



Members of the Peshmerga's Zeravani Force advance toward the front in a convoy 14 August 2016 near the Mosul Dam in Iraq. (Photo courtesy of Ministry of Peshmerga Affairs)

# Tactics, Techniques, and Procedures of the Islamic State Lessons for U.S. Forces

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**T**rucks packed with explosives and guided by sacrificial drivers, fields of simple improvised explosive devices (IEDs), and chlorine gas: these tactics, techniques, and procedures (TTP) are familiar to

those who have studied or participated in the American counterinsurgency campaigns in Iraq and Afghanistan (collectively, the “9/11 Wars”). Now, however, they are being adapted and practiced on a massive scale along the

seven-hundred-kilometer-long front line between the Kurdish Peshmerga and the Islamic State (IS).

The advancement of TTP used by IS indicates that it is a learning organization that has studied and incorporated lessons from the experience of other insurgents who have fought against the United States. Like any military, IS members are eager to learn from the experiences of others. In response, learning about IS's TTP is essential for U.S. forces if we are going to win the current fight, as others writing for *Military Review* have exhorted us to do.<sup>1</sup> Just as IS has learned from previous nonstate armed groups, other groups can learn and adapt from its TTP. Consequently, U.S. operators would do well to learn about IS's TTP and adapt accordingly for our next confrontation with nonstate armed groups.

I had the opportunity to visit the Kurdistan Region to conduct research three times in 2015 and 2016, staying a few weeks each time. On each occasion, I was able to speak with senior security officials in the Kurdistan Regional Government to gain the perspective of strategic military leaders on the threats they faced before I traveled to the front. On two of the occasions, I visited one unit west of Kirkuk, commanded by Dr. Kemal Kirkuki, and I was thus able to observe some progress on that front. On my last trip, in the summer of 2016, I stayed with the elite Zeravani commando battalion near the Mosul Dam. The Kurds have a keen sense of hospitality, and they were willing for me stay in their patrol bases, discuss their experiences, and observe them on the front.<sup>2</sup>

This article, based on that field research, aims to begin a more rigorous analysis than what is available from media reports. Previous articles on defeating Islamic jihadism, such as Allen B. West's "The Future of Warfare against Islamic Jihadism: Engaging and Defeating Nonstate, Nonuniformed, Unlawful Enemy Combatants," have focused on strategic imperatives; this article primarily focuses on the tactical level.<sup>3</sup> It investigates the principal TTP in IS's conflict in Northern Iraq and makes several recommendations on countering specific TTP for future U.S. commanders who will fight in the Middle East against IS or any group that will have learned from IS. It concludes that the United States should establish a combined lessons-learned team with the Peshmerga to systematically investigate the TTP of IS, the effectiveness of Kurdish responses to them, and how U.S. forces might best respond in future conflicts.

## Learning among Militaries

The literature on learning among militaries indicates they tend to learn more during wartime, and that learning is quicker in response to strategic exigencies rather than in response to organizational factors.<sup>4</sup> Being a group at war, with many strategic pressures, IS fits the bill of an organization likely to be highly adaptable. The forerunner of IS, al-Qaida in Iraq (AQI), was nearly extinguished after the Sunni Awakening and the U.S. surge in 2006, which subjected remaining al-Qaida members to high pressure to innovate or be eliminated. The lessons it learned from al-Qaida, combined with the free availability of information about the TTP of other insurgents on the Internet, meant that IS possessed the means and the motivation to adopt new TTP.

Militaries can generate new ideas within themselves, or they can borrow ideas from other organizations. As an example of the latter, Frank Hoffman has written about the learning process for U.S. submarine action in the Pacific, where U.S. "wolf pack" tactics were copied from their use by the Germans in the Atlantic and implemented through an initially top-down process in the U.S. Navy.<sup>5</sup> While many members of IS were members of AQI, they adopted TTP from other insurgent groups, in a manner similar to how U.S. submariners in the Pacific learned from the experiences of the German U-boats.

Many aspects of IS are opaque to outsiders. Generally, IS seems to have a decentralized command structure where tactical learning is left to the discretion of local emirs who draw on the lessons of their past experiences and from their peers, rather than a top-down doctrinal learning format. Previous work on IS's TTP attempted to see them as adaptations of the tactics of the Baathist regime of Iraq under Saddam Hussein because many IS members were formerly officials in that regime. This analysis was unsatisfactory because, though IS does seem to have a penchant for

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firepower similar to the old Iraqi army, there are many differences in terms of intelligence collection, force ratios, and guerrilla tactics.<sup>6</sup>

As a result, IS's TTP should be viewed as an eclectic mix of learned TTP that mostly draw from those used by insurgents during the 9/11 Wars, rather than as an evolution of Baathist military TTP. This conclusion is logical, given the high numbers of IS fighters who participated in the campaigns against the United States in Iraq and Afghanistan, and the similarity of IS's TTP to those employed by other anti-American insurgents.

