

NUCLEAR DETERRENCE CAN PREVENT BIOLOGICAL WARFARE DAVID G. GOMPERT pdf

1: Project MUSE - Deterrence and Dissuasion in Cyberspace

Biological warfare: opposing viewpoints Nuclear deterrence can prevent biological warfare / David G. Gompert Nuclear deterrence should not be used to prevent.

Are Nuclear Weapons Relevant? Deterrence and assurance contribute to several higher-level objectives, as indicated by the gray cloud in Figure. The objectives referring to defense, countervailing, war fighting, and damage limitation may seem more appropriate to Cold War days than to now. However, they remain enduring objectives that are applicable in many military situations. They also apply when deterrence fails. Even if objectives are agreed, how best to build and employ nuclear forces has always been controversial. Presidents have long insisted on employment flexibility, complaining about the narrowness of options provided to them in operations plans. They have been concerned both about the immorality of indiscriminate use and about how overly blunt options undercut the credibility that the United States would use nuclear forces if it had to. Having no option other than Armageddon is, arguably, to have no option. Although assumptions about warfighting and war winning seem to lose meaning in scenarios involving massive nuclear exchanges, the United States wanted to assure that any Soviet leaders would conclude that no nuclear warfighting strategy could lead to meaningful victory and that the price would be too high. Why is this relevant today when the Cold War is so long gone? The core reason is that the imperative to avoid nuclear war at all costs is not now, nor has it been, an inviolate and universally accepted principle of nature. During the Cold War, both the Soviet Union and the United States regarded nuclear weapons as valuable for coercive diplomacy. Despite an ostensible no-first-use policy, the Soviets had war plans for massive first use, which they characterized as preemptive. Page 27 Share Cite Suggested Citation: The National Academies Press. Pakistan regards nuclear weapons as a key to deterring a conventionally dominant India. Its programs appear to include tactical nuclear weapons, and its planning presumably includes preparing for at least limited nuclear warfighting. Additional observations could be made regarding Israeli, North Korean, British, and French perspectives. See Garthoff and the original telegram at <http://www.gia.org>. Some of us thought then the risks were very, very great. Had we attacked Cuba and invaded Cuba at the time, we almost surely would have been involved in nuclear war. National Archives Project, undated. Feroz Khan, a Pakistani, was writing while serving as a visiting fellow at the Stimson Center and has since written on the history of the Pakistani bomb Khan, Page 28 Share Cite Suggested Citation: Scenario details have matured and likely will continue to matter greatly. To reiterate, and despite successes in establishing international nonproliferation regimes and pressures in some areas of the world to eliminate nuclear weapons altogether, it is likely that some countries in some circumstances will in the future have powerful incentives for using or credibly threatening to use them. One of the most important contributions of nuclear strategic thinking in the 20th century was recognizing how the deterrent challenge varies with circumstances. Myriad scenarios should be considered, with certain distinctions being particularly important: Is the only significant role of U. Or, do nuclear weapons have a continuing, albeit less direct role to play in deterring conventional aggression against U. The Nuclear Posture Review NPR takes a view somewhere in the middle, observing that the role of nuclear weapons in deterring conventional, chemical, or biological aggression continues but has declined. One view is that the other classes of attack are in a lesser league and can be deterred or countered without resort to nuclear weapons. Another view is that the most destructive but not-implausible versions of biological attack especially would be catastrophic. Page 29 Share Cite Suggested Citation: Such weapons are extremely lethal. If history is a guide, however, nations, regimes, and commanders will not respect categorical boundaries, especially if stakes are high enough. Modern discussion of nuclear matters, including possible reductions to very small numbers or even to zero, typically does not address what operational nuclear planning should focus on—even if merely deterrent options that, presumably, would never be triggered. The question is this: If deterrence requires credibility and if credibility requires operational capability, then employment planning is necessary. But what should the targets be and

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what capabilities are needed? Even if this is so, it would be necessary that forces could be brought to high readiness quickly and that actual operational targeting could be decided at the time with some preplanning. For that to be viable, however, the substantial background work, training, and development of alternative targeting plans would still have to deal with the same issues faced by U. Thus, the question cannot be avoided: What should be targeted by nuclear weapons and what does this imply for planning and operations? The targeting question might be addressed from diverse perspectives. Some observations are as follows: Despite the precedents in the Second World War that included carpet bombing, fire bombing, and atomic bombing of Hiroshima and Nagasaki, attacking population centers raises enormous moral and legal concerns, even if the attacks are nominally on collocated industry. Terrorist attacks are of special concern, although the application of nuclear deterrence is unclear in such scenarios and higher priority should probably be given to preparing defenses and adaptations Danzig, Page 30 Share Cite Suggested Citation: Further, such an attack would virtually guarantee a response in kind, if possible. Thus, would such an attack merely be part of mutual suicide? If so, how could the capability for such an attack provide credible deterrence? Continuing from 2 , would such capability be credible for deterrence? Strategists have been extremely doubtful since the s. President seek very limited optionsâ€”for example, destroying a class of adversary forces or weapons, blunting an invasion, or demonstrating ruthless resolve? It is not the purpose of this report to resolve these weighty issues but rather to lay them out candidly because they bear heavily on nuclear analysis and the methods that should be brought to bear in such analysis. Although mostly focused on deterrence, this study considers assurance issues at every stage. The committee heard directly from officials and officers who are intimately involved in related work. Nonetheless, the following can be considered as contributing principles. Even at its simplest, assurance is complex. Even if deterrence is in fact strong, assurance can be demanding. The degree of assurance that can be achieved, then, is inextricably related to the credibility of extended deterrence. Assurance can have negative side effects. It is possible for efforts taken in the name of assurance to encourage allies to take courses of action contrary to U. This is why U. Assurance involves all forms of national power. The strength of a security relationship depends, after all, not just on deterring particular actions but also on its effectiveness in influencing events more generally, sometimes coercively. Assurance success in the current era depends on the United States being seen as successfully adapting to shifting power alignments in ways acceptable to the security partners. This issue is prominent not only in the Asia-Pacific region but also in the Middle East and along the borders of the former Soviet Union. One recurring issue is that influential allied representatives often see great value in forward-deployed systems, including nuclear-capable systems. Such deployments may not seem necessary or appealing to Americans given the demonstrated ability to fly long-distance missions and to redeploy forces if necessary, but they are seen as significantly improving the credibility of the U. The preceding material was largely general. The following sections describe what is new about the current era and what has been learned from the past.

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Biological warfare: opposing viewpoints. Nuclear deterrence can prevent biological warfare / David G. Gompert -- Nuclear deterrence should not be used to prevent.

Introduction Following a number of high-profile incidents of cyber attack, including those targeting Estonia in and Georgia in and the Stuxnet computer worm that targeted Iranian nuclear facilities in and , policy-makers and news media in the United States have paid increased attention to cyber security. Some influential voices in the national security community have claimed that the United States is already in a cyber war that it is losing. In response, some have argued that the U. Department of Defense, This essay critically evaluates a contradictory tendency within U. Simultaneously, however, cyber war proponents have deployed analogies to industrial era, Cold War nuclear deterrence, which implies a well-known template for successful response to cyber threats. This contradiction points to an ongoing crisis of effectively identifying and understanding what is old and new, the same and different, about cyber conflict. Though this essay does not reject the use of analogies and metaphors, it does argue that current contradictory tendencies are unproductive and even potentially dangerous. It argues that the war metaphor and nuclear deterrence analogy are neither natural nor inevitable and that abandoning them would open up new possibilities for thinking more productively about the full spectrum of cyber security challenges, including the as yet unrealized possibility of cyber war. Metaphors, analogies, and knowledge Western thought in the Enlightenment tradition has seen metaphor as a frivolous, literary device, a poor substitute for clear, literal language, which was to be the gold standard for truly scientific understanding and description of the world. This is especially the case when it comes to understanding things that are new or novel. As Lakoff and Johnson [6] suggest, metaphorical language used to describe and communicate can serve as a window into conceptual systems that power human understanding and, ultimately, actions. In fact, many have come to see metaphors as not merely tools for understanding and describing the world, but as at least partially constitutive of that world [7]. They shape how we understand the way the world is, but also how it should be and the actions that we take based on these beliefs. Not only can metaphors limit our vision and understanding of the world, but they can also constrain our possible avenues of action [10]. This is the case because metaphors do not just work individually or in isolation but collectively and systematically. First, they help to structure collective, human knowledge. This is where the use of metaphorical language helps to bridge the gap between individual human cognition and collective understanding and action. Scholars and practitioners alike of law Lamond, ; Nerhot, ; Weinreb, ; Hibbitts, , the natural sciences Wyatt, ; Keller, ; Cowan, et al. This means that a root metaphor can bring with it other, related metaphors. The very idea that the law of war can and should apply to cyber conflict and other malicious cyber activities is an entailment of employing a war metaphor, as is the resort to war-related analogies like Cold War nuclear deterrence. These two entailments, law of war and Cold War nuclear deterrence, will be the focus of the next two sections. Revolutionary change and the law of war The law of war is codified in the United Nations Charter, international treaties, the body of international case law, and in customary principles of behavior during times of conflict. Most notably, during his April Congressional confirmation hearing to become the first commander of U. Thus, several influential voices in the national security community, including former Director of National Intelligence, Adm. When the law of war is deemed inadequate, previously resolved questions are reopened for consideration. Daniel Ryan, a professor who teaches law of war at the National Defense University, stated the supposed problem most succinctly: Even the leadership of the U. Strategic Command, which oversees both the U. Cyber Command, are openly wrestling with questions like [D]o cyber attacks require a cyber response, or should the President order a live weapon reply? In response, some have argued for reform of the law of war. But it is not because cyber war is so revolutionary or unprecedented that the law of war seems inadequate. There is evidence to suggest that U. The strategy document advocated the preventive use of force against adversaries believed to be undeterred from

