**It Takes a Network: On Countering Terrorism
While Reforming the Military**

Testimony of Dr. John Arquilla before the House Armed Services
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The cold war's governing dynamic was an arms race in nuclear weapons; the age

of terror is driven instead by an "organizational race" to build networks. Al Qaeda and

its affiliates have been in this race for two decades; America and its allies entered the race

just seven years ago – and since then have "competed" only in fits and starts. The

terrorists remain on their feet and fighting, in large part because their nimble, networked

structures have been given the opportunity to keep developing, their hallmarks being the

decentralization of authority, the proliferation of small cells throughout the world, and an

abundance of lateral links – many in cyberspace – among and between their many nodes.

They have developed a highly evolved, battle-tested variant of the classic network

concept of operations: "small pieces, loosely joined."[1] For our part, there has been some

realization of the need for networking; but there has also been a dogged devotion to slow,

balky decision making structures and, especially in the realm of military action, a focus

on attacking hostile hierarchies – principally other nations – with the large formations

and massive firepower associated with the Powell Doctrine of "overwhelming force."

It should hardly be surprising, then, that in this first great war between nations and

networks, the networks have slipped most of our heavy punches and continued to land

new blows of their own. Not in the United States again, since 9/11, but with greater

frequency around the world, as significant terrorist acts that totaled just a few hundred

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[1] David Weinberg, *Small Pieces, Loosely Joined* (New York: Perseus Books, 2002).

worldwide in 2001 rose to more than 10,000 by 2006, according to our own State Department statistics. Thanks to the turn-around in Iraq, the number should fall significantly this year – but to an amount that will still reflect a staggering increase from 2001. These numbers also indicate that our war on terror has, in a very real sense, morphed into terror's war on us. By "us" I mean the international community that opposes terrorism, a portion of which has been beset by terrorist acts perpetrated across a swath of territory running from Morocco to Mindanao. Iraq and Afghanistan are the hottest spots along this belt of violence – a curious point, given that these are the two countries where American military presence is strongest. This paradox suggests that new ideas about organizational forms and concepts of operations are urgently needed.

Indeed, it might serve us best if we completely reconsidered the very problematic notion of waging a war of ideas against an enemy whose core constituency of zealots – numbering in the several tens of millions, if opinion polls across the Muslim world are to be believed – will never be talked down by even the slickest rhetoric. So instead, with the goal in mind of improving our ability to detect, disrupt and destroy terror networks, we should recast our intellectual efforts in favor of conducting "a war of ideas about the idea of war." If such a debate were fostered and undertaken, there would be a good chance that our military might be able to make the shift, in a more supple manner, from industrial-age interstate warfare – characterized by mass-on-mass maneuvers – to the new age of conflict in which the fundamental dynamic is that of "hider/finder," and whose key tactical formation is a "swarm" capable of simultaneous, omni-directional attack.[2]

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[2] This concept was introduced in John Arquilla and David Ronfeldt, *Swarming and the Future of Conflict* (Santa Monica: RAND, 2000).

Absent this debate, the U.S. military will continue to exhaust itself in traditional, firepower-heavy campaigns against opponents who can take as much or as little of the war as they wish – popping up when and where they want, across a global battlespace, rope-a-doping our relatively few, large units of action. A hierarchy trying to grapple with a network is a sad sight; for it takes a network to fight a network with any hope of lasting success. Much as, in the era of modern maneuver warfare – which ran roughly from 1939-1991 – it was the concentration of tanks in armored divisions that made it possible to fight successfully against enemy armor. For the longest time, the best weapon against a tank was a tank. Now, the best weapon against a network is another network.

The central difficulty with the American military today is that it is fighting a 21st century kind of war with the organizational structures and conceptual strategies of the 20th century. With units that can be mostly described as "the few and the large," we have great trouble coming to grips with an enemy comprised of the "many and the small."[3] With strategies that are essentially linear and sequential in nature – think of World War II's island-hopping campaigns in the Pacific, or our march up Mesopotamia in 2003 – we are trying to confront a widely distributed enemy capable of striking with effect, on any given day, anywhere from Madrid to London to Bali, and beyond.

