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BREAKING OTHER PEOPLE'S TOYS: SABOTAGE IN A MULTIPOLAR WORLD

by

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This thesis explores the value of sabotage as a strategic tool in a multipolar world. More specifically, it examines if sabotage can play a role in imposing costs on competitors, limiting escalation, and shortening the duration of conflict. The return of multipolarity to the international system and the proliferation of advanced military capabilities has raised specters of doubt regarding conventional U.S. military methods of deterrence and coercion as well as the United States technological overmatch. This thesis argues that U.S. competitors' military technologies and capabilities possess a grave vulnerability in that they rely heavily on specific critical infrastructure that is difficult to protect and repair. If these critical pieces of infrastructure are affected, competitors are incapable of effectively fielding or employing their forces. Historical case study analysis is used to identify past sabotage campaigns' impact on strategic operations, validate sabotage's potential in the modern world, and identify best practices for employing saboteurs. Finally, this analysis suggests the revival of sabotage as an option for engaging with bellicose states.

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BREAKING OTHER PEOPLE'S TOYS:
SABOTAGE IN A MULTIPOLAR WORLD

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This thesis explores the value of sabotage as a strategic tool in a multipolar world. More specifically, it examines if sabotage can play a role in imposing costs on competitors, limiting escalation, and shortening the duration of conflict. The return of multipolarity to the international system and the proliferation of advanced military capabilities has raised specters of doubt regarding conventional U.S. military methods of deterrence and coercion as well as the United States technological overmatch. This thesis argues that U.S. competitors' military technologies and capabilities possess a grave vulnerability in that they rely heavily on specific critical infrastructure that is difficult to protect and repair. If these critical pieces of infrastructure are affected, competitors are incapable of effectively fielding or employing their forces. Historical case study analysis is used to identify past sabotage campaigns' impact on strategic operations, validate sabotage's potential in the modern world, and identify best practices for employing saboteurs. Finally, this analysis suggests the revival of sabotage as an option for engaging with bellicose states.

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LIST OF ACRONYMS AND ABBREVIATIONS.

A2/AD	Anti-Access/ Area Denial
CISA	Cybersecurity and Infrastructure Security Agency
CIA	Central Intelligence Agency
DA PAM	Department of the Army Pamphlet
EDES	Greek Democratic National League
FBI	Federal Bureau of Investigation
LOC	Line of Communication
NATO	North Atlantic Treaty Organization
NYPD	New York City Police Department
OSS	Office of Strategic Services
SDS	Students for a Democratic Society
SOE	Special Operations Executive
T3R	Tooth to Tail Ration
TNT	Dynamite
UN	United Nations
USSR	Union of Soviet Socialist Republics
WW1	World War One
WW2	World War Two

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I. INTRODUCTION

The return of multipolarity to the international system, generally referred to as Great Power Competition, has raised specters of doubt regarding traditional U.S. military methods of deterrence and coercion. More to the point, modern industrialized war is disastrous to all states who enter into it.[1] Furthermore, massive investments by myriad countries and non-state actors in cutting-edge military equipment and training, combined with the continued proliferation of these capabilities worldwide, have brought into question the efficacy of conventional U.S. military intervention.[2] In response to this, much of the U.S. defense enterprise and its industries have focused on high-tech solutions, such as artificial intelligence, hypersonic weapons, cloud-based data systems, and robotics in an attempt to thwart this perceived lack of technological overmatch.[3] While there is little doubt that next generation technology will assist in future competition, this thesis takes a different approach. This thesis uses historical case study analysis, to examine the value and potential of low-tech sabotage as a means to impose physical costs on adversaries. The purpose of this thesis is twofold. The first is to identify whether sabotage can serve as a costly signaling method that manages escalation between competitive states. The second is to ascertain whether during times of kinetic interstate competition between near-peer adversaries, if sabotage serves both as an escalation control measure and a viable economy of force operation. This two-fold approach provides historical analysis and recommendations for the future utilization of sabotage across the spectrum of modern competition.

[1] Austin M. Carson, *Secret Wars: Covert Conflict in International Politics* (Princeton: Princeton University Press, 2018), 11.

[2] Andrew Krepinevich, Barry Watts, and Robert Work, *Meeting the Anti-Access and Area-Denial Challenge* (Washington: Center for Strategic and Budgetary Assessment, 2003), i.

[3] Christian Brose, The Kill Chain: Defending America in the Future of High-Tech Warfare (New York: Hachette Books, 2020), 12–17.

A. THE PROBLEM

The counterterror and counterinsurgency campaigns of the last nineteen years have hyper-focused the U.S. military on specific capabilities and practices. This hyper-focus has understandably atrophied U.S. capabilities and strategy against near-peer adversaries. Furthermore, in the decades following the collapse of the Soviet Union comprehensive deterrence and coercion planning has been largely an afterthought.[4] Now though, multiple potential adversaries, namely Russia and China, are dramatically more capable than they were just a decade ago.[5] Adversary investments in modernization, training, and technology have significantly closed the gap between their capabilities and U.S. capabilities. While the U.S. maintains a powerful nuclear triad, it has traditionally relied on its ability to project conventional overt forces worldwide as its primary means of both deterrence and coercion. However, the current and projected proliferation of Anti-Access/ Area Denial (A2/AD) technologies alone threatens to unhinge this concept. No longer will U.S. conventional access to, or maneuver within, a region be guaranteed.[6] U.S. platforms and capabilities will very likely become vulnerable targets as adversaries continue to develop robust and reliable kill chains.

This impending situation implies that, the utilization of conventional military force against another state actor will not only risk a competent kinetic response, but also unduly create escalation conditions that could result in a major war. Furthermore, during such a kinetic escalation, the qualitative technological overmatch that U.S. forces have relied on for the last three decades is unlikely to exist. This concern is complicated further by the ability of several of these revisionist states, namely Russia and China, to conduct operations under a nuclear umbrella that is more than capable of nonconventional retaliation. Thus, the future use of conventional U.S. deterrence and coercion continues to decline in both feasibility and tenability.

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[4] Michael J. Mazarr, What Deters and Why: Exploring Requirements and Effective Deterrence of Interstate Aggression (Santa Monica, CA: RAND Corporation, 2018), 1.

[5] Michael J Mazarr, "Understanding Deterrence," Perspective: Expert Insights on a Timely Policy Issue (Santa Monica CA: RAND Corporation, 2018), 1.

[6] Krepinevich, Watts, and Work, Meeting the Anti-Access and Area-Denial Challenge, 1.

This pending inability has led many to opine that the United States must dramatically invest in "Leap Ahead" technologies and next generation capabilities. Dozens of new military commands and organizations focus on innovation, modernization, technology development and integration. Entire groups, such as the Army Futures Command Artificial Intelligence Task Force, focus on very specific technologies. The goal of all these organizations is to develop technology and platforms that maintain qualitative advantages over U.S. adversaries. While this is a lofty goal, it is prudent to point out that these technologies take considerable effort and investment with no guarantee that they will work. Often billed as transformational or a revolution in military affairs, very few of these technologies ever become operational. During the 2000s alone, the Pentagon spent over $59 billion on weapons programs that resulted in no new technology or capability.[7] Even weapons platforms that do become operational can be fraught with problems. The F-35 Joint Strike Fighter program has cost $428 billion dollars to date, is more than eight years behind schedule, and as of January 2020, had 873 known deficiencies, fifteen of which endangered the crew and airframe.[8] This is not to say that the F-35 is a failure. It is to say that advanced systems take considerable time, money, testing and oftentimes a respectable number of growing pains before they come to fruition.

These U.S. developments are also not being made in a vacuum. Adversaries and allies continue to develop, test, and field their own advanced capabilities in competition to U.S. efforts. China is the preeminent example of this. The Chinese government has heavily invested in emerging technologies, like 5G and hypersonic weapons, in hopes that they can outpace U.S. technological advances. Concurrently, the Chinese military has developed and fielded a number of platforms specifically designed to thwart conventional U.S. threats. These systems include layered and integrated air defense networks, a modern blue water navy, fifth generation fighter jets, and an array of anti-ship ballistic missiles.[9] Commercial

[7] Brose, *The Kill Chain*, 12–13.

[8] Sean Kennedy, "Congress Is Ultimately to Blame for F-35 Fiasco," *Air Force Times*, March 2, 2020, https://www.airforcetimes.com/opinion/commentary/2020/03/02/congress-is-ultimately-to-blame-for-f-35-fiasco/.

[9] Brose, *The Kill Chain*, 31–36.

developments can also lead to an unexpected degradation of the capability of a platform before it becomes operational. Such was the case in 2018, when the stealth capability of the F-35 was called into question by a German sensor manufacturer. The manufacturer provided evidence that its newly developed passive radar had identified and tracked a pair of F-35s during the Berlin Air Show.[10] Despite millions of man hours of work and almost a half-trillion dollars in development, the F-35's stealth technology may already be obsolete.

This all being said, there is little debate that advanced technologies have benefited those who employ them properly. The machine gun, airplane, aircraft carrier, guided missile, and nuclear weapons have all left indelible marks in history. Additionally, it is absurd to think that a society should not continue to develop technology. As the Aztecs discovered with the arrival of the Conquistadors, spears and clubs are no match for gunpowder and cannons.[11]

Overall though, this technological avenue seems unlikely to be the panacea that its proponents prophesize it to be. It seems improbable to believe that adversaries will cease developing capabilities, platforms, and technologies at a pace on par with U.S. development. To use the Chinese for another example, they have publicly stated their plan to field a fully modernized world-class military by 2049.[12] This military is ostensibly designed to defend Chinese goals and specifically limit American opposition to those goals. This developmental reality infers that the current impasse between adversary Anti-access/ Area Denial capabilities and U.S. conventional deterrence and coercion capabilities is likely to remain in the future.

[10] Brose, 167.

[11] Derek Leebaert, To Dare and to Conquer: Special Operations and the Destiny of Nations, from Achilles to Al Qaeda (New York: Back Bay Books, 2007), 154–71.

[12] "A 'World-Class' Military: Assessing China's Global Military Ambitions," U.S.-China Economic and Security Review Commission (testimony of Taylor Fravel, Massachussets Institute of Technology), June 20, 2019, 15.

B. THE PROPOSITION

How then can the U.S. affect, particularly kinetically affect, its adversaries in order to maintain capable deterrence and particularly coercion? Further, how can the U.S. ensure it can continue to effectively impose costs on these states while staying below the threshold of retaliation? Last, in the event of conflict, what tools exist to levy costs while minimizing the risk of undesired escalation? This research argues that an unintended benefit of the current high-tech approach is that, while the U.S. and its adversaries focus on modernization and next generation capabilities, older lower tech capabilities are being forgotten or ignored. This forgetfulness, particularly in defending against low-tech capabilities, has opened an alternative, or sub-conventional, space within which to conduct activities. Specifically, what seems to be overlooked, in this modern high-tech arms race, is that the base infrastructure necessary for using advanced technology, and for maintaining human societies writ large, remains largely unimproved. The Trans-Siberian railroad, for example, was first laid down in 1891 and remains the primary means of logistics movement across Russia.[13] Planes continue to need runways, ships need ports, missiles require fuel, and most important, all of these technologies require access to energy and logistics.

If infrastructure supporting adversaries is damaged or destroyed, it directly affects their ability to employ forces, capabilities, and technology. Importantly, this critical infrastructure is often overlooked and, in many cases such as an electrical grid or road system, is too large to be effectively guarded.[14] Perhaps, in looking for ways to levy physical costs on bellicose states, the United States should look, not only, at future conventional technological advances but also at more covert capabilities, such as sabotage, that provided asymmetric parity prior to the United States' ascension to hegemony. Importantly, while advanced capabilities are being developed, the technology to conduct physical sabotage exists now. It may offer an alternative option that adversaries, who are also focusing on high-tech capabilities, likely do not expect and are not prepared to counter.

[13] EY, "Russian Infrastructure in the Global Context," 2014, https://ru.investinrussia.com/data/files/sectors/EY-russia-infrastructure-survey-2014-eng.pdf.

[14] Paul W Parfomak, "Physical Security of the U.S. Power Grid: High-Voltage Transformer Substations," CRS report R43604 (Washington: Congressional Research Service, June 17, 2014).

To this point then, does sabotage, as part of a comprehensive deterrence and compellence strategy, remain a viable option to deter, deny, and coerce revisionist states while managing escalation concerns? Furthermore, should the United States look to reinvigorate its sabotage programs as a means to affect aggressor states? The research presented below examines these questions.

II. FRAMEWORK OF RESEARCH

A. SABOTAGE DEFINITION

The current general definition of sabotage is a deliberate action aimed at weakening a polity through subversion, obstruction, disruption or destruction.[15] This definition is extremely broad. It covers an enormous spectrum of acts. Anything from slashing tires or purposefully working inefficiently to covert attacks on nuclear facilities fits this definition. This thesis is not interested in acts of simple sabotage that are generally opportunistic in nature and require little training or planning.[16] Rather this thesis looks at *coup de main*[17] sabotage acts conducted as part of a campaign against state-controlled infrastructure that require trained operatives and detailed planning prior to execution.[18] These sabotage acts are kinetic in nature and are for the purposes of supporting an operational or strategic goal. Department of the Army Pamphlet (DA PAM) 550–104 provides a definition that is more specific than the general definition. DA PAM 550-104 defines strategic sabotage as direct action[19] by specially trained units against such key targets as factories and military installations.[20] This is the definition this thesis uses when discussing sabotage.

B. APPROACH

This thesis explores a series of historical case studies. Looking at past examples and studying the effects of previous sabotage operations provide a venue through which to

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[15] Joint Special Operations University, *Special Operations Research Topics* (MacDill AFB FL: The JSOU Press, 2019), 3.

[16] Office of Strategic Services, *Simple Sabotage Field Manual*, 1st ed. (Washington DC: OSS, 1944), 1.

[17] The DOD *Dictionary of Military and Associated Terms* definition of *coup de main* is: "An offensive operation that capitalizes on surprise and simultaneous execution of supporting operations to achieve success in one swift stroke."

[18] Office of Strategic Services, *Simple Sabotage Field Manual*, 1.

[19] The DOD *Dictionary of Military and Associated Terms* definition of direct action is: "Short duration strikes and other small-scale offensive actions conducted as a special operation in hostile, denied, or diplomatically sensitive environments and which employ specialized military capabilities to seize, destroy, capture, exploit, recover, or damage designated targets."

[20] Andrew Molnar, Jerry Tinker, and John LeNoir, *Human Factors Considerations of Undergrounds in Insurgencies*, (Special Operations Research Office Department of the Army, 1965), 220.

postulate future potentialities. Historic case study analysis allows for the examination of the conditions and context prior to an act of sabotage; the general cost to the attacker; the cost to the victim; and the effect on critical capabilities. Finally, historic case studies are easily accessible for research. Any information on planned or current acts of sabotage are understandably inaccessible due to the required sensitivity and secrecy surrounding sabotage.

This research focuses on three sabotage campaigns that occurred between 1900 and the present: Lawrence of Arabia's campaign against the Medina Railroad (World War One), the Greek Guerrilla's campaign against Axis occupation (World War Two), and the Weather Underground's campaign against the U.S. government (Cold War). During this period, saboteurs operated under many of the same conditions and against industrial infrastructure that is similar to what is still in use today.[21] While there are myriad examples of sabotage operations particularly during World War One and World War Two, the chosen case studies are specific campaigns that include multiple operations over time. These campaigns are important to examine diachronically as they highlight sabotage effects and the reactions to them. Furthermore, they show sabotage in a multi-polar environment, not dissimilar to current and likely future international conditions. With a return to multi-polarity, it is important to understand how and why previous governments and organizations planned for and executed these covert acts against their competitors. The thorough study of World Wars One and Two by academics and historians also enables a depth of analysis and access to information that is not necessarily available with other conflicts. Acts, or planned acts, of sabotage during the Cold War period and the post-9/11 world are more difficult to study, due to many operations remaining classified or unverified by the perpetrators and victims. The evidence that does exist however, such as the Mitrokhin files, which outlines Russia's plan to cripple Canadian and American gas and

[21] Stephen D. Biddle, *Military Power: Explaining Victory and Defeat in Modern Battle* (Princeton: Princeton Univ. Press, 2004), 40–41.

electric infrastructure, are incredibly valuable for presenting contemporary planning against interstate competitors.[22]

C. CASE STUDY SELECTION CRITERIA

This thesis looks at sabotage campaigns sponsored by state actors. This means an act of sabotage conducted either unilaterally, or through a proxy, for the purpose of supporting the national goals and objectives of the sponsoring state. This eliminates sabotage campaigns conducted by organizations not tied to state powers, such as the Earth Liberation Front.[23] While these acts of sabotage are destructive, and often effective, they are not tied to a state goal and thus are not helpful in examining interstate competition. Additionally, these acts of non-state sabotage are unlikely to provoke a retaliatory response by the affected state against another state. Case study selection further focuses on those sabotage campaigns conducted by a state against a near-peer competitor. This is important as it shows the use of sabotage in a multi-polar setting versus a more powerful state acting against a weaker polity. Furthermore, by examining campaigns rather than individual acts it is possible to observe the impact of sabotage over time against a competitor and identify its potential value as part of a larger strategy.

D. THEORY ON ESCALATION CONTROL

This thesis utilizes the theory of covert interaction, developed by Austin Carson for discussing escalation control.[24] Carson's theory argues that states conduct covert intervention as a means to both control escalation and limit the scope of a conflict. He specifically argues that covert intervention in a conflict, by a third-party state, enables backstage escalation control that avoids both external influence and domestic pressure. He

[22] Churchill College "Mitrokhin's KGB Archive Opens " July 7, 2014, https://www.chu.cam.ac.uk/news/2014/jul/7/mitrokhins-kgb-archive-opens/.

[23] Gary A. Ackerman, "Beyond Arson? A Threat Assessment of The Earth Liberation Front," *Terrorism and Political Violence* 15, no. 4 (October 2003): 143–70, https://doi.org/10.1080/09546550390449935.

[24] Austin M. Carson, *Secret Wars: Covert Conflict in International Politics*, (Princeton, NJ: Princeton University Press, 2018), 11.

further argues that often the attacked state will hide knowledge of the intervention or even collude with the intervening state in order to enable its own goals in the conflict.

A key example of this is the Soviet intervention during the Korean War. The United States and the Soviet Union actively colluded to limit escalation during the conflict. Stalin, the leader of the USSR, sought ways to limit American and UN efforts against North Korea. Stalin feared that, following MacArthur's successful landings at Inchon in 1950, North Korean forces could be driven out of the Korean Peninsula.[25] This would likely escalate the war from a limited war on the peninsula to a regional or even global war that would directly impact the Soviet Union. During the 1950s, Stalin was working to consolidate Soviet power following World War Two. If the Korean War had expanded beyond the peninsula, domestic pressure from Soviet hawks would likely demand overt involvement in the conflict. This would entail direct aggression against the United States, dramatically escalating the conflict and threatening Stalin's consolidation efforts. In response to this concern, Stalin covertly deployed 40,000 – 70,000 Soviet troops to support North Korean aerial and air defense operations between 1950 and 1953.[26] The bulk of North Korean air and anti-air operations, up to 90 percent at times, were conducted, not by North Koreans or Chinese soldiers, but rather Soviet pilots and anti-aircraft gunners.[27] Stalin covertly employed these troops as a means of signaling to the United States the Soviet desire to limit the war to just the Korean Peninsula. The Soviets sought to stymie U.S. and UN operations in hopes they would seek a negotiated settlement to the conflict rather than the overall surrender of North Korea or, worse, expansion of the war.

American intelligence quickly detected Soviet involvement in Korea. At the highest levels of government the United State, to include President Truman himself, actively worked to ensure Soviet involvement did not become public for reasons similar to Stalin.[28] If Soviet involvement in Korea became public knowledge, hawkish domestic pressure,

[25] Carson, 157.

[26] Carson, 157–58.

[27] Carson, 165–66.

[28] Carson, 163–67.

from individuals like Senator Joseph McCarthy, would weaponize the information and likely demand the U.S. declare war on the Soviet Union. This was at a time when the U.S. Government was actively attempting to avoid war with the USSR. By not publicly releasing this information, the U.S. signaled to the USSR that it had limited goals on the Korean peninsula. This signaling and subsequent collusion on both sides enabled backstage communications between the two countries that were not impacted by domestic pressure on either side. John Gaddis famously sums the interaction up:

> the Soviet Union never publicized its involvement in these air battles, and the United States, which was well aware of it, chose not to do so either. The two superpowers had found it necessary but also dangerous to be in combat with one another. They tacitly agreed, therefore, on a cover-up.[29]

Another more recent example is the Iranian intervention following the U.S. invasion of Iraq. This resulted in a similar collusion as U.S. leaders sought to limit the scope of the war and Iran signaled that it was against any expansion of operations. During the 2000s there was no intent from any American administration to actively fight Iran. This is despite immense domestic pressure, particularly from right-wing political hawks. Iran, meanwhile, sought to ensure America did not attempt to expand the war into its territories. This costly covert signaling on Iran's part helped to limit any overt expansion of the War on Terror into a regional war against Iran.[30]

E. FOLLOW ON

Following case study analysis, this thesis will identify whether conditions that existed during the time of these acts, specifically infrastructure vulnerability, continue to exist. Additionally, this section will investigate and identify best practices behind these *coup de main* sabotage activities. This enquiry also identifies the risk management and mitigation that planners and decision makers conducted prior to executing strategic sabotage against competitors. This identification of best practices, risk management and risk mitigation are vital to understanding whether acts of sabotage as a costly signaling and

[29] John Lewis Gaddis, *The Cold War: A New History* (London: Penguin Books, 2007), 60.

[30] Carson, *Secret Wars*, 294–95.

escalation control measure remain viable in the modern world. Lastly, the thesis will provide recommendations for follow on study.