## **Improvised Explosive Devices: Quantity Has a Quality if Its Own**

The rise of IED use in the insurgencies in Iraq and Afghanistan is well known. From primitive beginnings using widely available military-grade explosives, IED usage evolved over the course of the 9/11 Wars to include a variety of sophisticated triggering mechanisms and employment strategies. The result was that IED attacks caused roughly half of the total U.S. casualties during these wars.<sup>7</sup> The evolution of IED tactics over the course of the war was an excellent example of the interactive nature of Carl von Clausewitz's conception of war (*Zweikampf*, or a duel).<sup>8</sup> When insurgents employed cell phones and radios to remotely detonate IEDs, the coalition developed sophisticated methods of electronic jamming. When the coalition employed mine rollers to detonate pressure-plate IEDs in front of the vehicles, insurgents began to offset the charge from the triggering device (or to delay detonation) to ensure that the detonation would still damage vehicles. For all of the asymmetry in resources between America and the insurgents, the simple fact is that while we could mitigate the IED threat, it remained the most effective single technique that insurgents could employ.<sup>9</sup> The effectiveness of IEDs against U.S. forces meant that they were a highly visible technique for IS to borrow.

Today in Iraq, IS tends to employ large numbers of small, unsophisticated, victim-initiated IEDs made with homemade explosives in order to limit the mobility of the Peshmerga forces and to raise the strategic costs of offensive action. Devices tend to have a small amount of explosives in the main charge, sufficient only to wound or kill a single combatant on foot. IS's IEDs tend not to be daisy-chained together; there is only one main charge for each triggering mechanism. The low-charge, victim-initiated devices are also employed in choke points such as

doors and in conjunction with items that the Peshmerga will be tempted to tamper with, reminiscent of the booby traps used by the Viet Cong during the Vietnam War.<sup>10</sup> Over the course of the war, the Kurdish Peshmerga engineering team has defused over eleven thousand IEDs.<sup>11</sup> It should be borne in mind that this is a specialized unit, and the number does not account for all of the IEDs recovered by the maneuver units of the Peshmerga. Some of these IEDs are arranged in dense fields organized along expected axes of advance for any Peshmerga offensive; over twenty tons of IEDs were recovered during a recent offensive in the village of Bashir in southern Kirkuk.<sup>12</sup>

To avoid these IED fields, the Peshmerga try to launch attacks on IS strong points from unexpected locations that are less likely to be mined. The wide-open terrain and long length of the front line mean that it is impossible for both sides to constantly surveil the entire front. While this causes problems for the Peshmerga when IS launches infiltration attacks, it also seems to allow the Peshmerga to advance on IS's fortified towns from unexpected directions. This is an important lesson for the future for tactical decision makers; attacking from an unexpected and unobserved direction is even more important in an IED dense environment.

Conventional militaries emphasize the need for observation of minefields, coordinating the use of direct and indirect fires onto a minefield to prevent the enemy from demining the area. In contrast, IS tends to have a "throw it out and see if it sticks" approach to the employment of IEDs. Some IED fields are positioned so they will impede the Peshmerga and fix them inside a kill zone, but many more are employed where IS could not reasonably expect to observe them. This lack of tactical sophistication means that for the volume of effort IS fighters put into their IEDs, they accrue relatively little tactical advantage. Nevertheless, this strategy is logical given that conflict is between two more or less conventional forces that both hold territory. In this context, it makes little sense to tie up personnel watching and eventually triggering complex command-detonated IEDs. In the case of a conventional attack by the Peshmerga, IS needs all available personnel employing small-arms and crew-served weapons to fight. Tying up manpower by observing command-detonated IEDs is simply not feasible for IS.

By contrast, insurgents fighting the United States during the 9/11 Wars could afford to spend their manpower watching large, command-detonated IEDs, waiting



for an American to get close, because they did not have to spend manpower holding ground in a conventional fight at the same time. More complicated main charges, such as explosively formed projectiles, are similarly unnecessary given how uncommon armored vehicles are in the Peshmerga. Complicated anti-explosive-ordnance-disposal (anti-EOD) techniques, such as rigging IEDs to trigger when tampered with, were also not reported. These TTP might be used by IS, particularly in other areas of operation where IS functions more as an insurgency and a terrorist group than as a conventional military, but they were not prevalent in any of the areas I visited.