Our guiding strategic metaphor is chess, where the concentration of forces is crucial, the rules of movement are circumscribed and the sequencing of operations generally culminates in an attack on the other side's well defined "center of gravity." The terrorists' governing strategic metaphor is "Go," an Asiatic war game older than chess where – contrary to chess – the wide but interconnected dispersal of forces is

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[3] I paraphrase here the expression introduced by Martin Libicki in his *The Mesh and the Net: Speculations on Armed Conflict in a Time of Free Silicon* (Washington, DC: National Defense University Press, 1994).

optimal, an attack can take place almost anywhere on the board from one turn to the next, and "edges" mean far more than "centers." In the al Qaeda War, the enemy has been playing Go. We, for the most part, are still playing chess.

On a smaller scale than the terror war, a similar situation arose in the Israeli-Hezbollah conflict of 2006, where the Israeli Defense Forces – which stand among the world's finest militaries – mounted an energetic air-ground campaign that massed both forces and fire in a primarily linear, sequential, chess-like manner. The dispersed, networked forces of Hezbollah, however, were organized in a multitude of fire teams, often with just 4-6 fighters in each. Further, the southern portion of Lebanon was divided into some 75 self-sustaining military zones in which rockets and missiles were pre-positioned. The guiding concept of operations was for these teams to hide most of the time, retrieve the hidden weapons, then pop up, strike and go to ground again. What I have called a "shoot and scoot" doctrine. The vastly outnumbered Hezbollah fighters, distributed like Go stones all over the "board" of southern Lebanon, were nevertheless able to fire as many of their weapons at Israel on the last day of the war – about 200 – as they had launched on the first day of the fighting a month earlier. In this conflict between a nation and a network, the network had more than held its own.

Events like this prompt the question "What kind of military reforms will be needed in order to grant our forces the degree of nimbleness necessary to defeat terror networks?" I believe that change will have to come in two key areas: organization and doctrine. In each domain, the "catalytic agent" should be the simple insight that interconnectivity has greatly empowered small groups. In 2001, this was demonstrated both by al Qaeda and by the American military. First, on 9/11, the huge disruptive and

destructive power of just nineteen attackers – riding the rails of our own technology to strike at us – was convincingly demonstrated. A few months later, eleven American Special Forces A teams – under 200 soldiers in all, working with the heavily outnumbered Northern Alliance – drove the Taliban and al Qaeda from power just a few weeks after they were unleashed.[4] At no other time in history have so few – representing both sides – achieved so much. In this respect, 2001 must be seen as a watershed year in conflict and military affairs.

In the organizational domain, the principal goal should be to create far more, and much smaller, "units of action." At the start of the terror war, for example, the U.S. Army had 33 brigades – its basic organizational structure. Today the number of brigade combat teams (BCT) is set to be closing in on 50. The shift to brigade "units of action" may well take the number up in the range of 100 in the next few years. But all this is just incremental change. The U.S. Army remains "brigadist" in thought and outlook, posing sharp constraints on the ability to engage in transformational change. If the evidence supporting the growing power of even very small groups suggests anything, it is that, in an information age, the centuries-old brigade is no longer useful. Indeed, it is a drag on efficiency, worsening the "scaling problem" of a few-and-large military like ours.

All this said, there is some interesting evidence, coming out of Iraq, of a willingness to consider groups as small as 40-45 soldiers to be viable units of action. Over the past year-and-a-half, more than 100 platoon-sized outposts have been created in Iraq – most, but not all, in the vicinity of Baghdad. Co-located with similar-sized Iraqi units, these outposts have formed a physical network that has contributed greatly to the drop in violence there. This has happened in part because their ability to respond to

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[4] After some four weeks of strategic aerial bombardment had achieved only desultory results.

terrorist acts quickly – much more quickly than larger components coming off forward operating bases – has improved deterrence enormously.

