Forensic Science & the War on Terror

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As the war on terror has raged on for nearly two decades, both policymakers and military leaders have sought to maintain the upper hand by any means necessary. Studies have been done to ensure our weaponry and fighting tactics have evolved in response to our changing enemy, and properly protective vehicular armor and evasive Humvee maneuvering have been developed to contend with improvised explosive devices (IEDs). However, advances are also being made in how we approach wartime physical evidence analysis, data collection, and culprit attribution. We have begun deploying forensic science techniques both on the battlefield and at home as we take on the threat of terrorism. This methodology is well known in local and state crime scene investigation (CSI) circles, but has only recently started to be applied to battlegrounds. Thus far, the impact has been palpable. Research has shown that active duty soldiers can be suitably trained on using CSI techniques to trace IED remnants back to their makers, and military intelligence analysts have successfully profiled terrorist masterminds based on proven forensic psychological studies. Looking forward, forensic science is now being sought as a preventative measure to thwart chemical, biological, radiological, or nuclear (CBRN) attacks. This review will shed light on the evolution of forensic science and its future warzone applications.

**Roots of Forensic Science & Relevance on the Battlefield**

Forensic science is hardly a new process. In fact, its foundational roots reach back to the late 19th century when Sir Francis Galton and Edward Henry pioneered the classification of uniquely identifiable arches, whorls, and loops in fingerprint ridges – a practice just as relevant in today’s war on terror as it has been in solving traditional crimes for over a century (Collins, 2009). The reason for this can be explained by Locard’s Exchange Principle, a central tenet followed by crime fighters, detectives, and forensic scientists the world over since its inception in 1910 by Edmond Locard. At the crux of the code is the theory that, without fail, any suspects or perpetrators at a crime scene will do two useful things that can be exploited: they will leave something of themselves behind at the scene and will take something from the scene along with them (Collins, 2009). More simply stated, every contact leaves a trace. This maxim has proven true even in the warzones of our conflict against radical Islamic terrorism in Iraq, Afghanistan, and the United States, leading to a new application of the scientific field called “battlefield forensics” (Jones, 2013).

Before delving into those particular applications, the question of why do we need to use scientific methods on the battlefield which are traditionally reserved for crime scenes should be answered. After all, war is brutally simple and simply brutal, is it not? The orthodox theater of war has clearly bifurcated factions pitted against one another and from there it becomes “good guys” versus “bad guys.” Soldiers on either side know who is friend and who is foe and the stakes are all or nothing in a game of kill or be killed. Given this blueprint, conventional combat zones should have no crimes to solve, no shadowy suspects to unmask, no protracted trials to assign guilt or proclaim innocence. Herein lies the answer to the above question – because this is not a conventional war and these are not conventional enemies. Terrorists don’t wear clearly defined uniforms and they know better than to stand toe-to-toe against our superior armaments. Instead, enemies often secrete IEDs along US military convoy paths before blending seamlessly back into the local population. Undoubtedly, the fog of war has never been denser and the frontlines have never been blurrier.

**Time-Proven Techniques**

In response, many modern warfighters are cross-trained in skills such as “lifting latent fingerprints[,] collecting DNA, […] special photography techniques[,] and proper documentation practices” in addition to their combat drills. This specialized training in evidence collection procedures allows the specially trained soldiers to “switch hats and effectively accomplish site biometrics and forensics exploitation” when they come across a roadside bomb. The military members are taught these forensic skills by civilian specialists such as Marvin Whitsfield. He is a team leader among a group of highly trained instructors for Six3 System’s Battlefield Forensics Mobile Training Course that come from law enforcement and forensic science backgrounds (Jones, 2013). Besides simply collecting pertinent warzone evidence, the armed forces sought the ability to process it as quickly as possible. Thus, the logical next step was developed in “modular, scalable, deployable laboratories for overseas contingencies” wherein the military cadres equipped with these mobile labs could “conduct field confirmatory chemical, biological, and explosive analysis and near-real-time chemical air monitoring” (Smith & Tranchemontagne, 2014).

**Terrorism-specific Forensic Science**

While classic techniques of crime scene forensics are clearly finding use on today’s battlegrounds, but America is always interested in staying as many steps ahead as possible. Therefore, nontraditional attitudes to defeating the enemy are being established that build upon the proven success of the core skills of forensic science. Rather than being geared towards crime scene investigation, these new methods are specific to the warzone and terrorist combatants.

**Weapons technical intelligence.** One such approach is the newly developed and deployed weapons technical intelligence (WTI). WTI takes a holistic approach to countering IEDs by melding the previously discussed forensic collection methods with technical and biometric disciplines, effectively creating “an especially powerful tool against terrorist organizations” (Smith & Tranchemontagne, 2014). For example, samples of exploded IED ordnance that were collected from the warzone in Operation Iraqi Freedom were then sent on to a metallurgist who was able to confirm that the bomb’s components were made of a high-purity copper that can only be fabricated with heavy machine presses not commonly found in Iraq. This led investigators to conclude that the IEDs were being imported from another country. In an insurgent based war such as Operation Iraqi Freedom, this is very telling as it “might indicate external support, arms smuggling, or the presence of foreign fighters” – all factors which can influence the American military’s mindset and decision making process.