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acquiring such capabilities [16]. Two months later, U. It later turned out that the attack had not in fact originated in North Korea Dunn, This expansion of what counts as war is seemingly necessary because, as the CCDCOE report indicated, even the most dramatic cases like the cyber attacks against Georgia in do not rise to the level of war as traditionally defined. Many observers agree with that assessment and also note that the cyber attacks against Estonia in were not war Ottis, ; Schneier, ; Lewis, a. Instead of using the law of war to determine whether the use of the instruments of cyber conflict amount to armed attack, many have merely presumed that the use of cyber instruments is armed attack and that, therefore, it is the law of war that is inadequate. Schmitt has provided a clear normative framework for determining if a cyber attack constitutes use of force or armed attack [19], as well as if self-defense is warranted [20]. These frameworks are thoroughly effects-based to the degree that the instrument used is largely irrelevant to determining whether an armed attack has occurred. This is possible, in part, because of the speed, difficulty of controlling, and likely collateral damage that would result from the use of the kinds of offensive cyber attacks imagined by many policy-makers and military leaders. When militarist cyber rhetoric results in use of offensive cyber attack, it is likely that those attacks will escalate into physical, kinetic uses of force Lewis, a; Clarke, Though cyber crime and cyber espionage are real problems [22], conflating them under one term limits the possibility for taking the most specific and effective actions in response to each, leading simultaneously to the possibility of miscalculation and overreaction in some cases and a do-nothing, boy-who-cried-wolf response in others Lewis, Similarly, Charles Dunlap, Jr. When the focus shifts from instruments to effects, what had appeared revolutionary and unprecedented suddenly seems much more familiar. While the tools by which humans engage in conflict might change, the human suffering associated with war has not and should not be forgotten. The use of an effects-based approach helps to correct an imbalance in dominant views about the new and novel in relation to the old and familiar in the context of hostile or malicious actions in cyberspace. Cyber cold war and deterrence Attempts to understand cyber conflict through the use of war-related analogies and, in particular, analogies to Cold War-era nuclear deterrence, are another entailment of applying a war metaphor to hostile or malicious actions in cyberspace. But while in the case of the law of war the seemingly revolutionary and unprecedented nature of cyber war has caused some to call into question extant rules, norms, principles, and definitions of war, the nuclear deterrence analogy seems to hold out the promise of an effective response to the radically new via the application of a well-known and familiar template. This section explores some of the key ways in which cyber war has been compared to the Cold War and nuclear weapons. It argues that analogies to Cold War nuclear deterrence falsely imply that two very different examples of radical change in technology can be responded to in the same way. His observation is largely correct. While he and McConnell have called for a process that is analogous to the one that led to the development of deterrence, many cyber security proponents, including Clarke and McConnell themselves, have instead attempted to import the results of the Cold War era process of strategy development into contemporary discussions of cyber war. This has included a tendency to see global cyber conflict in bipolar terms, to compare the effects of cyber weapons to nuclear weapons, and to seek to apply deterrence in the context of cyber conflict. Cyber security proponents in the United States have tended not only to see cyber conflict as global in scope, but also in terms of two main protagonists. Indeed, Richard Clarke is one of those cyber security proponents who have framed cyber conflict in these terms. Fifteen pages of his book, *Cyber war: This rhetoric has resonated with U. The Cold War nuclear analogy also invites comparison of cyber weapons to nuclear weapons. In making such comparisons, cyber security proponents have coined new terms and acronyms that place nuclear weapons and cyber weapons in the same category. Even President Barack Obama has used the term. Others have gone further by not only working to place cyber weapons and nuclear weapons semantically into the same category, but by arguing that cyber attack can have effects equivalent to nuclear attack. Similarly, retired Air Force Lt. In addition to agreeing with McConnell that attribution is essential, Raduege also stresses the importance of developing retaliatory capabilities that are not limited to in-kind, cyber responses but could include response with physical force: Administration officials have even*

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refused to rule out the possibility of nuclear response to particularly destructive or disruptive cyber attacks Markoff and Shanker, a. This tendency presents several problems. First, if cyber weapon capabilities have been exaggerated, then it is unlikely that strategic cyber attacks, if they did occur, could be decisive in the way that nuclear weapons could be [31]. Ironically, however, without the potential for decisiveness, the threat of cyber retaliation alone would likely have little deterrent value, meaning that one would have to rely upon threats of physical retaliation to deter cyber attacks. In turn, this could encourage an escalation to physical confrontation — that is, assuming the defender follows through on his threat of retaliation, without which any future threats would lose credibility. It is important to remember that during the Cold War, the threat of massive retaliation did not deter all war. It only deterred all-out nuclear war. As Raduege notes, the Cold War ended up taking the form of numerous proxy wars fought around the globe, from Southeast Asia to Latin America. Similarly, not only will U. Finally, all of this points to another problem: In short, there was no one nuclear deterrence strategy during the Cold War. Nuclear strategy evolved over time Freedman, Unfortunately, current notions of cyber deterrence are more akin to the strategy of massive retaliation that was ultimately deemed incredible and dangerous in comparison to the later, more nuanced variants of deterrence. Finally, a number of other differences between nuclear weapons and cyber weapons render the quest for cyber deterrence inappropriate at best and even potentially counterproductive. Cyber attacks generally suffer from a crisis of cause and effect. As Mike McConnell and others have noted, deterrence is impossible without the ability to credibly threaten the attacker. The unpredictable results of a cyber response could encourage the use of a more predictable but more deadly physical response. It is for all of these reasons that Myriam Dunn Cavelty warns against the use of the language of deterrence and aggression with respect to cyber threats. Such language is counterproductive because it results in a self-fulfilling prophecy: Alternative analogies and metaphors Although there are real cyber threats that need to be taken seriously, including the daily occurrences of cyber crime and cyber espionage conducted by both state and non-state actors Dunn Cavelty, , effective response requires disaggregating and distinguishing among the various threats that have been lumped under the term cyber war Dunn Cavelty, ; Dunn Cavelty and Rolofs, ; Lewis, Each threat should be addressed first and foremost by the institutions and using the techniques most appropriate to it. As such, instead of one metaphor and set of analogies through which to think about cyber threats e. The remainder of this essay will consider several alternative metaphors and analogies in an effort to demonstrate that it is neither natural nor inevitable that we should think about cyber conflict in terms of war and nuclear deterrence. First, I will suggest that analogies to counter insurgency or biological warfare might be more appropriate than analogies to nuclear deterrence for the subset of cyber threats of a political-military nature. Second, I will argue that various types of biological metaphors and analogies might be more appropriate for thinking about the full spectrum of cyber threats, including cyber war. Finally, I will conclude the section by discussing the limits of these metaphors and analogies in particular, the limits of metaphors and analogies in general, and the limits of military and government responses to cyber threats. Similarly, the drive to apply the law of war to cyber conflict and to look for guidance in analogies to Cold War nuclear deterrence overlooks the reality of the vast majority of cyber attacks. As mentioned above, numerous observers have noted that we have yet to see any cyber attacks that rise to the level of war or terrorism as traditionally defined. Nonetheless, two recent chronologies of cyber attack incidents indicate that there have been plenty of cyber incidents [33]. This does not include the number of similar incidents perpetrated for criminal or espionage purposes that have not been publicized. Even the most well-known cyber attack, Stuxnet, largely fits this pattern. The public discussion that followed the revelation that Stuxnet was a joint, U. But the details found in his reporting should suggest that even state-level cyber conflict currently resembles the world of intense espionage, covert actions, sabotage, and proxy conflicts more than it does global nuclear war. Just as acknowledgement that the war in Iraq had become an insurgency led to a substantial change in the way the U.

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3: Deterrence theory - Infogalactic: the planetary knowledge core

Authors offer their viewpoints on how serious a danger biological weapons pose, what groups constitute the greatest biological warfare threat, what measures the U.S. should take to prepare for biological warfare, and what ways are best to prevent biological warfare.