IS employs IEDs to reduce the tempo of the Peshmerga's operations by forcing the Peshmerga to sweep for IEDs and by inflicting casualties that increase the strategic costs of operations. At the beginning of the war, the Peshmerga possessed almost no capability to deal with IEDs on this scale. Today, there are specialized engineering detachments; knowledge of IEDs and the TTP required to defeat them have spread via word of mouth and formal training, held by either the Peshmerga itself or by coalition partners. Some units that I visited, however, still did not even have metal detectors, despite the units having led offensive operations

Peshmerga forces assemble prior to an assault 14 August 2016 near Kirkuk, Iraq. (Photo courtesy of Ministry of Peshmerga Affairs)

against IS. Even with proper equipment against simple IEDs, no IED detection and removal effort will have a 100 percent success rate. Thus, the IEDs have two chances to inflict damage—first, on the maneuver unit, and second, on the EOD unit clearing IEDs.

Rather than increasing the probability of success or the number of casualties per device, IS bets on simply increasing the number of devices in the hope that some will be undetected and triggered, and that of those that are detected, some will still inflict casualties. Even if there is only a 0.1 percent chance that an EOD unit will trigger a simple device when defusing it, eventually a Peshmerga EOD unit will be unlucky and hit that 0.1 percent, thereby reducing a highly skilled and much needed asset. While this strategy does not have decisive tactical effects, it does slow down operations and inflict casualties.

These TTP have many similarities to Taliban TTP in Helmand Province, Afghanistan. In Sangin, Afghanistan, the Taliban invested significant resources into putting out a high volume of relatively unsophisticated antipersonnel





IEDs. This tactic was successful in limiting the operational mobility of British forces, who were effectively hemmed in to the district center by IEDs. When marines took over in 2010, operational mobility was restored only at the cost of significant casualties.<sup>13</sup>

Similar to the current use of IEDs by IS, operations that would have enhanced friendly control of the area were impeded by the knowledge that any effort would have to navigate a mine field. Strategically, it is hard to say what the specific impact of the marine casualties in Helmand was, but it is generally agreed that democracies are less likely to continue wars in the face of casualties.<sup>14</sup> Again, it is unclear exactly how IS came to adopt the tactics of mass IEDs; however, given the links of IS to Afghanistan and the similarity to TTP employed there, it is reasonable to assume that IS did not reinvent this tactic but rather adopted it from the Taliban's experience.<sup>15</sup> It is similarly reasonable to assume that future enemies will have learned from IS experiences. U.S. forces in the

future must be trained and prepared to deal with IEDs in all forms, and in particular with the way that IS employs them; developing a joint doctrine on countering IEDs will be essential, as has been argued elsewhere.<sup>16</sup>

## **Suicide Vehicle-Borne Improvised Explosive Devices**

Up-armored with rusted metal plates and grills, the trucks that IS launches against the Peshmerga look like they belong more to a *Mad Max* movie than to the supposed technologically dominated battlefield of the twenty-first century. Yet, up-armored, "suicide vehicle-borne IEDs" (car or truck bombs whose drivers expect to die in the explosion, known as SVBIEDs) play an important role as IS's analog to the precision-guided cruise missile; they provide IS with the ability to (somewhat) accurately target enemy positions with high explosives, using an expendable human as their targeting hardware instead of sophisticated silicon chips. Any heavy vehicle can be





used as a base on which to build. Some SVBIEDs are based on high-mobility multipurpose wheeled vehicles or mine-resistant ambush-protected vehicles that were captured from the Iraqi Army; others are based on civilian vehicles ranging from pickup trucks to dump trucks. Almost all SVBIEDs are equipped with improvised armor to improve their survivability until they reach their target. This armor is mainly sheets of metal attached to the vehicle to protect it from small-arms and medium machine-gun fire, while grills are hung at a distance from the body of the vehicle in order to prematurely detonate rocket-propelled grenades. Most SVBIEDs also have a narrower field of view than normal for the driver, which is a trade-off that attempts to mitigate this weak point in the armor shielding. Additionally, the windshield is normally replaced by bullet-resistant glass to further protect the driver.

