DEATH BY MODERATION

This book addresses an important but little-noticed phenomenon in the revolutionary world of military technology. Across a wide range of otherwise unrelated weapons programs, the Pentagon is now pursuing arms deliberately crafted to be less powerful, deadly, and destructive than the systems they are designed to supplement or replace. This direction is historically anomalous; military forces generally pursue ever-bigger bangs, but the modern conditions of counterinsurgency warfare and "military operations other than war" (e.g., peacekeeping and humanitarian assistance) demand a military capable of modulated force. By providing a capacity to intervene deftly yet effectively, the new generations of "useable" weaponry should enable the U.S. military to accomplish its demanding missions in a manner consistent with legal obligations, public relations realities, and political constraints. Five case studies are provided regarding precision-guided "smart bombs," low-yield nuclear weapons, self-neutralizing antipersonnel land mines, directed-energy antisatellite weapons, and nonlethal weapons.

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Death by Moderation

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To Mort and Marcy

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Preface

"Paper tiger." That's how Mao Zedong famously derided the United States and its military muscle, including its burgeoning nuclear arsenal, during the 1940s and 1950s. There was no denying the devastating force of atomic power – and the Chinese leader was even then attempting to replicate it by enlisting scientific and materiel assistance from the Soviet Union to create a comparable inventory for Beijing. But Chairman Mao recognized that military tools alone were inadequate; even the most overwhelming weaponry can provide no guarantee of success on the battlefield or meaningful control over global political affairs.

The intervening decades have reinforced that message, repeatedly demonstrating that superiority in armaments – as valuable as it may be – hardly suffices to ensure victory, peace, stability, or even survival of a regime. From the jungles of Vietnam to the sands of Palestine to the collapse of the U.S.S.R., qualitative dominance in sophisticated military hardware has failed to translate into effective control of the situation on the ground and has left putative global or regional superpowers frustrated and hamstrung, if not outright defeated.

This book examines that conundrum – and the latest American efforts to overcome it. The focus here is on the ongoing U.S. quest to develop weapons that are more "useable" – weapons that would not merely adorn an arsenal and impress an audience, but that could actually be employed with telling effect on a modern battlefield. In particular, the book examines a series of proposed or emerging military technologies that are remarkable because they are deliberately *less* powerful, *less* deadly, and *less* destructive than their predecessors. Paradoxically, these new generations of armaments – featuring, in various measure, greater precision, shorter duration, less lethality, and reduced collateral damage – may

provide more effective power than their larger and more destructive, but also more inexact and crude, predecessors.

This incipient understanding – reflected simultaneously but independently in a wide array of ongoing U.S. weapons programs – emphasizes that values other than sheer firepower matter a great deal and will become even more decisive in the future. The ability to apply organized violence with something of a deft touch will have to characterize U.S. military operations; success today depends on influencing people, inducing them to bend to our will, and that often requires a mixture of both brutality and subtlety. To adapt another line from Mao, if "power grows out of the barrel of a gun," it grows best if the gun is sufficiently focused, precise, and narrowly tailored to achieve a particular purpose – the blunderbuss approach alone will no longer suffice.

To explore that proposition, the book features five case studies – analyses of five vastly different sorts of new weapons embodying the full array of explosive power, technological sophistication, frequency of use, and deadly effect. What they all share in common, however, is a gravitation toward "useability" – they enable the possessor to target a particular person, place, or thing with greater precision and to project a hostile effect in a more discrete, temporary, circumscribed manner. By being less powerful, less apocalyptic than their predecessors, these new, more moderate armaments may accordingly alter the familiar grammar of international conflict and become invoked in combat more often and with greater success.

As background to those five cases, Chapter 1 describes the ongoing "revolution in military affairs," a multifaceted undertaking that augurs broad-gauged transformation in all aspects of U.S. military life, from the structure, organization, and operation of the forces to the next waves of weapons our troops will wield. Over a period of years, these new generations of arms technology will institute changes in military doctrine as fundamental as those occasioned by the introduction of the airplane, the satellite, or the atom. One fundamental hallmark of the current revolution is an unprecedented emphasis on the emergence of "useable" weapons – the goal is not just the accretion of more raw explosive power, but more deft, calibrated power. This development is surprising, if not historically unique, for it runs contrary to the general thrust of centuries of weapons development, which almost monotonically has pursued tools of ever-increasing lethality and destructiveness.