III. LITERATURE AND CASE STUDIES

A. A DEARTH OF LITERATURE

There is very little academic literature specifically on sabotage. A quick search for counterinsurgency or nuclear proliferation will bring up thousands of articles and books on either topic. No such repository exists for sabotage. This dearth of literature is confounding due to the impact sabotage has had on previous military campaigns. Sabotage and covert infrastructure attack are so important from a strategic prospective that John Arquilla, a foremost expert in irregular warfare, listed it as one of the five key tenets in a successful military campaign. Arquilla points out that throughout history, adept leaders such as Robert Rogers, Nathan Bedford Forrest, Denis Davydov, Christiaan De Wet, and T.E. Lawrence have all used sabotage as a means to accomplish strategic goals. Arquilla also cogently points out that sabotage and infrastructure attack, as a strategic tool, has greatly waned in recent decades and posits that a "fundamental rethinking of the concept" is in order.[31]

What remaining academic discussions exist generally lump sabotage in with other forms of covert action, specifically espionage. This lumping is problematic. Covert action covers a large spectrum of activities. Studying it as a broad category vice its individual parts leads to findings that may be accurate for one activity but inaccurate for other activities. For example, Michael Joseph and Michael Poznansky, writing for *The Journal of Peace Research* in 2017, argue that covert action, such as that seen during the Cold War, is dead due to modern telecommunications.[32] They postulate a model that argues modern covert action is largely unviable because the risk of exposure is too high due to the prolific spread of information technology. They point to Russia's use of "little green men" in Ukraine as proof that, in the information age, it is nearly impossible to hide a government's involvement in subversive activities. This inability to hide activities then leads

[31] John Arquilla, *Insurgents, Raiders, and Bandits: How Masters of Irregular Warfare Have Shaped Our World* (Lanham, Md. Ivan R. Dee, 2011), 272–74.

[32] Michael F. Joseph and Michael Poznansky, "Media Technology, Covert Action, and the Politics of Exposure," *Journal of Peace Research* 55, no. 3 (2018): 320–335, https://doi.org/10.1177/0022343317731508.

governments to choose either overt action or no action at all.[33] Their model, however, focuses solely on subversion and obstruction of civil activities as covert action, with no mention of sabotage. Subversion and obstruction of civil action often require direct or near-direct involvement with the population. This involvement with the population gives credible justification to their argument that the increase in information communication technology will lead to an increased likelihood of covert action being found out. This model's focus on interactions with the population, and concerns about media discovery, fails however, to account for the targeted destruction of infrastructure, which does not necessarily involve engagement with the population. This is particularly true when sabotage is used against critical infrastructure, such as weapons facilities, logistics routes, or electrical production, which are often situated away from population centers

While academic literature is sparse at best, there are multiple declassified technical documents for practitioners. The Office of Strategic Services (OSS), a precursor to the Central Intelligence Agency, published the seminal work on sabotage in 1944. Titled the *Simple Sabotage Field Manual*, this manual provides ideas for basic acts that saboteurs can take to disrupt systems. These ideas include both outright destruction of equipment as well as encouraging faulty decision-making which results in accidents and delays. Owing to the fact that many of the manual's techniques continue to remain viable, the CIA did not declassify it until 2008.[34] Additionally, In the 1950s and 60s the Operations Research Office of the Department of the Army, in association with the Johns Hopkins University, published several papers on the viability and usefulness of sabotage against near-peer competitors. Their paper on incendiarism specifically noted that arson by saboteurs was not only viable but also enabled a small force to have oversized effects on a target. Their research pointed out that fire, and the water necessary to extinguish it, caused more damage than high explosives, such as conventional bombs.[35] In 1965, the Special Operations

[33] Joseph and Poznansky, Media Technology, Covert Action, and the Politics of Exposure.

[34] Office of Strategic Services, *Simple Sabotage Field Manual*.

[35] Operations Research Office, The Johns Hopkins University, and Charles Lewald, *Fundamentals of Incendiarism for Raiders and Saboteurs and for Planning Countermeasures*, 1st ed. (Department of the Army, 1956), 2–5.

Research Office at the American University, under contract for the Department of the Army, published *Human Factors Considerations of Undergrounds in Insurgencies*. While not ostensibly a sabotage manual, this paper, also known as DA PAM 550-104, spends a great deal of time outlining the benefits of sabotage. DA PAM 550-104 goes so far as to describe sabotage as a principal activity necessary for degrading an enemy's war capabilities.[36]

B. A RELIANCE ON INFRASTRUCTURE AND THE BEGINNINGS OF MODERN SABOTAGE

Concerns about infrastructure are not new. In 97 BCE, The Roman Civil Engineer Frontinus wrote extensively about defending Rome's aqueducts from sabotage.[37] These aqueducts were the strategic means by which Rome ensured water to its people. Any disruption of the water flow would have had catastrophic effects on the city. In addition to the aqueducts, the Romans built extensive infrastructure to support the logistics needs of their empire. They built more than 10,000 miles of road, connected to ports, throughout their empire that enabled their bureaucracy and allowed the Legions to reposition and resupply faster than any of their competitors.[38] The control of these logistics routes and nodes had strategic implications. For instance, during the Roman civil war, the port of Methone served as a critical logistics node for Antony's forces in Greece. Understanding the strategic importance of the port, the Roman General Agrippa conducted a daring surprise amphibious assault against the port and seized it in 31 BCE. The loss of Methone meant that Antony could no longer resupply his army from his logistics base in Egypt. Forced to live off the barren hillsides of Greece, Antony's army languished and was soon defeated at Actium. While not an act of sabotage, the loss of Methone highlights the importance of critical infrastructure throughout history.[39]

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[36] Molnar, Tinker, and LeNoir, *Human Factors Considerations of Undergrounds in Insurgencies*, 11.

[37] LacusCurtius "Frontinus on the Water Supply of Rome," n.d., https://penelope.uchicago.edu/Thayer/E/Roman/Texts/Frontinus/De_Aquis/text*.html.

[38] John Keegan, *A History of Warfare*, (New York: Vintage books, 1994), 303.

[39] Michael Grant, *Cleopatra* (London: Weidenfeld and Nicolson, 1972), 203–6.

The advent of all-weather road surfaces, railroads, and industrialization in the 1800s dramatically increased countries' reliance on large scale infrastructure for their success. Prior to the industrial revolution, campaigning armies had two choices: restrict their movements to nearby navigable waterways for resupply or rely on living off the land.[40] This naturally limited campaign capabilities and objectives by restricting the amount of resources available to a military. With the beginnings of reliable road and rail networks in addition to viable waterways, countries were now able to rapidly bring the full might of their national power against another nation. This growth in capability was remarkable and unprecedented.

In 1900, it took less than 24 hours to travel between Rome and Cologne, a trip that took 67 days during the Roman period.[41] However, this does not fully encapsulate the rapidity of infrastructure development. For a better comparison, examine the difference between the Peninsula Campaign against Napoleon in 1804 and the Austro-Prussian War in 1866. During the Peninsula Campaign, the Duke of Wellington's primary form of logistics and sustainment was cattle, in the form of bullocks and oxen. Wellington wrote that procurement of cattle, and food for them, was a primary concern of his, without which he could not fight. This need to maintain the cattle restricted Wellington's military movements to roughly twenty miles a day and directly impacted his options for action against Napoleon.[42] Sixty-two years later, Prussia, in the span of just seven days, deployed its entire Guard Corps of over 200,000 soldiers, with all their horses and equipment, from Berlin to Austria using railroads. Never before had a country accomplished such a feat, and it was crucial to the Prussian victory over Austria.[43] Where before armies had lived off the land or been slowly resupplied with pack animals and supply ships, now men, weapons, and equipment could be shipped directly from industrial centers and, as Keegan writes, "decanted on to the field of battle."[44] Historian A.P. Taylor went so far as to argue, in his

[40] Keegan, *A History of Warfare*, 301–4.

[41] Keegan, 306.

[42] Keegan, 304.

[43] Keegan, 306–7.

[44] Keegan, 307.

seminal work *War by Timetable,* that the rapid mobilization capabilities of railroads inadvertently caused the brutality of World War One.[45]

This growth in infrastructure enabled, and still enables, countries to accomplish things that were previously thought impossible. It allowed states to conduct operations at speed and to rapidly react or deploy military force. Coupled with the industrial revolution, the destructive capabilities of nation states grew dramatically. So too, however, did the requirements to sustain and employ these capabilities. Military machinery and units grew deadlier, but they also grew larger, and more complex, and required increased infrastructure and logistics to maintain them. New requirements now existed to maintain, and secure infrastructure in order to enable and sustain these complex military capabilities. Many countries, such as Germany, went so far as to nationalize their rail and telegraph infrastructure to ensure it was managed and maintained for military support.[46] This all meant that increased technological capability went hand in hand with increased technological dependency.

Belligerents also immediately noticed that while infrastructure was a huge benefit, it was also a weakness. If a nation could damage its enemy's infrastructure, it might be able to prevent its enemy from properly employing its forces. This became a goal of competing states. In November 1864 for example, Confederate saboteurs, stationed in Canada, infiltrated New York City, and set a series of fires designed to destroy the city. New York City was the central hub for Union logistics. Losing the port and rail yards would have crippled Union forces in the field who relied on regular resupply. The saboteurs, however, failed to properly fuel their blazes. The fires were quickly discovered and put out.[47] By the early 1900s, multiple leaders, writers, and thinkers were positing the potential of *coup de main* sabotage and the impacts it could have on states. Joseph Conrad's *The Secret Agent* and G.K. Chesterton's *The Napoleon of Notting Hill* remain famous works of the era that focus specifically on espionage and sabotage. During a 1911 war scare, Winston Churchill,

[45] A. J. P. Taylor, *War by Time-Table: How the First World War Began*, Macdonald Library of the 20th Century (London: Macdonald & Co, 1969), 15–45.

[46] Keegan, *A History of Warfare*, 306–7.

[47] Leebaert, *To Dare and to Conquer*, 366–68.

then the Home Secretary, was so concerned that a handful of German saboteurs could blow up Britain's naval cordite reserves that he ordered Royal Marines to guard the stockpiles.[48]

History however could be even stranger than fiction. In 1916, at the height of World War One, German saboteurs targeted Black Tom Island in New York Harbor. The United States had not entered the conflict yet and remained a neutral country. Factories in the United States openly manufactured and sold arms and ammunition to the European powers. Much of the ammunition was stored on Black Tom Island before being transported by ship to Europe. On July 30, 1916, German saboteurs lit several fires on Black Tom island where more than fifty tons of TNT and a thousand tons of ammunition were awaiting shipment to France and Britain.[49] The fires set the ammunition and explosives ablaze. The resulting explosion tore apart the ammunition stockpile in New York Harbor and is considered one of the largest non-nuclear explosions in history. The resulting blast was felt as far away as Philadelphia. The shockwave was so violent it killed at least four people including a ten-month-old child who was across the harbor in New Jersey. The majority of the windows in Lower Manhattan and Brooklyn were shattered. The Statue of Liberty was damaged so badly that parts of the statue remain closed to the public today because of the blast. Lastly, the fires were so intense they forced the evacuation of Ellis Island. The saboteur's simple arson did more than half a billion dollars in damage and directly affected British, French, and Russian wartime capabilities by destroying the munitions. It took years for American authorities to conclude that German saboteurs were behind the attack. Initial investigations believed that carelessness of the railroad company and the security guards at the site were the reason for the explosion.[50]

[48] Leebaert, 389.

[49] David Alan Johnson, *Germany's Spies and Saboteurs* (Osceola WI: MBI Publishing Company, 1998); Gilbert King, "Sabotage in New York Harbor," *Smithsonian*, November 1, 2011, https://www.smithsonianmag.com/history/sabotage-in-new-york-harbor-123968672/.

[50] King, "Sabotage in New York Harbor."

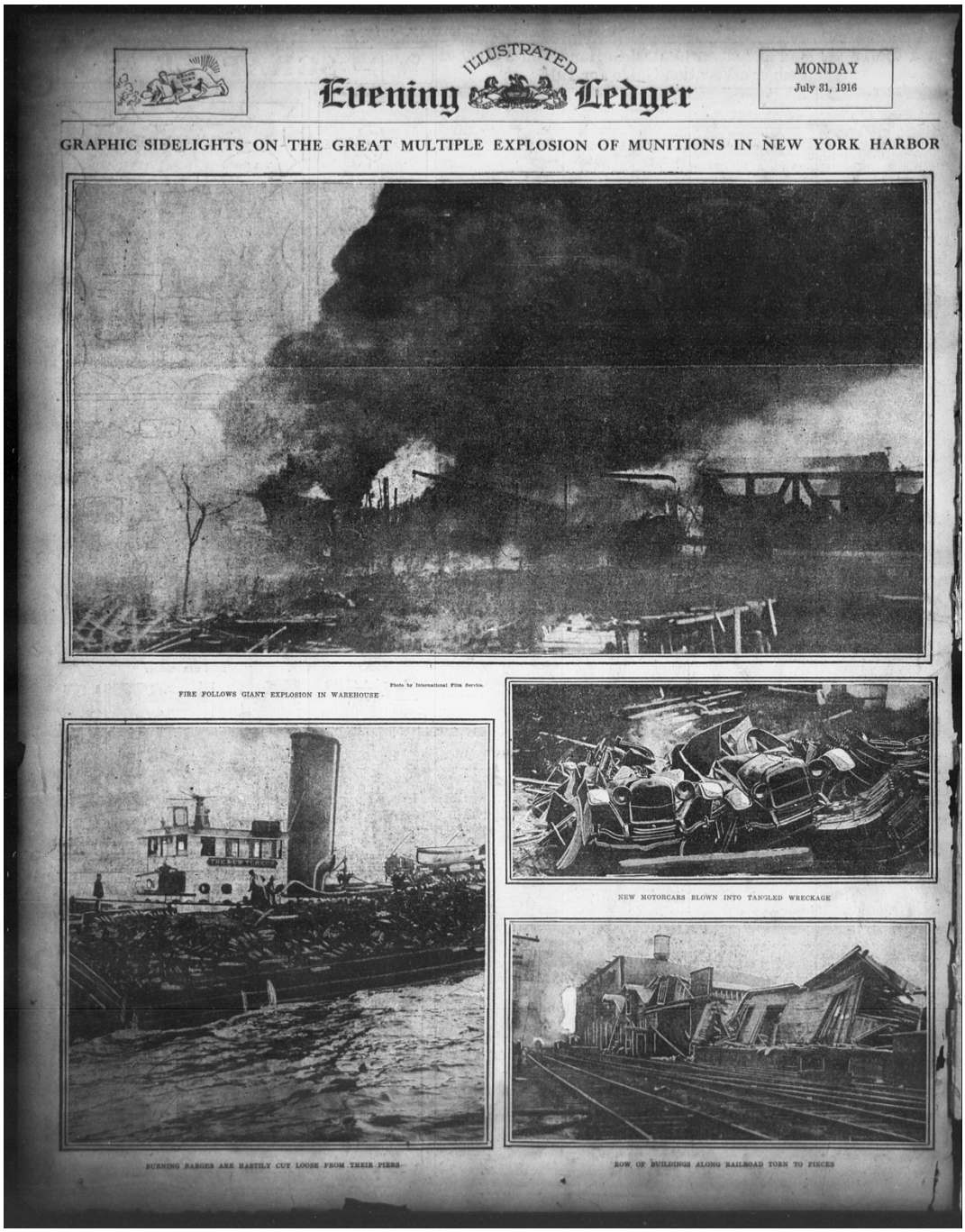
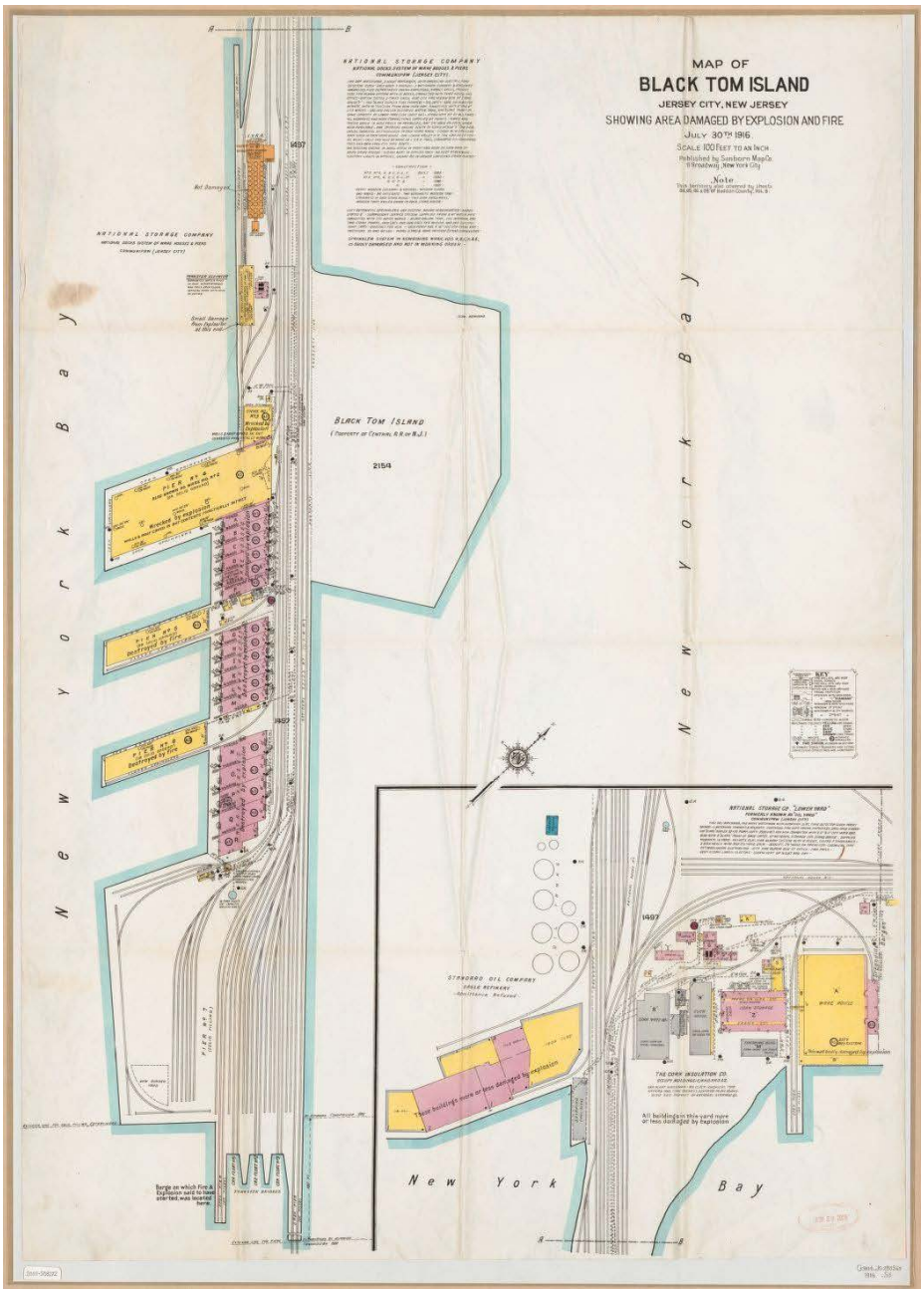


Figure 1. Front Page of the Evening Public Ledger Following Black Tom Explosion[51]

[51] Source: "Front Page," *Evening Public Ledger*, July 31, 1916, https://chroniclingamerica.loc.gov/lccn/sn83045211/1916-07-31/ed-1/seq-16/.



Black Tom Island was completely destroyed by sabotage. The structures in pink were destroyed in explosions. The structures in yellow were destroyed in the subsequent fires following the explosions.

Figure 2. Map of Black Tom Island Highlighting Sabotage Damage[52]

[52] Source: Sanborn Map Company, "Map of Black Tom Island, Jersey City, New Jersey : Showing Area Damaged by Explosion and Fire, July 30th 1916.," image, Library of Congress, Washington, D.C. 20540 USA, 1916, https://www.loc.gov/resource/g3814j.ct009962/.

Specific sites of scientific relevance were likewise vulnerable. Prior to America entering World War Two, the British strategy for defeating Germany relied on four pillars: blockading, bombing, subversive activity, and propaganda.[53] A full quarter of the British national strategy relied on subversive activity, namely sabotage and support to resistance fighters. A key front for the British was Norway, which lies directly across the North Sea from the United Kingdom. It was here that the British and Norwegians famously conducted a series of sabotage attacks against the Vemork Hydroelectric Plant. The Vemork plant produced heavy water, as a byproduct of power generation, and was crucial to Nazi Germany's nuclear program. Despite allied attempts to use overt force, in the form of bombing raids, they were unsuccessful in damaging the Nazis' heavy water production. Using small teams of saboteurs, however, the British and Norwegians were able to successfully end Nazi Germany's heavy water production in Norway. These sabotage actions culminated in two separate actions one year apart. The first, in February 1943, destroyed the heavy water production tanks inside the Vemork plant. This temporarily disabled Germany's ability to produce heavy water at the plant and resulted in 3,000 German soldiers being dispatched to the Vemork plant to search for the saboteurs, who were never found. The second sabotage action in February 1944, sank the ferry, SF Hydro, on Lake Tinn in Norway. The SF Hydro was carrying the remaining heavy water from Vemork, along with a contingent of German soldiers and a number of civilian passengers. A Norwegian team attached plastic explosives on a timer to the keel of the SF Hydro, which exploded as the ferry was crossing the lake. These sabotage actions effectively delayed Nazi Germany's nuclear program without forcing the allies to conduct an overt invasion of Norway and commit large sums of military men and equipment, which were in short supply.[54]

While none of the sabotage acts highlighted resulted in a cessation of hostilities, they do show the importance of infrastructure to modern militaries and the impact that

[53] Peter Paret, Gordon Alexander Craig, and Felix Gilbert, eds., *Makers of Modern Strategy: From Machiavelli to the Nuclear Age*, Princeton Paperbacks (Princeton, NJ: Princeton University Press, 1986), 684.

[54] M.R.D Foot, *SOE: An Outline History of the Special Operations Executive 1940-46*, 1st ed. (London, British Broadcasting Corporation, 1984).

sabotage can have on strategic plans. This reliance on infrastructure to support logistics for military options, in particular interstate deterrence, coercion, and competition, has only grown since 1900. This is directly related to the proliferation of advanced military equipment that requires extensive support to function.[55] The relationship between logistics and combat forces is known as the Tooth to Tail Ratio (T3R). The tooth refers to combat forces, while the tail refers to supporting functions that enable combat forces.[56] In the U.S. military the T3R has grown 35 percent in favor of the tail over the tooth since World War One. In World War One, the T3R was 60:40, meaning 60 percent of U.S. capabilities were combat related and 40 percent were dedicated to logistics. In Iraq in 2005, the T3R was 25:75. Only 25 percent of all U.S. capabilities were combat related while 75 percent supported logistics.[57] Similar ratios can be assumed for other modern states that employ comparable capabilities. Interesting and concerning is the reality that infrastructure development has not kept up with this demand. Both the U.S. and China, as examples, have limited redundancy in their logistics support infrastructure.[58] This quite simply means that now, more than ever, effects to infrastructure have outsized effects on the ability to employ, maintain, and sustain the conventional deterrent and coercion capabilities utilized by adversaries.

