface Fleet

The Chinese people continue to live under semi-totalitarian rule. The Communist regime's legitimacy is not derived from victory at the ballot box. Nor can the Chinese leadership credibly claim that it is at the vanguard of a movement—communism—whose ideology provides it an infallible guide for the future of mankind. Rather, popular support and regime legitimacy are conferred as a consequence of the country's dramatic economic growth. Continued growth, however, depends to a great extent upon China's access to foreign commodities, and to imported oil in particular. China began importing oil in large quantities only in the 1990s. Yet demand has grown rapidly as a result of the country's rapidly expanding economy and its relatively inefficient use of energy.[79]

Two decades ago, China was Asia's largest oil exporter; now it is the world's second-largest importer, behind the United States, with over 40 percent of its imports coming from the Middle East and roughly 30 percent from Africa.[80] Although China has taken steps to diversify its oil

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[79] UNDP, "China to Curb Energy Consumption," *Environment,* Vol.47, No.7, September 2005, p. 5.

[80] David Zweig and Bi Jianhai, "Global Hunt for Energy," *Foreign Affairs*, September-October 2005. China's largest supplier is Angola, which provides it with an average of 522,000 barrels/day; with Saudi Arabia (464,000 barrels/day) and Iran and Russia (over 300,000 barrels/day each) following in terms of supply. William Mellor and Le-Min, "China Drills where Others Dare not Seek Oil," *International Herald Tribune*, October 2, 2006.

supply, more than 70 percent of its imports still originate in the Middle East and Africa, which means it must transit through the Indian Ocean and the Strait of Malacca.[81]

The United States could take subtle (and deniable) steps to induce both political and military decision-makers in Beijing to question the security of China's energy lifeline to the Middle East and Africa. For example, the United States could encourage India's development of a blue-water navy, which would implicitly threaten the sea lines of communication (SLOCs) between the Persian Gulf and China, by offering to discount India's purchase of used, early model US surface combatants or modified, newly constructed Littoral Combat Ships (LCSs). Indian acquisition of expanded blue-water capabilities could potentially cause China to funnel substantial resources into developing, constructing, operating, and maintaining a blue-water fleet to secure its energy lifeline, and perhaps to diminish the amount of prestige that India might otherwise be able to reap from its fleet. In striving to achieve and maintain maritime parity with India, the PLA would have fewer resources to invest in more threatening capability areas (e.g., ballistic and cruise missiles; submarines) while its surface navy would still be no match for the US fleet.

Aside from exploiting China's historical rivalry with India, this competitive strategy would also take advantage of the mercantilist predisposition of many PRC officials—oil is frequently viewed, not as a commodity, but as a resource that must be secured.[82] Apparently motivated by the desire to secure its oil supply, the state-controlled China National Petroleum Corporation has aggressively expanded its overseas operations over the last few years. In some cases, it has paid well above market rates for oil concessions and extraction rights.

Periodic challenges to China's recent claim of sovereignty over the Paracel and Spratly Islands in the South China Sea might also be sufficient to induce the PLA to funnel more resources into the development of blue-water capabilities. As a dividend from increased investment in alliance relationships in Asia, the United States might be able to convince Vietnam and the Philippines to develop some blue-water naval capabilities and assert their territorial claims in the South China Sea more aggressively.[83]

Implementing this cost-imposing strategy may be facilitated by the likelihood that the United States is "pushing on an open door," as China is already favorably disposed toward the eventual creation of a blue-water fleet.[84] Far from attempting to encourage the PRC leadership, and the

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[81] Mai Tian, "CNPC Expanding Presence in Algeria Oil Fields," *Business Weekly*, July 22, 2003; and Antoaneta Bezlova, "'War' Prompts Beijing to Accelerate Energy Plans," *Asia Times Online*, November 7, 2001.

[82] See, for example, Erica Strecker Downs, *China's Quest for Energy Security* (Santa Monica, CA: RAND, 2000).

[83] Geoff Fein, "Global Maritime Partnership Gaining Steam at Home and with International Navies," *Defense Daily Intenational*, Vol. 7, No. 42. pg 1. The current Chief of Naval Operations, Admiral Michael Mullen, has advocated something similar to the concept described here. He calls it the "1,000-ship Navy." This navy, in the admiral's vision, comprises the roughly 300 ships of the US fleet, with the balance being provided by America's allies and partners. A prime purpose of this fleet is to maintain free access to the global commons.

[84] See, for example: Ian Storey and You Ji, "Chinese Aspirations to Acquire Aircraft Capability Stall," *Jane's Intelligence Review*, April 2002, pp. 36–39; Dr. Ehsan Ahrari, "China's Naval Forces Look to Extend Their Blue-Water Reach," *Jane's Intelligence Review,* April 1998, pp. 31–36; and Anthony Davis, "Blue-Water Ambitions," *Asiaweek*, March 24, 2002.

PLA Navy (PLAN) in particular, to pursue a path they would prefer not to take, the more limited goal of this strategy would be to induce China's leadership to begin investing in blue-water capabilities sooner, more vigorously, and on a larger scale than might otherwise be the case.

Coastal Anti-Submarine Warfare

The US Navy's proficiency in costal anti-submarine warfare (ASW) may also impose costs on China in a way that dissuades Beijing, albeit indirectly, from pursuing more worrisome military capabilities. For example, if the United States were to ratchet up the threat to China's home waters posed by American attack submarines, the PLAN might feel compelled to shift more resources into coastal ASW capabilities.[85] US submarines could, for instance, conduct more frequent patrols in China's littoral waters and occasionally make their presence known by "pinging" PLAN surface ships and submarines with active sonar. The efforts under way to expand the US naval base at Guam to support a greater submarine presence would naturally support such a cost-imposing strategy, as would the 2006 QDR's call to increase the rate of US submarine production.

Inducing the PLAN to invest more heavily in coastal ASW would be advantageous to the United States' competitive position for several reasons. First, even for highly capable militaries, developing and fielding an effective ASW capability is technically and operationally challenging. It is made all the more demanding given China's shallow littoral waters and the large number of commercial ships that constantly transit them. Developing the surveillance systems and human expertise required to find extremely quiet American SSNs lurking in this high ambient-noise environment would take years (and perhaps decades) to accomplish, while consuming vast resources. Second, the PLAN has historically been a very inefficient competitor in submarine and ASW-related technologies. Despite decades of focused effort, the Chinese have yet to master the design, construction, and operation of modern submarines in general, and nuclear-powered submarines in particular. Given its enormous relative advantage in this area of the military competition, the US Navy would likely be able to counter prospective PLAN advances in ASW well before they became operational. Third, even if the PLAN somehow managed to field more effective ASW capabilities, their effectiveness would likely be compromised by the PLAN's relatively loud submarines, which would remain extremely vulnerable to attack. In summary, given the challenges inherent in coastal ASW operations, China's poor track record in the area, and America's tremendous lead both technically and operationally, channeling PLA investment into ASW would be a "winning hand." There is, however, a potential drawback. A larger PLAN submarine fleet optimized for ASW and manned by more competent crews would provide a potent sea-denial capability against commercial shipping and high-signature surface combatants (e.g., destroyers; missile cruisers; amphibious assault ships; aircraft carriers) in the region. A larger PLAN submarine fleet could also pose a greater threat to the global energy trade, which might prove important in any Chinese strategy to deny others access to imported oil.

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[85] As mentioned in Chapter II, this basic strategy was used during the Cold War to bottle up the Soviet SSBN fleet and encourage increased Soviet investment in ASW capabilities.

Air and Missile Defense

As noted earlier, perimeter security and strategic defense in general are deeply engrained in China's strategic culture.[86] Over the last half century, the PRC has spent vast sums on coastal and border security. This "cult of the defense" might be exploited by the United States. In much the same vein as the United States employed low-altitude bombers and cruise missiles to induce the Soviet Union to expend more resources on air defenses, an increased US investment in stealthy, long-range strike capabilities might induce the PRC leadership to allocate relatively more funding to modernizing China's air and missile defenses over time.

The near invulnerability of American stealth aircraft to Serbian and Iraqi air defense systems (which are similar to China's current systems) during Operation Allied Force and Iraqi Freedom, respectively, could hardly go unnoticed in Beijing.[87] To elevate the threat posed to the Chinese homeland, the United States could, among other things, expand its fleet of stealthy bombers, which is currently limited to 16 operational aircraft, by developing and fielding stealthy, long-range, bombers and unmanned combat air vehicles (UCAVs). In addition, the American SSGN fleet, which is projected to cap out at four boats, might be enlarged to provide an expanded, highly survivable, mass-missile-attack capability. (Each SSGN can be armed with up to 154 stealthy cruise missiles.) Similarly, the 2006 QDR decision to replace the nuclear warheads on some SLBMs with conventional warheads might be extended further to expand the US capability to strike quickly, deeply, and with precision, deep inland targets.[88] Over the mid-to-long-term, the United States could also develop and field other conventional strategic-strike capabilities that would be difficult for the PLA to defend against such as unmanned suborbital strike systems,[89] unmanned undersea strike modules,[90] and airborne missile "trucks" capable of carrying large numbers of stealthy, air-launched cruise missiles (ALCMs).

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[86] Three of China's *Seven Military Classics*, for instance, extol the primacy of defensive strategies. See Alastair Iain Johnston, *Cultural Realism—Strategic Culture and Grand Strategy in Chinese History* (Princeton, NJ: Princeton University Press, 1995), pp. 109–154; and Andrew Scobell, *China and Strategic Culture* (Carlisle, PA: US Army Strategic Studies Institute, 2002), pp. 4, 8–13.

[87] One F-117 was shot down over Serbia, probably as a result of pilot error. In any event, the signature technology incorporated into the F-117 is antiquated compared to that of the B-2, F-22, and Joint Strike Fighter (F-35).