Right now, about 5% of the total number of troops in Iraq are stationed in small outposts, none of which has ever been overrun. And so we have a powerful example of a network of the "small and the many" achieving some remarkable things; and we should also question whether a surge of five additional brigades was *ever* necessary to make this shift. In my view, it was not, particularly when one considers the powerful effects of social networking with all twenty-three of the Sunni tribes in Anbar Province. The "awakening movement" added huge numbers of nodes and links to the counterinsurgent network in Iraq.

Taking this analysis further, I hypothesize that if the appropriate unit of action is now platoon-sized, it should be noted that fifteen brigades – the current number in Iraq – have over 400 platoons, all told, among them. Which means that very steep drawdowns in U.S. forces could take place without any reduction in the size of the outpost network. Indeed, if the small-and-many approach is used to solve our scaling problem, it's possible to see how we might even increase the number of outposts while deeply drawing down our overall numbers in country. To be sure, there would be resistance to such a notion, as the standard reaction among strategists to the current situation would no doubt be to stay on the existing course, making no changes that might disturb whatever equilibrium obtains at the moment. Clearly, this latter perspective has prevailed with the president, as his recent decision to authorize only a slight troop drawdown at year's end indicates.

The problem with this point of view, of course, is that it was only by upsetting the equilibrium with the shift to what I have called the "outpost and outreach" approach – a

concept I first advanced four years ago – was the situation in Iraq improved. This existence proof of the concept of building a network of our own to fight the terrorist networks should impel us to exploit this idea even more vigorously – not to shy away from it, or try to keep it contained. For the reactionary path is one guaranteed to keep us on a $10 billion per month spending trajectory in Iraq; and the failure to keep adjusting and expanding our new, networked approach virtually guarantees that we shall fall prey, over time, to a thinking enemy's adjustments. This will happen in Iraq, and in Afghanistan, too, if a traditional "numbers game" approach is taken, absent organizational redesign and doctrinal innovation. The Taliban will not be defeated simply by our sending two or three more brigades to Afghanistan. They will be defeated, without particular regard to the total number of U.S. forces deployed, if we organize them in small units of action and employ them in a far more networked fashion,

Lest this networked small-unit approach be too closely associated with primarily defensive and deterrent measures, I must remind that our initial campaign in Afghanistan in late 2001 showed how an offensive may be conducted in this manner. Indeed, if the enemy has regrouped and issued forth anew from Waziristan, it is principally because of the American and allied shift away from operating more offensive-mindedly, in "hunter networks" there. Instead, U.S. and NATO forces have laagered in, for the most part, on larger bases and ceded the initiative to the enemy. This has not been the case in Iraq, where the outpost network has been nicely complemented by super-secret "hunter networks" that have operated highly successfully there – and elsewhere around the world.[5] Little more can be said openly about this topic, save that I articulated and have

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[5] An interesting discussion of these units in the open literature can be found in Bob Woodward, *The War Within* (New York: Simon and Schuster, 2008).

been pushing for the adoption of this concept for the past four years.[6] To the extent to which we emphasize this as our principal offensive means, we will have a serious chance of tearing apart the terrorist networks that currently bedevil us – and new ones that will inevitably rise.