The following three case studies build on this argument along with the previous theory of covert interaction. The case studies look at the effects that sabotage campaigns, more so than just single acts, can have on belligerent states and how that effect can limit escalation.

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[55] John McGrath, *The Other End of the Spear: The Tooth-to-Tail Ratio (T3R) in Modern Military Operations*, The Long War Series Occasional Paper 23 (Fort Leavenworth KS: Combat Studies Institute Press, 2007), 69.

[56] McGrath, *The Other End of the Spear*, 2.

[57] McGrath, 67–68.

[58] "Logistics: The Lifeblood of Military Power," The Heritage Foundation, 2019, https://www.heritage.org/military-strength-topical-essays/2019-essays/logistics-the-lifeblood-military-power; Chad Peltier, Tate Nurkin, and Sean O'Connor, "China's Logistics Capabilities for Expeditionary Operations," Research (U.S.-China Economic and Security Review , 2019), https://www.uscc.gov/sites/default/files/2020-04/China%20Expeditionary%20Logistics%20Capabilities%20Report.pdf.

C. CASE STUDY #1 TRAIN PIRATES: LAWRENCE OF ARABIA AND THE ARAB REVOLT

> I touched off under the first driving wheel of the first locomotive, and the explosion was terrific… When I peered through the dust and steam of the explosion the whole boiler of the first engine seemed to be missing
>
> —T.E. Lawrence, *Seven Pillars of Wisdom*[59]

1. Introduction

World War One was a war of empires.[60] The main belligerents, the British Empire, France, Germany, Austro-Hungary, the Ottoman Empire, and Russia focused much of their efforts on butchering each other *en masse* on the plains and mountains of Europe. However, these empires did not forget about their colonies and just as importantly the colonies of their enemies. Colonial holdings presented vulnerable secondary fronts and sources of resources. These far-flung outposts of European power presented opportunities for the belligerents to cause increased damage to their enemies while hopefully avoiding the trenched stalemates of Europe. In the South Atlantic, warships blasted each other apart over the Falkland Islands.[61] German, British, South African, Portuguese, and French forces spent years fighting a guerrilla-style war amongst the malaria-ridden jungles of East Africa.[62] Even a country as remote as New Zealand was not immune to conflict on its shores. In 1917, the German Officer Felix von Luckner conducted a number of successful acts of piracy before being captured by the government of New Zealand. In one of the odder acts of the war, he subsequently escaped, stole a sailboat and led authorities on a low speed chase for a thousand miles through the South Pacific.[63]

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[59] T. E. Lawrence, *Seven Pillars of Wisdom: A Triumph*, 1st Anchor Books ed (New York: Anchor Books, 1991), 431.

[60] Robert Gerwarth and Erez Manela, eds., *Empires at War: 1911 - 1923* (Oxford New York, NY: Oxford University Press, 2015), 1–17.

[61] Hew Strachan, *The First World War* (New York: Viking, 2004), 78–80.

[62] Strachan, *The First World War*, 80–95.

[63] Sam Jefferson, *Sea Devil: The Adventures of Felix Von Luckner, the Last Raider under Sail*. (New York: Bloomsbury Publishing Plc, 2017), 207–12.

First, though, among these ancillary fronts was the Middle East. Located geographically between Europe, Africa and Asia, the region continues to be strategically important. During WW1, the region represented the frontier between the Ottoman and British Empires. The British, largely ensconced in Egypt and the Persian Gulf, sought to drive the Ottomans from the region in hopes that the Ottomans would sue for peace and cease support to the Germans. Further, driving the Ottomans from the region would better secure the access route to Britain's key colony, India. For the Ottomans, maintaining control of the region was key to maintaining their empire: it allowed them to threaten British shipping and diverted key resources and manpower that the British could not then employ in Europe.

It was here that one of the war's most well-known figures, TE Lawrence or, as he is better known, Lawrence of Arabia, earned his fame. Lawrence served as a British liaison officer to the Arab irregular forces operating against the Ottomans. Working through his Arab partners, Lawrence fought a mobile guerrilla campaign from the Hejaz region of Saudi Arabia through what is now Jordan to the Syrian capital of Damascus. His campaign was not one solely of sabotage. The Arabs he worked with conducted raids, reconnaissance in force, and even large-scale maneuver warfare, most famously wresting the city of Aqaba from Ottoman hands. This case study however focuses on Lawrence's and his Arab partners', main activity: logistics sabotage against the Ottoman rail system. These acts of sabotage hamstrung the Ottoman garrisons throughout the region, forcing them to employ large numbers of personnel and equipment to protect and repair the vital rail lines. These acts further deprived the Ottoman forces of key resources and restricted their ability to sally forth to either subdue the Arabs or fight the British forces maneuvering from Egypt. Importantly, this sabotage campaign shows that, even in time of outright war against a peer competitor, sabotage served as a way to manage escalation, impose costs, and deny resources while simultaneously preserving friendly combat power.[64]

[64] John Arquilla, *Insurgents, Raiders, and Bandits: How Masters of Irregular Warfare Have Shaped Our World* (Lanham, Md. Ivan R. Dee, 2011), 157–71.

2. Background

The Middle East and its Arab populations had spent several hundred years under the authority and control of the Ottoman Empire based in Constantinople, now Istanbul. At its zenith, the Ottoman Empire stretched from Poland to Cairo and the Persian Gulf, but by 1914 ,the empire was in decline.[65] Its span of control at the start of World War One included the Middle East through Turkey and what are now the countries of Armenia, Georgia and Azerbaijan. The Ottomans, having lost a war in the Balkans and failed to stop the Italian invasion of Libya between 1911 and 1912, had initiated massive reforms to stabilize their territory but remained an inferior organization compared to their European counterparts.[66] Additionally, while ruled by ethnic Turks, the empire was a multi-ethnic consortium whose dispossessed groups were not unaware of the empire's decaying power.

As early as the summer of 1908, Sharif Hussein, the man who would lead the Arab Revolt, approached the British to gain external support for the Arabs of the Hejaz, the western-most province of Saudi Arabia, which includes the cities of Mecca and Medina.[67] Sharif Hussein was the leader of the Hejaz and, while he was appointed by and subject to the Ottomans, he ruled fairly autonomously because of the aforementioned Ottoman inefficiency. He was concerned that Ottoman reforms, in particular the completion of the train line between Constantinople and Mecca, would result in more centralized control and erode the power he exercised in his fiefdom.[68] He viewed British support to his fiefdom as a way to maintain control and temper Ottoman efforts to renew their authority in the region. Further, if the Ottoman Empire were to collapse, Hussein had ideas for an Arab empire that stretched from Asia Minor to the Red Sea and the Persian Gulf. Initially, his overtures to the British were refused. The British did not want to upset another Great Power in the

[65] Strachan, *The First World War*, 99.

[66] Strachan, 101–2.

[67] Efraim Karsh and Inari Karsh, "Myth in the Desert, or Not the Great Arab Revolt," *Middle Eastern Studies* 33, no. 2 (1997): 267–312.

[68] Scott Anderson, "The True Story of Lawrence of Arabia," *Smithsonian*, July 2014, https://www.smithsonianmag.com/history/true-story-lawrence-arabia-180951857/; Karsh and Karsh, "Myth in the Desert, or Not the Great Arab Revolt."

region. However, the onset of war in 1914, and the subsequent entry of the Ottomans on Germany's side, changed Britain's view on the matter.[69]

Britain faced a formidable combat power issue at the start of the war. Its main effort was the defeat of Germany in mainland Europe. In order to do this, it needed to maintain control of critical exterior lines of communication and resource nodes far from the British Isles. Britain needed secure access to India, where much of its material and manpower came from, as well as to the commonwealth countries of Australia and New Zealand. It needed to maintain the flow of oil from its holdings in southern Iraq and critical to both of these it needed to ensure control of the Suez Canal.[70] The Suez Canal enabled the British to access the Eastern Hemisphere without traversing around the entirety of Africa. In order to accomplish this, Britain opted to place comparatively small numbers of its forces in critical locations, along the Suez Canal and in the Sinai Peninsula. These forces then partnered with local forces to conduct economy of force operations that enabled Britain's main effort against Germany. In 1916, when Hussein finally declared his revolt against the Ottoman Empire, the British chose to support him as an efficient way to kinetically pressure the Ottomans on multiple fronts.[71] It was into this context that TE Lawrence seized his moment.

[69] Karsh and Karsh, "Myth in the Desert, or Not the Great Arab Revolt."

[70] Strachan, *The First World War*, 102.

[71] Ministry of Culture and Heritage, "The Arab Revolt, 1916-18 - The Ottoman Empire," Ministry of Culture and Heritage, New Zealand History Online, 2014, https://nzhistory.govt.nz/war/ottoman-empire/arab-revolt.

Figure 3. T.E. Lawrence in 1918[72]

3. Foundations and Initial Actions

The Arab Revolt's start was lackluster. The Arab forces under Sharif Hussein and his sons lacked military equipment and were organized chiefly along tribal lines. The British, despite having sent assurances that they would support the revolt, were caught flat-footed when it occurred and unprepared to provide assistance.[73] On June 5, 1916, Sharif Hussein's sons Faisal and Abdullah attacked the Ottoman garrison at Medina. After three

[72] Source: Chase Harry, "T E Lawrence 1888-1935," Imperial War Museums, 1918, https://www.iwm.org.uk/collections/item/object/205022240.

[73] T. E. Lawrence, *Seven Pillars of Wisdom: A Triumph*, (New York: Anchor Books, 1991), 28.

days of fighting, the Arab force was unable to break the garrison and withdrew to the desert to regroup. Despite smarting from an initial failure, Sharif Hussein openly declared his revolt on June 10 and attacked the Ottoman garrison in Mecca. Here, his force was successful, and the Ottoman garrison quickly capitulated. His son Faisal simultaneously attacked the garrison at Jeddah on the Red Sea. Recognizing the importance of Jeddah's port, the British, despite their lack of preparedness, cobbled together a conventional naval flotilla to assist in the attack. Jeddah quickly fell to the combined Arab and British forces and provided the British with an initial foothold in the Hejaz.[74] Following the capture of Mecca and Jeddah by Hussein's forces, the British established a liaison office to coordinate intelligence and operations with the Arabs. This again was done as a means to pressure the Ottomans along multiple fronts while reserving critical British manpower and equipment for major offensives. T.E. Lawrence was assigned as a liaison to the Arabs beginning in October of 1916.[75]

TE Lawrence was not a traditional military figure. He was a small, slight man with an over-sized head. He studied history in college and had worked on an archeology team for the British Museum in Mesopotamia. Owing to his diminutive stature, he was initially rejected by the Army when he volunteered at the start of the war. However, by 1915, the need for manpower in the British Army enabled him to gain a commission and posting to Egypt.[76] His initial job was as a cartographer for the general staff. After the fall of Jeddah, both the British and Arabs seemed unsure how to continue with the revolt. Lawrence capitalized on this lull by convincing his superiors to assign him to a fact-finding mission to ascertain the status of the Arab rebels in the Hejaz.[77]

The British fact-finding mission determined that the Arab Revolt's issues resonated around two key elements. The first was a lack of leadership. Sharif Hussein was an old man, and his son, Feisal appeared to be the only other local leader capable of leading the

[74] Ministry of Culture and Heritage, "The Arab Revolt, 1916-18 - The Ottoman Empire."

[75] Lawrence, *Seven Pillars of Wisdom*, 63.

[76] Leebaert, *To Dare and to Conquer*, 406.

[77] Lawrence, *Seven Pillars of Wisdom*, 63.

Arab tribesman against the Ottomans. Hussein's desire that locals lead the revolt was also in opposition to the British Army, who favored using an Egyptian and former Ottoman Officer, Aziz al Misri, to coalesce the various Arab irregulars into a coherent conventional fighting force.[78] The Second element was equipment, the Bedouin tribesmen possessed little in the way of rifles, machine guns, and artillery.[79] Conversely, the Ottoman troops, particularly the 12,000-man garrison at Medina, were armed with modern machine guns and German artillery.[80]

[78] Eli'ezer Ṭa'uber, *The Arab Movements in World War I* (London: Routledge, 2013), 91, http://site.ebrary.com/id/10844178.

[79] Lawrence, *Seven Pillars of Wisdom*, 69.

[80] Ministry of Culture and Heritage, "The Arab Revolt, 1916-18 - The Ottoman Empire"; Strachan, *The First World War*, 102.

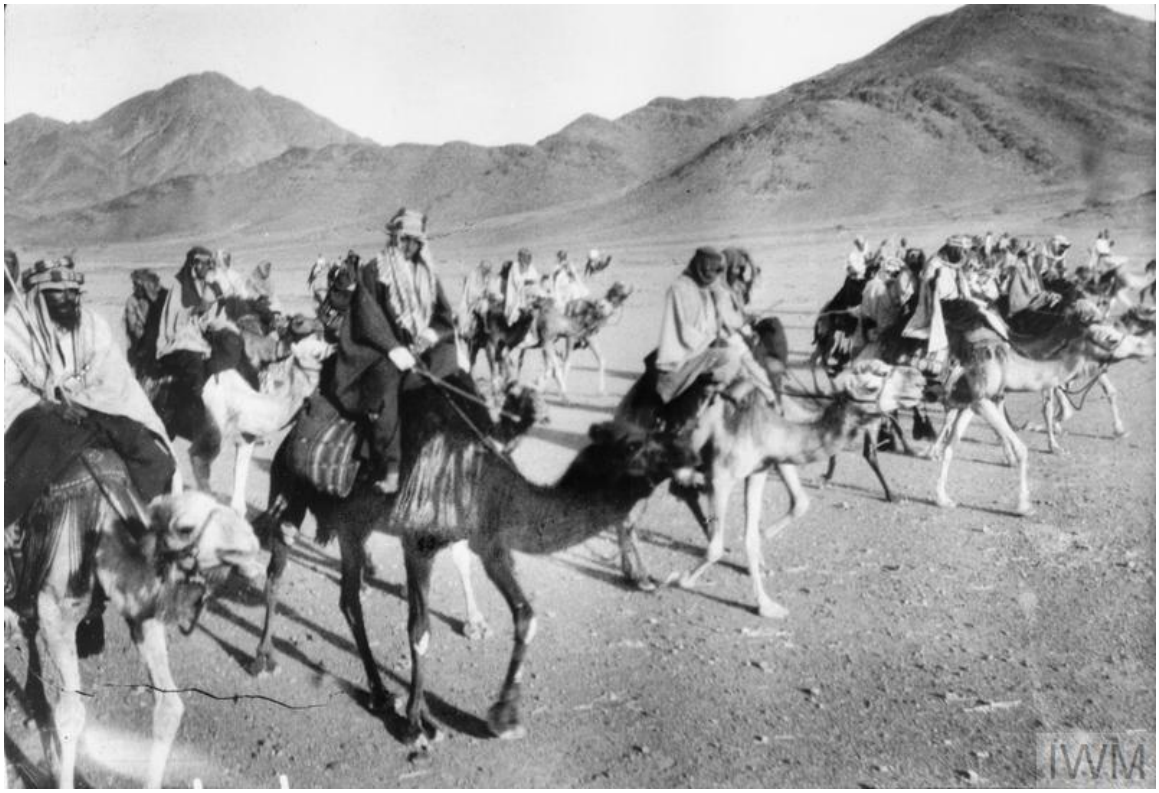


Figure 4. Arab Cameleers, March 1917[81]

4. Railway Campaign Overview

Following his fact-finding mission, Lawrence was assigned to the Arab desk and served as the British Liaison to Faisal, a position that garnered Lawrence great fame following the war. British attempts to install Aziz al Misri as the leader of the Arab Revolt were unsuccessful and Faisal was subsequently chosen to serve as the de facto commander of the Arab irregular forces.[82] The British hoped that this force would amalgamate into something resembling a conventional militia or provincial force, but in reality, it remained a consortium of opportunistic tribesmen who entered and left the campaign at will. This issue with tribal reliability would plague the British Headquarters throughout their campaign in the Middle East. With the number and capability of the Arab force consistently

[81] Source: Thomas Edward Lawrence, "T E Lawrence and the Arab Revolt 1916 - 1918," Imperial War Museums, March 1917, https://www.iwm.org.uk/collections/item/object/205018868.

[82] Ṭa'uber, *The Arab Movements in World War I*, 95.

in question, the British had issues accurately planning for their inclusion in operations. This led the liaisons, such as Lawrence, who were embedded with the Bedouins to advise their partners to conduct attacks against peripheral targets. These attacks against outlying garrisons and the railroad were damaging to the Ottomans without spoiling British conventional operations.

Lawrence was an astute advisor to Faisal. He recognized that mobility was the Bedouin's critical strength. He sought to capitalize on this while simultaneously denigrating the Ottomans' key strength: manpower. The Ottomans possessed enormous sums of troops, armed with state-of-the-art weapons. The lightly armed camel raiders stood little chance against entrenched soldiers with machine guns and artillery. However, as all armies throughout history have found, more manpower means more logistics. Lawrence recognized that affecting the flow of logistics using the highly mobile camel-borne Bedouins would hurt the Ottomans more than any assault he could mount. His task was made infinitely easier by the lack of logistics infrastructure in the region. Overland logistics was limited due to the hostile terrain and lack of roads. A dearth of ports, along with British naval superiority in both the Mediterranean and Red Sea, made seaborne resupply limited. Therefore, the bulk of Ottoman logistics traveled along the Hejaz railway, which connected Medina to Damascus. The length of the railway, some 820 miles, made securing the entirety of it impossible for the Ottoman garrisons. This vital infrastructure presented a prime target for Lawrence's camel raiders. It was a target that played to the Bedouins ability to strike quickly and fade into the desert while avoiding massed Ottoman troops.[83]

The criticality of railroads cannot be understated. Their strategic importance was well documented by the start of World War One. Railroads allowed, the ground deployment of supplies, troops, and equipment at speeds and in quantities previously unthought of. Military planners proved the importance of the railroad during the American Civil War. The North's access to 30,000 miles of rail, more than the rest of the world combined at the time, enabled quartermasters and commanders to reliably supply and deploy forces along any front at speeds the confederacy could never match. Further,

[83] Arquilla, *Insurgents, Raiders, and Bandits,* 159–60.

Northern forces were tasked with ripping up every section of Confederate track they came upon which denied Confederate forces reliable access to logistics from southern depots.[84] The Germans viewed railroads as a strategic resource, They nationalized their rail system and by 1914, rural German train stations along the frontier with Belgium and France featured platforms a mile long. This was done for explicit military reasons. The platform length enabled troop trains to disembark an entire division at each stop.[85] Between 1825 and 1900, Europe went from zero to 175,000 miles of train track.[86]

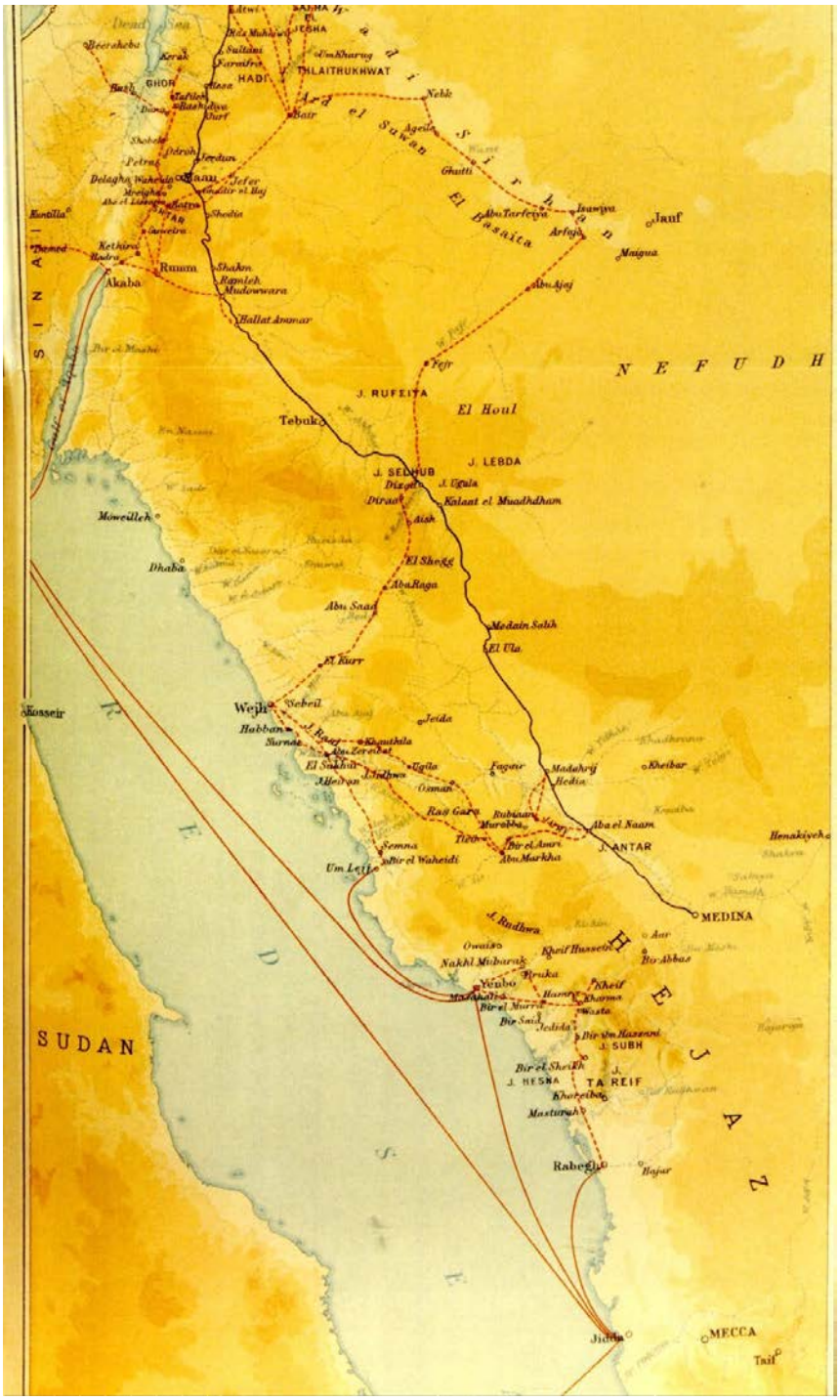
The Ottoman Empire was no different. The Hejaz railway was part of a strategic rail system that connected the empire. In 1914, an Ottoman citizen only needed to switch trains once when traveling between Constantinople and Medina.[87] In 1916, when Lawrence's train pirates began their sabotage attacks, the railroad was the critical line of communication that connected the far-flung Ottoman outposts to the rest of the Empire. Damage to the Hejaz railway delayed and denied vital supplies to Ottoman garrisons, which directly impacted their combat capability. Just as importantly, the Ottomans were forced to allocate large numbers of forces in an attempt to secure the railroad, which limited their ability to conduct offensive operations. Finally, continual repairs were costly and meant the reallocation of critical material that could not be used for the Ottoman war machine.