[88] Department of Defense, *Quadrennial Defense Review Report*, February 6, 2006, p. 50.

[89] Outfitted with an upper-stage containing Common Aero Vehicles (CAVs), a suborbital strike vehicle could strike fixed and possibly mobile targets as distant as halfway around the earth in tens of minutes after launch. The CAV, which is already under development, is basically a 12- to 16-foot long, cone-shaped, maneuvering reentry vehicle that will be able to carry and dispense up to six PGMs of various types. See Michael Sirak, "Pentagon Eyes Global Strike System," *Jane's Defence Weekly*, July 2, 2003, p. 8; Robert Wall, "Global Strike—DARPA Revives Interest in Hypersonic Attack System," *Aviation Week & Space Technology*, July 14, 2003, p. 37; and William B. Scott, "Wargames Zero in on Knotty Milspace Issues," *Aviation Week & Space Technology*, January 29, 2001, p. 52.

[90] The Defense Science Board (DSB) endorsed the "undersea strike module" concept in 1998. It was envisioned as a stealthy, unmanned, submerged platform containing a large quantity of missiles that could be towed to an area of interest by an attack submarine. Once in theater, the module would be released above the continental shelf in up to 500 feet of water. It would then bottom on the seafloor, self-anchor, or both. All non-essential equipment would be powered down to a "sleep" mode to preserve energy and keep the module's radiated signature as low as possible. In this mode, it could remain on station for up to 12 months, and be awakened at any time by an encoded extremely low frequency (ELF) message or acoustic signal. Once on-board command and control systems were up and running, the module could receive targeting coordinates, or alternatively, coded references to preset target packages

This competitive strategy is attractive for several reasons. First, it takes advantage of the PLA's institutional identity as the defender of China's territorial integrity and the political leadership's long-held anxieties about its personal safety. It is not a coincidence that the PLA is already investing heavily in air defenses. In essence, this US strategy would encourage China to move more quickly down a road that it is already traveling, inducing the PLA to spend more resources than it might otherwise be inclined to spend to develop and field next-generation air defense systems that are effective against stealthy platforms and missiles (e.g., multi-static radar networks, passive coherent location, and infrared search and track systems).

Pursuing this path would be technically challenging, costly, and time-consuming for China. The United States, moreover, is already working on a new generation of signature-reduction technologies and electronic counter-measures to better evade detection. Consequently, the prospect of China closing what is currently an ever-widening gap in relevant technologies seems quite remote. Nevertheless, given China's strategic culture, it seems unlikely that the leadership in Beijing would opt out of this competition and leave their homeland increasingly vulnerable to attack.

Second, stealthy extended-range aircraft (both manned and unmanned), cruise missiles, and other capabilities for conducting precision strikes deep into China's homeland would have tremendous military utility across innumerable other military contingencies. From the US perspective, the cost of such systems could be divided across many other mission requirements. Finally, in the unlikely event that China eventually managed to develop effective air and missile defense systems, it would be extraordinarily expensive to field, maintain, and defend a network that covers the country's entire 36,000-kilometer border.

DISSUADING ASYMMETRIC COMPETITION

The United States military has had great success in defeating or deterring rivals whose military capabilities were similar to its own. The Kaisar's army, Hitler's *Luftwaffe*, Yamamoto's carrier divisions, Stalin's tank armies and Saddam Hussein's Republican Guard were all roughly similar in structure to the American military they confronted. And they all fought in the conventional manner. However, although China may selectively invest in capability areas that are currently dominated by the United States (e.g., manned tactical aviation, blue-water naval operations, and mechanized, combined-arms ground operations) for regional power-projection purposes (e.g., to forestall Taiwanese independence and defend its territorial claims in the South China Sea), it is unlikely to challenge the United States head-on. Instead, it appears that China will compete asymmetrically; investing in niche capabilities employed in novel ways to exploit potential US vulnerabilities.

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that had already been downloaded into its digital library. After rising to launch-depth and firing a missile salvo, it would wait for additional instructions, and after a pre-defined period of time had elapsed, return to its sleep mode. SSNs could tow deployed modules to ports around the world for refueling and rearming as part of their routine mission taskings. DSB 1998 Summer Study, *Joint Operations Superiority in the 21st Century,* Vol. II (Washington, DC: Office of the Undersecretary of Defense for Science & Technology, 1998), pp. 5–14.

Over the last decade, a growing number of Chinese military thinkers and strategists have started writing about high-technology warfare. Influenced by early Soviet and American writings about the emerging revolution in military affairs (RMA), senior Chinese military strategists have argued since at least 1994 that China should exploit the ongoing RMA to narrow the gap between its current military, which they recognize as relatively weak, and those of the world's great powers; specifically, the United States. They foresee rapid changes in land, air and sea warfare, as well as the emergence of war in the information, electromagnetic and space realms.[91] By investing in the RMA over the next two to three decades, China hopes to leapfrog the United States in selected, high-payoff areas.

Chinese military strategists often use Mao's phrase "defeating the superior with the inferior" when discussing future wars against the United States. Major General Wu Guoqing, for example, has emphasized the notion of countering US forces by attacking the C4ISR nodes, GPS-based guidance and navigation systems, and vulnerable logistics depots upon which they depend. He concludes that:

> The systems engineering and the experiences of the modern war prove that in the systems of military forces and weapon equipment, there are vital parts or crucial links that can affect the whole situation, e.g., the C3I system that links the operational forces, the supply system that helps maintain strong operational forces, and the operational platform on which high-tech equipment depends. Once these targets are damaged, the fighting capabilities as a whole will certainly be affected, and the functions of the weapon system will be in disorder. Hitting the vital part of the enemy is quite effective in an operation and is favorable to winning greater victory with little costs. The high tech systems of scouting and surveillance, the accurate guidance weapons, and the equipment for electronic war all provide advanced measures for hitting the vital parts of the enemy effectively.[92]

Learning from American military operations over the last decade, Chinese planners contend that if war were to break out with the United States over Taiwan, or some other flashpoint in East Asia, the US military would launch an air and missile campaign while attempting to build up combat power within the region. To preclude this outcome, they advocate that the PLA launch missile barrages against ports and airfields in the opening phase of such a conflict, or even preemptively. They also point out the potential value of preemptive strikes against US aircraft carriers and major surface combatants. The Chinese call this overall approach to warfare *xianfa zhiren*, or "gaining the initiative by striking first." Their goal is to neutralize an adversary's more advanced warmaking capabilities at the outset of hostilities and prevent him from regaining a military foothold within the theater.[93]

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[91] For an overview of Chinese thoughts regarding future warfare and the future security environment see Michael Pillsbury, *China Debates the Future Security Environment* (Washington, DC: NDU Press, 2000); and Michael Pillsbury, *Chinese Views of Future Warfare* (Washington, DC: NDU Press, 1997).

[92] As quoted in Pillsbury, *Chinese Views of Future Warfare*, pp. 346–347.

[93] Mark Stokes, *China's Strategic Modernization: Implications for the United States* (Carlisle, PA: Strategic Studies Institute, September 1999), pp. 8–9.

Moving beyond doctrinal pronouncements, China is beginning to assemble the physical building blocks of a multidimensional, anti-access/area-denial capability. In 2001 the Defense Intelligence Agency determined that:

> In terms of its conventional forces, Beijing is pursuing the capability to defend its eastern seaboard – the economic heartland—from attack by a "high-technology" opponent employing long-range precision strike capabilities. This means China is expanding its air, anti-air, anti-submarine, anti-surface ship, and battle management capabilities, to enable the PLA to project "defensive" power out to the first island chain.[94]

The effort has only increased since then. In its recent report on the state of China's military, the Defense Department noted:

> [E]vidence suggests the PLA is engaged in a sustained effort to interdict, at long ranges, aircraft carrier and expeditionary strike groups that might deploy to the western Pacific . . . . China is developing forces and concepts focused on denying an adversary the ability to deploy to locations from which it can conduct military operations. Increasingly, China's area denial forces overlap, providing multiple layers of offensive capability.[95]

The United States should attempt to dissuade China from developing anti-access and area-denial capabilities or expanding upon existing capabilities.

The PRC's progress in five capability areas relevant to an anti-access strategy—ballistic and cruise missiles, radio-frequency weapons, space-denial capabilities, anti-navy systems, and low-yield nuclear weapons—are summarized below along with some preliminary thoughts on how the United States might dissuade China from emphasizing these investments. It should be noted, however, that myriad other capabilities might be exploited by China as part of a multidimensional anti-access strategy, such as advanced biological warfare and computer network attack capabilities. Such capabilities could yield high-payoffs. However, as the following discussion makes clear, the United States may find it difficult, if not impossible, to dissuade China from developing them.

Ballistic and Cruise Missiles

Missiles are widely considered to be one of the PLA's highest priority investments. Chinese military planners believe that a large arsenal of highly accurate ballistic and cruise missiles could be used to conduct deep strikes against an adversary's (i.e., Taiwan's) critical infrastructure and cripple its defenses. Missiles are also considered to be an important element of China's regional

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[94] Vice Admiral Thomas Wilson (Director, Defense Intelligence Agency), "Global Threats and Challenges Through 2015," *Statement before the Senate Select Committee on Intelligence*, February 7, 2001, p. 12.