The size and maneuverability of IS's SVBIEDs have varied as the Peshmerga TTP have evolved. The

Kurdish Peshmerga forces observe Islamic State positions 29 May 2016 near Kirkuk, Iraq. (Photo courtesy of Ministry of Peshmerga Affairs)

Peshmerga in the Mosul Dam area reported that SVBIEDs gradually grew in size, culminating in a few attacks by dump trucks that had been up-armored and packed with homemade explosives. However, the vehicles were so cumbersome and slow that a simple response was suggested: get out of the way! These monstrous SVBIEDs had gone so far to the extreme of survivability and lethality that they had sacrificed almost all of their maneuverability. The Peshmerga could simply relocate to areas that were inaccessible to wheeled SVBIEDs. Moreover, when SVBIEDs got caught on an obstacle or terrain feature, they would detonate themselves, usually far enough from any Peshmerga forces to prevent any harm to them.

Additionally, the French-made MILAN antitank missile began to appear in the Peshmerga's arsenal, courtesy

of the German armed forces. MILAN missiles are now prized commodities among the Peshmerga as they can defeat any of IS's improvised armor. However, there are currently only sixty launchers for almost seven hundred kilometers of front line. Even with very strategic placement along IS's likely axes of advance, there are simply not enough MILANs to adequately protect the Peshmerga.<sup>17</sup>

The next iteration of the Clausewitzian *Zweikampf* has been for IS to deploy several up-armored pickup trucks in place of one massive SVBIED. This generates more targets than the overstretched MILAN gunners can handle, with a maneuverability that means the Peshmerga cannot avoid them.

IS's ability to integrate SVBIEDs with conventional attacks has been very inconsistent. IS units frequently launch SVBIEDs without any sort of follow-on action, even in sectors where they had previously displayed enough tactical sophistication to link direct-fire attacks with SVBIEDs. In its capture of Ramadi, for example, IS integrated the use of bulldozers to remove obstacles, SVBIEDs to destroy Iraqi troop barracks, and small-arms fire to overwhelm the defenders.<sup>18</sup> In some instances, IS has similarly integrated a maneuver element with SVBIED attacks against the Peshmerga in order to generate truly horrible damage.

I passed through one mostly destroyed village where IS had used an eight- to nine-ton truck against the Peshmerga positions after the Peshmerga had concentrated to repel a conventional small-arms attack by IS. In this case, the explosives were highly effective. This level of sophistication, however, seems to be the exception rather than the rule. Even in the same area of the Mosul Dam as the well-coordinated attack cited above, there has only been one other time when SVBIED and conventional attacks were similarly coordinated. The evidence suggests that IS lacks the midlevel military commanders capable of consistently coordinating effects.

IS's TTP are therefore reliant on methods that do not expose their knowledgeable cadre to danger.

We should expect our future enemies to have learned from the TTP that IS currently employs. During the 9/11 Wars, U.S. troops adapted to this threat by hardening bases with Hesco barriers, employing serpentine obsta-

cles at the entrances, and training service members to identify and neutralize potential SVBIEDs before they could get close enough to patrols to do damage. Al-Qaida then attempted to use dump trucks full of explosives against marines to counter coalition security measures, prefiguring later IS tactics.<sup>19</sup>

IS's experience in using up-armored SVBIEDs to resist small arms will need to be considered. I predict that, at some point in

the next decade, U.S. service members will be killed by an up-armored SVBIED that cannot be stopped with small arms. Much has been made of the fact that the guards of the Marine Corps barracks who were attacked 23 October 1983 in Beirut, Lebanon, did not have ammunition in their weapons to stop the SVBIED.<sup>20</sup> However, small arms would have been irrelevant in the case of a heavily up-armored vehicle. Only the possession of antitank weapons at the lowest level can prevent U.S. service members from becoming the victims of up-armored SVBIEDs. An obvious solution would be to provide U.S. ground forces with light antitank weapons organic to the squad and at all vehicle checkpoints.

## Chemical Attacks

Seeming to revel in the barbarity of their tactics, IS forces regularly employ chemical weapons against the Peshmerga and occasionally against civilians. Mustard and chlorine gases are delivered against targets via mortars or rockets. While some of these munitions might be military grade, captured from either Iraqi or Syrian stockpiles, many of them are improvised. In the



The Islamic State uses trucks such as the one shown above, captured near Kirkuk, Iraq, in 2015, as vehicle-borne improvised explosive devices driven by suicide bombers. The vehicles are fitted with improvised armor to protect the trucks and their drivers until detonation. Note the grills intended to defeat rocket-propelled grenades. (Photo courtesy of Ministry of Peshmerga Affairs)



Mosul Dam area, chemical attacks were initially very disturbing to the Peshmerga, whether they were mustard or chlorine (differentiated by the fighters there as “yellow” or “white” smoke). Mustard gas, in particular, is a powerful vesicant, and it has caused several Peshmerga to lose their vision for days.