[84] John Keegan, *A History of Warfare*, (New York: Vintage books, 1994), 305–6.

[85] Keegan, *A History of Warfare*, 307.

[86] Keegan, ,306.

[87] Anderson, "The True Story of Lawrence of Arabia."



The Hejaz Railroad is denoted in black. Red lines indicate roads and sea routes.

Figure 5. Hejaz Region during World War One[88]

[88] Lawrence, *Seven Pillars of Wisdom*, 71.

Lawrence's campaign began in earnest in late 1916 and would run until the conclusion of hostilities in 1918. To be clear from the start, Lawrence's plan was not to permanently destroy the Hejaz railway, but rather to damage it just enough that the Ottomans would repair it.[89] It was better to keep the garrisons in the region bottled up and neutered through continual sabotage of the rail system, than to deal a decisive blow to their logistics infrastructure. If the railroad was fully destroyed, the Ottomans would likely abandon their Arabian garrisons and redeploy the troops to other fronts. The garrison at Medina was a key concern in this discussion. It consisted of 12,000 Ottomans under the competent command of General Fakhri Pasha.[90] The withdrawal and subsequent redeployment of such a force under a capable leader could spell disaster for the British main effort in the Sinai. With this in mind, Lawrence set out to continually break the railroad so as to make Ottoman resupply difficult but not untenable.[91]

Lawrence's weapon of choice in this endeavor was dynamite. His preference for, and skill with, Alfred Nobel's invention earned him the nickname "Emir Dynamite" among the Bedouins.[92] Dynamite's introduction to warfare was recent and profound. Its stability and portability, compared with more traditional nitroglycerin or black powder, enabled Lawrence's small raiding parties to exact a terrible toll on the Hejaz railway.[93] The lightweight dynamite was quick to emplace and easily turned valuable rail lines into twisted hulks. Lawrence and the Bedouin raiders became adept at destroying a rail bridge in such a way that it was "scientifically shattered," as he put it. This meant that while the bridge was unusable and unrepairable, it remained standing. This forced the Ottomans to go through the time-consuming task of dismantling the bridge before they could replace it.[94]

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[89] Anderson, "The True Story of Lawrence of Arabia."

[90] Ministry of Culture and Heritage, "The Arab Revolt, 1916-18 - The Ottoman Empire."

[91] Lawrence, *Seven Pillars of Wisdom*, 216.

[92] Arquilla, *Insurgents, Raiders, and Bandits*, 160.

[93] Arquilla, 160.

[94] Anderson, "The True Story of Lawrence of Arabia."

By Lawrence's count, he and his Bedouin camel raiders would blow up 79 bridges before the war ended.[95]

In early spring 1917, the Bedouin forces were conducting a demolition a day on the Hejaz Railway.[96] July of 1917 marked the highpoint of sabotage operations, with 800 charges emplaced on the Hejaz Railway.[97] In response to these demolitions, General Fakhri Pasha installed strong garrisons at every water station along the railroad. He believed these garrisons, and their daily patrols, would serve as a deterrent to the railway sabotage. Lawrence described Pasha's defense as "as stupid a defensive as could be conceived."[98] The reason for this is that Pasha viewed the Arabs as a conventional force seeking to hold and maintain terrain. This view was partially true; the Arabs had seized Mecca and a number of small ports along the Hejaz coast. However, along the railway, the Arabs were not concerned with holding or seizing terrain. They sought to disrupt Ottoman access to it and make Ottoman retention of it expensive in both men and material. By spreading out his forces, Pasha only provided more targets for the Bedouins to shoot at. Simultaneously, Fakhri Pasha used what had been his maneuver force to secure the railway garrisons, thereby losing any ability to sortie from Medina and the railway. He ceded all maneuver and the operational tempo to the Arab raiders.

[95] Scott Anderson

[96] Lawrence, *Seven Pillars of Wisdom*, 216.

[97] David Murphy, "The Arab Revolt, 1916-18 - A Complex Desert Campaign," Small Wars Journal, 2019, https://smallwarsjournal.com/jrnl/art/arab-revolt-1916-18-complex-desert-campaign#_edn3.

[98] Lawrence, Seven Pillars of Wisdom, 173.

The Ottoman garrison at Bijar Nasif. It was located 74 kilometers north of Medina along the Hejaz rail line and was typical of Ottoman defenses in the region.

Figure 6. A Fortified Ottoman Garrison on the Hejaz Rail Line[99]

This juxtaposition in strategy is clearly visualized in Lawrence's first mining operation. Lawrence and his raiders observed a rail station guarded by some 390 Ottoman soldiers. The Ottomans outnumbered Lawrence's party in size and equipment, in addition to being adequately entrenched in defensive positions around the station. However, this superiority meant nothing, as Lawrence's party had no intention of seizing the station. Instead, the Arabs waited until a train pulled into the station. Then, obscuring their movements using terrain and darkness, they mined the tracks in both directions. Using a pair of obsolete artillery pieces and several machine guns, Lawrence's raiding party fired on the rail station from a hilltop 2,000 meters away. The intent of the fire was two-fold. Their first purpose was to damage the station itself; in this they holed the water tank and damaged the pump room. The Second and more important purpose was to convince the train engineers to flee with the locomotive. In this they were also successful. The

[99] Source: Dietrich Riemer, "Bijâr Naṣîf Befestigte Station Der Ḥiğâzbahn, 74 Km Nördlich von Medina, 489 m ü. M. 1910.," image, Library of Congress, Washington, D.C. 20540 USA, 1916, https://www.loc.gov/item/2014648770/.

locomotive fled south and struck one of Lawrence's mines, severely damaging both the locomotive and the railroad. With the train and the railway sufficiently damaged, the raiding party withdrew. Seventy Ottomans were killed or wounded, another thirty were captured when some of the more daring Arabs overran an outlying defensive position, and rail traffic was held up for three days. In contrast, one Bedouin was slightly wounded.[100] While the Ottomans had succeeded in retaining their position, they had failed to maintain the integrity of the train line and their logistics, the common theme throughout the railway campaign.

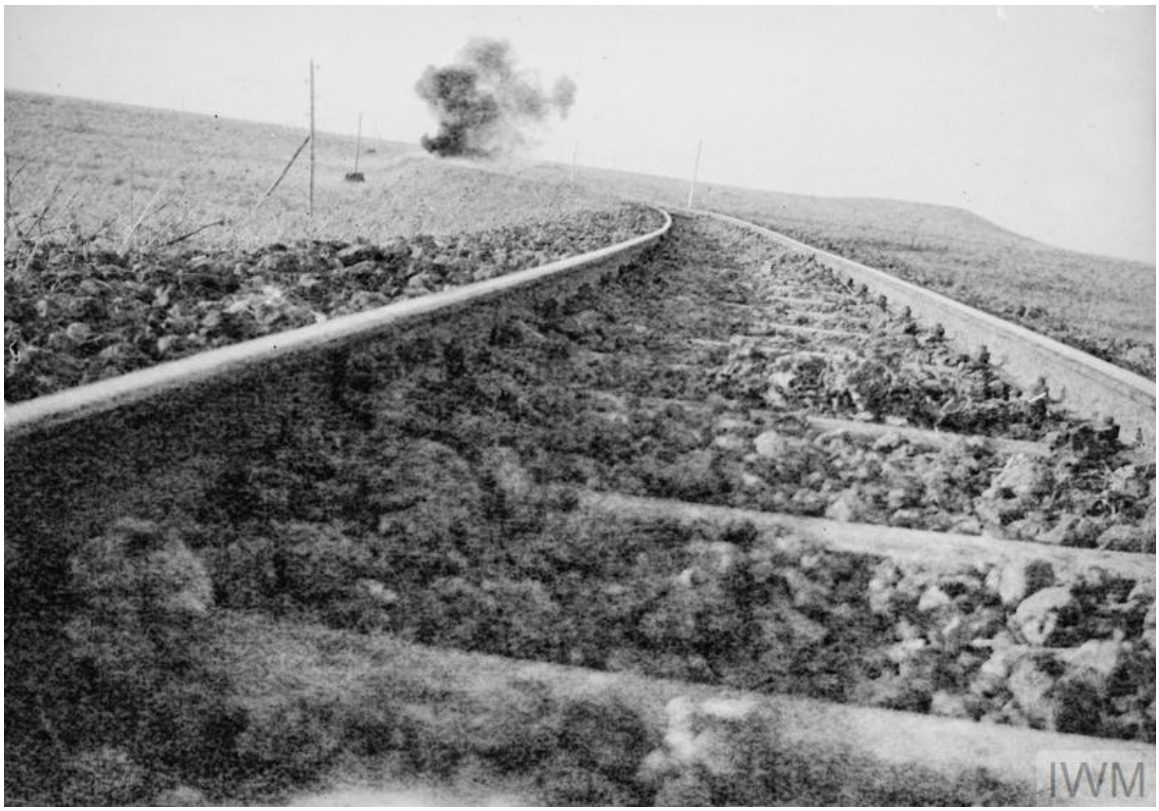

Figure 7. A Bomb Exploding on the Hejaz Rail Line near Deraa[101]

[100] Lawrence, *Seven Pillars of Wisdom*, 197–203.

[101] Source: "Egypt and Palestine 1914–1918: Guerrilla Operations 1918," Imperial War Museums, 1918, https://www.iwm.org.uk/collections/item/object/205022211.

Not every action though went as smoothly as the one described above. In the fall of 1917, Lawrence attempted to employ his train pirates against the rail bridges of the Yarmuk Valley. He hoped that a successful action would stir local tribes in the valley to join the revolt. Lawrence met up with Abd El-Kader Al Jezairi, the grandson of the famous Algerian insurgent Abd El-Kader in hopes that his name would further garner support, particularly with Algerian exiles in the vicinity of Damascus.[102] However, the French Intelligence Service believed Al Jezairi was an Ottoman spy and informed Lawrence of this. The local Arabs were also suspicious of the Algerian and refused to join up with Lawrence's party. Then one day Al Jezairi unanticipatedly left camp taking any potential Algerian support with him.[103] Lacking any local support, Lawrence attempted to blow a bridge in the valley, but the bulk of the explosives fell over a cliff during a friendly fire exchange between two Arab groups. Finally, hoping for a win in the Yarmuk, Lawrence and a group of sixty camel raiders used their remaining explosives on a train culvert. They blew the charge as a train was passing over the culvert. Unfortunately, Lawrence was unaware that the train carried the Commander of the Ottoman 8th Corps and four hundred of his best troops.[104] While the explosion was successful, destroying both the culvert and the two locomotives pulling the train, the Ottomans quickly recovered and counterattacked. Lawrence lost a third of his force in the ensuing retreat.[105]

5. Effects and Findings

Many of Lawrence's operations and activities were left out of this case study. His stunning attack on Aqaba, from the desert, defeated the 1,200-man Ottoman garrison at a cost of two Arabs killed. His long-range reconnaissance patrols provided critical intelligence to Allenby, the British Commander in Egypt. His capture by, and subsequent escape from, the Ottomans in Deraa. His defense of the town of Tafileh. His post-war

[102] Lawrence, *Seven Pillars of Wisdom*, 389.

[103] Arquilla, *Insurgents, Raiders, and Bandits*, 163–64.

[104] Lawrence, *Seven Pillars of Wisdom*, 432.

[105] Lawrence, 430–34.

efforts to support Arab nationalism.[106] These are just a few of his exploits that were ignored in the previous pages. These acts individually are all harrowing and remarkable. Together they paint the portrait of an individual who was "an extraordinary warrior unlikely to fit in anywhere else."[107]These exclusions though were done purposefully, if not albeit regrettably, in order to focus sharply on the railway.

Despite these exclusions, Lawrence's sabotage campaign against the Hejaz railway remains an important case study. The Ottoman soldiers of the Medina Garrison were first rate soldiers. Of particular note was their commander, General Fakhri Pasha. Fakhri Pasha was a highly skilled conventional commander and is still revered in Turkey as the "Defender of Medina." He had previously served as the Ottoman Commander of Mosul and the Deputy Commander of Aleppo. In 1916, with the outbreak of the Arab Revolt, Fakhri was personally selected to command the Hejaz Expeditionary Force tasked with defending Medina.[108] Fakhri Pasha established robust integrated defenses that successfully repelled multiple conventional Arab assaults and deterred the British. He held Medina through the war. No allied force, British, French, or Arab, set foot inside the city. When the Ottoman Empire signed its armistice with the Allies in October of 1918, Fakhri Pasha still refused to surrender Medina. Despite, the capitulation of his Empire, Fakhri and his troops remained in defense of the holy city. It was not until January of 1919, two months after the end of WW1, that Fakhri was arrested by several of his officers, and Medina was finally surrendered.[109] Fakhri's ability to retain Medina despite being besieged for over two years was a remarkable feat, one for which he and his men remain heroes in their native Turkey.

Fakhri Pasha's defense however was irrelevant in the grander scope of the conflict. Medina held emotional and religious value for the Ottomans who viewed themselves as the protectors of Islam, but the city held limited military value. By defending the city

[106] Arquilla, *Insurgents, Raiders, and Bandits*, 160-171.

[107] Leebaert, *To Dare and to Conquer*, 408.

[108] Alia El Bakri, "'Memories of The Beloved': Oral Histories from The 1916-19 Siege Of Medina," *International Journal of Middle East Studies* 46, no. 4 (2014): 707.

[109] El Bakri, Memories of The Beloved, 708.

Fakhri, and his superiors who encouraged his defense, enabled Lawrence and his camel raiders to play to their strength, mobility. The Ottomans provided fixed positions and known infrastructure that the Arabs could demolish at will, while fielding very few maneuver forces that the Arabs had to contend with. This made the sabotage campaign against the Hejaz railway wildly effective at both the operational and strategic levels. Despite multiple tactical failures and a partner force that was often fickle and unreliable, Lawrence and his fellow liaisons to the Arab Revolt succeeded in their railway sabotage campaign. Highly mobile indigenous forces played absolute havoc against the Hejaz Railway without causing the Ottomans to abandon the line. This was vital, as it kept the 12,000-man Ottoman garrison at Medina effectively out of the war for two years. As Lawrence described it, the camel raiders worked diligently to "make the maintenance of the garrison a shade less difficult than evacuating it."[110] This "bottling up" of such a large highly trained conventional force for so long a period is far more remarkable than Fakhri's defense.

This perhaps is Lawrence's greatest contribution to the war effort. By breaking the railway just enough that the Medina garrison stayed in place, believing it was strategically important, Lawrence and his raiders saved untold numbers of troops on both sides. If the Medina garrison withdrew to Damascus, it could have assisted in defending either Damascus or Jerusalem. This would have resulted in much heavier, and deadlier, fighting during General Allenby's drive from the Sinai. As it happened, Allenby's troops took very light casualties. This may not have been the case if Fakhri, his artillery and his machine guns been present. Lawrence, Feisal, and the Bedouin saboteurs definitively won at the operational and strategic level, rendering moot the hardship and bravery of their Ottoman foes.

When analyzing this case study using Austin Carson's theory of covert interaction, the railway campaign fails to support the theory. The Ottomans were well aware of British and French support to the Arab Revolt. The Ottomans were in open war against the British and French. Additionally, the generally overt nature of Lawrence's sabotage operations

[110] Lawrence, *Seven Pillars of Wisdom*, 216.

and the Arab Revolt writ large destroyed any semblance of plausible deniability. As such, Lawrence, his Arab partners, and their operations do not appear to have facilitated any backstage escalation control discussions between the Ottomans and British.

The above notwithstanding, the railway sabotage campaign served as an effective economy of force operation. Lawrence and his partners in the Arab Revolt required little in the way of support and equipment. Their transportation and food were locally procured. Some weapons were provided by the British while the bulk were seized from the Ottomans. As long as a steady stream of dynamite and mines were provided to Lawrence and his Train Pirates, they could continue to affect the strategic Hejaz Railway. They were able to strike largely at will against stationary infrastructure. The Ottomans guarding the railway had limited means to respond, despite holding the advantage in men, weapons, and equipment.

6. Conclusion and Future Potentialities

Several key lessons from the Arab Revolt remain relevant today and for future conflicts. First is the benefit of direct advisement. The British HQ in Egypt spent enormous effort attempting to coalesce the Arab Revolt into a force beneficial to their overall strategic effort against the Ottomans. However, it was not until they established a permanent liaison office with the Arab Revolt that they saw progress. Direct, on ground, advisors turned a disorderly revolt into a viable, although unconventional, force for shaping operational and strategic effects. Second is the precise use of technology. Modern explosives, and access to them, were the critical component that made the sabotage campaign work. Proper planning for and utilization of technology alongside indigenous forces enabled outsized success. Third and most importantly is the continued viability of logistics infrastructure sabotage and the incredible effects of it by highly mobile saboteurs.

Military planners and strategists continue to wrestle with how to deal with this issue of securing lines of communication across multiple domains, not just land. German maritime raiders wreaked havoc on allied supply lines during both World Wars. The Soviets dealt with interrupted lines of communication during their occupation of

Afghanistan.[111] The United States dealt with it in Vietnam, Iraq, and Afghanistan. In all these situations, lightly armed highly mobile saboteurs and attackers used explosives to render lines of communication either dangerous or unusable. Unfortunately, in all these situations commanders, planners, and strategists responded in generally the same way Fakhri Pasha did: by doubling down on securing these lines at the expense of possessing robust maneuver forces. Recently, many U.S. and NATO units in Iraq and Afghanistan went so far as to require route clearance be conducted before maneuver units could conduct operations.

Assuming then that, for at least the last hundred years, the standard response to logistics infrastructure sabotage is to reinforce lines of communication, this provides an opportunity for future conflict. In the event of overt conflict, logistics infrastructure saboteurs, like the Bedouin raiders, may provide an option to impose kinetic costs on an enemy that limits their mobility and efficacy while also potentially lowering the human costs of a conflict. Logistics sabotage may also potentially assuage some escalation concerns by limiting direct conventional encounters between states in conflict, such as the bottling up of the Medina Garrison. Further, logistics infrastructure sabotage may limit the ability of a foe to field specific units by forcing them secure key lines of communication. While not perfect, Lawrence's railway sabotage campaign provides proof that sustained sabotage and infrastructure attack, particularly against logistics, can support strategic goals.

[111] Artem G. Borovik, *The Hidden War: A Russian Journalist's Account of the Soviet War in Afghanistan* (New York: Grove Press, 2008), 88–91.

D. CASE STUDY #2 THE FOLLOWERS OF HADES: THE GREEK GUERRILLAS DURING WORLD WAR TWO

> When lecturing the Haifa sabotage school on this operation later, I staggered them by telling them the quantity we used. The same result could have been achieved with one-tenth the total charge, but of course we were in the dark as to the size of the bridge members until we reached the target.
>
> —British liaison officer speaking on a Greek viaduct attack[112]

1. Introduction

World War Two remains the seminal war in mankind's history. Never before or since has a conflict been so widespread, so all encompassing, and so deadly. Nazi Germany, Imperial Japan, and Italy assailed the rest of the world in a bid to establish autarkies. Before its end, more than 80 million people would die in battlefields and cities worldwide. From Europe to North Africa and the far Pacific, civilians as much as soldiers would be the targets of savage attacks, bombing campaigns, starvation, and disease. Perhaps most damaging, the conclusion of World War Two would usher in the nuclear era, and the world would know the power of atomic weapons.

While overshadowed by larger campaigns in Europe and the Pacific, Greece played an important role in the war. Despite lacking resources, Greece's geographic location made it strategic terrain for any nation attempting to secure the Mediterranean and North Africa. Its geography placed Greece squarely in the crosshairs of Italy and Nazi Germany. For four years, the Greeks would fight the combined forces of Italy and Germany. After the Greek army fell to German blitzkrieg tactics, Greek guerrillas took up the mantle of resistance and, supported by British and American commandos, waged a campaign of sabotage and destruction that lasted until the Axis withdrawal in 1944.[113] These sabotage acts served to stymie the flow of critical logistics to German forces in North Africa and effectively tied up multiple German divisions. This forced the Divisions to defend lines of communication

[112] Hugh Gardner, *Guerrilla and Counterguerrilla Warfare in Greece, 1941-1945*, 1st ed. (Washington: Office of the Chief of Military History, 1962), 50.

[113] Gardner, *Guerrilla and Counterguerrilla Warfare in Greece, 1941-1945,* 1.

and rendered them incapable of participating in operations in other theaters. Not unlike Lawrence's campaign in the First World War, the actions of the Greek guerrillas served to impose costs, manage escalation and deny resources to an adversary in a critical theater.

2. Background

At the outbreak of World War Two, the British, still stinging from the brutal lessons of World War One, sought a strategy of peripheral cost imposition against the Nazis based on Liddle Hart's theory of indirect approach. The British strategy consisted of blockades, bombings, subversive activities, propaganda, and attacks against outlying German territories while avoiding the main German war machine. It was a strategy well suited for Britain, which at the time had a small economy and limited manpower for ground forces. This peripheral strategy focused on two key locations. The first was Norway, which lies directly across the North Sea from the United Kingdom. The second, and equally important, was the Mediterranean, which Churchill referred to as "the soft underbelly" of the Nazi Regime.[114] Disrupting the Nazis the ability to launch attacks from Norway helped protect the British Home Islands, while securing the Mediterranean enabled vital supplies from the Middle East and India to rapidly reach the European Theater via the Suez Canal.[115]

This desire to secure the Mediterranean was shared by Nazi Germany and its ally Italy for similar reasons. All three nations viewed Greece as a critical position in the Mediterranean. The British maintained an alliance with Greece and stationed their Mediterranean Fleet there.[116] The Italians viewed Greece as a logical addition to their Mediterranean holdings. In addition, it would provide agricultural resources, in the form of sheep and leather, as well as operational reach into the eastern Mediterranean. Conversely, Nazi Germany saw Greece as the quickest logistical route to support their operations in North Africa. A line of communication through Greece would enable Nazi

[114] Paret, Craig, and Gilbert, *Makers of Modern Strategy*, 1986, 684–85.