[95] Office of the Secretary of Defense, *Annual Report to Congress: Military Power of the People's Republic of China, (2006),* pp. 24-25.

anti-access strategy.[96] Moreover, as Aaron Friedberg has noted, "China's interest in missiles may be due in part to the fact that, as opposed to manned long-range aircraft, submarines, or surface naval vessels, they are relatively cheap, comparatively simple, and potentially very effective."[97]

As the Pentagon's report on Chinese military capabilities notes:

> The PLA Second Artillery is fielding mobile, more survivable missiles capable of targeting the Untied States, Japan, India, Russia, and other targets in Asia and the rest of the world. It currently deploys approximately 20 silo-based, liquid-fueled CSS-4 ICBMs, which constitute its primary nuclear means of holding continental US targets at risk. In addition, it maintains approximately 20 liquid-fueled, limited range CSS-3 ICBMs that enable it to attack targets in the Asia region.[98]

China has theater ballistic missiles in production: the DF-11 (also known as the CSS-7) short-range ballistic missile (SRBM), the DF-15 (also known as the CSS-6) SRBM, and the DF-21 (or CSS-5) medium-range ballistic missile (MRBM).[99] These systems have approximate ranges of 300, 600, and 2,000 kilometers, respectively. All told, the PLA has over 700 of these missiles.[100] China is also steadily expanding the size of its missile arsenal. Given current missile production rates, which are roughly 100 a year, China's ballistic missile arsenal could easily surpass 1,000 by the close of the decade.[101] All three missiles rely on solid propellants and are road-mobile. An extended-range version of the CSS-6, which could be used to strike US bases as far away as Okinawa, is under development.[102] China has already taken advantage of GPS technology to determine the initial location of its missile launchers more accurately, making the missiles themselves considerably more precise. The inertial guidance system incorporated into the most recent generation of SRBMs (e.g., CSS-6 and CSS-7) can be updated in flight by GPS signals as well. China has recently initiated development of terminal guidance systems to further enhance

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[96] Consider the following statement by a PLA strategist: "The best way for the country on the defensive to attack its enemy's heavily fortified strategic points or fleet of aircraft carriers is to launch saturation [missile] strikes to destroy most of the enemy's high priced air defense missile systems and other large-scale equipment, thereby undermining its combat capability and fighting spirit in a big way. Since surface-to-surface tactical ballistic missiles are less expensive than antimissile air defense missiles, we should deploy them en masse." See Sun Zian, "Strategies to Minimize High-Tech Edge of Enemy," in *Xiandai Bingqi* [Modern Weaponry], August 8, 1996, pp. 110–11, as translated in FBIS-CHI-96-045, "PRC: Military Journal on Countering High-Tech Enemy," March 6, 1996, p. 64.

[97] Aaron Friedberg, "The Struggle for Mastery in Asia," *Commentary*, November 2000, p. 21.

[98] Office of the Secretary of Defense, *Annual Report to Congress: Military Power of the People's Republic of China (2006)*, p. 26.

[99] Not listed here are China's strategic missiles such as the road-mobile, solid-fueled DF-31, which has a range of 8,000 kilometers; an extended-range follow-on to the DF-31 formerly referred to as the DF-41, which is expected to have a range of 12,000 kilometers, and a submarine-launched version of the DF-31, dubbed the JL-2.

[100] Office of the Secretary of Defense, *Annual Report to Congress: Military Power of the People's Republic of China, (2006)*, p. 50.

[101] Office of the Secretary of Defense, *Annual Report to Congress: Military Power of the People's Republic of China, (2006)*, p. 29.

[102] Office of the Secretary of Defense, *Annual Report on the Military Power of the People's Republic of China (2003)*, p. 5.

the accuracy of its theater ballistic missiles. In addition, various types of submunitions are being developed to increase the lethality of conventionally armed ballistic missiles, especially against wide-area targets (e.g., airfields, ports, and military bases). China is also developing active countermeasures to degrade the effectiveness of US missile defense systems. Maneuvering re-entry vehicles, on-board jammers, decoys, counter-laser cladding, depressed trajectories, and multi-axis attacks are all being investigated as possible defense countermeasures.[103]

China has also recently intensified efforts to deploy a family of land-attack cruise missiles (LACMs) based upon currently deployed anti-ship systems. Last year the PLA began deploying the first versions of its 1,000-plus kilometer-range LACMs.[104] China is developing LACMs with increased accuracy, possibly to hold certain hard targets at risk and to enhance the PLA's extended-range strike capabilities.[105]

How might the United States dissuade China from further expanding and refining its missile capabilities? China's anticipated costs might be increased by discouraging American companies from launching American-made satellites on Chinese "Long March" space-launch vehicles (SLVs). This practice not only generates significant funding for China's missile sector (its space-launch industry overlaps significantly with its ballistic missile program), but also creates conditions conducive to the "unofficial" transfer of technology to China (i.e., US satellite manufacturers have an obvious vested interest in ensuring that nothing goes wrong with a Chinese launch). The US Government could, for example, subsidize American space launch services and help rebuild America's decaying space-launch infrastructure. The cost to China could also be increased by tightening multilateral export controls, making it more difficult and costly for the Chinese to acquire sensitive dual-use technologies, and by imposing broad economic sanctions on Chinese companies involved in the export of missiles or related technologies to aspiring proliferators around the world.

In concert with these cost-imposing measures, steps could also be taken to reduce the anticipated utility of missiles over the mid-to-long term, to include the following:

- Developing stealthy, long-range, persistent-surveillance and precision-strike platforms to make PLA leaders less confident about the anticipated survivability of their mobile missile launchers, and to encourage increased PLA investment in less threatening air defenses;

- Developing effective missile defense systems, including directed-energy based systems, which could credibly threaten to reduce significantly the overall military effectiveness of

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[103] Mark Stokes, "China's Military Space and Conventional Theater Missile Defense Development: Implications for Security in the Taiwan Straits," in *People's Liberation Army After Next* ed. Susan Puska, (Carlisle, PA: Strategic Studies Institute, August 2000), pp. 124–126.

[104] Richard Fisher, Jr., "China's New Strategic Cruise Missiles: From the Land, Sea and Air," International Assessment and Strategy Center, accessed at http://www.strategycenter.net.

[105] Office of the Secretary of Defense, *Annual Report to Congress: Military Power of the People's Republic of China, (2006),* p. 29.

Chinese missiles, or at a minimum, dramatically increase the number of missiles the PLA believes would be required to destroy a defended target;

- Reducing the US military's reliance upon fixed infrastructure (e.g., ports, airfields, garrisons, and staging areas) for projecting power, thereby denying the PLA lucrative, easy-to-hit targets;

- Proliferating and hardening bases within striking range of the Chinese homeland to complicate the PLA's defense planning, while increasing the number of missiles required to derail US power projection operations; and

- Exploiting stealth, mobility, dispersion, and C3D2 techniques throughout the US military to reduce the PLA's confidence in the efficacy of missile strikes.

One problem with these measures is their cost. Missiles provide China with an effective means of imposing disproportionate costs upon the United States. Indeed, China's missile forces may be a very effective way for Beijing to dissuade the United States from devoting resources to fielding capabilities it considers particularly worrisome. This can be accomplished by inducing Washington to spend large sums on neutralizing the PLA's missile threat. Thus the prospects for dissuading China from expanding its ballistic and cruise missile capabilities may be rather low.

As the horse is already well out of the barn with respect to the PLA's basic missile programs, US dissuasion strategy might better focus more narrowly on Chinese missile defense countermeasures (e.g. penetration aids) and terminal seekers, which are both at a comparatively early stage of development. Successful tests of US missile defense systems, for example, might be used to demonstrate (or perhaps even exaggerate) the anticipated effectiveness of counter-decoy sensor and signal-processing systems. Similarly, it might be leaked that the United States is on the cusp of fielding new electronic countermeasures that can reliably jam or deceive the types of terminal seekers the PLA is trying to develop.[106]

United States missile defense systems would not need to be 100-percent effective to dissuade China from ramping up its investment in missiles, or to influence Chinese planning. Even a less-than-comprehensive missile defense network would pose problems for the PLA. China's defense planners would be uncertain as to the system's overall effectiveness. To be sure of hitting their targets, the PLA would have to allocate more missiles per target in order to have a reasonably high level of confidence of destroying it. This could drive up the cost of a missile-based power projection strategy. In this regard, the US withdrawal from the Anti-Ballistic Missile (ABM) Treaty in late 2001 created considerable uncertainty for Chinese planners by expanding possible US defenses beyond a well-defined, limited, ground-based system proposed under the Clinton Administration, to a vaguely defined network potentially comprising an undetermined mix of ground-, sea-, air-, and space-based elements. Whether or not US planners viewed this as a benefit of terminating the ABM Treaty, the new uncertainties surrounding the US missile

[106] This points out the importance, mentioned elsewhere in this report, of establishing a strong track record in the area of black programs as a means of dissuasion.

defense program cannot but complicate the PRC's military planning and may induce China to funnel more R&D resources into a wider array of potential countermeasures than would otherwise have been the case.

It may also prove useful to transfer missile defense technologies to America's regional allies (e.g., Taiwan and Japan)—something the Chinese no doubt would like to dissuade the United States from doing—to devalue further China's ballistic missile arsenal and compel investments in costly countermeasures. Incorporating penetration aids into each PLA missile, for example, would add an appreciable incremental expense, and also would incur costs in the form of additional warhead weight (and thus lower yield) and/or a reduction in the missile's range. The PLA could shift production toward stealthy cruise missiles to circumvent ballistic missile defenses, but the cost of doing so would likely be substantial in terms of the time and the expense involved in retooling the PLA's existing production infrastructure. Assuming the United States maintains a sizeable lead in the technologies associated with air defenses, the cost to Beijing of pursuing the competition in this manner could be prohibitive. The US military might also field defenses against the PLA's cruise missiles to undercut further China's investment in its missile forces.

Radio-Frequency Weapons

Radio-frequency (RF) weapons, including both narrow-band, high-power microwave (HPM) devices and broadband Transient Electromagnetic Devices (TEDs), can disrupt, damage or destroy electronic equipment by releasing very short, but powerful pulses of energy (i.e., billions of watts within nanoseconds).[107] These "spikes" of energy offer a potentially potent means for burning out the sensitive electronic equipment upon which the US military depends. Unhardened computers, communications equipment, and sensor systems (e.g., radar) are especially vulnerable to RF weapons.