**Forensic theology.** While terroristic tendencies are certainly not symptomatic of Islam, sadly the bulk of bombings and violent attacks against the West are perpetrated by radicalized Muslims. This has led to another intelligence technique specifically developed as a product of the war on terror, a strategy called forensic theology. Leaders in the field of forensic theology include Yigal Carmon, a former anti-terrorism adviser to the Israeli Prime Ministry and director of the Middle East Media Research Institute (MEMRI) in Washington, DC. Carmon and others like him scrutinize statements released by terrorist organizations to see how they compare to rhetoric of known Islamic leaders sympathetic to a war on nonbelievers (Grey, 2004). These clerics are known to whip worshippers into violent frenzies with religiously-themed speeches and writings that call for death to infidels. For this reason, western governments have a vested interest in exposing the authors of such vitriol, so as to shut down mosques that may be hotbeds of future terrorism. Far from simply serving as a source of inspiration toward violence, radicalized Islamic clerics often give direct guidance and offer their blessings to jihadists prior to their deadly undertakings. Abu Qatada is a prime example of the dangers of unchecked radical Islamic proselytizing. In his sermons, Qatada was issuing *fatwas*, or religious edicts, that included legitimizing the murder of men, women, and children in the name of furthering the religion of Islam. British and European intelligence agencies began surveilling Qatada once this was uncovered and “as a result several dozen militants, among them some in Qatada's immediate circle, were arrested and a series of planned attacks were thwarted” (Grey, 2004).

**Forensic psychiatry and terrorist profiles.** The importance of forensic theology’s focus on extremist leadership and radicalized imams is underscored by forensic psychiatry, which has been utilized to probe the backgrounds of the actors of terrorism. Startling findings were made by Marc Sageman, a forensic psychiatrist who studied characteristics of persons linked to al-Qaeda and other nefarious organizations (O’Neill, 2004). Through his research of over 380 profiles of people tied to terrorism, Sageman discovered that many of those individuals were overwhelmingly from middle- and upper-class upbringings (54.9% and 17.6% respectively). Moreover, these persons were often well educated, with 28.8% having some college education and 33.3% having a college degree. Perhaps most surprising, Sageman found that 42.5% of the sample base held professional careers (such as doctors, attorneys, professors, etc.), 32.8% held semi-skilled jobs, and only 24.6% were deemed unskilled (O’Neill, 2004). This data clearly dismisses a notion held by many Americans. Radicalized jihadists are not poor and uneducated people who grew up in Middle Eastern countries, disillusioned with their place in the world and “hell-bent on revenge against the rich, secular, decadent west” (O’Neill, 2004). On the contrary, a majority of the terrorists whose profiles were examined by forensic psychiatrists were “well-off, well-educated, middle class, cosmopolitan, professional, married, and sane” (O’Neill, 2004).

**The Future Role of Forensics in War**

With the suspect profile in mind, and with bold and deadly terror attacks committed evermore frequently against civilian noncombatants in European and American cities, forensic scientists are intent on developing measures to protect large metropolitan areas from devastating radiological dispersal devices (RDDs). Radiological terrorism is one deadly arm of the CBRN (chemical, biological, radiological, nuclear) array of weapons that every government official fears. Thankfully, an RDD “dirty bomb” has never been effectively deployed in the United States, but it is not necessarily for a lack of trying by terrorists. Statistics distributed by the Nuclear Regulatory Commission (NRC) show that from 2006 through 2010 “17 [radioactive] sources were lost[,] but all were recovered” (Medalia, 2012). Just one RDD “dirty bomb” successfully loosed in a city-center has the ability to destroy scores of lives, both in the immediate explosion and in the even more lethal radionuclide (radioactive atoms) fallout. The dispersed radionuclides are a carcinogenic that could linger for years, and “a study of the economic impacts of an attack on the ports of Los Angeles and Long Beach using two RDDs placed total US losses at $8.5 billion for exports and $26.0 billion for imports” (Medalia, 2012). Fingerprint, DNA, and photo databases exist that can be accessed by law enforcement officials and forensic scientists working on cracking criminal cases, but in the interest of national security a radiological repository should be implemented. This is the contention of Jonathan Medalia, a Specialist in National Defense at the Congressional Research Service, who wrote a brief for Congressional policymakers based on his research on radiological terrorism. For this reason, a new discipline called radiological forensics is being developed as “libraries of information on sealed radioactive sources” built out by the NRC and the International Atomic Energy Agency are now being reconfigured and modernized to allow them to serve as referenceable repositories (Medalia, 2012). These founts of radiological information would let forensic experts identify radiological material collected from RDD attack sites for reasons of treatment, clean-up, and tracking the source nation of the radionuclides.

**Conclusion**

The intersection of century-old forensic science techniques and the modern day Middle Eastern battlefields has been an important development. This nexus of science and war has shown to be beneficial to our soldiers with boots on the ground, as well as increased homeland security within our borders. Tried and true forensic methods such as physical evidence collection and biometric analysis have served the military well in identifying IED source material and bomb makers. Just as terrorists have evolved in their tactics against our forces, forensic science methods in the war on terror have advanced and taken on a new shape. Innovative procedures such as forensic theology now exist and can help narrow down hateful and inciting rhetoric to certain mosques and initiate surveillance on their radicalized imams and dragnet type arrests of their dangerous followers. In order to be best prepared against the specter of mass casualties and crippling economic disruption from the deployment of RDDs, radiological repositories are being formulated which will aide forensic scientists working in tandem with national security experts in identifying and tracking carcinogenic radionuclides. Our nation and our military will be best served if specialists from these two fields continue to share information, ideas, concepts, and data.

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