[115] Paret, Craig, and Gilbert, 686.

[116] Gardner, *Guerrilla and Counterguerrilla Warfare in Greece, 1941-1945*, 6.

Germany to reliably supply Erwin Rommel's force, while simultaneously hampering British access to their beleaguered forces in Egypt.[117]

Figure 8. Allied Plan to Attack through the Mediterranean[118]

3. Foundations and Initial Actions

Greece's geography has determined much of its culture and history. Greece occupies the southern end of the Balkan Peninsula. Geographically, it is a rugged and mountainous landscape that is largely rocky and deforested. In addition to its mountainous mainland, almost one fifth of the country's landmass is made up of islands that surround the peninsula. These too are either mountainous or hilly.[119] This terrain favors semi-independent to independent agrarian communities over metropolitan development and industrialization. To get a sense of this independence, it is worth noting that in the last

[117] Erin Richardson, ed., *Case Study in Guerrilla War: Greece during World War Two*, Revised (Fort Bragg North Carolina: United States Army Special Operations Command, 1962), 29.

[118] Source: U.S. Office of War Information, *Mediterranean Front. 10. Allied Counteroffencive in the Mediterranean*, A War Atlas for Americans 23 (New York, NY: Simon & Schuster, 1944), 28–29.

[119] Gardner, *Guerrilla and Counterguerrilla Warfare in Greece, 1941-1945*, 2–4.

election prior to World War Two, sixty political parties were represented at the national level.[120] These political parties represented local regions, with no party possessing a platform capable of spanning the country. These agrarian communities placed an emphasis on the meager crops they grew for subsistence and historically lashed out violently against any who violated the integrity of their land. This geographic inhibition on large commercial and industrial development also affected federal control, and the mass employment of modern conventional forces. Instead, the terrain of Greece favored small communities and small scale, though violent, independent and unconventional warfare with the fragmented Greek City States of antiquity being the capstone example of this.[121]

In 1941, owing to its terrain, Greece remained largely undeveloped. The economy was agricultural, with 75 percent of its eight million citizens living rurally. Athens and Salonika were the only two commercial ports in the country. The economy was agricultural with wool, goat hair, and leather being the primary, and most profitable, exports. Fishing was important along the coast and islands, though only for local consumption. While there was some light industry that served local communities, no heavy industry existed in the country. There were few paved roads and only 1,700 miles of narrow-gauge railroad that traversed from Belgrade, in Serbia, to the ports at Athens and Salonika.[122] For comparison, the United States 80 years prior, in 1860, had more than 30,000 miles of railroad.[123]

Without seeming to understand this geography or the temperament of the agrarian people who occupied it, Mussolini issued an ultimatum, on October 27, 1940, demanding the surrender of Greece. When the Greeks refused to comply, he invaded on October 28. Despite domestic differences, the Greeks united in support of their small country and waged a brutal campaign against the Italians. Although lacking in personnel and equipment compared to the Italians, the Greeks succeeded in not only throwing back the Italian offensive but also in successfully counterattacking. In the span of three months, the Greeks

[120] Gardner, 6.

[121] Keegan, *A History of Warfare*, 246.

[122] Gardner, *Guerrilla and Counterguerrilla Warfare in Greece, 1941-1945*, 4.

[123] Keegan, *A History of Warfare*, 305.

pushed the Italians out of Greece and seized almost a third of Albania, inflicting more than 100,000 casualties on the Italians in the process.[124]

This Greek success was short lived. On March 1st, 1941, Bulgaria joined the Axis Pact, which enabled Germany to drive straight into Greece. Germany required Greek ports to support its campaign in North Africa, and Hitler directed his military to succeed where his weak Italian ally had failed. Germany invaded, through Bulgaria, on April 6, 1941. Britain sent 58,000 troops to support the Greeks, but it was too little, too late. Within three weeks German forces had conquered Greece and installed a puppet government. By June the Germans had also conquered the island of Crete and effectively gained control of the eastern Mediterranean.[125] Overall, the situation by late 1941 was bleak for the Allied cause. The Germans won every campaign they engaged in. Britain and Russia remained the only two European countries openly fighting the Nazis and unfortunately, both these fights were defensive in nature. The British were locked in continual air combat fending off the German strategic bombing campaign while Russia was defending itself from a German ground invasion.[126]

With its strategic goal of establishing a line of communication through Greece to North Africa accomplished and the invasion of Russia ongoing, Germany could not afford to leave valuable frontline troops in Greece. Germany quickly turned over occupation duties, and the puppet government, to its Italian allies and withdrew most of its combat troops from Greece. What troops the Germans did leave held key points in the country, such as the port of Athens-Pireaus, Salonika, western Crete, a portion of Thrace, and some of the larger Aegean islands. The railway between Salonika and Athens, while not wholly guarded by Germans, was used exclusively to support German logistics traffic to North Africa. The rest of the country was left to Italian occupation troops. Italy's occupation force was as successful as its initial offensive against Greece. The puppet government was hated by the Greek population. The Italian occupiers were hated even more. The Greeks had

[124] Gardner, *Guerrilla and Counterguerrilla Warfare in Greece, 1941-1945*, 7.

[125] Gardner, 7–9.

[126] Richardson, *Case Study in Guerrilla War: Greece during World War Two*, 3.

defeated the Italians in battle but now, despite that, the Italians possessed the bulk of the Greek mainland. What limited effective government activities existed before the occupation quickly failed under Italian incompetence. Inflation ran rampant. black markets for essential goods became commonplace. Food shortages and starvation, particularly in the cities, were the norm rather than the exception.[127]

Following Greece's defeat and occupation, the Greek people were left stunned and angered. What remained of the pre-war government fled to British-occupied Egypt. The army dissolved and what officers survived fled underground. Hatred for their occupiers ran deep, though, and quickly various resistance organizations began to take shape in both the cities and countryside. Owing to the aforementioned independent nature of the agrarian Greeks, many independent resistance groups developed, often with goals contradictory to neighboring groups. Greek Communist Party groups were the first to organize. Prior to the war, the Greek government had suppressed the Greek Communist Party, which caused them to develop a robust underground network. The Greek communists now used this underground to stimulate, coordinate, and organize much of the early resistance activities. The growth of the communist resistance galvanized other more conservative organizations, led by former Greek officers, to develop into their own resistance movements, and by the spring of 1942, the Greek resistance was conducting small-scale guerrilla attacks.[128]

In the Summer of 1942, Colonel Zervas, the leader of the EDES, the Greek Democratic National League, guerrilla movement conducted the first large scale sabotage attack in Greece. This would provide proof of guerrilla capability and usher in the period of direct British support. Zervas recognized that disruption of the lines of communication would cause far more damage to the Italian garrisons in his region than any direct attack he could muster. He identified that where the sole highway between the cities of Ioannina and Arta passed over the Louros River, there was a steep defile that all traffic needed to pass through. Reconnaissance by the guerrillas identified that Italian logistics convoys were lightly guarded and followed a fairly set schedule. On the 23rd of October 1942,

[127] Gardner, *Guerrilla and Counterguerrilla Warfare in Greece, 1941-1945*, 9–10.

[128] Gardner, 12.

Zervas and his men mined the end of the defile, set charges on the bridge, and occupied elevated ambush positions along the road. When the Italian convoy, consisting of two tanks, a gun truck, a command vehicle, and nineteen supply trucks, drove into the defile on the afternoon of 23rd, they were decimated. The lead tank struck a mine and burst into flames, blocking the convoy in the defile. Then Zervas' men blew the bridge behind the rear tank effectively trapping the convoy. Greek Guerrillas poured gunfire and dropped boulders on the trapped Italians. When the shooting stopped 70 Italians were dead and 23 vehicles were destroyed, including the two tanks. What supplies the guerrillas couldn't carry out on mules were covered in gasoline and burned. For two weeks following the attack, Italian forces combed the countryside, but never captured Zervas or his men.[129]

Figure 9. EDES Guerrillas and SOE in Greece[130]

[129] Gardner, 60–64.

[130] Source: Bower Rosslyn, "Special Operations Executive with the EDES (National Republican Greek League) Resistance Movement in Greece during the Second World War," Imperial War Museums, 1943, https://www.iwm.org.uk/collections/item/object/205027775.

4. Proxy Support and Sabotage Campaign

In accordance with its strategy of peripheral attacks and subversive activity, in addition to its long-standing alliance with Greece, Britain allocated forces and equipment to support the Greek resistance in late 1942.[131] Specifically, the British sought to use the Greek guerrillas to impede the flow of logistics from Greece to Germany's Afrika Corps. Under the command of Erwin Rommel, the Afrika Corps had advanced into Egypt and were only seventy miles from the British Headquarters in Alexandria.[132] The British needed Rommel's supply line cut so they could effectively counterattack. Due to commitments elsewhere, a general manpower shortage, and concerns about the ability to mount an overt offensive to retake Greece, the British opted to infiltrate commandos to support and advise the Greek resistance.

During the period of darkness between September 30 and October 1, 1942, the British attempted to parachute twelve British Commandos, nine officers and three enlisted soldiers, into occupied Greece. The infiltration was a calamity. None of the planes found their mark. The first group of commandos parachuted over a set of fires that they assumed were their signal. The fires turned out to be fires to warm local shepherds and had no correlation with the resistance. The second group parachuted into a field and met a member of the Greek resistance who had expected a supply drop. He was surprised and unsure what to do with the commandos. The last group was unable to find any signals and returned home. When they attempted to infiltrate a month later, they again could not find their link up signal. They decided to jump blind in the vicinity of their link up point. They accidentally landed near an Italian garrison and were forced to immediately evade mortar and small arms fire. Despite their inauspicious entry into Greece, none of the British advisors were hurt, and they linked up with both the Greek resistance and each other within a month of infiltration.[133]

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[131] Peter Paret, Gordon Alexander Craig, and Felix Gilbert, eds., *Makers of Modern Strategy: From Machiavelli to the Nuclear Age*, Princeton Paperbacks (Princeton: Princeton University Press, 1986), 687.

[132] Richardson, *Case Study in Guerrilla War: Greece during World War Two*, 3.

[133] Richardson, 29.

The principal mission of the British Commandos was to destroy any one of the three bridges that supported the North-South rail line through Greece. This rail line was the primary resupply route for Rommel's Afrika Corps. At the time, 80 percent of the logistics to Rommel flowed along this route. From depots in Eastern Europe, Rommel's supplies moved along the Greek railroad to Athens-Pireaus where they were loaded on boats and sent to Crete. From Crete supplies were shuttled nightly to Rommel's forces in Egypt who were in active offensive action against the British 8th Army. While destroying bridges behind enemy lines was considered extremely risky, the mission was of strategic value to the British. If Rommel's supply line was interrupted, it would support the British attempt to break out of the El Alamein Line.[134]

After reconnaissance of the three bridges, the British Commander, Colonel E.C.W. Myers, selected the northernmost bridge as the ideal target for sabotage. Referred to as the Gorgopotamos viaduct, it was the most accessible of the three, and the Italian garrison that defended it seemed incompetent.[135] The garrison, with an outpost at either end of the viaduct, numbered approximately 80 men.[136] Within a month, Col. Myers along with several guerrilla leaders, to include Col. Zervas, developed a plan to demolish the viaduct. Approximately 150 Greek guerrillas would destroy the Italian outposts guarding each end of the viaduct while the British commandos would set charges and demolish it.

On the night of November 25, 1942, the combined Greek and British contingent moved into position around the Gorgopotamos. Colonel Myers set up a temporary Command and Control center at the base of the viaduct and waited. At approximately 11:15 pm, Greek guerrillas began their diversionary assaults on the Italian outposts at either end of the bridge. An hour later, and after committing his guerrilla reserves to support heavy fighting on the north end of the bridge, Myers ordered the saboteurs to move in and place their charges.[137] The demolition party laid their charges quickly, the signal to take cover

[134] Richardson, *Case Study in Guerrilla War: Greece during World War Two*, 29–30.

[135] Richardson, 31.

[136] Gardner, *Guerrilla and Counterguerrilla Warfare in Greece, 1941-1945*, 75.

[137] Richardson, *Case Study in Guerrilla War: Greece during World War Two*, 31.

was sounded, and the charges exploded. The first charges cut an eight-foot section of steel from the main pier and dropped two one-hundred-foot railway spans into the ravine.[138] Hoping to further foul repairs, Myers ordered another set of charges on the bridge. The second explosion rocked the already heavily damaged bridge rendering it completely useless. The combined guerrilla force suffered no serious injuries in the destruction of the Gorgopotamos. Conversely, the Italians suffered 20 to 30 soldiers killed and all rail logistics traveling through Greece were halted for six weeks.[139]

Following the events at the Gorgopotamos viaduct, the Greek guerrillas began conducting almost incessant sabotage acts. Guerrillas conducted so many operation, to include roadblocks, rockslides, and bridge demolitions along the main east-west highway through Greece that the Italians were unable to use it between mid-1942 and fall 1943.[140] The guerrillas also employed medieval caltrops, a four-pronged metal form that, when thrown, always lands with one point facing up. Caltrops were cheap and easy to make. They scattered them along regular Italian and German logistics routes. The frequent stops to repair flat tires delayed convoys and wasted axis resources. Additionally, Axis soldiers had to leave their vehicles to repair their tires which created opportunities for Greek snipers. Lastly, the guerrillas made good use of British concrete covered mines. These small mines were strewn along dirt roads where they were indistinguishable from regular rocks, and hard to detect with metal detectors. The mines were demoralizing to Italian troops who, in unarmored vehicles, were regular casualties.[141]

In early May 1943, British Headquarters in Cairo requested that the Allied Commandos and Greek guerrillas step up their sabotage campaign. The British hoped Greek sabotage would serve as a strategic deception operation. The British hoped that the Germans would see an uptick in guerrilla sabotage as a precursor to an allied invasion in

[138] Gardner, *Guerrilla and Counterguerrilla Warfare in Greece, 1941-1945*, 84.

[139] Richardson, *Case Study in Guerrilla War: Greece during World War Two*, 31.

[140] Gardner, *Guerrilla and Counterguerrilla Warfare in Greece, 1941-1945*, 65.

[141] Gardner, 94.

the Aegean.[142] The Commandos and guerrillas replied with the impressive destruction of the Asopos viaduct, the second of the three viaducts supporting the rail line in Greece.

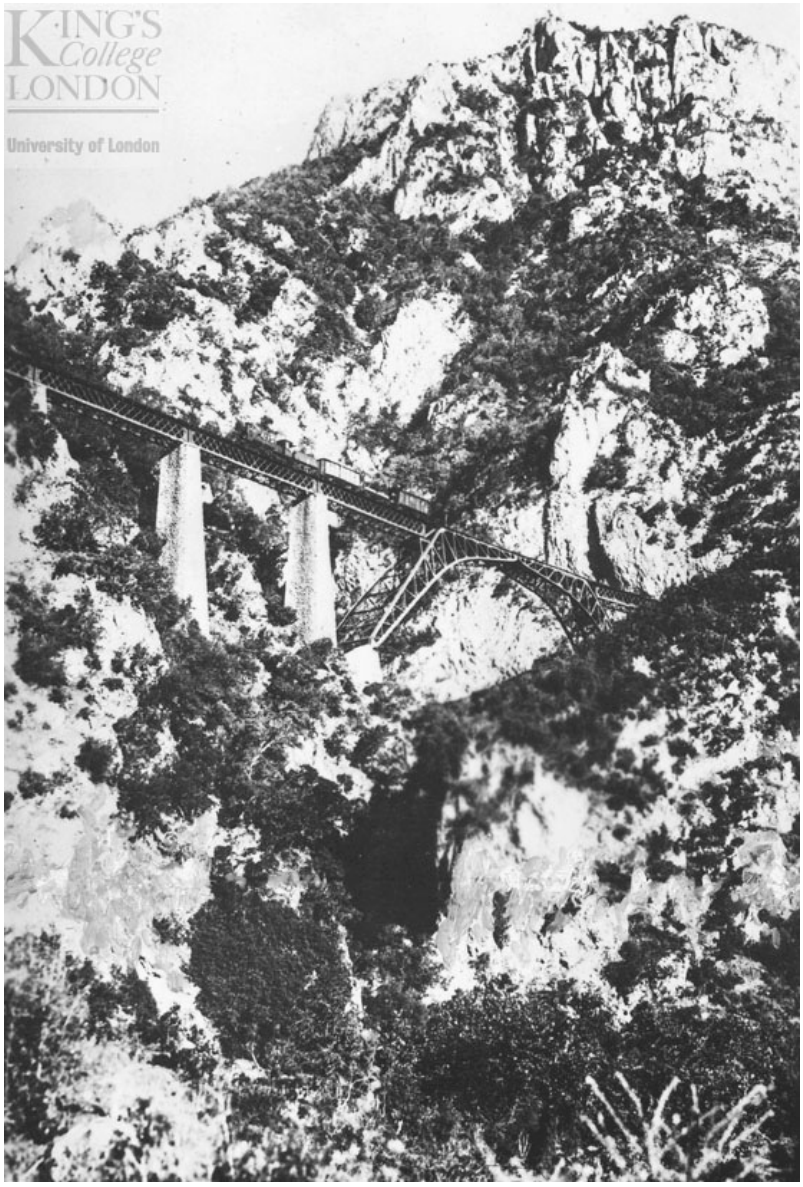

Figure 10. Asopos Viaduct and the Surrounding Terrain in 1943[143]

[142] Richardson, *Case Study in Guerrilla War: Greece during World War Two*, 185.

[143] Source: "King's Collections : Online Exhibitions : Greece," 1943, https://kingscollections.org/exhibitions/archives/empire/cold-war-begins/greece.

The Asopos viaduct was a two-hundred-yard-long cantilever bridge that soared some two hundred feet above the raging Asopos River. The viaduct was passed over as a target in 1942, because of a lack of accessibility. The two main approaches involved traveling through train tunnels, which were impossible for either the commandos or guerrillas to traverse without being spotted. The third approach was from the east across open terrain and was quickly ruled out; the guerrillas estimated they would need 1,000 men with heavy weapons to attack from this direction. The final approach, from the west, was through a near vertical gorge that was considered impossible to navigate. Additionally, the viaduct had a garrison of 40 German soldiers, in strong defensive positions with heavy machine guns and search lights. The Germans were better trained and less likely than the Italians to panic if attacked. All of this made Asopos viaduct seem impregnable.[144]

[144] Gardner, *Guerrilla and Counterguerrilla Warfare in Greece, 1941-1945*, 110.

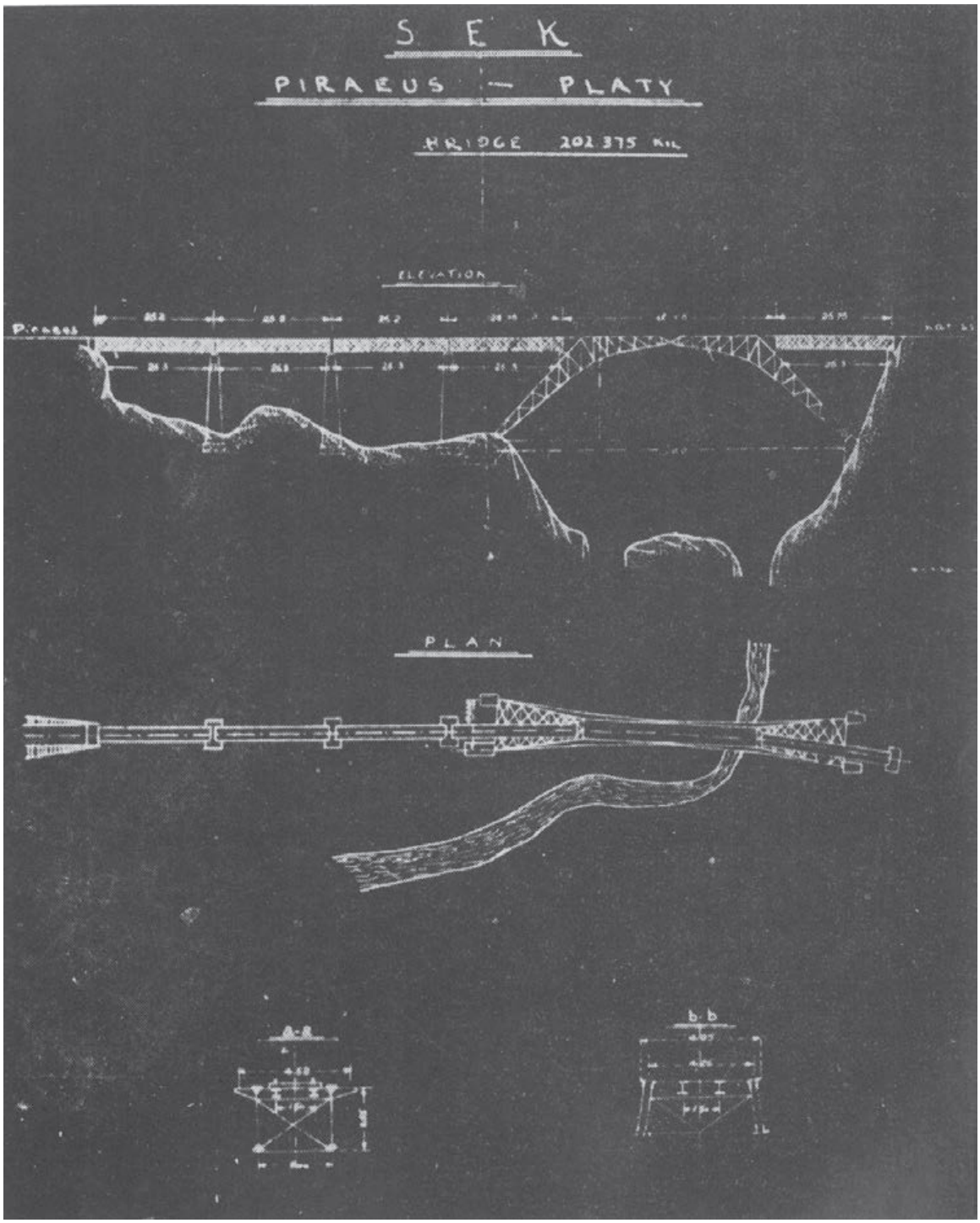

Figure 11. Diagram of Asopos Viaduct used by British Commandos[145]

[145] Source: Richardson, *Case Study in Guerrilla War: Greece during World War Two*, 200.