While the key enabling technologies for RF weapons have been available for many years, and in some cases, for several decades, worldwide interest in them has spiked recently. China has reportedly placed a priority on the development of RF weapons.[108] While China probably does not have a high-power RF weapon deployed at this time, DoD estimates that:

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[107] HPM systems radiate a short, but continuous wave of energy over a relatively narrow band. They are most effective when tuned to the target's operating frequency or one appropriate for exploiting known "backdoor" vulnerabilities. TEDs generate a short burst (i.e., measured in 100s of pico-seconds) of energy with a very high peak power that occupies a very large spectrum space (e.g., 100 MHz to several GHz). Mr. David Schriner, "The Design and Fabrication of a Damage Inflicting RF Weapon by 'Backyard' Methods," Testimony before the Joint Economic Committee of the US Congress, February 25, 1998 [http://www.fas.org/irp.congress.1998_hr/s980225ds.htm]. See also: Carlo Kopp, "The Electromagnetic Bomb – A Weapon of Electrical Mass Destruction," available online at http://www.globalsecurity.org/military/library/report/1996/apjemp.htm; and Curt Weldon (chairman), Hearing on EMP Threats to U.S. Military and Civilian Infrastructure, House Armed Services Subcommittee on Military Research and Development, October 7, 1999.

[108] Office of the Secretary of Defense, *Annual Report to Congress: Military Power of the People's Republic of China, (2006)*, p. 29.

> PRC officials have publicly indicated their intent to acquire RF weapons as a means of defeating technologically advanced military forces. Chinese writings have suggested that RF weapons could be used against C4ISR, guided missiles, computer networks, electronically-fused mines, aircraft carrier battle groups, and satellites in orbit.[109]

The prospective acquisition of RF weapons by China is especially troubling because the US military has started to rely more upon unhardened, commercial-off-the-shelf (COTS) components and equipment in recent years to reduce costs.[110] Moreover, emerging very-short-pulse RF weapons (i.e., pulse durations measured in nanoseconds or less) may be able to defeat even "hardened" US military systems designed to survive nuclear EMP and lightening strikes.[111]

To dissuade China from developing and fielding militarily effective RF weapons, the United States could attempt to increase the associated financial and manpower costs by imposing tighter export controls on key technologies, such as explosively pumped flux compression generators, magneto-hydrodynamic generators, virtual cathode oscillators, electron accelerators, and high-voltage spark-gap switches. Unfortunately, there is a wide international supplier base for these technologies and many of them have legitimate civilian end-uses, making effective export controls problematic.

An alternative dissuasion strategy centers on reducing the perceived effectiveness of RF weapons by hardening US military systems. Unless the US military reverses the current trend of relying on unhardened, COTS-derived systems, RF weapons will remain a very attractive asymmetric capability for the PLA. Yet this approach may not prove effective if, as seems likely, the cost of hardening key US military capabilities is greatly in excess of what the PLA would incur to place US systems at risk.

A more promising approach might find the United States keeping its development of RF weapons as "black" as possible. Rather than publicize the prospective utility of RF weapons, the US military should discourage others from investing in their development by conveying an official disinterest in them (i.e., keeping such US programs in the black world). It might be asserted, for example, by the Pentagon that practical RF weapons would have insufficient range

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[109] Office of the Secretary of Defense, *Annual Report to Congress: Military Power of the People's Republic of China, (2006),* p. 34.

[110] Semiconductors, which operate at very low voltages (3-5 volts), are very sensitive, for example, to voltage spikes produced by RF weapons. Furthermore, the heat generated within a semiconductor when exposed to EMP-induced currents may not be able to dissipate quickly enough, especially at small junction areas within the semiconductor, to avoid permanent damage from overheating.

[111] According to an expert on RF weapons from the US Army's Space and Missile Defense Command: "[T]here is an increasing variety of equipment capable of generating very short RF pulses that are capable of disrupting sophisticated electronics. These pulses are not addressed by current design standards and will challenge existing front-end RF protection and other forms of EMI [electromagnetic interference] protection. New capabilities are needed to reject high-power, very-fast RF pulses and to minimize their effect on systems. We believe that common EMI and EMP mitigation techniques will not provide adequate protection against nanosecond and sub-nanosecond pulses from future radio frequency weapons, since active mitigation device response times are typically several nanoseconds to microseconds." Dr. Ira Merritt, "Proliferation and Significance of Radio Frequency Weapons Technology," Statement before the Joint Economic Committee of the US Congress, February 25, 1998.

and lethality to be of military interest.[112] Consequently, the Defense Department's public ("white") budget would show little or no investment in RF weaponry or defenses against them. However, the military's "black" budget would find significant investments being made in these programs.

Space-Denial Capabilities

Although China is officially opposed to the "weaponization" of space, it is believed to have initiated development on a broad range of space-denial capabilities.[113] Current R&D programs appear to be motivated by a desire to exploit what PLA doctrinal writings identify as one of the US military's key vulnerabilities—excessive reliance on space for the effective conduct of operations. This potential American vulnerability, moreover, has been highlighted by high-ranking US military officers. As the former commander of US Space Command, General Charles Horner cautioned, "Our military forces are so dependent on space that it's created a vulnerability for us . . . . We may be faced with a Pearl Harbor in space."[114]

The Chinese are aware of this vulnerability and have been working to exploit it for some time. According to a Defense Department report released in June 2002:

> China already may possess the capability to damage, under specific conditions, optical sensors on satellites that are very vulnerable to damage by lasers. Beijing also may have acquired high-energy laser equipment and technical assistance, which probably could be used in the development of ground-based ASAT weapons.[115]

And the Chinese appear to be making progress. Recently it was reported that China fired high-powered lasers at US satellites orbiting over its territory to test the PLA's ASAT capabilities.[116]

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[112] The Defense Department's interest in RF weaponry is hardly new. For example, in the lead up to Operation Iraqi Freedom, there were many articles in the open press about US development of RF weapons of different types. See, for example, David Fulghum, "Microwave Weapons May be Ready for Iraq," *Aviation Week & Space Technology*, August 5, 2002, p. 24.

[113] For an overview of China's counter-space developments, see Stokes *China's Strategic Modernization: Implications for the United States*, pp. 117–123. See also DoD, *Annual Report on the Military Power of the People's Republic of China (2003)*, p. 36; Vice Admiral Thomas Wilson, "Global Threats and Challenges," *Statement before the Senate Armed Services Committee*, March 19, 2002, p. 17; and DoD, *Annual Report on the Military Power of the People's Republic of China (2002)*, pp. 11–13.

[114] Comments at a Heritage Foundation Forum. See Andrea Stone, "Dependence on U.S. Satellites Makes U.S. Vulnerable," *USA Today*, January 11, 2001, p. 5.

[115] DoD, *Annual Report on the Military Power of the People's Republic of China (2002)*, p. 12.

[116] Vago Muradian, "China Attempted To Blind U.S. Satellites With Laser," *Defense News*, no date, accessed at http://www.defensenews.com/story.php?F=2121111&C=america, on November 15, 2006. According to experts, lasers—depending on their power level—could blind electro-optical satellites (b)(5) (b)(5). Blinding requires less power than disabling a spacecraft. The power requirements to shoot a laser through the dense lower atmosphere and reach a fast-moving satellite in space are substantial. If this can be accomplished, however, it creates severe problems for those trying to defend the satellites, as their hardware cannot be modified once in orbit. There are, however, software changes that can help mitigate the effects of disruptive attacks.

According to the Defense Department, Beijing has a "major effort underway to develp the technologies required for RF weapons, including high-power radiofrequency sources, prime-power generators, and antennas to radiate RF pulses."[117]

Given the US military's growing reliance upon space for precision navigation, long-haul communications, and terrestrial ISR requirements, dissuading China and other prospective competitors from developing, expanding, or transferring capabilities for interfering with, damaging, or destroying space-based systems would be strategically advantageous.

Unfortunately, when it comes to increasing the anticipated costs of developing such capabilities, the United States appears to have few options. It could attempt to increase the PLA's costs to field these capabilities by imposing, and encouraging its allies to impose, more stringent controls on the export of sensitive dual-use technologies. Again, however, as in the case of radio-frequency weapons, given the diversity of suppliers and the relative maturity of China's indigenous space-related technology base, however, this strategy would likely prove ineffective.

The United States might seek to keep the likely diplomatic costs associated with China's fielding of space-denial capabilities as high as possible. To this end, US development of "offensive space control" capabilities should probably be disavowed, at least publicly, and R&D on related programs moved into the black world. To date, the United States has been far too open about its activities in this area, providing convenient diplomatic cover for competitors to follow suit. The *unclassified* defense budget for fiscal year (FY) 2007, for example, included about $47 million for the development and fielding of various "space control" capabilities including $16 million for the Counter Satellite Communications System, $7 million for Offensive Counter Space, and $24 million for the Rapid Identification Detection and Reporting System.[118] Funding has also been earmarked for these and other space control programs in the FY 2008 budget request.

In comparison to the problems associated with pursuing effective cost-inducing strategies, the opportunities for diminishing the perceived military effectiveness of a future PRC space-denial network seem more promising. First, China's existing space-launch, surveillance, and tracking facilities, which would likely serve as the backbone of a future space-denial network, represent a huge sunk cost in fixed, soft, difficult-to-defend installations. Although China could elect to develop and assemble a more survivable network relying more upon mobile or hardened systems, the price tag would be extraordinarily high. In either case, the United States could subtly call into question the survivability of such a network by maintaining and or/developing stealthy, long-range surveillance and precision-strike capabilities that can identify and destroy both fixed and mobile space-denial targets, including those located deep within China's interior.