The foregoing analysis implies a point about the close interconnectedness of organizational redesign and innovative doctrinal thinking, as the new, small units will only be embraced and empowered when their existence is fortified by the appropriate changes in concepts of operations. In recent decades – certainly since the latter days of the cold war, when ideas about massive tank battles against the Russians were last relevant – official U.S. military doctrine has been wandering in something of an intellectual wasteland. Indeed, in most respects, doctrine has been yoked to the service of parochial interests. For example, the network-centric warfare (NCW) concept that the late Admiral Arthur Cebrowski introduced over a decade ago is, in the main, an effort to improve the effectiveness of carrier-heavy fleets by creating more lateral links between "sensor and shooter grids." The basic idea is to make our existing "tools" a bit better by introducing more efficient information-sharing "practices." The system of systems approach (SOSA), first articulated by former vice chairman of the joint chiefs of staff, Admiral William Owens, is, to a great extent, simply an adjunct to the NCW concept.[7]

The other major strand of strategic thought that has, until recently, bewitched the U.S. military is the notion of "effects-based operations" (EBO). The core idea behind this concept is laudable: the belief that especially well-judged and precise targeting can allow for more disruption to be done to an enemy while reducing the overall need for

[6] See, for example, John Arquilla, "A Better Way to Fight the War on Terror," *The San Francisco Chronicle,* March 28, 2004.
[7] William Owens and Ed Offley, *Lifting the Fog of War* (New York: Farrar, Straus and Giroux, 2000).

destruction.[8] Clearly, the rise of EBO reflects an effort to shore up intellectual support

for the Air Force's quixotic, century-long pursuit of victory via strategic bombardment.

Were this not so, we would have seen far greater support given to such principally non-

destructive means as psychological operations, deceptions – even cyberspace-based

strategic attack.[9]

The Air Force recently tipped its hand, regarding its preferred "kinetic" variant of

EBO, however, with the decision to shut down its own Cyber Command. Beyond this

bureaucratic Freudian slip is the fundamental problem that *all* military operations are

designed with "effects" in mind. What isn't an EBO? Further, there is a sad record of

failure, across nearly a century of conflict, to win wars with strategic aerial

bombardment.[10] Whatever the merits of paying more attention to "effects," concluding

that this approach will somehow re-animate bombing is foolhardy. This is especially true

in an era replete with irregular wars, where distributed networks are, for the most part,

impervious to such strikes. Small wonder that officers like General James Mattis of the

Joint Forces Command have come out strongly against the continuance of EBO as a

viable doctrinal concept.[11]

If network-centric warfare is not the answer, nor effects-based operations, then

how is the U.S. military to proceed, in doctrinal terms? I respectfully submit that, given

the rise of networks as our principal opponents, the development of a network war-

fighting doctrine is most appropriate. The good news is that some thinking has been

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[8] See Paul Davis's study of this concept, *Effects-Based Operations: A Grand Challenge for the Analytic Community* (Santa Monica: RAND, 2002).
[9] On this last point, see Gregory Rattray, *Strategic Warfare in Cyberspace* (Cambridge: The MIT Press, 2001).
[10] Robert Pape, *Bombing to Win: Air Power and Coercion in War* (Ithaca: Cornell University Press, 1996).
[11] See General James Mattis, "Commander's Guidance for Effects-Based Operations," Norfolk, VA: Joint Forces Command. Issued 14 August 2008.

going on in this area, starting with my colleague David Ronfeldt's and my introduction of the "netwar" concept in our work over a decade ago.[12] In the course of our joint research, we developed a range of doctrinal ideas about how to detect, track and counter insurgent, terrorist and criminal networks. Our main points, as they apply to military reform, can be easily summed up as follows: 1) Many small units of action should be created, then empowered to coordinate, rather than restricted by central controls; 2) Action against the enemy should consist of greater parts "waiting and watching" early on, as striking too quickly and destroying the few nodes located will actually *reduce* overall knowledge about the opposing network; and 3) The fundamental tactic of a network is the swarm, hitting at the enemy from all directions simultaneously when going over to the attack.

The netwar notion overturns a lot of traditional military thought – which is probably why its adoption has been resisted for so long, and why the concept has been mistakenly characterized as being applicable only to the realm of cyberspace-based operations. For when it comes to the canonical principles of war, instead of massing, netwar calls for the wide distribution of many small units of action. Instead of defeating portions of an enemy force "in detail," the goal is to illuminate as much of the opposing network as possible before striking with a swarm. Yet another traditional principle of war, "unity of command," is also undermined by netwar – which calls not for centralized control of field forces but rather what Ronfeldt and I like to call "decontrol."