The British, however, disagreed with the Greek assessment, that the western approach to Asopos was unnavigable, and in late May conducted a successful reconnaissance of the viaduct. On May 21, 1943, six British Commandos made their first attempt to fully navigate the western gorge and sabotage Asopos. After two days of navigating the gorge, they were forced to turn back when they ran out of rope and were unable to descend a waterfall. They stashed their explosives in the gorge and returned to camp bruised and battered from the gorge. No additional rope was available in the local area. The commandos used 340 feet in the initial attempt, and the operation had to be postponed until more rope could be flown in from Egypt.[146]

On June 16, now possessing the needed rope, the Commandos set out again to destroy the Asopos viaduct. The Commandos arrived at the viaduct on June 19 and realized that a German maintenance crew had erected scaffolding and cut a path through the barbed wire at the base of the viaduct. These changes were hugely beneficial to the saboteurs, who now had direct access to the viaduct's main pier. As night fell on the 20th of June, the Commandos began placing their charges. Charge placement took 90 minutes. At one point, a German guard patrolled past the saboteurs. Fearing discovery, a British Commando jumped out of a bush, knocked the German unconscious, and threw him off a cliff into the Asopos River. Once the charges were set, the Commandos lit 90-minute fuses and beat a hasty withdrawal up the gorge. At approximately 2 am, the Asopos viaduct exploded. The entire central span of the bridge and both cantilevers collapsed into the gorge.[147]

The strategic result of the Asopos sabotage was unexpected and profound. The German command in Greece was so convinced of the impregnability of Asopos that they believed the destruction was due to treachery. They condemned the entire German garrison to death, promptly shooting the commanding officer and several men.[148] The specific

[146] M.B. McGlynn, *Special Service in Greece*, vol. Volume 2, The Official History of New Zealand in the Second World War (Wellington: Historical Publications Branch, 1953), 25–26, http://nzetc.victoria.ac.nz/tm/scholarly/tei-WH2-2Epi-c2-WH2-2Epi-j.html; Richardson, *Case Study in Guerrilla War: Greece during World War Two*, 197.

[147] McGlynn, *Special Service in Greece, Volume 2:*28; Gardner, *Guerrilla and Counterguerrilla Warfare in Greece, 1941-1945*, 111–12.

[148] Richardson, *Case Study in Guerrilla War: Greece during World War Two*, 200.

nature of the Asopos viaduct required that a bridge expert be flown in from Germany to effect the repairs. Five weeks after the initial sabotage, as a work crew was anchoring the new superstructure for the bridge, it collapsed. The collapse killed the bridge expert and forty workers, as well as hurling a large section of the bridge into the gorge.[149] In total, the Greek rail line would remain broken well into October of 1943. For sixteen weeks, all Axis logistics through Greece were snarled.[150]

Following the successful Asopos operation, acts of sabotage swept through Greece. British, and also now American, commandos assisted multiple Greek guerrilla bands in destroying and harassing Axis supply lines.[151] Radio became the only viable means of communication in Greece, as telephone and telegraph lines across the country were cut and repair parties attacked. Guerrillas successfully blocked the main highway through Sarandopou pass, for two weeks, cutting off all overland travel between northern and southern Greece. Italians soldiers were unable to dislodge the roadblock due to continual guerrilla harassment. Regaining use of the road ultimately required the deployment of two reinforced German battalions who, after stiff resistance, removed the roadblock. Logistics travel along the east-west rail line was continually delayed as guerrillas cut the rail line in multiple places daily. Fifty miles of the main east-west highway through Greece was methodically demolished by the guerrillas rendering it completely unusable by the Axis. Guerrilla units dynamited every culvert and bridge on the road. In open sections of the highway, guerrillas either collapsed sections of cliff onto the road or blasted the embankments supporting the road, which dropped it into the gorge below. One of the American operational groups destroyed seven bridges, two locomotives, and killed 574 axis soldiers during the summer of 1943.[152] Outside Athens, guerrillas demolished the main bridge to southern Greece. In southern Greece, British and Greek saboteurs blew up a bridge as a train passed over it, causing massive German casualties as the train derailed

[149] McGlynn, *Special Service in Greece*, Volume 2:29.

[150] Gardner, *Guerrilla and Counterguerrilla Warfare in Greece, 1941-1945*, 113.

[151] Anthony Cave Brown, *The Last Hero: Wild Bill Donovan* (New York, N.Y: Times Books, 1982), 431–33.

[152] Brown, 432.

into a ravine. This created additional delays to Axis repairs of the bridge, as bodies, and the train itself, had to be recovered before repairs could begin.[153]

In June and July of 1943, captured German soldiers stated it took them 17 days to travel from Athens to Epirus, a distance of 200 miles. This was because of constant sabotage to the lines of communication. Soldiers and materiel were forced wait at depots while repairs occurred. In response to this, Germany deployed an additional two divisions of troops, roughly 60,000 men, to secure Greece. The German deployment was brutal. Fearing an allied invasion, the German troops sought to stamp out any indigenous resistance as quickly as possible. Between July 2 and 5, of 1943, the Germans summarily executed 187 Greek citizens for suspicion of sabotage acts.[154] These reprisals did not have the intended affect and instead hardened the guerrillas, who continued unabated. Then on July 11, the British commandos received word that the Allied landings in Sicily had succeeded and the guerrillas could stand down. As quickly as they had started their sabotage campaign the commandos and guerrillas ceased all operations and went underground to regroup. Two German Divisions were left impotent on the Greek mainland, unable to reinforce their peers in Sicily who were quickly overrun by Allied forces.

5. Effects and Findings

While guerrilla sabotage operations would continue until the end of the war, they would never again reach the levels seen in 1943. When Italy surrendered to the Allies in September of 1943, Germany assumed full occupation duties in Greece. The Germans estimated that between 67 and 80 percent of mainland Greece was under guerrilla control at the time.[155] Both the countryside and the vital logistic lines were in the hands of the guerrillas. This issue was further confounded by the fact that an Italian division, totaling 12,000 men, surrendered themselves and their equipment to the guerrillas after Italy vacated the war.[156] This provided a huge number of arms to the guerrillas for use against

[153] Gardner, *Guerrilla and Counterguerrilla Warfare in Greece*, 112–14.

[154] Gardner, 115–16.

[155] Richardson, *Case Study in Guerrilla War: Greece during World War Tw*o, 226.

[156] Richardson, 224.

the Germans. While the Germans always retained the ability to travel anywhere in Greece in large formations, and conducted multiple large-scale clearing and anti-guerrilla operations, they would never regain this terrain. They would be violently harassed until their withdrawal in 1944.

Owing to the fastidious record keeping of the British, Germans, and to a lesser extent, the Greeks and Italians, it is possible to identify concrete costs, results, and numbers from the Greek sabotage campaign. Over 18 months, Allied air support parachuted 2,514 tons of equipment to the guerrillas, which cost $2.5 million. British payments to the guerrillas, in the form of gold sovereigns, cost between $1.6 and $3.2 million over the course of the campaign. Both of these figures are extremely low when compared with other campaigns. The Italian guerrillas and Yugoslav guerrillas received 6,000 tons and 16,500 tons of supplies, respectively, during the same period. All of these numbers further pale in comparison to the general cost of an infantry division in the field for the same period. Lastly, the Greek guerrillas were decidedly cheaper and more accurate than conventional bombing missions.[157]

The Greek guerrillas claim they suffered 4,500 killed and another 6,000 wounded between 1942 and 1944. This includes guerrilla casualties suffered during German anti-guerrilla operations. This equates to roughly one in every four guerrillas being a casualty at some point. Another 70,000 Greek civilians were killed in reprisal attacks by both the Italian and German occupation forces.[158] While these numbers seem extreme, they are in fact quite low compared to other Axis-occupied areas during the same time frame. Yugoslavia, for example, experienced 581,000 civilian casualties during Axis occupation.[159] Germany suffered between 5,000 and 15,000 casualties at the hands of the Greek guerrillas. Though exact Italian casualties are unknown, it is likely they are much

[157] Richardson, 7.

[158] Richardson, 6–8.

[159] World Peace Foundation, "Yugoslavia: Post World War II, Mass Atrocity Endings," 2015, https://sites.tufts.edu/atrocityendings/2015/08/07/yugoslavia-post-wwii-assaults/.

higher due to their larger occupation force and the guerrillas' tendency to target Italian formations over German formations.[160]

The Special Operations Research Office at Johns Hopkins University estimated that the Greek guerrillas had a tie down effect of 1:3 on the Axis. This meant that the Axis dedicated three soldiers for every guerrilla they believed existed.[161] In 1943, at the height of Axis occupation, there were roughly 22,000 guerrillas and 590,000 Axis soldiers in Greece.[162] Elements of the Axis forces were there to defend against any potential invasion by the British from Egypt, however the bulk were there to thwart the guerrillas. This density of counter-guerrilla forces is a remarkable feat for such an impoverished and small territory, particularly when the guerrilla population was much smaller than what the Germans estimated, and their main activity was sabotage not pitched engagement with Axis forces.

The American Surge in Iraq provides a powerful recent comparison. Greece during the 1940s had a population of approximately 7.3 million[163] with an active guerrilla population of approximately 22,000.[164] Conversely, Iraq, during the U.S. surge in 2007, had a population of approximately 28 million[165] and an estimated Sunni insurgent population of 70,000.[166] This gives fairly similar densities of guerrillas and insurgents at .03 percent and .025 percent of the population, respectively. In 1943, the Germans surged two Divisions, or 60,000 troops, to support counterinsurgency, bringing the total number of Axis troops to roughly 590,000 in Greece. This equated to roughly one Axis soldier for every twelve Greek citizens. For the surge in Iraq, the U.S. deployed an additional 30,000

[160] Richardson, *Case Study in Guerrilla War: Greece during World War Two*, 7.

[161] Richardson, 7.

[162] Richardson, 218.

[163] Richardson, 33.

[164] Richardson, 218.

[165] Nicholas Schlosser, *The Surge 2007-2008*, 1st ed. (Washington: Center of Military History US Army, 2017), 9, https://history.army.mil/html/books/078/78-1/cmhPub_078-1.pdf.

[166] Schlosser, *The Surge 2007-2008*, 26.

soldiers for a total U.S. troop population of 170,000 soldiers.[167] This equated to approximately one U.S. soldier for every 165 Iraqi citizens. These numbers do not take into account the Iraqi and multinational forces supporting counterinsurgency operations. However, it is safe to assume that even including them would not amount to anything close to a ratio of one soldier for every twelve Iraqi citizens. In order to get to the ratio Greece experienced, Iraq would have needed a little more than 2.3 million troops on the streets. This is simply not feasible today. A RAND study from 2011 highlights that the U.S. Army, who provided the overwhelming bulk of ground forces, possessed very little unutilized manpower during the Surge.[168] There were essentially no more U.S. Army units to deploy. Most importantly in examining this comparison is the reality that, despite such a high soldier to insurgent ratio, the Greek guerrillas continued to conduct regular and successful sabotage operations.

The impact of Greek guerrilla sabotage attacks on Axis logistics provided valuable strategic support to Allied operations. Constant sabotage of the limited Greek railway system created huge logistical shortfalls for the German Afrika Corps. The sabotage of the Gorgopotamos and Asopos Viaducts stopped all rail traffic to North Africa for six and sixteen weeks, respectively. Only 415 miles of the 1,700 miles of railway infrastructure in Greece remained usable by 1944.[169] Guerrillas destroyed 1,300 bridges and forced German convoys to travel with heavy protection. This stressed German materiel means, particularly trucks and gasoline, which were in short supply. During the lead up to the Allied invasion of Sicily, Greek guerrillas tied up two German Divisions, in addition to the 500,000 Italian troops and 30,000 German troops already tasked with occupation duty. This denied the Axis valuable reinforcements during the Allied landings.

[167] Reuters Staff, "Timeline: Invasion, Surge, Withdrawal; U.S. Forces in Iraq," *Reuters*, December 15, 2011, https://www.reuters.com/article/us-iraq-usa-pullout-idUSTRE7BE0EL20111215.

[168] Dave Baiocchi, *Measuring Army Deployments to Iraq and Afghanistan*, Research Report (Santa Monica CA: RAND Corporation, 2013), 1.

[169] Richardson, *Case Study in Guerrilla War: Greece during World War Two*, 220.

6. Conclusion and Future Potentialities

The Greek guerrillas and their sabotage campaign are overshadowed by the reality that, following the conclusion of World War Two, Greece experienced a civil war. This civil war was fought by the same disparate guerrilla bands, specifically the communist bands, that had fought against the Axis occupation. While not addressed in this case study, the British, and later American, commandos spent much of their time during WW2 convincing the different guerrilla bands to work in coordination with each other rather than independently or against each other. This was particularly true between the republican and communist guerrilla factions who bitterly hated each other. With the withdrawal of the Axis occupation these elements quickly turned on each other. The Greek Civil War would require the deployment of U.S. advisors as well as economic and military support to subdue communist elements and restore peace to Greece.[170] This is how Greece in the 1940s is generally remembered.

This overshadowing, however, ignores the lessons, and strategic impact, of the Greek guerrillas in World War Two. By taking advantage of favorable terrain and understanding the logistical requirements of a modern army, the guerrillas were able to have an oversized impact during the war. The Asopos viaduct operation is considered one of the greatest acts of sabotage during the war.[171] Six commandos with a small bag of explosives denied Axis forces access to rail logistics for a whole theater of operations for sixteen weeks. Guerrilla sabotage operations forced the Axis to dedicate valuable men and material to safeguard lines of communication which meant they could not be employed elsewhere.

The Greek guerrillas highlighted the criticality and vulnerability of logistics in modern war and how affecting it can limit escalation. Viaduct sabotage in Greece affected German operations in North Africa and removed critical combat power from the front lines. Limiting access to the materiel that enables war limits the ability to wage such wars. The

[170] Harvey Smith, "Greek Guerrilla Forces," Intelligence Report (Athens, Greece: US Army, August 20, 1949); H.A. Tidmarsh, "Organization of the Bandit Army," Intelligence Report (HA Greece: Greek Army Intelligence School, December 15, 1948).

[171] McGlynn, *Special Service in Greece*, Volume 2:29.

specific targeting of viaducts and roadways through mountainous terrain delayed repairs and made interdiction efforts by counterguerrilla forces very difficult. The Greek guerrillas showed how low-cost directed sabotage against critical transportation infrastructure can impact strategic capabilities and affect theater level operations.

E. CASE STUDY #3 THE WIND OF REVOLUTION: THE WEATHER UNDERGROUND

> We have attacked the Capitol because it is, along with the White House and the Pentagon, the worldwide symbol of the government which is now attacking Indochina. To millions of people here and in Latin America, Africa, and Asia, it is the monument to U.S. domination over the planet. The invaders of Laos will not have peace in this country
>
> —Weather Underground, communiqué 8, February 28, 1971

1. Introduction

On Saturday July 26th, 1969, two bombs exploded at the United Fruit Warehouse along the Hudson River in New York City. The forty sticks of dynamite used in the bombs damaged a door and punched a hole in the warehouse's outer wall. While not particularly meaningful in a destructive sense, the warehouse was used as storage for a tugboat company, the explosions were historic. They marked the start of the Radical Underground bombing campaign in America.[172] The protesters of the '60s threw rocks and Molotov cocktails. The Radical Underground, an umbrella term for the myriad domestic terrorist groups of the 1970s and '80s, would use bombs. In 1972, Radical Underground groups conducted 1,900 bombings in America.[173] Those numbers are unimaginable today, when a single small explosion will bring dozens, if not hundreds, of federal and local officials to the scene.

The most successful of these groups was the Weather Underground, or simply the Weathermen. A radical left-wing group, the Weather Underground publicly declared war

[172] Bryan Burrough, *Days of Rage: America's Radical Underground, the FBI, and the Forgotten Age of Revolutionary Violence*, Paperback edition (New York: Penguin Books, an imprint of Penguin Random House LLC, 2016), 15–16.

[173] Burrough, *Days of Rage*, 5.

on America. It would go on to conduct dozens of attacks, including successfully bombing the Pentagon, the State Department, and the U.S. Capital Building, before dissolving in the late 1970s.[174] What made the Weather Underground so successful was its willingness to take risks, and its outside support from Cuba and North Vietnam.[175] Extensive literature exists on the Weathermen, much of it written by former Weathermen, though little exists to discuss the benefit they provided to their sponsors. The Weather Underground provides a valuable historic case study on the validity of providing proxy support to domestic terrorist organizations. The Weather Underground shows that supporting domestic terrorism, particularly the sabotage and bombings against security forces for which the group was known, is a means to disrupt and impose costs on a country without escalating to interstate violence. With a return to multipolarity in international affairs, it is pertinent to understand this option.

2. Background

The 1960s and early 70s saw the United States and much of the world in turmoil.[176] U.S. involvement in the Vietnam War was unpopular. The Cuban Missile Crisis had almost destroyed the world. The assassinations of President John F. Kennedy and Dr. Martin Luther King Jr. were fresh in the collective U.S. memory. The civil rights movement remained a divisive topic. For the first time in history, war and racial injustice were being broadcast directly into people's living rooms. The youth of America, having grown up with parents who extolled America as all that was right in the world, were appalled.[177] Hunter S. Thompson, writing for Rolling Stone, colorfully described the period between 1965 and

[174] Federal Bureau of Investigation, "Weather Underground Summary Dated 8/20/76 Part #1," File (Washington: Federal Bureau of Investigation, August 20, 1976), https://vault.fbi.gov/Weather%20Underground%20%28Weathermen%29/Weather%20Underground%20%28Weathermen%29%20Part%201%20of%206.

[175] Federal Bureau of Investigation.

[176] Jeremi Suri, *Power and Protest: Global Revolution and the Rise of Detente* (Cambridge, Mass.: Harvard Univ. Press, 2005), 1–6.

[177] Burrough, *Days of Rage*, 56–57.

1970 as a "nightmare of failure."[178] His coverage of the Democratic National Convention in 1968 is even more damning.

> Probably it was Chicago – that brain-raping week in August of '68. I went to the Democratic Convention as a journalist, and returned a raving beast. For me, that week in Chicago was far worse than the worst bad acid trip I'd even heard rumors about. It permanently altered my brain chemistry, and my first new idea – when I finally calmed down – was an absolute conviction there was no possibility for any personal truce, for me, in a nation that could hatch and be proud of a malignant monster like Chicago[179]

It was in this context, this belief that America was not what they were told it was, and not what they wanted, that youth protest groups sprang up to fight injustice, as they saw it. The first and largest college protest organization was the Students for a Democratic Society (SDS). The SDS served as the initial organization that many of the later domestic terror groups, such as the Weather Underground, would come from. A left-wing organization, the SDS protested for civil rights and against the Vietnam War with slogans such as "Not with my body you don't."[180] As early as 1966, though, SDS leaders saw limited responses to their protests and began to talk about the need for violent action under the new slogan "From Protest to Resistance."[181] Peaceful protests in America continued to be met with police violence and limited change in policy. Then in 1968, multiple protests erupted around the world almost simultaneously. In North America, South America, and both Eastern and Western Europe, workers and citizens yelled and fought their governments for change. It seemed that the revolution was underway. It was from this turmoil that members of the SDS decided violence was necessary, and the Weather Underground was formed.

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[178] Hunter S Thompson, Jann Wenner, and Paul Scanlon, *Fear and Loathing at Rolling Stone: The Essential Writing of Hunter S. Thompson* (New York: Simon & Schuster, 2012), 25.

[179] Thompson, Wenner, and Scanlon, *Fear and Loathing at Rolling Stone*, 34.

[180] Burrough, *Days of Rage*, 58–59.

[181] Burrough, 59.

3. Foundations and Initial Actions

The Weathermen officially formed in a Chicago apartment in the winter of 1968–69.[182] They took their name from a Bob Dylan song and viewed themselves as the vanguard of the revolution to overthrow America. In their minds, they were the winds of change. The FBI, which was monitoring the SDS, identified the formation of the Weathermen, and from the very beginning viewed the group as a strategic threat to America.[183] The FBI's number two man went so far as to state that the Weathermen could be more damaging than the Communist Party in America had been during the 1930s.[184] In early 1969, the Weathermen sought to turn themselves from the affluent coffee shop intellectuals they were into the "urban fighting force" that their leader John Jacobs, known as JJ, desired. The Weathermen sent cells from their initial cadre of followers in Chicago, to every major city in America. They then began conducting street brawls against police. They also invaded high schools and university classrooms, where they preached the need for violent revolution, to garner support. This work culminated in the Days of Rage, beginning October 8, 1969.[185]

The Days of Rage were not a tactical success. The series of violent riots in Chicago were far smaller and more expensive, in literal U.S. dollars, than the Weathermen had anticipated. Leaders of the Weather Underground hoped that thousands of young revolutionaries would show up in Chicago's Lincoln Park to support the revolutionary movement. Around 200 actually attended. Initially, the Chicago Police were unprepared, and the small crowd of Weathermen were able to leave the park and began destroying a wealthy neighborhood nearby. The police quickly responded, stopped the riot, and arrested a number of the Weathermen. Three days later, the Weathermen tried again to riot. This time, the police were prepared and arrested over 120 rioters. In total, the riots cost the SDS, which the Weather Underground was still technically a part of, $2.3 million in bail money

[182] Burrough, *Days of Rage*, 67–69.

[183] Federal Bureau of Investigation, "Weather Underground Summary Dated 8/20/76 Part #1."

[184] Burrough, *Days of Rage*, 71.