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[117] Office of the Secretary of Defense, *Annual Report to Congress: Military Power of the People's Republic of China, (2006),* p. 34.

[118] Theresa Hitchens, Michael Katz-Hyman and Victoria Samson, "Space Weapons Spending in the FY 2007 Defense Budget," available at, http://www.stimson.org/space/pdf/FY07SpaceWeapons.pdf.

Second, the United States could develop and field a range of counter-measures and defensive systems to reduce the vulnerability of its space-based assets, thereby making space-denial capabilities less attractive from a strategic and operational perspective. Potential steps that could be taken, for example, include the following:

- Designing satellites that use laser datalinks, or narrow, high-power RF beams to transmit data, thereby negating or reducing the effectiveness of traditional RF jamming;

- Accelerating the fielding of the GPS-III series of satellites, which are considerably more resistant to jamming than the current models;

- Equipping satellites with proximity sensors that alert their terrestrial controllers to the presence of small, nearby objects such as microsatellites;

- Increasing reliance upon constellations of small, single-purpose satellites that are comparatively robust and easy to replenish relative to large, expensive, multi-mission satellites;

- Testing next-generation satellite protection systems (e.g., shutters to reduce the effectiveness of laser dazzlers; reflective or ablative coatings to protect satellites from high-power lasers; and satellite maneuvering capabilities); and

- Developing a rapid reconstitution capability to replenish lost or damaged satellites in the event of a successful surprise attack.

Third, the United States could threaten to change the competition's character by developing and possibly fielding viable terrestrial alternatives to satellites. Stealthy, high-altitude, extremely long-endurance unmanned aerial vehicles (UAVs), for example, might provide the basis for a robust long-haul communications network, offer persistent ISR coverage over areas of interest, and act as GPS beacons or "pseudolites" for precision navigation and timing.

Finally, as part of the overall strategy for dissuading China from investing in space-denial capabilities, the United States might field an extremely capable space surveillance network and then unambiguously convey to PRC officials that the United States would be aware of any Chinese attempts to launch covertly any space-based ASAT systems. This might dissuade Chinese adventurism in space.

Anti-Navy Capabilities

Writing in Chinese military journals, several high-ranking PLAN officers have highlighted the contribution that anti-navy capabilities could make to a broader anti-access strategy. Particular attention has been given to enumerating the potential vulnerabilities or "defects" of American

aircraft carrier battlegroups, amphibious assault formations, and logistics assets.[119] Like other Chinese efforts to develop A2/AD capabilities, this effort is not new; rather, it is the product of focused effort over time. A decade ago, one PLA general officer, writing in the Chinese journal *Modern Weaponry*, observed that:

> The transport ships of the expeditionary force present a large target. In addition to size, they are vulnerable also because of their limited maneuverability. So an economical and effective strategy for the country on the defensive is to develop and produce a number of weapons systems which may be short on sophistication and precision but are capable of intercepting the enemy's transportation platforms at long distances. Examples are the conventional cruise missile and super guns.[120]

The PLAN appears to be in the early stages of developing and fielding what could eventually become an integrated, layered "anti-navy" network. Core elements currently include over-the-horizon (OTH) maritime surveillance and tracking, anti-ship cruise missiles (ASCMs), submarines, and sea mines.

China has several ongoing R&D programs focused on developing ocean-monitoring satellites, including multi-satellite electronic intelligence and synthetic aperture radar constellations. China has also been attempting to develop a "backscatter" OTH radar capability and is currently testing a prototype sky-wave system and two surface-wave systems.[121] To both complement and facilitate indigenous long-term development efforts for fielding modern airborne early warning aircraft and long-range UAVs, the PLAN is attempting to acquire platforms and sensor systems from abroad. China has already procured an aerostat-borne maritime patrol radar that is expected to have an effective range of up to 200 kilometers and the ability to detect, classify, and target ships at sea.[122] The Pentagon reported to Congress in 2002 that "China's procurement of new space systems, airborne early warning aircraft and long-range UAVs, and over-the-horizon radar will enhance its ability to detect, monitor, and target naval activity in the Western Pacific Ocean."[123] It further notes that "China may have developed passive acoustic sensors for use in coastal waters" and will probably continue to develop and deploy additional, and more capable,

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[119] See, for example: Colonel Ying Nan in "Hangmu de biduan ji fan hangmu zuozhan" (Aircraft carrier defects and anti-aircraft carrier operations) in *Xiandai Junshi* (Contemporary Military Affairs), January 1998, pp. 13–15 as quoted in Michael Pillsbury, *China Debates the Future Security Environment*, pp. 83–84.

[120] Sun Zian, "Strategies to Minimize High-Tech Edge of Enemy," in *Xiandai Bingqi* [Modern Weaponry], August 8, 1995, pp. 110–11, as translated in FBIS-CHI-96-045, "PRC: Military Journal on Countering High-Tech Enemy," March 6, 1996, pp. 63–64.

[121] If the skywave radar becomes operational, it would reportedly have a detection range of between 800 and 3,000 kilometers. Kanwa News Agency (Beijing), "China Develops Sky-Wave Backscatter OTH Radar," November 7, 2001. See also: DoD, *Annual Report on the Military Power of the People's Republic of China (2003)*, p. 8.

[122] The radar, which is a modified version of Russia's Novella system, is reportedly capable of operating in four modes: air-to-air detection; long-range surface search; inverse SAR for vessel classification; and target acquisition. See Piotr Butowski, "China's New Radar Watch on Taiwan Strait," *Jane's Defence Weekly*, September 4, 2002.

[123] DoD, *Annual Report on the Military Power of the People's Republic of China (2002)*, pp. 4, 22.

underwater sensors, some of which "may be installed as far offshore as the edge of the continental shelf."[124]

The PLAN is aggressively pursuing development of nearly a dozen varieties of ASCMs through indigenous R&D efforts, as well as by acquiring missiles and associated technology from abroad.[125] Russia, for example, has reportedly sold SS-N-22 Sunburn (Moskit) and SS-N-27B (Sizzler) ASCMs to China.[126] The former, which was originally designed to sink Arleigh-Burke class destroyers and other major US surface combatants, is essentially a Russian version of the US Harpoon system and has a range of about 130-140 kilometers, while the latter has a similar range and attacks its target at faster than Mach 2, while making rapid (up to 15-g) turns to evade ship defenses.[127] China is also developing its own standoff, air-launched ASCM called the C-803, which is expected to have a range of 250 kilometers (or beyond the range of most of the US Navy's current surface-to-air missiles).[128]

The PLAN's submarine fleet currently comprises about 50 boats, but most are obsolete by Western standards.[129] A growing number of Chinese strategists reportedly believe, however, that the undersea power balance will be a critical determinant of future wars. One PLAN captain, for example, writes that,

> After the First World War, the dominant vessel was the battleship. In the Second World War, it was the aircraft carrier. If another global war breaks out, the most powerful weapon will be the submarine.[130]

China is placing considerable emphasis on modernizing its submarine fleet. China purchased four *Kilo*-class diesel-electric attack submarines (SSKs) from Russia, which are armed with wake-homing torpedoes, and is acquiring eight more.[131] Meanwhile, China's *Song*-Class diesel electric submarine is in serial production.

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[124] DoD, *Annual Report on the Military Power of the People's Republic of China (2002)*, p. 29.

[125] Office of the Secretary of Defense, *Annual Report to Congress: Military Power of the People's Republic of China, (2006)*, p. 29.

[126] Dmitriy Safonov, "Moskit Has Been Completely Declassified. The Chinese Navy Will Get Unique Russian Missile," *Moscow Kommersant-Daily* (as translated by FBIS), April 14, 1998, p. 2.

[127] The SS-N-22 uses an active radar seeker and carries a 300-kg warhead. China is also reportedly interested in buying sea-skimming 3M54 Alfa ASCMs from Russia that have an effective range of about 300 km. See Yihong Zhang, "China to Acquire Anti-Ship Missiles," *Jane's Defence Weekly*, February 21, 2001; Yihong Zhang, "China Negotiates to Buy Advanced Russian Anti-Ship Cruise Missile," *Jane's Defence Weekly*, August 9, 2000.

[128] John Hill, "China's Armed Forces Set to Undergo Face-Lift," *Jane's Intelligence Review*, February 2003, p. 15.

[129] Office of the Secretary of Defense, *Annual Report to Congress: Military Power of the People's Republic of China, (2006)*, p. 48.

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[131] Office of the Secretary of Defense, *Annual Report to Congress: Military Power of the People's Republic of China, (2006)*, pp. 4-5.

The PLAN currently has a huge stockpile of sea mines comprising both vintage Soviet-era designs, as well as more modern mines with a variety of triggers.[132] China has developed rocket-propelled rising mines and is thought to have developed an acoustically activated remote control system for at least one type of mine. China is also believed to be developing mines with small motors that could enable them to move a short distance at random intervals, which would make mine mapping more difficult and time consuming.[133] The PLAN is also interested in acquiring submarine-launched, mobile, bottom mines.[134]

How might the United States dissuade China from continuing to develop and field elements of an increasingly threatening anti-navy network? The best course of action involves encouraging Chinese investments in less threatening areas of maritime competition, such as littoral ASW and blue-water surface operations. In addition to this indirect strategy, however, the United States should also consider options for increasing the economic costs involved in creating an anti-navy network, as well as for lowering the perception within China's decision-making circles of the likely strategic, operational, and tactical effectiveness of such a network.

One means for driving up the economic costs of building an effective anti-navy network is to curtail China's access to relevant cutting-edge foreign technology, compelling the PLAN to rely more heavily upon indigenous development programs. This approach would be especially appealing for impeding the PLAN's development and fielding of more capable ASCMs and submarines. China's indigenous submarine development programs (e.g., the *Song*-class guided missile submarine and *Ming*-class attack submarine) have been plagued by innumerable difficulties. Despite years of effort and billions of dollars in investment, the overall performance of Chinese-designed and built submarines remains comparatively poor. The mechanism for denying China access to foreign submarine technology, however, is not obvious.