However disturbing those initial attacks were, the chemical attacks of IS are not particularly effective against the Peshmerga who have been trained and who are properly equipped. Most of the Peshmerga are now equipped with gas masks that they carry everywhere. Even without masks, the Peshmerga quickly figured out that moving to higher ground and breathing through a wet cloth were effective countermeasures.

Furthermore, IS’s chemical attacks were not well coordinated with maneuver elements, meaning that they rarely had a significant tactical impact. According to a senior official at the Ministry of Peshmerga Affairs, the ministry knew of no cases where a chemical attack had killed a Peshmerga, although many hundreds had been wounded and had to be removed from the front lines.<sup>21</sup> This is entirely consistent with the literature on chemical weapon use in World War I: non-nerve-agent gas attacks can cause many casualties to the unprepared but rarely cause fatalities to prepared soldiers.<sup>22</sup> The number of chemical attacks seems to have tapered off in recent months. Yet, while the Peshmerga attributed this to IS stockpiling chemical weapons for the defense of Mosul, the decrease could be ascribed to the disruption of IS’s chemical weapons cell, including the capture of the cell’s leader, Sleiman Daoud al-Afari, in Tel Afar, Iraq, in February 2016.<sup>23</sup>

IS’s chemical weapons have had operational impacts out of proportion with their tactical effects. When IS launched chemical weapons from the occupied town of Bashir at civilian targets in the Iraqi-government-controlled village of Taza, residents marched and demanded that the government attack the launch sites to prevent further attacks.<sup>24</sup> In response, the government-sponsored Hashd al-Shaabi militia launched several disastrous attacks, being beaten back by IS and incurring many casualties and several prisoners.<sup>25</sup>

The employment of chemical weapons by IS builds on AQI’s TTP; AQI used chlorine gas tanks in Iraq to attack coalition forces and Iraqi civilians. From 2006 to 2007, fifteen attacks caused many Iraqi civilian casualties, although many of the fatalities were likely due to the paired

explosives rather than the gas itself.<sup>26</sup> IS’s use of mortars and rockets as a delivery system indicates an evolutionary advance on AQI’s TTP although IS’s chemicals seem to be similarly unable to produce fatalities on prepared soldiers.

U.S. planners of future operations should plan to encounter chemical attacks, and they should know the attacks will have a strategic impact on public opinion, even if their tactical impact is minimal. Basic chemical, biological, radiological, and nuclear training for our service members would adequately prepare them for the improvised, unsophisticated attacks that our opponents might learn from IS. Local allies and civilian populations we might be protecting will likely react strongly to even these rudimentary chemical attacks. Local allied forces should be given some modicum of training in preparation, and they should prepare an information operations campaign to inform civilian populations about defensive measures and to assuage fears. Otherwise, it is possible that the use of chemical weapons will create a tension within the local community that manifests itself in distrust of local allies and U.S. forces.

## **Suicide Vests and Counterintelligence, Surveillance, and Reconnaissance**

IS equips many of its fighters with suicide vests, an innovation that might be troublesome to an unprepared U.S. force. In the past, vests of explosives were made for jihadists whose sole mission was a “martyrdom operation”; they were conceived of as separate from the insurgents who would use small arms against U.S. forces and allies. Now, these two categories have merged. While employment seems to vary from area to area based on the judgment of the local IS emir, in most areas, from 40 to 60 percent of fighters will wear suicide vests.<sup>27</sup> This practice is not limited only to the foreign fighters but also is common among the local Sunni Arabs (comprising the majority of IS fighters). IS fighters will also frequently take off their vests, delay their discharge, and throw them as improvised grenades. Americans who are unfamiliar with this tactic of widespread suicide-vest use may suffer casualties, particularly if they adhere to normal techniques of “dead-checking” enemy combatants.<sup>28</sup>

IS uses a variety of TTP to counter coalition intelligence, surveillance, and reconnaissance. Some techniques, such as coating technicals (improvised fighting vehicles) with aluminum foil or mud to try to defeat heat imaging from the air, are likely to be ineffective. Others,



such as the widespread use of tunnel systems, might be effective. Other authors have already pointed to the similarity in TTP between IS and the Palestinian group Hamas in this respect; U.S. military planners would do well to consider countermeasures for these TTP in advance.<sup>29</sup> Finally, IS will employ suicide soldiers who wait in elaborate “hides” until a high-value target gets close; the Kurds lost a brigadier general to this tactic during the recent liberation of villages in the Khazir region.<sup>30</sup>