Research has predominantly focused on the theory of rational deterrence to analyze the conditions under which conventional deterrence is likely to succeed or fail. Alternative theories however have challenged the rational deterrence theory and have focused on organizational theory and cognitive psychology. The concept of deterrence can be defined as the use of threats by one party to convince another party to refrain from initiating some course of action. In international security, a policy of deterrence generally refers to threats of military retaliation directed by the leaders of one state to the leaders of another in an attempt to prevent the other state from resorting to the threat of use of military force in pursuit of its foreign policy goals. Situations of direct deterrence often occur when there is a territorial dispute between neighboring states in which major powers like the United States do not directly intervene. On the other hand, situations of extended deterrence often occur when a great power becomes involved. It is the latter that has generated the majority of interest in academic literature. Building on these two broad categories, Huth goes on to outline that deterrence policies may be implemented in response to a pressing short-term threat known as immediate deterrence or as strategy to prevent a military conflict or short term threat from arising known as general deterrence. A successful deterrence policy must be considered in not only military terms, but also in political terms. In military terms, deterrence success refers to preventing state leaders from issuing military threats and actions that escalate peacetime diplomatic and military cooperation into a crisis or militarized confrontation which threatens armed conflict and possibly war. The prevention of crises of wars however is not the only aim of deterrence. In addition, defending states must be able to resist the political and military demands of a potential attacking nation. If armed conflict is avoided at the price of diplomatic concessions to the maximum demands of the potential attacking nation under the threat of war, then it cannot be claimed that deterrence has succeeded. Furthermore, as Jentleson et al. In broad terms, a state wishing to implement a strategy of deterrence is most likely to succeed if the costs of non-compliance it can impose on, and the benefits of compliance it can offer to, another state are greater than the benefits of noncompliance and the costs of compliance. Deterrence theory holds that nuclear weapons are intended to deter other states from attacking with their nuclear weapons, through the promise of retaliation and possibly mutually assured destruction MAD. Nuclear deterrence can also be applied to an attack by conventional forces; for example, the doctrine of massive retaliation threatened to launch US nuclear weapons in response to Soviet attacks. A successful nuclear deterrent requires that a country preserve its ability to retaliate, either by responding before its own weapons are destroyed or by ensuring a second strike capability. Other countries, such as the United Kingdom and France, have only sea- and air-based nuclear weapons. Proportionality Jentleson et al. This is a challenge, as deterrence is, by definition, a strategy of limited means. George goes on to explain that deterrence may, but is not required to, go beyond threats to the actual use of military force; but if force is actually used, it must be limited and fall short of full-scale use or war otherwise it fails. This has been seen in the cases of Libya, Iraq, and North Korea where defending states have sought to change the leadership of a state in addition to policy changes relating primarily to their nuclear weapons programs. Reciprocity Secondly, Jentleson et al. The balance lies neither in offering too little too late or for too much in return, not offering too much too soon or for too little return. Coercive credibility Finally, coercive credibility requires that, in addition to calculations about costs and benefits of cooperation, the defending state convincingly conveys to the attacking state that non-cooperation has consequences. A defending state having a superior military capability or economic strength in itself is not enough to ensure credibility. The other important consideration outlined by Jentleson et al. The first factor is whether internal political support and regime security are better served by defiance, or if there are domestic

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political gains to be made from improving relations with the defending state. The second factor is an economic calculation of the costs that military force, sanctions, and other coercive instruments can impose, and the benefits that trade and other economic incentives may carry. The third factor is the role of elites and other key domestic political figures within the attacking state. Rational deterrence theory The predominant approach to theorizing about deterrence has entailed the use of rational choice and game-theoretic models of decision making see game theory. Huth [6] outlines that a threat is considered credible if the defending state possesses both the military capabilities to inflict substantial costs on an attacking state in an armed conflict, and if the attacking state believes that the defending state is resolved to use its available military forces. Huth [6] goes on to explain the four key factors for consideration under rational deterrence theory being i the military balance; ii signaling and bargaining power; iii reputations for resolve; and iv interests at stake. In either case, the strategic orientation of potential attacking states is generally short term and driven by concerns about military cost and effectiveness. For successful deterrence, defending states need the military capacity to respond quickly and in strength to a range of contingencies. Signaling and bargaining power The central problem for a state that seeks to communicate a credible deterrent threat through diplomatic or military actions is that all defending states have an incentive to act as if they are determined to resist an attack, in the hope that the attacking state will back away from military conflict with a seemingly resolved adversary. If all defending states have such incentives, then potential attacking states may discount statements made by defending states along with any movement of military forces as merely bluffs. Costly signals are those actions and statements that clearly increase the risk of a military conflict and also increase the costs of backing down from a deterrent threat. States that are bluffing are unwilling to cross a certain threshold of threat and military action for fear of committing themselves to an armed conflict. Reputations for resolve There are three different arguments that have been developed in relation to the role of reputations in influencing deterrence outcomes. The second approach argues that reputations have a limited impact on deterrence outcomes because the credibility of deterrence is heavily determined by the specific configuration of military capabilities, interests at stake, and political constraints faced by a defending state in a given situation of attempted deterrence. The third approach is a middle ground between the first two approaches. It argues that potential attacking states are likely to draw reputational inferences about resolve from the past behaviour of defending states only under certain conditions. The insight is the expectation that decision makers will use only certain types of information when drawing inferences about reputations, and an attacking state updates and revises its beliefs when the unanticipated behaviour of a defending state cannot be explained by case-specific variables. Interests at stake Although costly signaling and bargaining power are more well established arguments in rational deterrence theory, the interests of defending states are not as well known, and attacking states may look beyond the short term bargaining tactics of a defending state and seek to determine what interests are at stake for the defending state that would justify the risks of a military conflict. The argument here is that defending states that have greater interests at stake in a dispute are more resolved to use force and be more willing to endure military losses to secure those interests. Even less well established arguments are the specific interests that are more salient to state leaders such as military interests versus economic interests. Furthermore, Huth [6] argues that both supporters and critics of rational deterrence theory agree that an unfavourable assessment of the domestic and international status quo by state leaders can undermine or severely test the success of deterrence. In a rational choice approach, if the expected utility of not using force is reduced by a declining status quo position, then deterrence failure is more likely, since the alternative option of using force becomes relatively more attractive. Nuclear weapons and deterrence Main articles: Nuclear strategy , Massive retaliation , Mutual assured destruction and Flexible response In Schelling [2] is prescriptive in outlining the impact of the development of nuclear weapons in the analysis of military power and deterrence. In his analysis, before the widespread use of assured second strike capability, or immediate reprisal, in the form of SSBN submarines, Schelling argues that nuclear weapons give nations the potential to not only destroy their enemies but humanity itself without drawing immediate reprisal because of the lack of a conceivable defense system and

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the speed with which nuclear weapons can be deployed. Historical analysis of nuclear weapons deterrent capabilities has led modern researchers to the concept of the stability-instability paradox, whereby nuclear weapons confer large scale stability between nuclear weapon states, as in over 60 years none have engaged in large direct warfare due primarily to nuclear weapons deterrence capabilities, but instead are forced into pursuing political aims by military means in the form of comparatively smaller scale acts of instability, such as proxy wars and minor conflicts. The early stages of the Cold War were generally characterized by ideology of containment, an aggressive stance on behalf of the United States especially regarding developing nations under their sphere of influence. This period was characterized by numerous proxy wars throughout most of the globe, particularly Africa, Asia, Central America, and South America. A notable such conflict was the Korean War. In contrast to general opinion, George F. Kennan, who is taken to be the founder of this ideology in the famous Long Telegram, asserted that his ideas had been misinterpreted and that he never advocated military intervention, merely economic support. Although all factors listed above contributed to this shift, the most important factor was probably the rough parity achieved in stockpiling nuclear weapons with the clear capability of Mutual Assured Destruction MAD. The doctrine of mutual nuclear deterrence characterized relations between the United States and the Soviet Union during this period, and present relations with Russia. Reagan attempted to justify this policy in part due to concerns of growing Soviet influence in Latin America and the new republic of Iran, established after the Iranian Revolution of 1979. Similar to the old policy of containment, the United States funded several proxy wars, including support for Saddam Hussein of Iraq during the Iran-Iraq War, support for the mujahideen in Afghanistan, who were fighting for independence from the Soviet Union, and several anti-communist movements in Latin America such as the overthrow of the Sandinista government in Nicaragua. While the army was dealing with the breakup of the Soviet Union and the spread of nuclear technology to other nations beyond the United States and Russia, the concept of deterrence took on a broader multinational dimension. The document explains that such threats must also be used to ensure that nations without nuclear technology refrain from developing nuclear weapons and that a universal ban precludes any nation from maintaining chemical or biological weapons. The current tensions with Iran and North Korea over their nuclear programs are due in part to the continuation of this policy of deterrence. Criticism of deterrence theory Deterrence theory is criticized for its assumptions about opponent rationales. First, it is argued that suicidal or psychotic opponents may not be deterred by either forms of deterrence. An arms race is inefficient in its optimal output, as all countries involved expend resources on armaments that would not have been created if the others had not expended resources, a form of positive feedback. Fourth, escalation of perceived threat can make it easier for certain measures to be inflicted on a population by its government, such as restrictions on civil liberties, the creation of a military-industrial complex, and military expenditures resulting in higher taxes and increasing budget deficits. In recent years, many mainstream politicians, academic analysts, and retired military leaders have also criticised deterrence and advocated nuclear disarmament. Sam Nunn, William Perry, Henry Kissinger, and George Shultz have all called upon governments to embrace the vision of a world free of nuclear weapons, and in three Wall Street Journal op-eds proposed an ambitious program of urgent steps to that end. The four have created the Nuclear Security Project to advance this agenda. Organisations such as Global Zero, an international non-partisan group of world leaders dedicated to achieving nuclear disarmament, have also been established. The film is a visual and historical depiction of the ideas laid forth in the Wall Street Journal op-eds and reinforces their commitment to a world without nuclear weapons and the steps that can be taken to reach that goal.