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[12] See John Arquilla and David Ronfeldt, *The Advent of Netwar* (Santa Monica: RAND, 1996). We followed up on this study in our *Networks and Netwars: The Future of Terror, Crime, and Militancy* (Santa Monica: RAND, 2001). For a specific discussion of network warfare in the context of military operations, see John Arquilla, *Worst Enemy: The Reluctant Transformation of the American Military* (Chicago: Ivan R. Dee, 2008), especially Chapter 7, "A New Course of Instruction: Netwar 101."

It is hardly surprising that this new doctrine has had a difficult time getting much traction. But its time has nevertheless come; for it is the netwar concept that affords us a clear guide to redesigning our military to be able to fight and defeat insurgent or terrorist networks. It is the right doctrine for an age in which many have problems with seeing the war on terror as an actual war. The struggle against al Qaeda and its affiliates is indeed a real war; but it is not a regular sort of war. It is a netwar, something that looks, feels and tastes different from most of our earlier experience, as a nation, with warfare. This new concept of conflict, though, may give us the handhold we need to see our way through to destroying the terror networks now arrayed against us and our allies – and to do so before they have a chance to develop weapons of mass destruction that would give them a real war-winning potential.

Perhaps the biggest stumbling block in the way of a shift in favor of network warfare is the worry that large-scale, old-style warfare will return. Even though there have been only a handful of conventional wars fought since the end of World War II in 1945, the fear of blitzkrieg – or possibly nostalgia for it – remains in the forefront of the military mind. And if such a war were to come, some argue, armed forces that had networked themselves, and so now lacked "mass," would be run over. With this concern in mind, the best that could be hoped for would be to network a small portion of the U.S. military – allowing it to take on terror networks – while keeping the rest ready for massed operations against other armies or carrier or bomber fleets.

The problem with this plausible-sounding line of argument is that it perpetuates the terrible "scaling problem" that plagues the U.S. military, keeping costs exceedingly high and slowing response time in the face of any given crisis. For example, the initial

phase of operations in Afghanistan – where just eleven A teams engaged – occurred as it did precisely because of the American inability to do anything more than this in the near term. Had the U.S. Army been replete with small units of action in the fall of 2001, several dozens of them, easily topping 1,000 troops – not just the hundred or so special operators – could have been quickly deployed to far greater effect. And Osama bin Laden's and Mullah Omar's chances of escaping into Waziristan would have been very small indeed.

Similarly, in Iraq, where we still have over 140,000 troops in country, a shift to platoon-sized Marine and Army units of action would simultaneously give us greater on-the-ground coverage and yet require far fewer occupying troops, overall. It may be bureaucratically attractive to think in terms of networking just a small part of our forces while leaving the rest as they are; but such a course keeps our operating costs high, slows our response time in crisis and conflict, and crimps our ability to wage netwar-styled campaigns against terrorists and insurgents.

But what if another World War II-style conflict comes along? How would such a "net force" deal with, say, an invasion of South Korea by the million-man army of the communist regime in the North? There are two answers to this sort of problem, both of which would allow our transformation along networked lines. The first reply is that we could "rebalance" our active-reserve mix, which today has most of our traditional war-fighters on active duty, with many irregular warfare skills residing primarily in the Reserves. Rebalancing would place most of our small units of action, along with those most suited to the demands of irregular warfare – including psychological operations and civil affairs specialists – in a much-reduced active duty force. Traditional combat

soldiers – tankers, heavy artillerymen and the like – would, for the most part, populate Reserve and Guard units, and train regularly for just such contingencies as the above mentioned, and would be ready to ship out swiftly in crisis or conflict. Their deployment would be greatly aided by careful prepositioning of weapons and other war materials. In the meantime, the more irregular-warfare oriented active force would take on terrorists and insurgents.