## Conclusion

IS is a protean organization, taking different forms in different areas in order to move toward its apocalyptic vision. Using Robert Shultz’s classification of terrorists, insurgents, and militias, it is clear that IS possesses the characteristics of all three.<sup>31</sup> Even just considering its conventional battle tactics against the Peshmerga, IS has exhibited a varied repertoire of TTP that have been seen before in different conflict zones, and which we will undoubtedly see again in the same and other theaters. It would be foolish to not aggregate accounts of these tactics and weigh future responses to them.

To accomplish this, the United States should commission a combined lessons-learned team with the Peshmerga. For a small cost, a combined U.S. and Kurdish team could visit several sections of the front line and interview key leaders to gain a holistic understanding of the enemy’s TTP and the responses that have been the most effective against them. Such an effort would benefit both the United States and its allies.

For the doctrine-poor Peshmerga, these results could have an immediate impact if they were distilled into an easily understood pamphlet and then widely distributed. While there are some professional Peshmerga units and a growing level of training thanks to the coalition against IS, many Kurdish best practices are still spread by word of mouth rather than by a formal system of doctrinal promulgation. A combined lessons-learned team could therefore have an immediate impact on the fight against IS by helping the Peshmerga to adapt to IS’s TTP and by giving Peshmerga forces a leg up in their current tactical Zweikampf.

For the U.S. defense establishment, a lessons-learned team would expose us to TTP that we possibly will encounter in the future, allowing us to learn relatively painlessly. Whether we believe that the current operating environment is uniquely complex, or that complexity has always been a hallmark of warfare, we need to lean forward in the process of military adaptation or else risk serious setbacks.<sup>32</sup> The Beirut barracks bombing was a painful lesson in the need to harden our outposts abroad against SVBIEDs. Now, those lessons have been partially eclipsed by IS’s evolution of SVBIEDs to have armor against small-arms attacks. Rather than waiting for these TTP, or any other of IS’s TTP, to cause U.S. losses, we should advance our learning process. With up-armored SVBIEDs, chemical weapons, and widespread suicide vests, the TTP of IS will be on the battlefields of tomorrow, and we would ignore them at our peril. ■

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## Notes

1. Michael T. Flynn, “How about Winning Our Nation’s Wars Instead of Just Participating in Them?” *Military Review* 96, no. 2 (March–April 2016): 8–15, accessed 13 December 2016, [http://usacac.army.mil/CAC2/MilitaryReview/Archives/English/MilitaryReview\\_20160430\\_art006.pdf](http://usacac.army.mil/CAC2/MilitaryReview/Archives/English/MilitaryReview_20160430_art006.pdf).

2. I would like to thank Dr. Richard Shultz for funding my initial trip and providing me indispensable mentorship and guidance in executing this project. I would also like to thank Dr. Roger Petersen for assisting with my latest trip. Of course, my research would not have been possible without my many friends in Kurdistan, who are too numerous to mention.

3. Allen B. West, “The Future of Warfare against Islamic Jihadism: Engaging and Defeating Nonstate, Nonuniformed, Unlawful Enemy Combatants,” *Military Review* 96, no. 1 (January–February 2016): 39–44, accessed 13 December 2016, [http://usacac.army.mil/CAC2/MilitaryReview/Archives/English/MilitaryReview\\_20160228\\_art010.pdf](http://usacac.army.mil/CAC2/MilitaryReview/Archives/English/MilitaryReview_20160228_art010.pdf).

4. Stephen Peter Rosen, *Winning the Next War: Innovation and the Modern Military* (Ithaca, NY: Cornell University Press, 1991); Barry Posen,

*The Sources of Military Doctrine: France, Britain, and Germany Between the World Wars* (Ithaca, NY: Cornell University Press, 1984).

5. F. G. Hoffman, “The American Wolf Packs: A Case Study in Wartime Adaptation,” *Joint Force Quarterly*, no. 80 (First Quarter, January 2016): 131, accessed 1 December 2016, <http://ndupress.ndu.edu/Portals/68/Documents/jfq/jfq-80/jfq-80.pdf>.