However, one obvious way of discouraging Chinese investment in their submarine forces is for the United States to maintain a clearly dominate position in undersea warfare. The 2006 QDR supports this approach in its call for increasing *Virginia*-class submarine production. Another step, not recommended in the QDR, would be to begin the process of developing a follow-on submarine to the *Virginia*-class boats.

In summary, reducing the perceived utility of a fully mature Chinese anti-navy network in the eyes of PLA officers and political decision-makers forms the basis for a more effective dissuasion strategy. This might be accomplished by pursuing three, mutually reinforcing courses of action. The first would be to call into question the likely survivability of critical elements of a prospective anti-navy network. If key Chinese decision-makers could be convinced that the network would be impractical to defend and could be "rolled back" quickly by the US military,

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[132] The variety of mines in China's stockpile include bottom and moored influence mines, mobile mines, remotely controlled mines, command-detonated mines, and propelled-warhead mines, which are potentially effectively deep waters. DoD, *Annual Report on the Military Power of the People's Republic of China (2003)*, p. 27.

[133] DoD, *Selected Military Capabilities of the People's Republic of China*, p. 8.

[134] DoD, *Annual Report on the Military Power of the People's Republic of China (2002)*, p. 15.

they would be less enthusiastic about funneling billions of dollars into its development and expansion. However, it is not clear that the US military has, or will soon have, the requisite capabilities to execute such an attack. Although the US military could easily destroy OTH radars and other fixed nodes in the network, hunting down and eliminating stealthy, high-flying UAVs, mobile ASCM launchers, quiet diesel-electric submarines, and thousands of mobile mines is a much more daunting proposition. For this course of action to be effective, therefore, new US military capabilities would likely need to be developed and demonstrated. They might include:

- ISR platforms (e.g., long-endurance UAVs and a space-based radar constellation) for locating and tracking mobile ground targets such as ASCM launchers in cluttered environments;

- Wide-area ASW capabilities and rapidly deployable "sensor nets" that threaten to make the sea "transparent," at least in confined geographical areas or chokepoints; and

- Autonomous underwater vehicles for conducting ISR, offensive ASW, and mine-hunting operations in heavily defended littoral waters.

The second element in this strategy centers on developing defensive capabilities that reduce the anticipated military effectiveness of China's offensive anti-navy systems. Developing and fielding an effective defense against barrages of stealthy, hypersonic ASCMs would be especially critical in this regard. Demonstrating highly effective countermeasures against torpedoes, including wake-homing varieties, would also be useful. Outfitted with these defensive systems, US ships could credibly threaten to conduct aggressive "roll back" operations, casting more doubt on the survivability of China's A2/AD network.

The final aspect of the strategy is to render a prospective Chinese anti-navy network, at least as currently envisioned, less relevant by changing the character of the competition. For example, rather than continuing to invest in large, high-signature surface combatants for projecting power from the sea, the United States could shift, over time, toward increased reliance upon submerged platforms (e.g., SSGNs, SSNs, UUVs, undersea strike modules, and submerged troop-carrier platforms) that are undetectable from space or high-flying aircraft and immune to ASCM attack.

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IV. SELECTED DISSUASION ISSUES

THE UNIVERSAL RATIONALITY TRAP

As mentioned earlier in this report, when crafting dissuasion strategies it is imperative to avoid what might be called the "universal rationality trap." All actors do not view the world in the same way; nor, consequently, do they share the same model of rationality. Dissuasion strategy, therefore, must be informed by an understanding of how the target perceives the world and evaluates alternative courses of action. Decisions that might appear "irrational" to American observers could be entirely logical when the target's culture, religious beliefs, political concerns, personal jealousies, life experiences, and other psychological factors are taken into consideration. Similarly, the decision-making processes within government bureaucracies and other institutions are often not value maximizing because of deeply engrained bureaucratic biases, institutional rivalries (e.g., political-military tensions), "strategic culture" and other factors.[138] An effective dissuasion strategy should exploit these factors—pushing with them, not against them—to shape the target's decision-making.

The problem is that the US intelligence community does not have a solid understanding of how prospective competitors interpret the world around them or the factors that shape their thinking—either at the individual or collective level. The US Government must make intelligence collection, research and analysis in this area a higher priority. Key research questions include the following:

- Which individuals are critical to the decision-making process in foreign states, how do they interact with each other, and what factors most influence their thinking?

- How do government institutions and bureaucracies in different states make decisions? What dynamics most strongly affect the decision-making process? What factors determine which issues get on the agenda and which ones get excluded?

- What is the rhythm of a competitor's decision making? How can the United States insure that its efforts to dissuade a rival are felt *before* that rival reaches a critical decision point, after which it will prove very difficult to overturn or alter?

- To what extent do biological, cultural, or other factors limit the range of options considered during the decision-making process? Put another way, are there some things a state will do or fail to do regardless of the cost-benefit tradeoff?

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[138] For more on non-rational decision-making and the influence of organizational factors, see A.W. Marshall, *Bureaucratic Behavior and the Strategic Arms Competition*, Southern California Arms Control and Foreign Policy Seminar, October 1971.

SECOND-ORDER EFFECTS

Knowledge of how the target of a dissuasion strategy calculates costs and benefits will always be imperfect. Indeed, in some cases the target's decision-makers may not even be able to explain convincingly to each other how they happened to decide upon a particular course of action. Thus US decision-makers will never be able to discern whether a particular dissuasion strategy will achieve its desired effect. Moreover, even if the desired effect is achieved, and a rival is dissuaded from pursuing a particular capability, it will not be clear how that rival will choose to employ the resources liberated by an effective dissuasion strategy, or what new competitive path it might choose to follow.

For example, creating high barriers to achieving a credible posture entry can be an important element of a dissuasion strategy. The higher the entry barrier, the more difficult it is to enter the competition. As the barrier rises, the cost becomes increasingly difficult to bear, and may eventually become prohibitive. In many cases, competing with a dominant power may simply not be possible, because the inferior power lacks sufficient resources, no matter how great its determination to compete. But if a rival is dissuaded, then what?

There is an old saying, "Be careful what you ask for, you might just get it." For those contemplating dissuasion strategies, it is worth considering what course of action a rival might pursue once he is dissuaded from entering a particular area of the military competition. Put another way, one must consider the second-order effects of a dissuasion strategy that achieves its first-order goal. For example, it may be that, after over a half century of futility against Western armies (to include the Israeli Defense Forces (IDF)), Middle Eastern states are dissuaded from attempting to compete against them through direct means; i.e., symmetrically: plane-on-plane; tank-on-tank, etc.

Iran provides a good example. During the latter years of the Shah's reign, the windfall in petrodollars following the 1973 oil shock was spent on efforts to shape the Iranian armed forces in the mold of western militaries. Large sums were spent on late-model F-14 fighter planes, Chieftain tanks, and Hawk air defense missile systems. The arms embargo that followed the Shah's fall, combined with other factors, raised the barriers to Iranian acquisition of conventional military capabilities. This, combined with the enduring failure of Arab armies (and the stalemate that emerged during the Iran-Iraq War) probably had a dissuasive effect on Tehran's willingness to emphasize conventional forces for its military.

The second-order effects, however, have been quite pernicious. Iran's defense strategy now centers on three elements that are far more worrisome for Pentagon planners. One centers on the use of irregular forces that practice a modern form of insurgency, whether in Lebanon, Palestine or Iraq. Another involves the development of weapons of mass destruction—nuclear weapons in particular. The third element focuses on improving Iran's nascent anti-access/area-denial capabilities. Thus while Iran has foregone developing more traditional forms of military power—whether or not this is the result of a formal US dissuasion strategy is unclear—the alternative course pursued by Tehran following its abandonment of that effort (i.e., the second-order effect) has arguably produced a far more worrisome situation for the United States than if Iran had pursued more traditional forms of military capability.

Put another way, success in dissuading the Iranians from emphasizing conventional capabilities—an area of the competition where the US military is both highly proficient and institutionally comfortable—has produced second-order effects in which the "cure is worse than the disease." But could it have been otherwise? The sheer size of the United States conventional forces exerts a strong dissuasive effect. And there is little Washington could have done to avoid having the Iranians learn the cautionary tale provided by a series of Arab-Israeli wars and the more recent Gulf wars. The point here is not that dissuasion strategies produce unintended and unwelcome consequences. Rather, it is to emphasize the importance of careful planning when it comes to crafting dissuasion strategies, so that the second-order consequences might be identified and steps taken to minimize the prospects for negative outcomes, and to mitigate them if they occur.

Similarly, in crafting dissuasion strategies that impose costs on an adversary, it is important to do so in a way that keeps the rival *in the competition*, rather than driving him out. In this way dissuasion differs from deterrence, where the higher the cost, the better the deterrent. Consider our example of the cost-imposing strategy represented by the United States' manned bomber force against the Soviet Union's air defense network. The bomber force could be maintained and modernized at far less expense than the costs associated with effecting corresponding improvements in the Soviet air defense network. However, the success of this strategy depended on the United States finding the "sweet spot" in its cost-imposing strategy: a situation that imposes the maximum cost the Soviets would be willing to continue to bear to modernize their air defenses, without crossing a cost threshold that would find the Soviets deciding to depart the air defense competition altogether. This again brings home the importance of understanding how the target of dissuasion strategies calculates costs and benefits. To succeed, this indirect approach involves creating in the mind of one's rival a belief that the benefits of pursuing the course of action (in this case, maintaining and modernizing a national air defense network) exceed, if only just barely, the costs incurred.[139]

Finally, actions taken for reasons apart from dissuasion may produce some interesting second-order effects relative to dissuasion. For example, a perceived willingness to engage in preventive war (and to do so *effectively*) may be an important element in strategies of dissuasion. Recall the discussion earlier in this report of the Third Punic War, which offers a useful case in point. Following the first two Punic Wars, in which Rome and Carthage engaged in a desperate struggle for supremacy in the Mediterranean, the former emerged victorious. Rather than run the

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[139] It is interesting to speculate what the effect of an American B-2 stealth bomber force would have been on Soviet calculations with respect to their air defense forces. The Defense Department originally planned to field 132 of these bombers, which would have severely challenged Soviet air defenses, and required Moscow to undertake a major expansion and modernization of its air defense forces if their effectiveness were to be retained. Would this bomber force have put the US cost-imposing dissuasion strategy in the heart of the "sweet spot," or would Moscow have finally decided that the cost of remaining in the penetrating bomber-air defense competition now exceeded the benefits? If the latter case obtained, the question then arises: What would the Soviets have chosen to do with the resources liberated by its decision? Put another way: What were the possible second-order effects of pushing Moscow's costs beyond its anticipated benefits?