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4: Deterrence theory - WikiVisually

Nuclear Deterrence Can Prevent Biological Warfare David G. Gompert 4. Nuclear Deterrence Should Not Be Used to Prevent Biological Warfare

Types of war War must entail some degree of confrontation using weapons and other military technology and equipment by armed forces employing military tactics and operational art within a broad military strategy subject to military logistics. Studies of war by military theorists throughout military history have sought to identify the philosophy of war , and to reduce it to a military science. Modern military science considers several factors before a national defence policy is created to allow a war to commence: Biological warfare , or germ warfare, is the use of weaponized biological toxins or infectious agents such as bacteria, viruses, and fungi. Chemical warfare involves the use of weaponized chemicals in combat. Poison gas as a chemical weapon was principally used during World War I , and resulted in over a million estimated casualties, including more than , civilians. Civil war is a war between forces belonging to the same nation or political entity. Conventional warfare is declared war between states in which nuclear , biological , or chemical weapons are not used or see limited deployment. Insurgency is a rebellion against authority, when those taking part in the rebellion are not recognized as belligerents lawful combatants. Information warfare is the application of destructive force on a large scale against information assets and systems, against the computers and networks that support the four critical infrastructures the power grid, communications, financial, and transportation. Total war is warfare by any means possible, disregarding the laws of war , placing no limits on legitimate military targets , using weapons and tactics resulting in significant civilian casualties , or demanding a war effort requiring significant sacrifices by the friendly civilian population. Unconventional warfare , the opposite of conventional warfare, is an attempt to achieve military victory through acquiescence, capitulation, or clandestine support for one side of an existing conflict. War of aggression is a war for conquest or gain rather than self-defense; this can be the basis of war crimes under customary international law. War of liberation , Wars of national liberation or national liberation revolutions are conflicts fought by nations to gain independence. The term is used in conjunction with wars against foreign powers or at least those perceived as foreign to establish separate sovereign states for the rebelling nationality. From a different point of view, these wars are called insurgencies, rebellions, or wars of independence. Military history The percentages of men killed in war in eight tribal societies, and Europe and the U. Keeley, archeologist The earliest recorded evidence of war belongs to the Mesolithic cemetery Site , which has been determined to be approximately 14, years old. About forty-five percent of the skeletons there displayed signs of violent death. The advent of gunpowder and the acceleration of technological advances led to modern warfare. According to Conway W. Henderson, "One source claims that 14, wars have taken place between BC and the late 20th century, costing 3. For comparison, an estimated 1,, people died from infectious diseases in the 20th century. All of these forms of warfare were used by primitive societies, a finding supported by other researchers. Scarcity of resources meant defensive works were not a cost-effective way to protect the society against enemy raids. At the end of each of the last two World Wars, concerted and popular efforts were made to come to a greater understanding of the underlying dynamics of war and to thereby hopefully reduce or even eliminate it altogether. These efforts materialized in the forms of the League of Nations , and its successor, the United Nations. According to the U. Bureau of the Census , the Indian Wars of the 19th century cost the lives of about 50,

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5: Pakistan and weapons of mass destruction - Wikipedia

The United States should aim to reduce the importance and attractiveness of nuclear weapons, to delegitimize their use in response to conventional threats, yet also to sharpen nuclear deterrence against biological weapons.

Risks of Nuclear Conflict Summary The United States has long recognized the dangers inherent in the spread of nuclear, biological, and chemical NBC weapons, and missiles. This report, which analyzes NBC weapons programs potential threat patterns around the globe, is updated as needed. The total number of nuclear, biological, and chemical weapons in the world is shrinking as the major powers scale back their inventories through unilateral reductions and arms control, but other countries and groups still try to acquire these weapons. India and Pakistan declared their nuclear weapons capability with nuclear tests in , as did North Korea in . Israel is also widely believed to have a nuclear weapon arsenal. About a dozen countries have offensive biological weapons BW programs, and the same number have chemical weapons CW programs. That number could grow, as new technologies are developed and the international flow of information, goods, expertise, and technology continues. While the United States and Russia eliminated intermediate-range missiles and are reducing their intercontinental missile inventories, China is modernizing and expanding its missile force. North Korea, Iran, Israel, India, and Pakistan are building short- and medium-range missiles and are developing longer-range missiles. Dozens of countries have or are developing short-range ballistic missiles and more are likely to buy them. Over 80 countries have cruise missiles; about 40 manufacture or have the ability to manufacture them. And terrorists continue their efforts to acquire NBC capabilities. The potential for secondary proliferation markets has grown, and concern about the ability of individual actors like the Pakistani nuclear scientist, A. Khan, to peddle nuclear technology has grown considerably. The number of countries or groups that will acquire or produce NBC weapons may decrease if diplomacy, arms control treaties, nonproliferation regimes, and security and assistance strategies are effective. NBC weapons and missiles will remain a potential threat for the foreseeable future, but most observers readily agree that, even if nonproliferation policies alone are insufficient to halt NBC programs, such measures can slow those programs until states are persuaded that NBC weapons are not in their national security interest. Nuclear, Biological, and Chemical Weapons and Missiles: Around the same time, U. It could no longer be assumed that the United States would face symmetric or parallel threats. A "paradox of the new strategic environment," according to then-Secretary of Defense William Cohen, was that "American [conventional] military superiority actually increases the threat of nuclear, biological and chemical attack against us by creating incentives for adversaries to challenge us asymmetrically. The heightened sense of vulnerability to terrorism since the attacks in September , coupled with reports of al Qaeda pursuing research on chemical, biological, radiological, and nuclear weapons, has focused attention on the connection between terrorism and WMD. In March , President Bush stated that " In particular, the Bush Administration has singled out state sponsors of terrorism with NBC weapons programs as particular security threats. The status of nuclear, chemical, and biological weapons worldwide has changed only slowly over time. In absolute numbers, stockpiles are actually decreasing. Others emphasize the negative impact of the nuclear tests by India, Pakistan and North Korea; missile tests by North Korea, Iran, India, and Pakistan; continuing transfers of dangerous technology by states such as China, Russia, and North Korea; the activities of clandestine procurement networks; and a growing interest in NBC weapons among terrorists. This report focuses on the current threat and trends in nuclear, biological, and chemical weapons and missiles. In addition, the status and trends of these weapons are key factors in national and international debates regarding: In the last decade, the U. Finally, consequence management entails homeland defense against WMD threats. Proliferation and Risk of Use Several factors appear to facilitate the spread of dangerous technology to additional countries and groups. These same factors also might increase the likelihood that NBC weapons will be used either militarily or for blackmail: Technological developments in NBC, computer, and production technology. Increasingly free flow of information, people and goods.

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Growing disparities in conventional military capabilities. Growing disparities in strategic defenses. Continued prestige of nuclear power. Growing prestige of missile capabilities. Perceived utility of NBC threats to deter U. Perceived disdain by major powers for certain arms control agreements and international cooperation on nonproliferation. Threat assessments are highly debated exercises and necessarily subjective because they must assess not only technical capabilities quantity and quality of weapons and control thereof but also the intentions of the state or group that possesses the weapons including options and thresholds for use. The connection between the existence of the technology or weapon and risk of use is not always clear. One school of thought is that the risk of use is directly proportional to the size of stockpiles or diffusion of technology or material. An opposing view is that the weapons themselves are manageable on a case-by-case basis. Economic and political integration are also thought to reduce incentives for proliferation. The strong and credible U. Analysts debate whether U. The NBC threat emanating from terrorist groups is even more complicated to assess. It is frequently argued that terrorist groups will find it easier to cross thresholds of NBC use than even some rogue states and that they will not adhere to traditional notions of deterrence. President Bush stated in a March 11, , speech, "Some states that sponsor terror are seeking or already possess weapons of mass destruction; terrorist groups are hungry for these weapons, and would use them without a hint of conscience. And we know that these weapons, in the hands of terrorists, would unleash blackmail and genocide and chaos. In the National Security Strategy for a New Century , the Clinton Administration noted that the "proliferation of advanced weapons and technologies threatens to provide rogue states, terrorists and international crime organizations with the means to inflict terrible damage on the United States, our allies, and U. Special Representative for Nuclear Nonproliferation remarked to the NPT Preparatory Committee that "The spread of nuclear weapons to additional states not only increases the risk of nuclear war among nations, but also increases the risk of nuclear terrorism. The nuclear weapon program of a proliferating state, from the design of a weapon to its assembly, offers new opportunities for exploitation by terrorists. New stockpiles of weapons-grade nuclear material present a tempting target. Nations seeking nuclear weapons who also harbor terrorists represent a particularly severe threat to the civilized world. But others contend NBC weapons might nevertheless be seen by these countries as useful to limit U. The United States government works hard to decrease the risk of WMD use, the spread of such weapons and capabilities, and the U. Some critics are concerned that broader nonproliferation objectives will fall prey to shorter term goals in the war on terrorism. About twenty-five countries, according to various U. Table 1 lists those countries that have, or may have had NBC weapon programs and missile capabilities within the last several years. Most of these capabilities have been developed covertly. In general, nuclear and ballistic missile programs are more easily detectable than biological and chemical weapons programs because the former often have specific characteristics e. These variables would have a significant impact on threat assessments of WMD capability. In numerical terms, NBC weapons, missiles and programs have not grown much in the last decade, as proliferation by a few countries has been offset by reductions in weapons by others. However, some countries are actively building NBC weapon stockpiles and they are improving capabilities to deliver these weapons, taking advantage of increasingly available missile technology. These states are seeking or have developed indigenous production capabilities, and some have themselves become suppliers of NBC weapon or missile technologies. Some of these new suppliers either support terrorism or have terrorist activities on their soil. The potential for additional countries, or possibly terrorist groups, to produce NBC weapons using available technology, has become a greater concern in recent years. Four of these countries have declared that they have stopped producing fissile material; China is believed to have stopped. The first three have not signed the NPT. Whether the government remains an NPT state-party is unclear. Nuclear Weapons-States China does not publicly disclose its nuclear arsenal. However, a Chinese foreign ministry fact sheet stated that Beijing "has performed the least number of nuclear tests and possesses the smallest nuclear arsenal. Rather, some units may be tasked for nuclear delivery as a contingency mission. Each missile can hold up to six warheads. Paris has also been developing a new class of ballistic submarines; the last of the four is to come into service in