6. Barak Barfi, “The Military Doctrine of the Islamic State and the Limits of Ba’athist Influence,” *CTC Sentinel* 9, no. 2 (February 2016): 18, accessed 1 December 2016, <https://www.ctc.usma.edu/v2/wp-content/uploads/2016/02/CTC-SENTINEL-Vol9Iss27.pdf>.

7. Based on the author’s analysis of “iCasualties: Operation Iraqi Freedom and Operation Enduring Freedom Casualties,” iCasualties website, accessed 7 July 2016, <http://icasualties.org/>. More precise estimates are outdated; see, for example, Clay Wilson, *Improvised Explosive Devices (IEDs) in Iraq and Afghanistan: Effects and Countermeasures* (CRS Report No. RS22330) (Washington, DC: Congressional Research Service, 2006).

8. Carl von Clausewitz, *On War*, eds. and trans. Michael Eliot Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1989), 75.

9. For a harsher critique of the Joint Improvised-Threat Defeat Organization's track record, see Peter Carey and Nancy Youssef, "JIEDDO: The Manhattan Project That Bombed," *The Center for Public Integrity*, 27 March 2011, accessed 1 December 2016, <https://www.publicintegrity.org/2011/03/27/3799/jieddo-manhattan-project-bombed>.

10. For a video of an Islamic State (IS) booby-trapped door, see Vlogger, "Peshmerga Defuse ISIS IED Found in a House," *Military.com* video, accessed 7 July 2016, <http://www.military.com/video/operations-and-strategy/terrorism/peshmerga-defuse-isis-ied-found-in-a-house/4052459496001>. For IEDs and booby traps during Vietnam, see BACM Research, *Vietnam War: After Action Reports* (Los Angeles: Paperless Archives, 2009), CD-ROM.

11. "Peshmerga Defuse over 11,000 IEDs," *Kurdistan24* website, 10 March 2016, accessed 1 December 2016, <http://www.kurdistan24.net/en/news/589ac399-db3c-47aa-bd0d-3d774da274c6/Peshmerga-defuse-over-11-000-IEDs>.

12. "Over 20 Tons of IEDs Defused by Peshmerga in Southern Kirkuk," *NRT News* website, accessed 1 December 2016, <http://www.nrtv.com/EN/Details.aspx?Jimare=4742>.

13. The intense fight that was faced by 3rd Battalion, 5th Marine Regiment, is well chronicled. For example, see "Afghanistan—Battle for Bomb Valley 1 of 3," YouTube video from a BBC Panorama Investigative Documentary, 2 December 2011, posted by Travel Places & Culture, accessed 8 July 2016, <https://www.youtube.com/watch?v=XCdP4K78NAA>. The author deployed with 1st Battalion, 5th Marine Regiment, to Sangin, Afghanistan, in 2012.

14. The assertion that a democratic nation-state would be less likely to continue a war in the face of casualties is based on a theory first expounded by Immanuel Kant, which seems to be empirically supported now. See Kant, *To Perpetual Peace: A Philosophical Sketch*, trans. Lewis White Beck, (New York: Macmillan, 1957); and Joseph Paul Vasquez III, "Shouldering the Soldiering: Democracy, Conscription, and Military Casualties," *The Journal of Conflict Resolution* 49, no. 6 (December 2005): 849–73.

15. While not many foreign fighters in Iraq come from Afghanistan, there is a strong branch of IS in Afghanistan. See Associated Press, "ISIS Actively Recruiting in Afghanistan, Says US General," *The Guardian* website, 23 May 2015, accessed 1 December 2016, <https://www.theguardian.com/world/2015/may/23/isis-actively-recruiting-afghanistan-us-general>.

16. Marc Tranchemontagne, "The Enduring IED Problem: Why We Need Doctrine," *Joint Force Quarterly* 80 (First Quarter, January 2016): 153–60, accessed 1 December 2016, <http://ndupress.ndu.edu/Portals/68/Documents/jfq/jfq-80/jfq-80.pdf>.

17. The United States has thus far declined to provide the Peshmerga with tube-launched, optically tracked, wire-guided missiles that would be comparable to French MILAN antitank missiles.

18. Margaret Coker, "How Islamic State's Win in Ramadi Reveals New Weapons, Tactical Sophistication and Prowess," *Wall Street Journal* website, 25 May 2015, accessed 1 December 2016, <http://www.wsj.com/articles/islamic-states-gains-reveal-new-prowess-on-battlefield-1432592298> (subscription required).