Note that in the case described here, dissuasion involves encouraging the target to persist in a particular area of the military competition (i.e., air defense) in order to discourage competition in an area that is the object of dissuasion efforts.

risk of Carthage recovering its strength, Rome initiated a third war and destroyed Carthage once and for all. One suspects that Rome's willingness to undertake preventive war, the ruthless way in which the war was waged, and the war's successful outcome, had an important second-order effect, specifically on those who might be contemplating posing a challenge—in any form—to Rome's power.[140] Unfortunately, at present the United States' track record in employing, consciously or unconsciously, preventive war as part of a dissuasion strategy, is unimpressive. Thus while a particular action (e.g., preventive war) may be taken, or a specific capability (e.g., missile defense) may develop for reasons other than dissuasion (e.g., defeating or deterring an enemy; reassuring an ally or partner), they may still have potential indirect (or second-order) effects on dissuasion.

THE LINK BETWEEN R&D AND DISSUASION

A vigorous, diversified R&D program can make an important contribution to dissuasion. By creating a broad portfolio of capability options from which the United States can pick and choose to develop new capabilities, R&D initiatives complicate the defense planning of prospective competitors. This is especially true of science and technology projects that push the bounds of the technological state-of-the art and periodically lead to discontinuous change in military capabilities. Put another way, a robust R&D program can instill competitors with the feeling that "no matter what path we go down, we'll be checked." This sense of futility can be intensified by waiting until competitors have sunk substantial resources into the development and fielding of a given capability before unveiling a new US capability that renders it less effective or obsolete. (The reader will recall Admiral Fisher employing this approach, which he termed "plunging.") Again, this points out the importance of having good intelligence on how the targets of US dissuasion efforts calculate advantage and cost/risks.

There is however, a tension between keeping R&D initiatives secret (so as to maintain surprise) versus the need for adversaries to know about them for dissuasion purposes. Programs that are completely "black" obviously have negligible immediate dissuasive value.[141] The resolution to this conundrum may be found in deciding the release of information regarding black programs on a case-by-case basis, attempting to balance the dissuasive effects generated by increasing a rival's uncertainty with the potentially intimidating effects of actually knowing when he has been trumped.

For example, the United States could be overt about its pursuit of various defensive capabilities, but keep publicly available information general—leaving the details up to the imagination of potential competitors. There would be considerable dissuasive value, for example, in signaling that the United States is on the cusp of a major breakthrough in missile defense or has promising programs underway for protecting its computer networks and satellites. Again to maintain

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[140] Rome's ruthless destruction of Carthage, which was utterly destroyed as a city, produced the Roman historian Tacitus' famous quote, *Solitudinem fecerunt, pacem appelunt*—"They made a desert, and then called it peace."

[141] The dissuasive value of these programs is in their contribution to establishing a strong track record over time for producing, with little warning, important military capabilities that exert a significant influence on the military competition.

credibility, it would be important to maintain a strong track record of technological innovation. Conversely, those R&D programs with significant *offensive* potential (e.g., space-denial capabilities, RF weapons, and low-yield nuclear designs), should generally be kept secret for as long as possible not only to deny competitors the opportunity for developing countermeasures or offsets, but also to avoid promoting and legitimizing foreign R&D programs in those areas.

DISSUADING COVERT PROGRAMS

How do you dissuade what you don't know about? There is no doubt that the United States' rivals are also pursuing black programs of their own. The development of advanced biological weapons, RF weapons, and novel information warfare capabilities, for example, would be very easy for competitors to conceal. The US intelligence community might not become aware of them until they were deployed, or used. At that point, dissuasion would be irrelevant.

There may be some value in importing negative object lessons as a means of dissuading covert programs. For instance, when the United States periodically discovers such programs (e.g., North Korea's nuclear program), it might make a public example out of the offending state. If the United States can establish a strong track record, or clearly recognizable pattern that communicates "We'll find out about covert programs and the cost to those pursuing them will be high," the results may be a dampening effect on future rival efforts to develop or expand upon proscribed capabilities. Again, intelligence is crucial to success. The earlier a rival's efforts can be detected, the more likely this approach will enjoy some success. By reinvigorating its human intelligence and clandestine service activities, the United States would be better able to detect covert programs. In summary, more frequent American successes in this area would, over time, make foreign leaders less confident in their ability to hide proscribed programs. Unfortunately, as the cases of Iran, Iraq, and North Korea show, the United States to this point has not been successful in addressing the problem of covert nuclear programs either through preventive action (as in the case of Iraq) or through non-military measures (as in the case of Iran and North Korea). If anything, US actions in recent years have undermined dissuasion in this area, rather than reinforced it.[142]

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[142] Libya, of course, is the notable exception to this trend.

V. INSTITUTIONALIZING DISSUASION

How might the Defense Department organize itself to craft, execute and evaluate dissuasion strategies? The following discussion represents a first cut at the problem.

THE IMPORTANCE OF INTELLIGENCE

To begin, it is important to have intelligence on the United States' most threatening existing and prospective rivals, as well as on its most important allies and partners (who, themselves, may be targets of dissuasion efforts). As dissuasion strategies, like deterrence strategies, seek to influence the behavior of others, it is critical to understand how prospective targets view the world and the military competition; how they calculate benefits, risks, and costs; how they gauge the success of their efforts; and how certain events (especially predictable events) may significantly alter their calculations.

With respect to this latter point, an example is instructive. In the course of developing a major new capability, certain decision points are crossed. The target state's leadership must, at some point (or points), decide whether to proceed with the effort, modify it (e.g., scale it back; alter the capability's characteristics, etc.), or cancel it altogether. If the decision is made to proceed—for example, from a weapon concept to full-scale development—it often becomes much more difficult to alter that decision down the road, even if the capability is seen to decline in relative value. This is because of the "program momentum" that such decisions produce. Senior decision-makers, having passed judgment and thus staked their reputations on the program's success, become reluctant to admit later they were mistaken. Moreover, new resources committed to the project by the decision cannot easily be recovered; often they cannot be recovered at all. Thus "sunk costs" make it more difficult to change course; i.e., to be dissuaded. Key players (e.g., the communities where the weapon will be built; the firms that will do the work; major suppliers of components) now have a stake in the project and will fight to preserve it (along with their narrow interests). Thus just as it is critical for purposes of deterrence to know under what circumstances a rival might decide to employ his military capabilities, it is just as important for those crafting dissuasion strategies to have intelligence on the key decision points that go into determining whether a rival's prospective military capability will generate program momentum.

Dissuasion involves cause-and-effect. The intent is that the elements of a dissuasion strategy serve to alter the behavior of rivals in ways favorable to us. But how do we know that a target's decision not to pursue a particular military capability was decisively influenced by our actions? Or even influenced at all? If a rival decides to proceed with developing a particular military capability, how do we know whether our efforts at dissuasion significantly influenced the characteristics of that capability? Intelligence that enables those crafting dissuasion strategies to get the answers to these questions is critical to success.

During the Cold War, intelligence efforts were dominated by the US national security strategy's emphasis on deterring rivals and identifying their capabilities (so as to improve our warfighting position). Moreover, these efforts were directed predominantly at the Soviet Union. For dissuasion strategies to be effective, the US Intelligence Community will need to develop the

capacity to address effectively the different requirements posed by dissuasion, and the dramatically altered set of rivals now confronting the United States.

DISSUASION'S OVERT AND COVERT ELEMENTS

For deterrence to succeed, a threat must be clearly communicated to a target such that the target understands the threat, believes it to be credible (i.e., that it will be carried out under the circumstances stated), and also believes that, in light of this threat, the anticipated costs of employing its military forces exceed the anticipated benefits. For those practicing deterrence, it does no good to conceal their military capabilities, or to fail to make clear to the target of their efforts that these capabilities will be used if the target employs military force.[143]

This is not always the case with dissuasion.

As outlined below, some dissuasion strategy initiatives are best pursued in the light of day, where the target (or targets) and others can readily discern their presence and effect. On the other hand, some dissuasion strategies are best pursued covertly, such that a rival cannot easily discern a direct link between US actions and their intent. This is especially useful when an acknowledged link would serve to increase the target's resolve to pursue the course of action that is the object of US dissuasion efforts. For example, were the United States to pursue a public strategy whose openly declared objective is to dissuade the European Union from fielding its Galileo constellation of global positioning satellites, it could very well have the effect of encouraging the effort, as it is likely the EU consortium would react strongly, out of a sense of pride and a need to affirm its independence and status, to any overt attempt by the United States to influence such an important decision.