Chapter 2 places this transformation into context by elaborating on the concept of deterrence. The most prominent traditional application

of deterrence involves precluding international military aggression by intimidating the opposition. When we lack a robust ability to prevent, to intercept, or to defeat an enemy's attack upon us (or even if we did enjoy that power) a desirable, and often plausible, alternative is to *persuade* the potential enemy not to launch a strike against us in the first place. Often, that persuasion comes in the form of threatening retaliation ("unacceptable damage") in response to any attack, convincing any putative aggressor that the gains from an onslaught would not be worth the losses suffered in return.

The flip side of deterrence is self-deterrence, describing, in this context, a situation in which a country is reluctant or unwilling to exercise its military power, not because of fear of retribution, but for other reasons. The most relevant inhibition here would be a sense that application of excessive or indiscriminate power would be inappropriate, politically and morally unacceptable, and illegitimate. The worst problems of Gulliver in Lilliput arise when a country (arguably, the United States today) possesses an overwhelming military ability to obliterate any foe in all-out combat but does not simultaneously possess a sufficiently refined military capability to wage effective wars at less than the all-out level. If we are self-deterred against using too much power, then we may wind up doing little or nothing at all in effective response to provocations that, although serious, do not warrant the massive use of overly crude weaponry.

Standards of international law reinforce that judgment, and Chapter 3 describes the relevant principles of the "law of armed conflict" that underpin military and diplomatic dealings. Although this body of widely accepted jurisprudence enjoys neither the precision we might like nor the universal adherence it deserves, it provides important principles that align well with the intuitive sense of what is appropriate and justifiable in hostilities. In particular, the hoary concepts of necessity and proportionality, derived from nineteenth-century international diplomatic correspondence, and the accompanying notion of a requirement for discrimination or distinction between combatants and nonbelligerents, retain their validity. Together, these privileged legal obligations channel armed combat into more tolerable, more civilized forms in the hope of avoiding the worst depredations, and they reinforce the progression toward increasing the useability of nascent weapon systems. The fundamental legal requirement to be proportional in our exercise of military force – to sufficiently graduate our applications of violence – constrains our military operations: doing too much is illegal; doing too little is feckless.

Five case studies then follow. Chapter 4 presents the most obvious illustration of a military transformation under way: the creation of precision-guided munitions (PGMs) of various sorts, especially smart bombs for air-to-surface operations. Promising – and already conveying – a genuine revolution in combat, modern bombs and projectiles can be targeted with hitherto unimaginable accuracy and reliability, zeroing in on a selected location while leaving neighboring sites unaffected. This capacity has accorded military planners a much more useable vehicle for projecting power; missions can now be undertaken in settings that would previously have been ruled off-limits out of fear of inflicting unacceptable collateral damage on the surrounding people and places. When we have the ability to do *less* damage by striking and destroying or disabling only the intended target, we gain more freedom of action.

Chapter 5 pursues that proposition in a very different setting: nuclear weapons. The history of the evolving U.S. nuclear arsenal reveals a persistent pressure toward the bigger bang, with modern nuclear leviathans exceeding by several times the explosive power of their forebears; a similar story can be told for the other nuclear countries. But in recent years, some strategists have opined that the hypertrophy of the nuclear arsenal has gone too far – by concentrating on developing such large and overwhelming devices, we have lost (or failed to pursue) the ability to apply lesser nuclear power with a sufficient degree of precision or finesse. They have suggested that a smaller, more restricted nuclear weapon might be the appropriate tool for selected missions, such as attacking an enemy's hardened or deeply buried command bunkers without inflicting massive cratering and widespread radioactive fallout on the surface. If, they reason, we possessed a calibrated nuclear arsenal capable of that kind of deft, localized destruction, we could undertake militarily valuable missions that, at present, remain outside our capacity.