19. Robert Shultz, *The Marines Take Anbar: The Four Year Fight Against Al Qaida* (Annapolis, MD: Naval Institute Press, 2013).

20. "Report of the DOD Commission on Beirut International Airport Terrorist Act, October 23, 1983," transcribed by Patrick Clancey, HyperWar Foundation website, 20 December 1983, accessed 3 January 2017, <http://www.ibiblio.org/hyperwar/AMH/XX/MidEast/Lebanon-1982-1984/DOD-Report/>.

21. Name withheld, brigadier general in the Ministry of Peshmerga Affairs, in discussion with author, 2 July 2016.

22. Charles E. Heller, "Chemical Warfare in World War I: The American Experience, 1917–1918," *Leavenworth Papers* No. 10 (Fort Leavenworth, KS: Combat Studies Institute, September 1984), accessed 1 December 2016, [http://usacac.army.mil/cac2/cgsc/carl/download/csipubs/LP10\\_ChemicalWarfareInWWI-TheAmericanExperience\\_1917.pdf](http://usacac.army.mil/cac2/cgsc/carl/download/csipubs/LP10_ChemicalWarfareInWWI-TheAmericanExperience_1917.pdf).

23. Helene Cooper and Eric Schmitt, "ISIS Detainee's Information Led to 2 U.S. Airstrikes, Officials Say," *The New York Times* website, 9 March 2016, accessed 1 December 2016, <http://www.nytimes.com/2016/03/10/world/middleeast/isis-detainee-mustard-gas.html>.

24. "Hundreds Block Key Highway in Iraq, Demand Air-strikes in Response to ISIS Chemical Attack," *RT International* website, 10 March 2016, accessed 8 July 2016, <https://www.rt.com/news/335159-iraqi-protest-isis-chemical/>.

25. "Hashd Al-Shaabi Unable to Retake Bashir Village," *Kurdistan24* website, 10 April 2016, accessed July 8, 2016, <http://www.kurdistan24.net/en/news/35754323-fd33-4542-a7a4-8b6161707914/Hashd-al-Shaabi-unable-to-retake-Bashir-village>.

26. William Robert Johnston, "Chemical Weapon Terrorism in Iraq and Afghanistan," Johnston's Archive, last modified 5 April 2015, accessed 1 December 2016, <http://www.johnstonsarchive.net/terrorism/wmdterror-1.html>; Alissa J. Rubin, "Chlorine Gas Attack by Truck Bomber Kills Up to 30 in Iraq," *The New York Times*, April 7, 2007, <http://www.nytimes.com/2007/04/07/world/middleeast/07iraq.html>.

27. Name withheld, major in the Zeravani forces, in discussion with author, 29 June 2016.

28. "Dead-checking" is the process of verifying that enemy combatants who appear to be dead are actually dead and not simply wounded or, more sinisterly, pretending to be dead in order to attack unsuspecting U.S. soldiers later. As it involves U.S. soldiers getting very close to enemy soldiers, there is a great risk from suicide vests.

29. Benjamin Runkle, "Preparing for Warfare's Subterranean Future," *War on the Rocks* (blog), 16 April 2015, accessed 1 December 2016, <http://warontherocks.com/2015/04/preparing-for-warfares-subterranean-future/>.

30. Ayub Nuri, "Despite ISIS Hazards, Peshmerga Offensive Liberates Shabak, Kakei Villages," *Rudaw* website, 29 May 2016, accessed 1 December 2016, <http://rudaw.net/english/kurdistan/290520162?keyword=brigadier>.

31. Richard H. Shultz Jr. and Andrea J. Dew, *Insurgents, Terrorists, and Militias: The Warriors of Contemporary Combat* (New York: Columbia University Press, 2006).

32. Patrick M. Hughes, "On Convergence, Emergence, and Complexity," *Military Review* 96, no. 2 (March–April 2016): 42–46, accessed 2 February 2017, [http://usacac.army.mil/CAC2/MilitaryReview/Archives/English/MilitaryReview\\_20160430\\_art010.pdf](http://usacac.army.mil/CAC2/MilitaryReview/Archives/English/MilitaryReview_20160430_art010.pdf); Clay Mountcastle, "The Myth of the New Complexity," *Military Review* 96, no. 2 (March–April 2016): 47–53, accessed 2 February 2017, [http://usacac.army.mil/CAC2/MilitaryReview/Archives/English/MilitaryReview\\_20160430\\_art011.pdf](http://usacac.army.mil/CAC2/MilitaryReview/Archives/English/MilitaryReview_20160430_art011.pdf).