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Moscow also has 14 ballistic missile submarines, equipped with a total of SLBMs. An unauthorized or accidental nuclear launch of a Russian strategic missile is deemed highly unlikely. That missile has a range of about 7,000 km. The size of that stockpile is secret, but the paper describes it as a "small margin to sustain the operationally available warheads. Life Extension Program for the Trident missile, which will enable London to retain the missile in service until the early 2030s. States Outside the NPT Israel is said to have produced its first nuclear weapon in the late 1980s and may now have between 75 and 100 weapons. According to current estimates, Pakistan has approximately 60 nuclear warheads and India has between 36 and 100 nuclear warheads. Pyongyang shut down the facilities related to its plutonium-based nuclear weapons program in July 2003. The intelligence community continues to assess that Pyongyang has in the past pursued a uranium enrichment capability and judges with "at least moderate confidence" that the program continues today. North Korea continues to deny the existence of a uranium enrichment program. But these concerns increased when an IAEA investigation, which began in 2002, revealed an array of nuclear activities that had not previously been reported to the agency. These included centrifuge and laser enrichment activities and facilities, and the separation of a small quantity of plutonium. As part of an agreement with three nations of the European Union known as the EU-3, or Germany, France, and the United Kingdom, Iran agreed in October 2003 to sign the Additional Protocol to its nuclear safeguards agreement which allows for enhanced inspections and to suspend all uranium enrichment-related activities in return for a promise of technical assistance. Although Iran renewed and expanded its pledge in November 2003 to encompass all enrichment and processing related activities, little negotiating progress was made. Security Council in February 2004. The most recent National Intelligence Estimate NIE, released in December 2004, states that Iran had a nuclear weapons program in the past, but halted it in fall 2003. The NIE also states that the intelligence community assesses "with moderate confidence Tehran had not restarted its nuclear weapons program as of mid-2004," but adds that Iran "at a minimum is keeping open the option to develop nuclear weapons. Khan offered nuclear technology and hardware to Syria, according to Pakistani press, and we are concerned that expertise or technology could have been transferred. We continue to monitor Syrian nuclear intentions with concern. Nuclear Weapons Trends Although sensitive nuclear technology exports have been controlled by the Nuclear Suppliers Group NSG since the mid-1990s, nuclear technology nonetheless has become increasingly available. The exposure in 2004 of the Khan network has led many observers to propose further controls on nuclear exports. Some of these include a ban on export of reprocessing and enrichment technology by the NSG, a ban on development of reprocessing and enrichment by states that do not already have such capabilities, a legally binding agreement on export controls, and international management of reprocessing and enrichment.

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6: Nuclear strategy | Revolv

David G. Gompert, vice president of the Rand Foundation in Santa Monica, California and director of the National Security Research Division brings up interesting points surrounding nuclear weaponry and its tremendous influence on the world.

The thoughts of a former Naval person and current educator. Monday, February 20, Flexible Credibility: Alternatives to Nuclear Weapons Introduction Some uses for which the United States has historically reserved the right to use nuclear weapons may not be a credible threat to some potential adversaries. Conventional alternatives to nuclear weapons may create a more flexible and credible response to a broader range of strategic problems. The United States historically has reserved the right to use nuclear weapons for the following principal reasons: Deter use of nuclear weapons against the United States e. NATO Defend against overwhelming conventional enemy force e. NATO Retaliate for use of biological and chemical weapons Recently, some cases have been identified as new reasons for requiring nuclear weapons. These specialized targets include: Hardened deep underground bunkers HDUB Satellites sensors, and weapons C4ISR systems Nuclear, Biological, and chemical development sites The use of nuclear weapons is justified for the above targets based principally on the tremendous power they possess and the ability to quickly inflict exceptional damage over large areas. In the case of specialized targets, nuclear weapons are justified because of their unique ability to overcome various difficulties. If, in the calculus of American national security, the above targets remain valid, and if it is true that nuclear weapons offer the only valid response to neutralizing those targets, then current strategy is also valid. If, however, some targets are not threats to national security, or if non-nuclear answers are available and perhaps even more useful, a change to strategy is warranted to make it more credible and offer greater flexibility of response. As early as , the major powers recognized that nuclear weapons brought a new calculus to war, especially war on the scale of the recently concluded world war. Bernard Brodie, writing in, concluded that the use of nuclear weapons was too terrible to contemplate. He believed that the only effective role for nuclear weapons was in the threat and not actual use. He reasoned that no nation would willingly submit itself to nuclear retaliation. Historically, the United States and Great Britain believed that the proper role of nuclear weapons was to deter major conflict, not merely to deter the use of other nuclear weapons. It is clear that early thinkers on nuclear strategy saw such weapons as deterrents to major war. The United States embarked upon a strategic program that emphasized nuclear readiness and deterrence. A significant amount of the Air Force budget was for development, acquisition, and operation of nuclear strategic forces. By the early s, the Navy was spending a significant portion of its budget developing and deploying ballistic missile submarines SSBN and submarine launched ballistic missiles SLBM. They can assume that the loss of dozens of great cities is somehow a real choice for some men. This sent a signal that the nuclear weapons, while still an option, may not actually be used. Thus, the utility of nuclear weapons as a deterrent force was brought into question. That, combined with the long-term non-use of nuclear weapons since World War II, raised serious doubt as to whether the United States or any other state wouldl actually use the weapons. After lengthy negotiations, the Soviet Union essentially agreed to the idea that each country would hold the other hostage to total nuclear destruction. President Reagan, who wanted to either eliminate nuclear weapons or develop a realistic plan that would use them, was uneasy with a plan that essentially left the United States naked to attack. As total elimination of nuclear weapons appeared not to be feasible or practicable, he directed strategic thinkers to figure out how to use the weapons in warfighting, essentially as larger, more powerful, conventional weapons, and to develop a plan to defend the United States from nuclear attack SDI. The strategy, as finally expounded by NATO, was in response to a perception that only by using nuclear weapons could the allies hold off large scale conventional attack by massive Soviet tank armies advancing through the Fulda Gap. War, especially in Europe, became a continuous spectrum of conflict that included conventional and nuclear options, regardless of what weapons the enemy might chose. Arguments

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have arisen recently that the only valid use for nuclear weapons is to deter the use of other nuclear weapons. The Canberra Commission and the Tokyo Forum advanced positions that nuclear weapons were irrelevant for modern security. While there is no doubt that the threat of mutual destruction is very real and effective, it is also apparent that it is not the only reason nations go to the expense and effort to obtain nuclear weapons. Thus, it would appear that many nations have an understanding that nuclear weapons are to not only deter other nuclear weapons, but also are necessary to deter a potentially overwhelming conventional enemy force. During the Cold War, our principal adversary had conventional forces in Europe that were numerically superior. For us, nuclear weapons were the equaliser. The threat to use them was present and was used to compensate for our smaller numbers of conventional forces. Today, nuclear weapons can still be the equaliser against superior conventional forces. It follows that if nuclear weapons are to be a mainstay of strategic deterrence there must be no question on the part of the enemy whether or not the nuclear power will actually authorize the use of the weapons. This must be true for both massive retaliation and as a counter to overwhelming conventional force. If there is significant doubt that nuclear weapons will be used, an enemy may decide to launch an attack. Deterrence will have failed, leaving the nuclear power little alternative but to either carry out the threat of massive retaliation or surrender. Given the record of non-use since the end of World War II, the role of nuclear weapons in international diplomacy has limited American ability to deal with some threats.