Chapter 6 tests the arguments for useability in a very different setting. Antipersonnel land mines (APL) are much lower than nuclear weapons on the scale of explosive power and much higher on the scale of frequency of use. But in the past decade and a half – in reaction to the deployment of millions, perhaps hundreds of millions, of land mines in the field – the world has awoken to the humanitarian crisis caused by long-lived APL that remain lethally active for years (or decades) after the war has ended and the soldiers have moved on. Many countries, therefore, have responded by pledging to refrain from mine warfare and have negotiated a treaty to ban APL completely. The United States, however, has abstained from joining that instrument, favoring instead pursuit of a new

technology of "smart" APL devices that self-destroy or self-neutralize in various measure after a short, predetermined period of time. That way, the Pentagon asserts, we can have the best of both goals: the nonpersistent smart mines enable us to employ the systems in situations in which there is a military advantage in doing so, without contributing to the humanitarian horrors of long-lived "dumb" mines. By making the mechanisms less robust and less durable, so they do not last as long in the field as did the earlier forms, the inventors achieve another dimension of useability.

Chapter 7 continues the exploration by investigating another very different genre of military programs: antisatellite (ASAT) weapons. The United States and the Soviet Union, as global superpowers and the major spacefaring states, explored various incarnations of ASATs throughout the cold war, and more recently, China has entered this insidious competition as well. But each of these ASAT schemes has suffered from inherent defects. Although several of the systems would likely have sufficed to obliterate enemy spacecraft, they would have accomplished that combat mission via crudely destructive explosions (nuclear or conventional) or debris-creating high-speed collisions that would simultaneously endanger the user's own satellites and perhaps inflict erratically widespread damage on the ground as well. Where any antisatellite warfare would be Pyrrhic in that way, the potential users were self-deterred. In contrast, the modern concept for ASAT – to destroy, damage, or disrupt an enemy's satellite via beams of nonexplosive directed energy – again undertakes to accomplish the assigned mission with more finesse and less collateral damage. The new technology – relying on high-energy lasers, microwaves, or subatomic particle beams – is less crudely destructive, again resulting in a more useable capacity while avoiding excessive self-deterrence.

Finally, Chapter 8 addresses one additional emerging technology, or a group of somewhat related technologies lumped under the heading of "nonlethal weapons" (NLW). Although some might see the concept of a nonlethal weapon as an oxymoron (the whole point of fighting, after all, is to inflict pain, incapacity, and death on an enemy force), there are, in fact, many situations in which it is preferable to disorient, disable, or constrain an enemy without killing, or to damage or disrupt enemy equipment without utterly destroying it. NLW advocates, therefore, have sponsored research into a bevy of novel mechanisms, and several of these nonlethal systems are now about to spill out of laboratories and research facilities. Again, the notion is that by providing an intermediate capability – less than invoking traditional lethal force, but more than doing nothing – these developments can scratch an itch in a place that's hard

to reach, empowering the military where a forceful and deft presence is required.

Each of these chapters opens with an illustration – a historical (Chapters 1–3) or hypothetical (Chapters 4–8) scenario in which the principles and weapons are demonstrated in realistic settings. These illustrations, based on contemporary or near-term future contingencies, adduce in simplified form the factual predicates and strategic constraints confronting decision-makers in recent or plausible use-of-force imbroglios.

After those disparate case studies, Chapter 9 raises fundamental questions about what we should make of this broad-based, multisector drive toward useability in weapons. The headlong pursuit of useability is not the product of a central directive, emanating from senior Pentagon officials and directed uniformly at all arms programs; nor is it uniquely a hobby horse of the Bush administration or former Secretary of Defense Donald Rumsfeld. But it is now a clear trend, with applications across this wide array of quite different programs – is that a good or a bad thing?

On the one hand, we should welcome the progress toward useability. If it makes our forces more effective, if it enables them to carry out legitimate missions more surgically and to pursue valid national security goals with greater discretion and finesse, it should be welcomed. Reducing collateral damage – thereby validating the legal, political, and public affairs emphasis on avoiding unintended casualties among civilian persons and property – is desirable not only on humanitarian grounds, but also because it enhances the competence of the military as a tool of national policy.