The foregoing presupposes a belief that an old-style opponent has to be fought in an old-style manner. However, if one believes in the growing power of small combat formations, and has even a modicum of faith in American air and naval mastery, then it is possible to see how an entire force based on nimble, networked units of action would make absolute mincemeat of traditionally configured foes. Indeed, while having a netwar-styled force would undoubtedly improve our chances against insurgents and terrorists, the "net force" – backed by air and naval support – should be able to do even better against a big, balky opponent. The basic point being that, if one is willing to accept that old-style forces need not be confronted in an old-style way, a world of possibility for military transformation opens up. A world where our capacity for conducting irregular wars is vastly improved – and so is our capacity for confronting more traditional opponents.

The only question remaining is whether we will have the wit, and the grit, to make such a choice. Perhaps an example from one of our earliest wars – the struggle against the French and their Native American allies between 1756-1763 – will help to illustrate the possibilities. This war was waged across a great wilderness, against enemies who blended both conventional and irregular tactics skillfully. The British, then

our colonial overlords, had much trouble at the outset, losing one conventional battle

after another, and suffering even sharper defeats against the enemy's irregular forces.

But they eventually came to realize that the Americans had a special knack for "bush

fighting," and began to incorporate Rangers and other irregulars into their ranks. The

results were remarkable, and transformative – and led to victory. But this was not the

victory of an old-style force that had simply been shored up by irregulars. No, it was

completely transformed. In the words of one of the great historians of this conflict,

commenting on the Anglo-American force that won the last campaign at Montreal:

> This was no conventional army . . . Its tactics had undergone a transformation in America
> . . . For three years the redcoats had been firing at marks and were now accustomed to
> aiming, rather than merely leveling, their muskets at the enemy . . . Forces included fewer
> grenadiers, but many more light infantry . . . whole battalions of little wiry men able to
> move quickly through the woods and . . . ranger companies to make the raids and
> reconnaissance patrols . . . "[13]

Curiously, by the time that the American Revolution broke out fifteen years after

the fall of Montreal, the British military had reverted completely to its old, conventional

ways. The embryonic American Continental Army seemed to be following suit – and a

stalemate ensued by 1780, one that was only broken when Nathanael Greene embraced

and integrated irregular operations into his campaign plan in the South. There, guerrilla

fighters like Marion, Pickens and Sumter gave the British fits, eventually exhausting Lord

Cornwallis's forces and impelling him to fall back on Yorktown – where he was trapped,

effectively ending the war. But it was only by this rekindling of a capacity for irregular

warfare that the Revolutionaries came through victoriously.[14]

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[13] Fred Anderson, *Crucible of War: The Seven Years' War and the Fate of Empire in British North America* (New York: Vintage Books, 2000), pp. 410-11.

[14] This argument was nicely articulated by the great historian, Forrest C. Pogue, in *The Revolutionary Transformation of the Art of War* (Washington, DC: The American Enterprise Institute, 1974).

So it seems that an aptitude for irregular warfare and an openness of mind toward innovation are in our "strategic DNA." These traits came to the fore in the colonial conflict that first made it possible for the American national experiment to begin unfolding, and then in the revolution that gave our country life. Sometimes these traits have been submerged beneath a veneer of conventional thought, as happened in Vietnam when the strategic emphasis shifted away from irregular warfare and toward "big units." Yet our aptitude for the unconventional and knack for innovation have remained – lying dormant for a while, perhaps, but reawakened once again by the demands of the age of terror. Now these traits will prove essential once again – as they were at the dawn of the Republic – in an era fraught with new perils, a time that will test us as severely as at any point over the past 250 years.

We have mastered the gravest past challenges. Whether we prevail yet again depends – on this occasion far more than any others – on our ability to reach back to the suppleness of our own strategic roots, and to embrace the bold organizational and doctrinal changes that are so desperately needed now. I pray that we find it in ourselves to do so.