Analysis and Conventional Alternatives In order to deter an enemy from an undesirable course of action, or to coerce an action they might otherwise not pursue, a credible threat must be present. It is clear that nuclear weapons have offered valuable deterrence to general nuclear and major power war. It is less clear that nuclear weapons offer a credible response to anything much less than national survival. It is useful to look at the historical uses for which the United States has reserved nuclear weapons and how those used may or may not be valid exercises of deterrence or coercion. In his book, *Bombing to Win*, Robert Pape made an extensive study of the role of coercion in war. He divided coercion into two categories: Punishment, while not limited to attacking civilians and major population centers, operates by holding civilians and cities and risk. It can also take the form of creating huge casualties upon an enemy military force. Denial uses military means to keep an enemy from reaching its political, military, or territorial goals. Pape determined that there were differences in conventional and nuclear coercion. He summarized them with the following propositions: Punishment strategies rarely succeed. Inflicting enough pain to subdue the resistance of a determined adversary is normally beyond the capacity of conventional forces. Punishment strategies will work only when core values are at risk. Risk strategies will fail. They are diluted, and therefore weaker, versions of punishment. Denial strategies work best. Surrender of homeland territory is especially unlikely. Nationalist sentiments demand resistance to foreign rule even when physical security cannot be guaranteed. Surrender terms that incorporate heavy additional punishment will not be accepted. There is no incentive to concede when the costs of surrender outweigh those of continued resistance. Societies that expect to become victims of genocide will not surrender. Coercive success almost always takes longer than the logic of either punishment or denial alone would suggest. Targets of coercion are usually slow to recognize the magnitudes of both increased civilian suffering and declining military prospects. Also, the domestic political costs of concessions encourage delay until the hopelessness of the situation becomes inescapably obvious. Even small hopes of success can cause coercion to fail. Nuclear coercion requires superiority. If the target state has an assured destruction capability, any coercer is likely to be deterred. Denial strategies are not useful in nuclear disputes. The horrific levels of societal destruction in nuclear war are likely to so dominate decision making as to make the prospects for success or failure of military campaigns largely irrelevant. Risk strategies can be successful in nuclear disputes. Unlike conventional threats, nuclear threats raise the prospect of so much harm that they can coerce without being fully implemented. Nuclear punishment should be effective but rare. No target could resist. However, nuclear bombardment would not only reduce the value of the disputed territory, but would also earn the coercer a reputation for unparalleled barbarism. The propositions above imply that nuclear weapons are most effective when they threaten civilian populations with great harm, that is, in the coercion by

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punishment role. In such a role, leaders will likely be deterred from making decisions that run the risk of nuclear retaliation. On the other hand, in situations where denial is the object, conventional weapons appear to be the more effective. This becomes even more true in situations where it is unlikely that nuclear weapons will be used. If Pape contentions are correct, that nuclear means are more effective for coercion by punishment and conventional weapons the more effective in coercion by denial, the uses for which the United States has reserved the right to use nuclear weapons may not be completely valid. Reviewing the list on page 1 above, the first two, 1 deter use of nuclear weapons against the United States, and 2 deter general conventional war between major powers, appear to be coercion by punishment. These are within the realm of effective use of nuclear weapons. The remaining reasons, 3 defend against overwhelming conventional enemy force, 4 retaliate for use of biological and chemical weapons, 5 hardened deep underground bunkers, 6 satellites, 7 C4ISR systems, and 8 nuclear, biological, and chemical development sites, appear to fall into the coercion by denial category. Effective conventional responses are available now, or are in development. New conventional systems currently in various stages of production or research and development offer capabilities that can substitute for nuclear weapons on some missions. Air-launched cruise missiles and other precision guided munitions are currently under development by the Department of Defense. Advanced research into miniaturized warheads with explosive power four to five times more powerful than available today may permit aircraft, UAVs, and missiles the ability to lift far more strike power per sortie. The United States Air Force has been developing unmanned aerial vehicles that promise loiter time measured in days rather than just hours. The ability to generate EMP from conventional sources offers a method of disrupting enemy C4I networks and systems. High-power microwave HPM can produce similar destructive results and may even produce effects on personnel over an extended area. Conventionally generated EMP and HPM, used as part of an electronic attack EA , will increase ability to affect enemy C4ISR systems over broad areas without the negative aspects brought about by the use of nuclear weapons. Since the United States eliminated its biological and chemical weapons programs, the stated policy has been to imply that the use of any WMD, whether nuclear, chemical, or biological, may expect a response by nuclear attack. While it is apparent that American leaders are reluctant to think about the use of nuclear weapons, there has been no reticence to discuss their potential use. During the Cuban Missile Crisis, President Kennedy went out of his way to avoid the use of nuclear weapons. President Reagan, despite a strategy advocating the use of nuclear weapons as a tactical warfighting tool e.

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7: CivMilBlog: Flexible Credibility: Alternatives to Nuclear Weapons

Noting that previous studies have focused on assessing the potential lethality of these weapons, Koblentz expands his examination to include the role of biological weapons on four other key areas of concern: proliferation, deterrence, civil-military relations, and threat assessment.

Please help this article by looking for better, more reliable sources. Unreliable citations may be challenged or deleted. November See also: Project After the Partition of India in , India and Pakistan have been in conflict over several issues, including the disputed territory of Jammu and Kashmir. With these two centres, the basic research work started. This continued for about three years from to Mining of uranium began in the same year. Abdus Salam and Dr. Ishrat Hussain Usmani also sent a large number of scientists to pursue doctorate degrees in the field of nuclear technology and nuclear reactor technology. Abdus Salam began lobbying for commercial nuclear power plants, and tirelessly advocated for nuclear power in Pakistan. Its project director was Parvez Butt , a nuclear engineer, and its construction completed in Currently, Pakistan Government is planning to build another MWe commercial nuclear power plant. However, the work is put on hold since If India builds the bomb, we will eat grass and leaves for a thousand years, even go hungry, but we will get one of our own. The Christians have the bomb, the Jews have the bomb and now the Hindus have the bomb. Why not the Muslims too have the bomb? At this meeting Munir Khan concluded: Munir Khan pointed out to the President that Pakistan must acquire the necessary facilities that would give the country a nuclear weapon capability, which were available free of safeguards and at an affordable cost, and there were no restrictions on nuclear technology, that it was freely available, and that India was moving forward in deploying it, as Munir Khan maintained. After hearing the proposal President Ayub Khan swiftly denied the proposal, saying that Pakistan was too poor to spend that much money and that, if Pakistan ever needed the atomic bomb, it could somehow acquire it off the shelf. Ahsan Mubarak , [29] who were sent to Sellafield to receive technical training. Both these reactors are of MW capacity and are being built at Chashma city of Punjab province. There, Bhutto vowed never to allow a repeat. At the Multan meeting on 20 January , Bhutto stated, "What Raziuddin Siddiqui , a Pakistani, contributed for the United States during the Manhattan Project , could also be done by scientists in Pakistan, for their own people. Raziuddin Siddiqui and Asghar Qadir. This is also called a cold test, and was codenamed Kirana-I. There were 24 more cold tests from " Zaman Sheikh a chemical engineer and Hafeez Qureshi , a mechanical engineer. As for its Biological warfare capability, Pakistan is not widely suspected of either producing biological weapons or having an offensive biological programme. This initiative was taken a year after both countries had publicly tested nuclear weapons. In November , The International Atomic Energy Agency Board of Governors approved an agreement with the Pakistan Atomic Energy Commission to apply safeguards to new nuclear power plants to be built in the country with Chinese assistance. Chagai-II on 30 May , at Kharan was quite a successful test of a sophisticated, compact, but "powerful plutonium bomb" designed to be carried by aircraft, vessels, and missiles. These are believed to be tritium -boosted weapons. This is consistent with earlier statements from a meeting of the National Command Authority which directs nuclear policy and development saying Pakistan is developing "a full-spectrum deterrence capability to deter all forms of aggression. These were deemed essential risk reduction measures in view of the seemingly unending state of misgiving and tension between the two countries, and the extremely short response time available to them to any perceived attack. None of these agreements limits the nuclear weapons programs of either country in any way. Revitalise the UN disarmament machinery to address international security, disarmament and proliferation challenges. It rejects any unilateral disarmament on its part. Khalil Qureshi , did most of the calculations as a member of the uranium division at PAEC, which undertook research on several methods of enrichment, including gaseous diffusion , jet nozzle and molecular laser isotope separation techniques, as well as centrifuges. Khan as its senior scientist. Electronic materials were imported from the United Kingdom by two liaison officers posted to the High Commission of Pakistan in

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London and Bonn Germany. In contrast PAEC was unable to enrich any Uranium or produce weapons grade fissile material until The uranium program proved to be a difficult, challenging and most enduring approach to scale up to industrial levels to military-grade. Khan, was quoted in the book Eating Grass that " hydrodynamical problem in centrifuge was simply stated, but extremely difficult to evaluate, not only in order of magnitude but in detailing also.

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8: War - Wikipedia

A case can be made that nuclear weapons are useful in deterring use of biological and chemical weapons, but there is an apparent lack of willingness on the part of U. S. leaders to actually commit to crossing the nuclear threshold.