On the other hand, there are profound reasons to be apprehensive about these new capacities, too, and Chapter 9 also outlines the case against useability in the abstract. First, if we come to possess the ability to apply force more deftly, reducing some of the inhibitions against the exercise of power, is it not predictable that we will inevitably come to apply that military force more often? When we shift the nation's traditional cost-benefit calculation about warfare by lowering some of the costs, we must anticipate that reduced self-deterrence will result in an increased willingness – perhaps increased too much – to go to war or to employ selected more deft weapons in ambiguous circumstances. Second, we must also be mindful that any unilateral pursuit of these advanced capabilities will not remain unilateral for long – if increased useability in weapons is advantageous to the U.S. military, then other countries may well reach similar conclusions for themselves, too, and pursue comparable capabilities. Before taking these first steps down the momentous path

toward more useable weapons, we should contemplate whether a world filled with these more deft arms is truly to our advantage, because no monopoly can be perpetual.

This vast new armada – precision-guided munitions, low-yield nuclear weapons, smart antipersonnel land mines, antisatellite weapons, non-lethal weapons, and all the rest – carries profound implications for U.S. and global national security policies. Any transformation that enhances the effectiveness of a military force can be wielded for good purposes or for evil – even mechanisms that aim to reduce the frequency and severity of unintended collateral damage can be perverted to horrific ends. And when a new technology – or a revolutionary new approach to military weaponry across the board – influences such a wide array of capabilities, it bears special attention. If American weapons, with increased useability, are no longer "paper tigers," what, exactly, will they become?

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Abbreviations and Acronyms

ABM	Antiballistic missile
ADS	Active denial system
APL	Antipersonnel land mine
ASAT	Antisatellite weapon
AVL	Antivehicle land mine
BW	Biological weapon
BWC	Biological Weapons Convention
C^3	Command, control, and communications
CALCM	Conventional air-launched cruise missile
CBU	Cluster bomb unit
CCW	Convention on Certain Conventional Weapons
CDEM	Collateral damage estimation methodology
CEP	Circular error probable
CW	Chemical weapon
CWC	Chemical Weapons Convention
DoD	Department of Defense
EMP	Electromagnetic pulse
EOGB	Electro-optical guided bomb
ExComm	Executive committee
GPS	Global positioning system
HDBT	Hard and deeply buried target
ICBM	Intercontinental-range ballistic missile
ICJ	International Court of Justice
IED	Improvised explosive device
JASSM	Joint air-to-surface standoff missile
JCS	Joint Chiefs of Staff
JDAM	Joint direct attack munition
JSOW	Joint standoff weapon

KE-ASAT	Kinetic-energy antisatellite weapon
kt	Kiloton
LGB	Laser-guided bomb
LoAC	Law of armed conflict
MAD	Mutual assured destruction
MHV	Miniature homing vehicle
MIRACL	Mid-infrared advanced chemical laser
MOAB	Massive ordnance air blast
MOOTW	Military operations other than war
MOUT	Military operations in urban terrain
MRE	Meal ready to eat
Mt	Megaton
NATO	North Atlantic Treaty Organization
NLW	Nonlethal weapon
OC	Oleoresin capsaicin
OST	Outer Space Treaty
PAROS	Prevention of an arms race in outer space
PGM	Precision-guided munition
RCA	Riot control agent
RMA	Revolution in military affairs
RNEP	Robust nuclear earth penetrator
SAINT	Satellite interceptor
SDB	Small diameter bomb
SIPRI	Stockholm International Peace Research Institute
SLBM	Submarine-launched ballistic missile
SPOT	Satellite Pour l'Observation de la Terre
START	Strategic Arms Reduction Treaty
TASER	Thomas A. Swift's electric rifle
TERCOM	Terrain contour matching
UAV	Unmanned aerial vehicle
UN	United Nations
UNGA	United Nations General Assembly
UNSC	United Nations Security Council
WMD	Weapon of mass destruction