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[143] A classic example of the problems associated with concealing intentions and capabilities is seen in the 1964 motion picture, *Dr. Strangelove*. In the movie, a US B-52 bomber armed with nuclear weapons mistakenly sets out to attack the Soviet Union. As the plane penetrates Soviet airspace, the Soviet ambassador (de Sadesky) informs the US president, Merkin Muffley, and his adviser, Dr. Strangelove, that the Soviets have built a "doomsday" device that will automatically detonate and destroy the world if the USSR is ever subjected to a nuclear attack. However, the Soviets have failed to notify the United States of this fact. Hence the deterrent effect sought cannot be realized. The dialogue makes this clear:

[Discussing the Doomsday machine]

President Merkin Muffley: How is it possible for this thing to be triggered automatically and at the same time impossible to untrigger?

Dr. Strangelove: Mr. President, it is not only possible, it is essential. That is the whole idea of this machine, you know. Deterrence is the art of producing in the mind of the enemy . . . the FEAR to attack. And so, because of the automated and irrevocable decision-making process which rules out human meddling, the Doomsday machine is terrifying and simple to understand . . . and completely credible and convincing.

Dr. Strangelove: Of course, the whole point of a Doomsday Machine is lost, if you "keep" it a "secret"! Why didn't you tell the world, EH?

Ambassador de Sadesky: It was to be announced at the Party Congress on Monday. As you know, the Premier loves surprises.

Cited at http://www.imdb.com/title/tt0057012/quotes.

Or consider another example. Admiral Jackie Fisher's battle cruiser program, cited earlier, was designed to be sprung upon the Imperial German Navy as a means of wrecking its shipbuilding program, thereby not only imposing high costs but also to dissuade the Germans from thinking they could challenge Britain's maritime supremacy. For Fisher's stratagem to succeed the Germans had to believe he was committed to the *Dreadnought* design as the arbiter of naval dominance; hence the move toward emphasizing battle cruisers, Fisher's real priority, had to be kept secret.

Overt Efforts

Overt dissuasion tools were described earlier in this report. Diplomatic efforts such as political sanctions, arms control treaties, public diplomacy and the formation of alliances, among other things, can play important roles in dissuasion. Similarly, overt economic instruments such as sanctions and embargoes are conducted "in the open." The same holds for military instruments. The reader will recall that the Romans and British conducted certain military operations for which a primary purpose was to dissuade rivals, in part by raising the prospective costs of undertaking a proscribed action (e.g., creating the military capability to pose a challenge; transferring military capabilities, etc.). The US Navy today, like the Royal Navy of the 19th century, seeks to advertise its overwhelming size and strength so as to create in the minds of prospective rivals a belief that the cost of attempting to challenge America's maritime supremacy is to undertake a fool's errand.

Covert efforts

Covert dissuasion tools are also addressed in an earlier section of this report. Unlike the "doomsday machine" in Dr. Strangelove, sometimes a successful dissuasion strategy depends on the target not being aware he is being targeted at all. A good example is found in the Defense Department's black programs. Here it is essential that the target of dissuasion efforts remain unaware of the capabilities being developed. If this can be achieved, and if the United States maintains its strong reputation for fielding novel and effective new capabilities from the black world, rivals are forced to confront a much more uncertain planning environment—one that requires them to account for a significantly broader set of US military capabilities. If the target of this dissuasion technique decides to cover its bets against all these potential capabilities, it will likely dilute the target's efforts on creating capabilities the United States wants to dissuade.

Another example of covert dissuasion strategies are those that might lead the target to behave in undesirable ways if US involvement is made clear. For example, US efforts to impose costs on the Iranian regime might involve covertly supporting Iranian resistance groups hostile to the regime. If the US role were overt, the resistance efforts might seem less genuine in the eyes of sympathetic Iranians, who might withhold their support. Or suppose the United States trumpeted its efforts to render the next generation of Chinese air defense systems impotent by developing a new generation of advanced stealth aircraft. This might not only discourage the Chinese from spending (and wasting) large sums of money on their new air defense systems, but encourage the PLA to abandon air defenses in favor of fielding far more worrisome military capabilities, such as extended-range ballistic missiles to strike the air bases from which the advanced US strike aircraft would operate.

INSTITUTIONALIZING DISSUASION

There are two reasons why dissuasion strategies should be the province of the secretary of defense, a small number of senior defense decision-makers, and a small analytic staff. First, as noted, some aspects of a US strategy will need to remain covert. Thus the fewer people who are aware of these efforts, the better. Second is the military services' traditional focus is on waging war. Indeed, over half a century since they became prominent, most of the thinking on other traditional pillars of US defense strategy—such as deterrence and ally reassurance—has been dominated by the civilian strategic studies community. Thus it seems unlikely the Services will provide much value-added support when it comes to dissuasion.

Moreover, given the prominence of defeating aggression and deterring it, considerations pertaining to dissuasion are not likely to be the dominant factor in Defense Department deliberations on whether a military capability is developed, or adjustments to the global posture are pursued. But the value of a given capability for dissuasion purposes could be a decisive factor in deciding whether or not to develop it, field it, or maintain it as a part of the US force posture. For example, the B-1 bomber is not an especially capable bomber. It has failed to displace the B-52s which preceded it, and which remain in service two decades after the B-1 appeared. And the B-1's successor, the B-2, is superior to the B-1 in just about every way. Moreover, cruise missiles can penetrate better than the B-1, as can ballistic missiles. Thus, arguably, the most important reason for pursuing the B-1 through to completion was its value as a key element in a cost-imposing strategy designed to dissuade the Soviet Union from investing in far more worrisome military capabilities.

In circumstances like this, the secretary of defense is likely to be in the best position to assess a particular capability's dissuasion value. As the ultimate arbiter in setting priorities in the defense program, the defense secretary is also in the best position to "put his thumb on the scale" if need be, and tip the balance of the argument in favor of a capability felt to be effective in supporting a particularly promising dissuasion strategy.

The defense secretary will need some advice and analytic support as to what dissuasion strategies look profitable, how they might best be implemented, and what elements of the defense program should be accorded high priority for these purposes. Toward this end, a Senior Dissuasion Strategy Group (SDSG) might be established, comprising the most senior Defense leaders, to include the secretary of defense, deputy secretary of defense, the undersecretaries for policy, intelligence and acquisition, and the chairman of the Joint Chiefs of Staff. This body would review the work of a Dissuasion Strategy Working Group, or DSWG, with the Director, Office of Net Assessment, serving as its chair (as well as an *ex officio* member of the SDSG).

Thus the SDSG is intended to serve as the governing body on dissuasion policy, strategy, program and resource issues. It provides guidance to the DSWG, which responds to this guidance, and which is also empowered to undertake assessments of potentially attractive dissuasion efforts. The DSWG would also be tasked with identifying the dissuasion efforts (ongoing or potential) of rivals, and identifying US counter-strategies.

SUMMARY

To sum up, then, decisions pertaining to forces, basing, new capabilities, the division of labor between the United States and allies should be made with an eye as to how they support the various elements of the US national security strategy, to include deterring aggression, defeating aggression if deterrence fails, reassuring allies, taking preventive action against emerging dangers, and dissuading existing and prospective rivals from developing, expanding or transferring particularly threatening capabilities.

The secretary of defense and his most senior advisers must set priorities among these elements of US strategy, and perhaps others as well (e.g., preemption, appeasement, persuasion). Doing so requires they have a sense of what options are available to them and what approaches might prove effective in each area. Clearly there are interrelationships between the elements and the need to make trade-offs. For example: a decision must be made as to what level of effort should be placed on dissuading China from enhancing and expanding its submarine force, deterring the existing (and prospective force), defeating it in war if that becomes necessary, reassuring allies whose capabilities may prove useful in addressing the challenge, and so on. While there is a long tradition of advocacy with respect to the war-fighting/deterrence and reassurance elements of strategy, there has been far less emphasis on dissuasion. This factor, combined with the covert character of certain dissuasion strategy initiatives, argues for creating a Dissuasion Strategy Working Group to develop overt and, especially, covert options in support of a Senior Dissuasion Strategy Group.

VI. AREAS FOR FURTHER STUDY

This assessment of dissuasion strategy is far from comprehensive. Issues surrounding the application of dissuasion strategies to rogue states, non-state actors (e.g., trans-national terrorist organizations), and American friends and allies, are not given the detailed treatment found in the China case study. Several additional questions meriting additional research and analysis include the following:

- How are other countries dissuading America from investing in promising capability areas? How might those dissuasion strategies be countered?

- How might the United States dissuade groups that are "ripe for radicalism" from adopting terrorist tactics?

- What elements would need to be incorporated into a comprehensive strategy for dissuading states (e.g., Iran, Syria, and Saudi Arabia) from harboring or providing resources to terrorist groups?

- How might the secretary of defense most profitably employ the two small groups outlined in this report for the purpose of crafting and executing effective dissuasion strategies?

- How can a given dissuasion strategy's success or failure be determined? What might be useful measures of effectiveness (MOEs)?

- What taskings should be given to the Intelligence Community to enable it to support the development and implementation of dissuasion strategies?

- Assuming the first-order objective of dissuasion is achieved, how might adversaries seek to continue the competition if they do not yield entirely? What second-order effects might be stimulated by effective US dissuasion strategies?[144]

- How does dissuasion interrelate with defense and deterrence? How might synergies be exploited and tensions mitigated?

- How might the United States best exploit the tools of dissuasion described in this report? In particular how well positioned is the United States to employ the dissuasion techniques of dominant powers?

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[144] For example, while France abandoned challenging Great Britain symmetrically for maritime domination after the mid-19th century, the second-order effect was to encourage France to adopt asymmetric strategies, such as developing a *guerre de course* fleet and exploring novel ways to destroy battle fleets such as by using torpedo-armed submarines and fast torpedo boats.

- If dissuasion is important, than one issue worthy of consideration is *persuasion*—how do we persuade (rather than coerce) adversaries to do something they did not intend to do?

- What role might gaming play in developing dissuasion strategies and putting them into practice?