Concept[edit] The use of military threats as a means to deter international crises and war has been a central topic of international security research for at least years. Alternative theories however have challenged the rational deterrence theory and have focused on organizational theory and cognitive psychology. The concept of deterrence can be defined as the use of threats by one party to convince another party to refrain from initiating some course of action. In international security, a policy of deterrence generally refers to threats of military retaliation directed by the leaders of one state to the leaders of another in an attempt to prevent the other state from resorting to the threat of use of military force in pursuit of its foreign policy goals. Situations of direct deterrence often occur when there is a territorial dispute between neighboring states in which major powers like the United States do not directly intervene. On the other hand, situations of extended deterrence often occur when a great power becomes involved. It is the latter that has generated the majority of interest in academic literature. Building on these two broad categories, Huth goes on to outline that deterrence policies may be implemented in response to a pressing short-term threat known as immediate deterrence or as strategy to prevent a military conflict or short term threat from arising known as general deterrence. A successful deterrence policy must be considered in not only military terms, but also in political terms. In military terms, deterrence success refers to preventing state leaders from issuing military threats and actions that escalate peacetime diplomatic and military cooperation into a crisis or militarized confrontation which threatens armed conflict and possibly war. The prevention of crises of wars however is not the only aim of deterrence. In addition, defending states must be able to resist the political and military demands of a potential attacking nation. If armed conflict is avoided at the price of diplomatic concessions to the maximum demands of the potential attacking nation under the threat of war, then it cannot be claimed that deterrence has succeeded. Furthermore, as Jentleson et al. In broad terms, a state wishing to implement a strategy of deterrence is most likely to succeed if the costs of non-compliance it can impose on, and the benefits of compliance it can offer to, another state are greater than the benefits of noncompliance and the costs of compliance. Deterrence theory holds that nuclear weapons are intended to deter other states from attacking with their nuclear weapons, through the promise of retaliation and possibly mutually assured destruction MAD. Nuclear deterrence can also be applied to an attack by conventional forces; for example, the doctrine of massive retaliation threatened to launch US nuclear weapons in response to Soviet attacks. A successful nuclear deterrent requires that a country preserve its ability to retaliate, either by responding before its own weapons are destroyed or by ensuring a second strike capability. Other countries, such as the United Kingdom and France , have only sea- and air-based nuclear weapons. Proportionality[edit] Jentleson et al. This is a challenge, as deterrence is, by definition, a strategy of limited means. George goes on to explain that deterrence may, but is not required to, go beyond threats to the actual use of military force; but if force is actually used, it must be limited and fall short of full-scale use or war otherwise it fails. This has been seen in the cases of Libya, Iraq, and North Korea where defending states have sought to change the leadership of a state in addition to policy changes relating primarily to their nuclear weapons programs. Reciprocity[edit] Secondly, Jentleson et al. The balance lies neither in offering too little too late or for too much in return, not offering too much too soon or for too little return. Coercive credibility[edit] Finally, coercive credibility requires that, in addition to calculations about costs and benefits of cooperation, the defending state convincingly conveys to the attacking state that non-cooperation has consequences. A defending state having a superior military capability or economic strength in itself is not enough to ensure credibility. The other important consideration outlined by Jentleson et al. The first factor is whether internal political support and regime security are better served by defiance, or if there are domestic political gains to be made from improving relations with the defending state. The second

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factor is an economic calculation of the costs that military force, sanctions, and other coercive instruments can impose, and the benefits that trade and other economic incentives may carry. The third factor is the role of elites and other key domestic political figures within the attacking state. Rational deterrence theory[edit] The predominant approach to theorizing about deterrence has entailed the use of rational choice and game-theoretic models of decision making see game theory. Huth [7] outlines that a threat is considered credible if the defending state possesses both the military capabilities to inflict substantial costs on an attacking state in an armed conflict, and if the attacking state believes that the defending state is resolved to use its available military forces. Huth [7] goes on to explain the four key factors for consideration under rational deterrence theory being i the military balance; ii signaling and bargaining power; iii reputations for resolve; and iv interests at stake. In either case, the strategic orientation of potential attacking states is generally short term and driven by concerns about military cost and effectiveness. For successful deterrence, defending states need the military capacity to respond quickly and in strength to a range of contingencies. Signaling and bargaining power[edit] The central problem for a state that seeks to communicate a credible deterrent threat through diplomatic or military actions is that all defending states have an incentive to act as if they are determined to resist an attack, in the hope that the attacking state will back away from military conflict with a seemingly resolved adversary. If all defending states have such incentives, then potential attacking states may discount statements made by defending states along with any movement of military forces as merely bluffs. Costly signals are those actions and statements that clearly increase the risk of a military conflict and also increase the costs of backing down from a deterrent threat. States that are bluffing are unwilling to cross a certain threshold of threat and military action for fear of committing themselves to an armed conflict. Reputations for resolve[edit] There are three different arguments that have been developed in relation to the role of reputations in influencing deterrence outcomes. The second approach argues that reputations have a limited impact on deterrence outcomes because the credibility of deterrence is heavily determined by the specific configuration of military capabilities, interests at stake, and political constraints faced by a defending state in a given situation of attempted deterrence. The third approach is a middle ground between the first two approaches. It argues that potential attacking states are likely to draw reputational inferences about resolve from the past behaviour of defending states only under certain conditions. The insight is the expectation that decision makers will use only certain types of information when drawing inferences about reputations, and an attacking state updates and revises its beliefs when the unanticipated behaviour of a defending state cannot be explained by case-specific variables. The argument here is that defending states that have greater interests at stake in a dispute are more resolved to use force and be more willing to endure military losses to secure those interests. Even less well established arguments are the specific interests that are more salient to state leaders such as military interests versus economic interests. Furthermore, Huth [7] argues that both supporters and critics of rational deterrence theory agree that an unfavourable assessment of the domestic and international status quo by state leaders can undermine or severely test the success of deterrence. In a rational choice approach, if the expected utility of not using force is reduced by a declining status quo position, then deterrence failure is more likely, since the alternative option of using force becomes relatively more attractive. Nuclear weapons and deterrence[edit] Main articles: Nuclear strategy , Massive retaliation , Mutual assured destruction , and Flexible response In Schelling [2] is prescriptive in outlining the impact of the development of nuclear weapons in the analysis of military power and deterrence. In his analysis, before the widespread use of assured second strike capability, or immediate reprisal, in the form of SSBN submarines, Schelling argues that nuclear weapons give nations the potential to not only destroy their enemies but humanity itself without drawing immediate reprisal because of the lack of a conceivable defense system and the speed with which nuclear weapons can be deployed. Historical analysis of nuclear weapons deterrent capabilities has led modern researchers to the concept of the stability-instability paradox , whereby nuclear weapons confer large scale stability between nuclear weapon states, as in over 60 years none have engaged in large direct warfare due primarily to nuclear weapons deterrence capabilities, but instead are forced into

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pursuing political aims by military means in the form of comparatively smaller scale acts of instability, such as proxy wars and minor conflicts. The early stages of the Cold War were generally characterized by containment, an aggressive stance on behalf of the US especially on developing nations under its sphere of influence. This period was characterized by numerous proxy wars throughout most of the globe, particularly Africa, Asia, Central America, and South America. A notable such conflict was the Korean War. In contrast to general opinion, George F. Kennan, who is taken to be the founder of this ideology in his Long Telegram, asserted that his ideas had been misinterpreted and that he had never advocated military intervention, merely economic support. Although all factors listed above contributed to this shift, the most important factor was probably the rough parity achieved in stockpiling nuclear weapons with the clear capability of Mutual Assured Destruction MAD. The doctrine of mutual nuclear deterrence characterized relations between the United States and the Soviet Union during this period, and present relations with Russia. Reagan attempted to justify this policy in part due to concerns of growing Soviet influence in Latin America and the new republic of Iran, established after the Iranian Revolution of 1979. Similar to the old policy of containment, the United States funded several proxy wars, including support for Saddam Hussein of Iraq during the Iran-Iraq War, support for the mujahideen in Afghanistan, who were fighting for independence from the Soviet Union, and several anti-communist movements in Latin America such as the overthrow of the Sandinista government in Nicaragua. While the army was dealing with the breakup of the Soviet Union and the spread of nuclear technology to other nations beyond the United States and Russia, the concept of deterrence took on a broader multinational dimension. The document explains that such threats must also be used to ensure that nations without nuclear technology refrain from developing nuclear weapons and that a universal ban precludes any nation from maintaining chemical or biological weapons. The current tensions with Iran and North Korea over their nuclear programs are due in part to the continuation of this policy of deterrence. Criticism [edit] Deterrence theory is criticized for its assumptions about opponent rationales. First, it is argued that suicidal or psychotic opponents may not be deterred by either forms of deterrence. An arms race is inefficient in its optimal output, as all countries involved expend resources on armaments that would not have been created if the others had not expended resources, a form of positive feedback. Fourth, escalation of perceived threat can make it easier for certain measures to be inflicted on a population by its government, such as restrictions on civil liberties, the creation of a military-industrial complex, and military expenditures resulting in higher taxes and increasing budget deficits. In recent years, many mainstream politicians, academic analysts, and retired military leaders have also criticised deterrence and advocated nuclear disarmament. Sam Nunn, William Perry, Henry Kissinger, and George Shultz have all called upon governments to embrace the vision of a world free of nuclear weapons, and in three Wall Street Journal op-eds proposed an ambitious program of urgent steps to that end. The four have created the Nuclear Security Project to advance this agenda. Organisations such as Global Zero, an international non-partisan group of world leaders dedicated to achieving nuclear disarmament, have also been established. The film is a visual and historical depiction of the ideas laid forth in the Wall Street Journal op-eds and reinforces their commitment to a world without nuclear weapons and the steps that can be taken to reach that goal. The wound inflicted on unsuspecting populations he calls an "integral accident": The first deterrence, nuclear deterrence, is presently being superseded by the second deterrence:

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Nuclear deterrence can also be applied to an attack by conventional forces; for example, the doctrine of massive retaliation threatened to launch US nuclear weapons in response to Soviet attacks.