[185] Burrough, 79–81.

alone.[186] The rioters did fairly minimal damage and were easily bested by the police. Despite this shaky start, the Days of Rage nevertheless cemented the Weather Underground as a radical militant organization. This enabled it to garner support and funding from domestic and international donors. The riots also convinced Weather Underground leadership that protests and open street brawls were futile. More violent clandestine urban guerrilla tactics were necessary.[187]

Figure 12. Weathermen Leading the Days of Rage Protests in Chicago[188]

Following the riots in Chicago, many members of the Weather Underground disappeared into the social underground of America. They moved to different cities and adopted new names and identities to defeat police and FBI monitoring. Identity theft was a whole branch of the Weathermen. They needed to ensure that members always had spare identities in the event their covers were blown. Their most popular tactic was to use the records from dead infants to file for social security cards, which would then allow them to

[186] Burrough, 79–81.

[187] Burrough, 81–82.

[188] Source: Fenton, David. Getty Images, 1969

get drivers' licenses and government identification.[189] With the ability to assume new identities and avoid detection, the Weather Underground now felt they could begin their bombing campaign.

4. Proxy Support and Bombing Campaign

The Soviet Union and its various communist allies directly and indirectly sponsored several proxy forces in America during the Cold War. The Weather Underground was one of those proxies. Police and the FBI labeled the Weather Underground as a domestic terrorist organization. However, declassified Top Secret FBI documents show that the key members of the Weathermen were trained and sponsored by the Cuban government.[190] These FBI documents from 1976 show that the Cuban government, who viewed the United States as its number one enemy, used the Weather Underground as a means to support its national policy goals. The Weather Underground was further sponsored and supported by the North Vietnamese government as a tool to stir up anti-war sentiment in hopes that domestic dissent would force the United States to withdraw from South Vietnam.[191] The North Vietnamese went so far as to encourage the Weather Underground to recruit individuals who had already shown a hatred for authority, such as those who had previous histories fighting the police. This was a departure from other leftist organizations in the 1960–70s who largely recruited from college campuses.[192] Starting in July of 1969, before the Weather Underground conducted any violent actions, they met in Cuba with representatives of the Cuban and North Vietnamese governments. These communist advisors provided guidance and training for "revolutionary acts." This foreign influence and advisement would continue throughout the 1970s.[193]

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[189] Burrough, *Days of Rage*, 92.

[190] Federal Bureau of Investigation, "Weather Underground Summary Dated 8/20/76 Part #1."

[191] Federal Bureau of Investigation.

[192] Federal Bureau of Investigation.

[193] Federal Bureau of Investigation, "Weather Underground Summary Dated 8/20/76 Part #2," File (Washington: Federal Bureau of Investigation, August 20, 1976), https://vault.fbi.gov/Weather%20Underground%20%28Weathermen%29/Weather%20Underground%20%28Weathermen%29%20Part%202%20of%206.

"Beyond any doubt, Cuba has shaped, supplied technical training to, given political indoctrination for and, perhaps most important of all, served as the inspiration for the American radical movement in its avowed aim to bring down the American system that it so fiercely despises," reads a passage from declassified FBI documents outlining the influence and support by a foreign power that the Weather Underground received.[194] Documents further show that the Cuban Mission to the United Nations conducted secret meetings and dispersed funds to support "revolutionary acts" within the United States.[195] However, Weather Underground members met not just with Cuban advisors but also with North Vietnamese, Soviet, and Chinese advisors. North Vietnamese advisors wanted the Weather Underground to "Bring the war home." They actively supported Weathermen acts of violence in the U.S..[196] The North Vietnamese told Bernadine Dohrn, a senior member of the Weathermen, said that "you must begin to wage armed struggle as soon as possible."[197] They went so far as to present the Weathermen with rings made from the metal of U.S. fighter jets shot down in Vietnam.[198]

[194] Federal Bureau of Investigation.

[195] Federal Bureau of Investigation.

[196] Federal Bureau of Investigation.

[197] Burrough, *Days of Rage*, 74.

[198] Burrough, 76.

Figure 13. Poster for the Days of Rage Protests[199]

With foreign support and training, on October 7, 1969, the Weather Underground conducted its first bombing, to coincide with the Days of Rage, destroying the police monument at Haymarket Square in Chicago. Subsequently, the Weather Underground took up an initial tactic of bombing police stations and courthouses. They bombed the Berkeley Police station, the Chicago Police Department, and firebombed the house of a judge in New York City. On March 6th, 1970, a Weather Underground safe house exploded in Greenwich Village, killing three Weathermen who were preparing bombs to attack a U.S. Army dance in Fort Dix, New Jersey. In the wake of the explosion, and the death of several members, the Weathermen opted to begin a campaign of strategic sabotage against U.S. government facilities rather than personnel.[200] Throughout 1970–71, the Weather Underground built and stocked "bomb factories" in major U.S. cities such as New York, San Francisco, Detroit, and Chicago, while also successfully bombing the New York Police Headquarters, the Pentagon, and a California prison. In 1973, they bombed the International Telephone and Telegraph Corporation in New York City. In 1974, the Weathermen successfully bombed the Gulf Oil Headquarters and the Office of the California Attorney General. Finally, in 1975, they bombed the State Department and the U.S. Capitol building.[201] In total, the Weather Underground would be responsible for more than two dozen bombings and attempted bombings, 19 of them against strategic government facilities, in less than five years.

[199] Source: Todd Gitlin, "What Was the Protest Group Students for a Democratic Society? Five Questions Answered," *Smithsonian* Magazine, May 4, 2017, https://www.smithsonianmag.com/history/what-was-protest-group-students-democratic-society-five-questions-answered-180963138/.

[200] Federal Bureau of Investigation, "Weather Underground Summary Dated 8/20/76 Part #1."

[201] Federal Bureau of Investigation; United States. Congress. Senate. Committee on the Judiciary. Subcommittee to Investigate the Administration of the Internal Security Act and Other Internal Security Laws, *State Department Bombing by Weatherman Underground : Hearing before the Subcommittee to Investigate the Administration of the Internal Security Act and Other Internal Security Laws of the Committee on the Judiciary, United States Senate, Ninety-Fourth Congress, First Session, January 31, 1975* (Washington : U.S. Govt. Print. Off., 1975), http://archive.org/details/statedepartmentb00unit.

Figure 14. Aftermath of the New York City Townhouse Explosion that Killed Three Weathermen[202]

5. Copycats and Effects

The Weather Underground's focus on attacking government and industrial infrastructure did not go unnoticed. After the Weather Underground publicly released its manifesto, *Prairiefire*, in early 1974, multiple homegrown groups attempted to copy Weathermen tactics. Twenty bombings and attempted bombings occurred in California alone.[203] The impact these bombings had, not just in physical damage but also in psychological effect, was far reaching. The Quicksilver Times Newspaper of Washington, D.C., published an article on November 20, 1970 arguing that by 1972, Americans should expect a guerrilla war in the United States. The article continued by saying that a few acts

[202] Source: "Weather Underground Bombings," Page, Federal Bureau of Investigation, 1970, https://www.fbi.gov/history/famous-cases/weather-underground-bombings.

[203] United States. Congress. Senate. Committee on the Judiciary. Subcommittee to Investigate the Administration of the Internal Security Act and Other Internal Security Laws, *State Department Bombing by Weatherman Underground*.

of strategic sabotage combined with political assassinations would "bring America to an angry, ass-grinding halt."[204] Dismantling and defeating the Weather Underground and its fellow Radical Left terror groups was the FBI's number one priority.

Despite its consistent pace of operations, the Weather Underground cost very little to operate. Its bombs were exceedingly cheap to make and employ. In 1970, twenty-three states had limited to no restrictions on dynamite sales, and sixty dollars bought two cases of dynamite. Two cases were enough to build multiple bombs.[205] Bill Ayers, one of the founders, stated in his memoir, *Fugitive Days,* that the operation to bomb the Pentagon had cost less than $500.[206] Conversely, that same bomb caused over $100,000 in physical damage and even more in psychological effects to the U.S. Government. Following the bombing of the New York City Police Headquarters, substantial security upgrades were made across the city at both public and private buildings, at no small cost.[207] The Weathermen' bombing of the U.S. Capital building alone did more than $300,000 in damage.[208] These were significant impacts based on the low cost of employment their bombs and the oversized political impacts the subsequent explosions had.

[204] United States. Congress. Senate. Committee on the Judiciary. Subcommittee to Investigate the Administration of the Internal Security Act and Other Internal Security Laws.

[205] Burrough, *Days of Rage*, 151.

[206] William Ayers, *Fugitive Days: A Memoir* (Boston, Mass: Beacon Press, 2001), 261.

[207] Burrough, *Days of Rage*, 130–31.

[208] Burrough, 164.

Figure 15. NYPD HQ after the Weather Underground Bombing 1970[209]

The size of the Weather Underground also enabled it to keep costs low, maintain secrecy, and subsequently avoid detection and apprehension. The New York cell of the Weather Underground, for example, averaged six people. The U.S. Government spent tens of millions of dollars and thousands of man hours in New York alone trying to track down these six people. The FBI had Weathermen Task Forces in many major cities.[210] In 1970, two thousand Federal Agents were assigned to counter the Weathermen and its Radical Left peers.[211] All of these cost time, energy and money. That was time, energy, and money that could not be used elsewhere. The investment in the Weather Underground by donors, such as Cuba and North Vietnam, was seemingly small compared to the rewards. Unfortunately, it is unknown exactly how much money and training Cuba and North

[209] Source: Fenton, David. Getty Images, 1970

[210] Federal Bureau of Investigation, "Weather Underground Summary Dated 8/20/76 Part #1."

[211] Ron Jacobs, *The Way the Wind Blew: A History of the Weather Underground* (London ; New York: Verso, 1997), 116.

Vietnam provided to the Weather Underground, as no element has ever spoken about it. Additionally, Cuba and North Vietnam hid their contributions through a number of cut outs and intermediaries. It has been suggested that the National Lawyers Guild, which represented first the SDS and later Weather Underground members at trial, was the premier intermediary for financial support to the Weather Underground. The U.S. Government has been unable to legally substantiate this claim, however. It is clear, though, that members of the National Lawyers Guild did provide money, representation, and housing to members of the Radical Left, including the Weather Underground.[212]

6. Dissolution and Findings

The Weather Underground would dissolve in the mid-1970s for a multitude of reasons, not least of which was its members desire to live. The death of three Weathermen in an accidental explosion, in Greenwich Village, took a heavy toll on the group. While they valued their far-left ideals, none of the members wanted to die over these ideals. The American drawdown in Vietnam also meant that the Weather Underground was losing its anti-war pillar.[213] Another factor that led to the dissolution of the Weather Underground resulted from the illegal operations that the FBI had conducted while investigating the group. These missteps by the FBI forced Federal Prosecutors to drop almost all the charges against the Weathermen.[214] This provided a viable exit strategy for many members of the Weathermen, two of whom were on the FBI's top ten most-wanted list. Lastly, the U.S. people, particularly the young college students who were the Weathermen's base, had moved on. U.S. culture adopted the clothes, music, and hairstyles of the counterculture, but had no interest in its politics. The Weathermen and their revolution became irrelevant.[215]

What remains overlooked is the outside support that the Weather Underground received and the U.S. response to this support. According to the Weather Underground,

[212] Burrough, *Days of Rage*, 142.

[213] Jacobs, *The Way the Wind Blew*, 173.

[214] Burrough, *Days of Rage*, 370–72.

[215] Burrough, 6–7.

much of its funding came from the radical National Lawyers Guild.[216] The National Lawyers Guild maintained ties with the Cuban government, which likely enabled them to funnel money to the Weather Underground. Regardless, it is clear that Cuba and North Vietnam supported the Weather Underground with training, support, and funding.[217] Why then did the United States not actively work to dissuade and disrupt this support? This support went to terrorists who subsequently blew up U.S. infrastructure. Austin Carson's theory provides a potential answer.

Support to the Weather Underground from the North Vietnamese Government makes logical sense. The U.S. and North Vietnamese governments were in a conventional war in Indochina and the North Vietnamese were looking for alternative ways to affect the U.S. Cuba, though, was not at war with the U.S. Why then did Cuba, a miniscule country in terms of power, seek to covertly support domestic terrorists? For example, in early 1970, the Chicago Daily News reported that, with the exception of the actual representative to the United Nations, every member of the Cuban Mission to the UN in New York was a Cuban Intelligence Officer tasked with supporting subversion in the United States. Then later the same year, two Cuban officials were declared *persona non grata* in the U.S. after a still classified issue that involved support to far-left U.S. radicals and involved explosives.[218]

Applying Austin Carson's framework for covert interaction provides a theory for why the U.S. and Cuba acted the way they did.[219] His theory, applied to the case study of the Weather Underground, also illuminates a potential future use for domestic terrorists in a multipolar world. Carson's theory is that states look to limit escalation in conflict for a number of reasons, but particularly if that escalation could lead to outright inter-state

[216] Burrough, 142.

[217] Federal Bureau of Investigation, "Weather Underground Summary Dated 8/20/76 Part #3," File (Washington: Federal Bureau of Investigation, August 20, 1976), https://vault.fbi.gov/Weather%20Underground%20%28Weathermen%29/Weather%20Underground%20%28Weathermen%29%20Part%203%20of%206; W.R. Wannall, "Directors Meeting 3/31/71 with Attorney General, Mr. Richard Helms and Admiral Noel Gaylor" (Washington Federal Bureau of Investigation, 1971), https://nsarchive.gwu.edu/documents/spying-americans-new-release-infamous-huston-plan/17a.pdf.

[218] Federal Bureau of Investigation, "Weather Underground Summary Dated 8/20/76 Part #3."

[219] Carson, *Secret Wars*. Pp 26-74

conventional or nuclear war. This need to limit escalation leads aggressor states to intervene covertly, or sub-conventionally. Often this covert intervention is identified by the opposing state. From here, Carson argues that the opposing state, not desiring to escalate either, will often deny, refuse to acknowledge, or even actively collude with the intervening state to hide the covert intervention.

In the case of the Weather Underground, Carson's theory seems to explain why U.S. authorities, intelligence officials, and leaders did not actively seek to expose or thwart foreign support, particularly support from Cuba and North Vietnam. The United States was already in a costly war with North Vietnam. It was simultaneously shouldering the brunt of conventional and nuclear deterrence operations against the Soviet Union in Europe. The failed Bay of Pigs invasion and the feverish nightmare of the Cuban Missile Crisis were still fresh in leaders' minds. If Cuban direct support to domestic terrorists became open knowledge, the U.S. government may have been forced to openly act against Cuba because of hawkish domestic pressure. This was likely viewed as an unacceptable escalation by U.S. government officials and leaders. Officials instead opted to hide the evidence of foreign involvement and directly target the Weather Underground.

From the Cubans' perspective, their leaders viewed the U.S. as enemy number one.[220] Again, the failed Bay of Pigs invasion and the Cuban missile crisis showed that the American government was openly hostile to the government of Cuba. However, Cuba lacked a traditional overt means to affect American policy, such as economic embargoes or military coercion. It instead opted to intervene covertly in American affairs as a means of costly signaling about Cuba's resolve against the United States.[221] Cuba was so successful in this that the Senior Counterintelligence Officer for the Defense Intelligence Agency listed Cuban covert capabilities as being among the best in the world.[222] This costly signaling also provided Cuba the opportunity to present a voice of peace and civility

[220] Stéphane Lefebvre, "Cuban Intelligence Activities Directed at the United States, 1959–2007," *International Journal of Intelligence and CounterIntelligence* 22, no. 3 (June 1, 2009): 452–69, https://doi.org/10.1080/08850600902896928.

[221] Lefebvre.

[222] Lefebvre.

on its front stage, through the Cuban Mission to the United Nations, while enabling more assertive backstage discussions with the United States. It is speculative, but this more assertive backstage may explain why the Department of Defense listed Cuba as a threat to U.S. technologies.[223] Overall though, it seems accurate to say that Cuba correctly judged that while the United States viewed Cuba as a threat, it did not wish to risk escalation in the Caribbean.

7. Conclusion and Future Potentialities

The Weather Underground were wildly successful for a group of upper-class college students with no background in guerrilla warfare. With less than fifty core members, they occupied 20 percent of the FBI's most wanted list at one point.[224] Their actions are unique among the other case studies and examples in that they show the effects of a stochastic campaign of sabotage against the pillars of society. This is vastly different than the other studies which highlight campaigns against military functions. Ultimately, their bombing campaign caused millions of dollars in damage and diverted incredible amounts of the U.S. domestic security apparatus to combat such a small organization. They publicized their actions and encouraged copycat bombings, which is also unique in the presented case studies. The Weather Underground is a key case study of far-left terror groups and sabotage organizations.

Additionally, Cuba and North Vietnam's involvement, posturing with, and support to the Weather Underground highlights the low-cost high-reward potential in covertly supporting resistance groups. To further this point, U.S. willingness to publicly downplay foreign support to a labeled domestic terror organization provides an interesting precedent to explore future potentialities. With a return to multipolarity in world politics, in particular the rise of Russia and China, the more traditional and overt means that America uses to strong-arm bellicose powers become less useful. While not foolproof, the Weather Underground case study provides promise. Covert support to foreign resistance movements, particularly those that focus on the destruction of government infrastructure,

[223] Lefebvre.

[224] Jacobs, The Way the Wind Blew, 112–13.

could serve as a viable low-cost tool to impose costs and re-direct security and military assets to domestic security vice external security, while concurrently reducing the risk of escalation to overt conflict.

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IV. FINDINGS

A. CRITICAL INFRASTRUCTURE FROM THEN TO NOW AND WHY ATTACKING IT MATTERS

This thesis is predicated on two arguments about infrastructure. The first is that infrastructure design has remained fairly consistent over the last 100 years. Second is reliance on critical infrastructure has increased while the ability to build and repair such infrastructure has decreased.

The first argument does not imply that critical infrastructure has not improved over the last century. It means that the infrastructure's base form has remained consistent. Put simply, a car from the early 1900s could drive on a modern road because a road's base form has remained the same even if the technology involved in construction has greatly improved. Likewise, power generation and distribution, as an example, have utilized similar means across the last century. The primary method continues to be centralized generation of power and then distribution along lines to consumers.[225] While the efficiency has increased, all issues with this system remain the same. Distribution through electric cables remains the primary form of electricity transfer worldwide. Damage to these cables, such as a tree falling and severing a cable during a storm, results in the cessation of power transfer. This remains as true today as it did in 1900.

For further proof of this consistency in critical infrastructure's base form, examine the structure of railroads, which were a primary target of saboteurs in the case studies. Railroads operate by a train locomotive, and its subsequent cars, running along two vertical rails laid in parallel a set distance apart on a track. The distance between the rails is called the gauge.[226] Worldwide, there are three distinct gauge sizes: narrow, standard, and broad. These gauge sizes were standardized in the mid-1800s.[227] Following the Civil War, the

[225] David Tuttle et al., "The History and Evolution of the U.S. Electricity Industry," White Paper (Texas: University of Texas at Austin, 2016).

[226] George W. Hilton, "A History of Track Gauge," TrainsMag.com, May 1, 2006, http://trn.trains.com/railroads/abcs-of-railroading/2006/05/a-history-of-track-gauge.

[227] Hilton.

Lincoln administration mandated that all railroads in the U.S. be built on the same gauge for efficiency in logistics and personnel movement.[228] This became standard gauge and accounts for 60 percent of railroads worldwide.[229] The second most widely used gauge is broad gauge. It is found in Russia and many former Soviet states. It was standardized by Czar Nicholas I in the 1840s.[230] Trains are designed to run along rails of a specific gauge and any change to this gauge can have detrimental effects on a train to include derailment. While materials have improved, the assembly of rail lines has remained essentially unchanged since trains were invented. A level base layer is carved out of the ground. On top of this cleared ground are placed cross ties made of either wood or concrete, usually twenty inches apart. Finally, the metal rails are laid on top of the cross ties and fastened to the cross ties with spikes.[231] This level of standardization, in both gauge and assembly of the rail line, means that, while rail technology has improved over the last century, the base infrastructure of railroads remains essentially unchanged.

The second argument, that reliance on critical infrastructure has increased while the ability to construct or repair this infrastructure has decreased, is critical to understanding how infrastructure sabotage can affect interstate competition. Two simple comparisons anchor this argument. The first is comparing critical infrastructure requirements over the last 100 years. The second is comparing critical infrastructure construction and repair times.

The first comparison, comparing infrastructure requirements across time, is easily done. The Combat Studies Institute of the U.S. Army published a paper in 2007 specifically on the increasing logistics requirements of modern armies, which was mentioned earlier in Chapter 2.[232] John McGrath's study on the increasing Tooth to Tail Ratio (T3R) of modern

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[228] Hilton.

[229] "Complications for a Railway Project from Russia to Europe," Stratfor, October 10, 2012, https://worldview.stratfor.com/article/complications-railway-project-russia-europe.

[230] "Complications for a Railway Project from Russia to Europe."

[231] Paul D. Schneider, "Crossties," TrainsMag.com, May 1, 2006, http://trn.trains.com/railroads/abcs-of-railroading/2006/05/crossties.

[232] McGrath, *The Other End of the Spear: The Tooth-to-Tail Ratio (T3R) in Modern Military Operations.*

forces provides quantitative proof that the logistics requirements continue to increase in order to enable the employment of advanced combat forces. Between World War One and Operation Iraqi Freedom in 2005, the T3R has grown from 60:40 to 25:75. In the span of 85 years, the U.S. military went from 60 percent of its forces being combat related to only 25 percent. The remaining 75 percent of military forces conduct logistics and support functions.[233] This is in no small part due to the ever-increasing requirements to maintain advanced military technology. For instance, the M1 tank, the current U.S. Main Battle Tank, requires three times the fuel and 20 percent more repair stockpiles than the M60 tank that preceded it.[234] This rise in logistics demands an increased reliance on critical infrastructure in order to maintain forces in the field.[235]

Logistics is not the only modern requirement that has increased reliance on critical infrastructure. Like the M1 referenced above, many modern pieces of military hardware have robust infrastructure requirements that are far more robust than previous generations of equipment. The Royal Australian Air Force, which opted to upgrade from the F/A-18 fighter jet to the F-35A, is in the midst of improving their facilities because their current infrastructure is insufficient to support the F-35A. The F-35A requires an improved runway with a minimum length of 8,000 meters and a preferred length of 10,000 meters. This is drastically more than the F-18 it is replacing. Additionally, due to its stealth coating, the F-35A cannot be left outside in either the sun or the rain. Every F-35A requires a hangar and individual maintenance area which are both requirements that did not exist with the F-18.[236] The infrastructure required in order to enable operation of the F-35A, also severely restricts the number of facilities where the aircraft can operate. Lastly, all maintainers on the F-35A are required to have security clearances to safeguard and protect the planes technology which further increases the tail requirements. Similarly, it is rumored that China is unable to operate its fighter aircraft from the Spratly islands because the runways are not

[233] McGrath, *The Other End of the Spear*, 67–68.