Policy, Doctrine, and Strategy 13 IV. Current Capabilities 21 V. Shortfalls, Improvements, and Recommendations 31 VI. Conclusions 41 Notes 45 Disclaimer The views expressed in this publication are those of the author and do not reflect the official policy or position of the Department of Defense, the U. Acknowledgments The end of the Cold War created a new-world order and presented new challenges for future leaders. One of the challenges is countering the ever growing terrorist threat. Accompanying this threat is a proliferation of weapons of mass destruction. These weapons are now available to individuals, as well as groups and nations, and pose a serious threat to global stability and security. The bombing of two U. Air War College gave me the opportunity to examine the military role in countering this terrorist threat. Classes throughout the year focused on future conflict and the asymmetric means others would use to counter U. This paper would not be possible without the help of the Air War College Counterproliferation team. Special thanks to my research advisor, Dr. Barry Schneider, for his patience, insight and critiques. He was instrumental in helping me produce a quality product. Additional thanks to Dr. Schneider, Colonel Bob Sutton, and Colonel Jim Davis for their expert instruction in counterproliferation and chemical and biological warfare. Finally, a special thank-you to my wife Jody for her never-ending support throughout the academic year. Her encouragement and patience allowed me to survive and grow in this academic environment. Thanks again for letting me chase my dreams. Abstract Terrorist use of weapons of mass destruction threatens Americans and our armed forces every day. To many nations and groups, their only means to counter the United States is with nuclear, biological, or chemical weapons. This paper examines the U. It describes the terrorist threat to U. Our current national policy, strategy and doctrine highlight the problem, but show a need to improve interagency coordination and cooperation in the fight against terrorism. On the military level, combating the threat is an integral part of our strategy but needs increased emphasis at the planning level. Capabilities do exist to deter or counter the threat, protect our forces, and sustain and operate after an NBC attack. But countering a terrorist threat presents unique challenges to future leaders and requires improvements in intelligence, equipment, training and education. The key to defeating the terrorist threat is timely and accurate intelligence collection, analysis and dissemination for detecting, characterizing, and countering the threat. Improvements in individual and collective protection are necessary to sustain operations. As important, the military needs to emphasize realistic joint and combined training and must add chemical and biological scenarios to future war games. Introduction A paradox of the new strategic environment is that American military superiority actually increases the threat of nuclear, biological, and chemical attack against us by creating incentives for adversaries to challenge us asymmetrically. Proliferation of advanced weapons and technologies threatens to provide rogue states, terrorists and international crime organizations the means to inflict terrible damage on the United States, its allies and U. This threat is not from a regional force, rogue state, or specific terrorist group. The first section will examine the terrorist threat to U. It will describe the weapons and delivery means available and look at past incidents of use or threat of use. The second section will review current U. This includes joint doctrine, strategy, and procedures for guidance on military preparation and response. The third section will examine the current military capability to respond to WMD. Are we prepared to deter, defend, and respond effectively in a nuclear, biological, and chemical NBC environment? The final section will detail current shortfalls, planned improvements for the future, and recommendations to improve overall military capability. The terrorist threat is real. Some say it is only a question of time before terrorists use weapons of mass destruction against our military forces. This requires that the U. Imagine that this group recruits scientists from around the world, including a number of converts among the scientific and professional communities in Russia and Japan. This group also has as converts

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members of the Japanese and possibly the Russian national police forces, military, and intelligence services. Believing in Armageddon, they decide to hasten it along by developing a panoply of weapons of mass destruction right under the noses of their government and completely unnoticed by U. They purchase sophisticated dual-use technology in the United States to develop their lethal weapons. On at least three occasions, they launch unsuccessful biological attacks. However, they succeed in a sarin gas attack on an unsuspecting, sleeping, suburban community, killing seven and injuring five hundred. Ultimately, the cult is only stopped by authorities after another sarin gas attack on a major subway system during morning rush hour goes awry. A mistake in crafting their chemical potion and the premature destruction of their normal delivery system reduces the potential fatalities from tens of thousands to twelve dead and five thousand injured. Sopko

The scenario described by John Sopko, former senior advisor to Senator Sam Nunn on terrorism and proliferation issues, is not fictitious. It describes the Japanese terrorist group Aum Shinrikyo. It shows the potential threat posed to the United States military by nonstate actors and terrorist groups. The threat is real, the technology available, agents relatively inexpensive, with attacks that are difficult to prevent. This has to do with the rise of groups and individuals that practice or might take up terrorism with the weapons available to them. Terrorist groups have attempted using all three in the past, with nuclear the most difficult to obtain and deliver. Chemical and biological agents are easier to produce, yet more difficult to disperse. Why Weapons of Mass Destruction? Why would terrorists want to use weapons of mass destruction? The particular group would receive enormous publicity, and the event would be perceived as not just another assassination, kidnapping, bombing, or hijacking. Seth Carus lists four reasons terrorist groups might use biological warfare: This is due to the ease of acquisition, inexpensive, and easier methods of delivery. Today, however, the means and methods of terrorism can be easily obtained at bookstores, from mail-order publishers, on CD-ROM, or even over the Internet. Relying on such commercially published or readily accessible. There are no meaningful controls on the availability of chemicals, and what little control exists over pathogenic cultures can be overcome in a variety of ways. Perhaps most important is the fact that the chemical and biological materials can be produced under the cover of an apparently legitimate commercial venture such as a small research company, fine chemical manufacturer, or bio-medical laboratory. Laqueur contends religious fanatical elements are the most likely to use WMD. These extremist groups consider the religious cause justification for taking lives. Although the use of a nuclear weapon by a terrorist is less likely than a CB attack, the possibility still exists. News reports about smuggling, however, generally overstate the potential impact of the particular theft. For example, most incidents have not involved weapons-usable materials, but rather radioactive isotopes, natural or low enriched uranium. It is important to emphasize, however, that all known highly enriched uranium and plutonium stolen to date is still insufficient to make a single nuclear weapon and that reports of thefts of weapon-grade material have declined in the last three years. However, obtaining the material still remains difficult. In his view, terrorists are more likely to use chemical weapons over biological and nuclear weapons. The Congressional OTA report highlighted the ease of producing chemical weapons. Many production techniques for chemical weapons, for example, can be found in the open literature and can be assimilated from standard chemical engineering principles. Certain chemical agents such as mustard gas are very simple to produce. Multipurpose chemical plants capable of manufacturing organo-phosphorus pesticides or flame retardants could be converted in a matter of weeks or months to the production of nerve agents. Choking agents cause the lungs to fill with fluid; blood agents prevent blood cells from utilizing oxygen; blister agents cause eye, lung and skin damage; and nerve agents paralyze the respiratory muscles. G-series nerve agents such as Tabun, Sarin, and Soman can lead quickly to death, while the even more toxic and persistent V-series creates long-term contamination of people, equipment, and territory. Procedures are based on old technology used prior to World War I and within reach of any terrorist group. In many ways, production of chemical warfare agents is like that of legitimate commercial compounds. The greatest similarities occur between pesticide and nerve agent production units because these compounds are so closely related. It is also possible to disseminate them in aerosol form from a crop duster or mobile generator.

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Biological agents are of great concern because all the equipment needed for production is dual-use and available on the open market. You can produce biological agents from naturally occurring pathogens such as bacteria and viruses, which are often self-replicating. Death may be inflicted by biological agents for a variety of reasons including cessation of breathing, collapse of body tissues, cell tissue trauma, and pulmonary failure. They consider anthrax, botulinum toxin, and the plant toxin, ricin, as typical biological agents. Anthrax grows aerobically, a product of fermentation, much the same as brewing beer. Preparing it for dissemination as spores requires some expertise, but the terrorist can practice disseminating species that are not pathogenic to humans. Botulinum toxin is a bacteria found virtually everywhere. Improperly handling food can cause botulinum toxin poisoning. The toxin, when crystallized, is extremely lethal and is easy to produce and dispense. Another easy procedure is extracting ricin from the castor bean which produces a deadly toxin. When inhaled, this toxin causes death in hours. Extracting the protein toxin is a well-documented, easy two-step procedure. Anthrax is a deadly toxin that, depending on the quantities used, can disable and kill thousands of people within hours or days.

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