[234] McGrath, 69.

[235] Keegan, *A History of Warfare*, 301–15.

[236] "Facilities Requirements for the New Air Combat Capability," Statement of Evidence to the Parliamentary Standing Committee on Public Works (Canberra Australia: Australian Department of Defence, June 2014).

improved enough to support the landing and takeoff of modern jet fighters.[237]A decrease in access to any critical infrastructure, transportation, energy, manufacturing or otherwise is much more likely to adversely affect conventional military capabilities than at any time in history.

The second comparison between repair times is similarly straightforward. Repair times on critical infrastructure continue to increase, particularly if this infrastructure is large physical infrastructure. Take, for example, the Asopos viaduct operation and compare it to the recent destruction of the Central Washington Railroad (CWR) bridge over the Yakima River in Washington State. The Asopos viaduct was a complex and strategically important bridge through a narrow mountain pass. The Central Washington Railroad bridge is the primary rail bridge through central Washington.[238] The sabotage of the Asopos viaduct, in 1943, required that a bridge specialist be flown in from Germany; the repairs took place in extremely restrictive terrain and under hostile conditions. Overall Asopos took 16 weeks to repair.[239] Comparatively the CWR bridge, which was destroyed in September of 2020, is not in hostile territory and is in non-mountainous terrain with access to vast American resources. It is estimated that the bridge will not be repaired until April of 2021 a time period of seven months, or 28 weeks.[240] Understanding now the growth in repair times the destruction of infrastructure is likelier now to have a longer lasting impact than in the case studies.

B. EFFECTS ON ESCALATION

The case studies examined, in Chapter 3, provide mixed evidence of sabotage as an escalation management tool. In the case of Lawrence of Arabia, the British and the

[237] Ian Storey, "Why Doesn't China Deploy Fighter Jets to the Spratly Islands?," *The Diplomat*, August 14, 2020, https://thediplomat.com/2020/08/why-doesnt-china-deploy-fighter-jets-to-the-spratly-islands/.

[238] "Timber Rail Bridge Destroyed by Wildfires in Wash. Does Not Qualify for Federal Funding after All," *Railway Track and Structures*, October 26, 2020, https://www.rtands.com/rail-news/timber-rail-bridge-destroyed-by-wildfires-in-wash-does-not-qualify-for-federal-funding-after-all/.

[239] Gardner, *Guerrilla and Counterguerrilla Warfare in Greece*, 1941-1945, 113.

[240] "Timber Rail Bridge Destroyed by Wildfires in Wash. Does Not Qualify for Federal Funding after All."

Ottomans were already in all-out declared conventional war. Similarly, Greece was an Axis occupied country with Britain and Germany at war. In both instances there was little left to escalate. Conversely, the Weather Underground shows promise as an example of using sabotage as an escalation tool while also imposing costs on a competitor.

The Lawrence of Arabia case study fails to support Carson's theory on covert interaction and escalation management. However, it does provide intriguing evidence for the validity of sabotage as a means to combat conventional forces, shorten conflict duration, and reduce casualties on both sides. Lawrence's campaign against the Medina railroad effectively kept the Ottoman garrison at Medina out of the war for two years.[241] The Medina garrison was led by a competent commander and equipped with state-of-the-art weapons and equipment.[242] By sabotaging the railroad just enough that the Ottomans chose to repair it rather than withdrawing from Medina, Lawrence kept the garrison from being used to combat British forces maneuvering from the Sinai. This saved countless Allied and Ottoman lives prevented the brutal industrial war carnage and casualties that typified fighting in World War One. Also, by removing the Medina Garrison from operations in the Middle East, Lawrence and his train pirates directly reduced the duration of combat. The British were able to launch a quick decisive offensive from the Sinai and force the Ottoman Empire to an armistice. This was partly possible because the British were not concerned about a flank attack from the Medina Garrison.

While the Greek case study also fails to support Carson's theory it, like Lawrence's campaign, shows evidence of sabotage's validity in providing strategic opportunities. The Greek guerrillas' ability to hold up almost 600,000 Axis troops directly contributed to the Allies' success in invading Sicily. With so many Axis troops stationed in Greece, particularly the two additional German divisions sent in 1943 to conduct counter-guerrilla operations, the Axis powers were unable to reinforce their defenders in Sicily. The British described the Greek operations as a strategic victory in the Mediterranean Theater.[243]

[241] Lawrence, *Seven Pillars of Wisdom*, 216.

[242] El Bakri, "Memories of the Beloved," 707.

[243] Richardson, *Case Study in Guerrilla War: Greece during World War Two*, 7.

Similar to Lawrence's campaign, the Greek guerrillas also likely contributed to reducing casualties by tying up so many Axis forces for occupation duty. With these forces unable to support offensive and defensive operations against the Allied powers, they were unable to contribute to or become part of the massive casualty statistics of World War Two.

Finally, the Weather Underground campaign does provide support for Carson's theory. The Weathermen received indoctrination, training, and support from communist states, specifically Cuba and North Vietnam.[244] The United States knew the Weathermen were receiving external support from belligerent states and did not make this information public. Cuba, in particular, used the Weathermen as a means to signal resolve to the United States that they were willing and able to conduct kinetic operations inside the United States but did not desire to escalate to more open conflict. In turn, the United States signaled its intent to not escalate the conflict between the two countries by labeling the Weathermen as a domestic terrorist organization rather than a foreign proxy. By doing this, both sides signaled that covert meddling between the countries was acceptable but more overt action was both undesirable and unwanted. This costly signaling by both countries enabled them to utilize harsh public rhetoric while having a more nuanced backstage relationship.

C. SABOTAGE AS AN ECONOMY OF FORCE OPERATION

All three case studies support the idea that sabotage campaigns serve as valuable economy of force operations. All three of the campaigns analyzed show that very small groups of saboteurs can have dramatic impacts on much larger enemy organizations. This utilization of small sabotage forces allowed leaders and planners to focus their limited manpower and materiel elsewhere while presenting their enemies with multiple dilemmas. Lawrence's small group of cameleers exacted a terrible toll on the Medina garrison while enabling General Allenby's larger campaign through the Sinai Peninsula and Palestine. The Greek guerrillas forced the Axis powers to commit 590,000 troops to secure Greece, continually damaged German logistics capabilities, and served as a strategic decoy for the invasion of Sicily. The Weather Underground's bombing campaign maintained covert

[244] Burrough, *Days of Rage*, 76.

pressure on the U.S. government, which allowed the Cuban government to focus its resources on regime changes in Nicaragua, El Salvador, Grenada, and Angola.[245]

This finding is also critical from a friendly manpower perspective. The sabotage campaigns examined are all light on personnel requirements. The overall Greek campaign at its peak only used 30 British and American advisors.[246] The Asopos viaduct sabotage, for example, required six saboteurs yet stopped German rail logistics through Greece for sixteen weeks.[247] Lawrence of Arabia's Yarmuk operation consisted of only sixty camel raiders and successfully stranded the Ottoman Eighth Corps Headquarters after derailing their train.[248] The Weather Underground's New York cell averaged six people, and their bombing of the New York City Police Headquarters was conducted by a single person.[249] These are tremendous effects for such small groups of saboteurs.

This friendly manpower perspective is especially important when placed in the context of current U.S. military personnel realities. The Army continues to struggle with both recruitment and retention.[250] The Air Force is 2,100 pilots short of the 21,000 it requires to execute the National Defense Strategy.[251] The Marine Corps, similarly, requires an additional 800 pilots to fill its 4,000 required billets.[252] The Navy is the only service that is "cautiously optimistic" that it can meet their recruiting requirements to

[245] William J Daugherty, *Executive Secrets: Covert Action and the Presidency* (Lexington, Ky: University Press of Kentucky, 2006), 179–90.

[246] Richardson, *Case Study in Guerrilla War: Greece during World War Two*, 58.

[247] McGlynn, *Special Service in Greece*, Volume 2:24–30.

[248] Lawrence, *Seven Pillars of Wisdom*, 432.

[249] Burrough, *Days of Rage*, 128–31.

[250] Dennis Laich, "Manning the Military: America's Problem," *Military Times*, July 23, 2019, https://www.militarytimes.com/opinion/commentary/2019/07/23/manning-the-military-americas-problem/.

[251] Stephen Losey, "Air Force: No Progress in Closing Pilot Shortfall," *Air Force Times*, March 4, 2020, https://www.airforcetimes.com/news/your-air-force/2020/03/04/air-force-no-progress-in-closing-pilot-shortfall/.

[252] Oriana Pawlyk, "Marine Corps May Not Have Enough Pilots for Its F-35 Fleet, Top General Warns,", Military.com, March 30, 2020, https://www.military.com/daily-news/2020/03/30/marine-corps-may-not-have-enough-pilots-its-f-35-fleet-top-general-warns.html.

sustain their current size.[253] These personnel realities force U.S. leaders and planners to make tough decisions about risks to the force which also constrains conventional deployment and employment options.

In addition to these shortfalls, in the event of a protracted conflict, it is highly questionable whether the U.S. could quickly replace casualties or grow the size of the military. During 2007, the military was almost fully utilized between the Surge in Iraq, operations in Afghanistan, and National Defense requirements.[254] Recruitment remains sluggish and the current Selective Service System is untested. If Selective Service was activated during a catastrophic event, it has no requirement to deliver draftees to the services for the first 193 days, or just over six months.[255] Then it is the services' job to train and employ these draftees. The current length of the U.S. Army Infantry course is 22 weeks, or five and a half months.[256] This means that it would take just shy of a year before any additional infantry forces were available for employment. It is important to note that these would just be basic infantry soldiers, not individuals in technical fields such as pilots, UAV operators, intelligence analysts, electronic warfare technicians, or medics.

This all implies that force protection is critical for U.S. leaders. The smaller the number of U.S. servicemembers exposed to danger prior to outright conflict, the better. Replacing lost servicemembers is a long slow process. This makes the potential employment of saboteurs appealing because so few personnel are required. TE Lawrence's campaign was coordinated through the British HQ in Cairo but executed by himself and his Bedouin partners.[257] The entirety of the Greek guerrilla campaign was executed by no

[253] Diana Correll, "Navy 'Cautiously Optimistic' It Will Reach Recruiting Goals This Year, despite COVID-19 Challenges," News, *Navy Times*, May 18, 2020, https://www.navytimes.com/news/your-navy/2020/05/18/navy-cautiously-optimistic-it-will-reach-recruiting-goals-this-year-despite-covid-19-challenges/.

[254] Baiocchi, *Measuring Army Deployments to Iraq and Afghanistan*, 1.

[255] "Return to the Draft," Selective Service System, n.d., https://www.sss.gov/about/return-to-draft/.

[256] Todd South, "New, Longer Army Infantry Training Is Making Better Shooters, Soldiers and Life Savers, Data Shows," *Army Times*, October 15, 2019, https://www.armytimes.com/news/your-army/2019/10/15/new-longer-army-infantry-training-is-making-better-shooters-soldiers-and-life-savers-data-shows/.

[257] Arquilla, *Insurgents, Raiders, and Bandits*, 157–71.

more than 30 British, and later American, commandos who worked alongside the Greeks.[258] The Weather Underground never numbered more than roughly 150 active members, spread out across the United States.[259] The utilization of such small groups of saboteurs in collaboration with indigenous partners reduces the number of potential friendly personnel losses while simultaneously reducing a competitors' ability to employ and maintain their forces and capabilities.

D. BEST PRACTICES IDENTIFIED

Following examination of the case studies, five best practices for utilizing sabotage were identified. These are: the use of advisors; indigenous partners; appropriate technology; command, not necessarily control; and effects based. These best practices are discussed in further detail below.

1. Direct Advisors

The employment of direct advisors to conduct sabotage campaigns appears critical to success, particularly during large-scale combat operations. Both the Arab and Greek guerrillas experienced only marginal success until the introduction of on-ground advisors. These advisors, while technically not commanders of the various guerrilla bands, often took direct charge of operations and tied their operations back to strategic objectives. The advisors also brought technical and material support to their units that was not available otherwise. Additionally, advisors on the ground were able to conduct unilateral operations that were beyond the skill or capability of their indigenous partners. Such was the case with the Asopos viaduct, which the British conducted without the Greeks because the Greeks believed the operation was beyond their capability.[260] Direct Advisors also allowed commanders and planners to receive ground truth on operations, capabilities, and issues. Ground truth is incredibly important, as incorrect information may lead commanders and planners to misallocate resources or select a course of action that is incongruent with

[258] Richardson, *Case Study in Guerrilla War: Greece during World War Two*, 59.

[259] Burrough, *Days of Rage*, 88.

[260] McGlynn, *Special Service in Greece*, Volume 2:24–30.

reality. These ground truths, provided by advisors, were often more accurate than information provided by indigenous forces, who would often exaggerate operations or capabilities in order to receive additional support and material.[261] Direct advisors were paramount to the successes of the Arab and Greek campaigns. Conversely, the Weather Underground lacked direct advisors and while their campaign took a huge financial toll on the United States the campaign failed to achieve its goal of overthrowing the American government.

2. Indigenous Partners

While saboteurs can certainly operate unilaterally, their success is greatly improved with the introduction of indigenous partners. Indigenous forces possess an understanding of the culture and geography of their respective region better than any foreigner ever can. T.E. Lawrence spoke Arabic and worked throughout the Middle East on archeological digs prior to World War One.[262] He had a greater understanding of the region than most British citizens; however, his understanding paled when compared to the local Bedouins. His local forces regularly showed him routes, oases, and staging areas that he did not know existed. This indigenous experience and support enabled him to mask his movements and strike the Hejaz railway at will. The Greek guerrillas provided identical capabilities to the British and American advisors. Furthermore, both groups also provided valuable manpower to execute large sabotage operations. Similarly, the Weather Underground's understanding of American culture because they were natives, particularly the far left and the radical underground movement, enabled them to avoid capture by law enforcement for years. The Weathermen moved generally at will across America under aliases acquired by stealing the identities of children who died.[263] This paperwork loophole that the Weathermen discovered allowed them to acquire new identities regularly and maintain a steady bombing campaign. All indigenous partnerships have downsides. Lawrence had multiple experiences with the Arab bands leaving and joining operations at will. The British and

[261] Ṭa'uber, *The Arab Movements in World War I*, 83–100.

[262] Anderson, "The True Story of Lawrence of Arabia."

[263] Burrough, *Days of Rage*, 92.

Americans had long running issues with particularly the communist Greek guerrillas committing war crimes.[264] The Weathermen's use of drugs and orgies as a way to bring the organization together actually created rifts that drove people away from the group. However, the usefulness and necessity of indigenous partners cannot be understated.

3. Appropriate use of Technology

Technology is often lauded as the answer to modern military problems. In actuality, technology does nothing by itself. It is the appropriate employment of specific technology for specific problems that provides benefit usually in the form of relative superiority.[265] In all three case studies, the appropriate use of specific technology was part of what made them successful. For both Lawrence of Arabia and the Weather Underground, dynamite was the key technology. Small, stable, lightweight, and easily transportable, dynamite provided both campaigns with a precise destructive capability that they used extensively while ignoring other less effective technology.[266] Other destructive technology was available during both campaigns, Lawrence in particular had access to airpower if he so desired, however, dynamite provided the ability to conduct precise sabotage in a way that aerial bombardment could not. Dynamite allowed bridges to be destroyed in such a manner that repairs were far more difficult than if the whole bridge had collapsed under bombardment. Dynamite allowed the Weathermen to produce lightweight bombs that they then were able to secret in places that larger explosives would not fit or would be too easily noticed. When the Weathermen blew up the Berkeley police station, they lodged the bomb under a car, where it was not noticed by multiple police officers.[267] They used dynamite almost exclusively while ignoring other options such as fire-bombing, which was less precise. The Greek guerrillas were no stranger to dynamite. However, simpler technology was hugely beneficial to their campaign. Caltrops and concrete mines wreaked continual

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[264] Gardner, *Guerrilla and Counterguerrilla Warfare in Greece, 1941-1945*, 86.

[265] William H McRaven, *Spec Ops: Case Studies in Special Operations Warfare : Theory and Practice* (New York: Presidio Press, 1996), 6–7.

[266] Arquilla, *Insurgents, Raiders, and Bandits*, 170–71.

[267] Burrough, *Days of Rage*, 96.

havoc on Axis patrols causing constant casualties and vehicle repairs.[268] These constant casualties and repairs had a huge morale impact on Axis forces, who viewed themselves as incessantly under threat by the locals. These low-cost simple pieces of equipment allowed small numbers of guerrillas to exact great tolls on the larger Axis occupation force.

4. Command not Necessarily Control

In all three case studies, limited control was exercised by command elements. More important than control was intent. In all three campaigns, the saboteurs were provided with the intent of their campaign, attack the Hejaz railway to contain the Medina Garrison, deny Germany access to Lines of Communication through Greece, and "bring the war home." Outside of this intent, very little direct control of the saboteurs was conducted by commanders. Of the three case studies, Lawrence experienced the most control. He regularly traveled to British HQ in Cairo and had fairly routine interactions with his superiors. When in the field, though, he acted largely at will based on the conditions on the ground. He was not told how to conduct his operations.[269] The British and American advisors to the Greeks had limited contact with British HQ in Alexandria. Once the Commandos infiltrated into Greece the British HQ had almost no control over them. In fact, after the first infiltration the British HQ lost the codenames for the commandos and was unable to contact them for months.[270] The commandos operated largely on intent from their higher HQ. There was no discussion on how the commandos and Greek guerrillas were to accomplish specific tasks. The Weather Underground's foreign supporters provided absolutely no command or control over them. Cuba and North Vietnam simply wanted the Weathermen to "bring the war home" to America and left it up to the Weathermen how they would accomplish the task. This limited level of external control appears very important for forces operating behind enemy lines and in occupied territories. It allows these forces to adapt to the reality on the ground. It allows them to take advantage of opportunities when they arise and avoid situations that are not ideal. Take for example

[268] Gardner, *Guerrilla and Counterguerrilla Warfare in Greece*, 1941-1945, 94.

[269] Lawrence, *Seven Pillars of Wisdom*, 62–63.

[270] Richardson, *Case Study in Guerrilla War: Greece during World War Two*, 7.

the Asopos viaduct sabotage. Because the operation was not tied to a specific date, the saboteurs were able to withdraw on their first attempt and return a month later and finish the job.[271] Similarly, the Weather Underground was able to successfully regroup and reorganize following an accidental explosion at one of their safehouses that killed three of their members.[272]

5. Effects based

Sabotage campaigns generally require effects-based missions rather than time-based missions. This builds off the command, not necessarily control, best practice. Owing to the complex nature of operating in denied territory, saboteurs may not be able to accomplish operations on a time schedule. This may be due to a myriad of reasons; increases in local security forces, lack of access to supplies, issues with indigenous partners, issues with access to the site, are only some of the problems that may occur. A general timeline for operations may exist, such was the case when British HQ asked the Greek guerrillas to increase sabotage operations in 1943.[273] However, the timeline was exceptionally broad in order to allow the guerrillas to overcome any local issues. Possessing an effects-based campaign also allows local saboteurs to conduct operations randomly, which makes targeting by enemy forces decidedly more difficult and increases the safety of sabotage forces.

E. RECOMMENDATIONS FOR FUTURE STUDY

The Cybersecurity and Infrastructure Security Agency (CISA) of the Department of Homeland Security is responsible for monitoring, policing, and securing critical infrastructure in the United States.[274] CISA has divided critical infrastructure into 16 sectors:

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[271] McGlynn, *Special Service in Greece*, Volume 2:26–29.

[272] Burrough, *Days of Rage*, 76.

[273] Richardson, *Case Study in Guerrilla War: Greece during World War Two*, 58–59.

[274] Cybersecurity and Infrastructure Security Agency, "Critical Infrastructure Sectors," October 21, 2020, https://www.cisa.gov/critical-infrastructure-sectors.

Chemical - The Department of Homeland Security is designated as the Sector-Specific Agency for the Chemical Sector.	**Commercial Facilities** - The Department of Homeland Security is designated as the Sector-Specific Agency for the Commercial Facilities Sector, which includes a diverse range of sites that draw large crowds of people for shopping, business, entertainment, or lodging
Communications - The Communications Sector is an integral component of the U.S. economy, underlying the operations of all businesses, public safety organizations, and government. The Department of Homeland Security is the Sector-Specific Agency for the Communications Sector	**Critical Manufacturing -** The Department of Homeland Security is designated as the Sector-Specific Agency for the Critical Manufacturing Sector.
Dams - The Department of Homeland Security is designated as the Sector-Specific Agency for the Dams Sector. The Dams Sector comprises dam projects, navigation locks, levees, hurricane barriers, mine tailings impoundments, and other similar water retention and/or control facilities.	**Defense Industrial Base -** The U.S. Department of Defense is the Sector-Specific Agency for the Defense Industrial Base Sector. The Defense Industrial Base Sector enables research, development, design, production, delivery, and maintenance of military weapons systems, subsystems, and components or parts to meet U.S. military requirements.

Figure 16. Sixteen Critical Infrastructure Sectors[275]

Emergency Services - The Department of Homeland Security is designated as the Sector-Specific Agency for the Emergency Services Sector. The sector provides a wide range of prevention, preparedness, response, and recovery services during both day-to-day operations and incident response.	**Energy -** The U.S. energy infrastructure fuels the economy of the 21st century. The Department of Energy is the Sector-Specific Agency for the Energy Sector.
Financial Services - The Department of the Treasury is designated as the Sector-Specific Agency for the Financial Services Sector.	**Food and Agriculture -** The Department of Agriculture and the Department of Health and Human Services are designated as the co-Sector-Specific Agencies for the Food and Agriculture Sector.
Government Facilities - The Department of Homeland Security and the General Services Administration are designated as the Co-Sector-Specific Agencies for the Government Facilities Sector.	**Health Care and Public Health -** The Department of Health and Human Services is designated as the Sector-Specific Agency for the Healthcare and Public Health Sector.

Figure 16. Sixteen Critical Infrastructure Sectors

Information Technology - The Department of Homeland Security is designated as the Sector-Specific Agency for the Information Technology Sector	**Nuclear Reactors Materials and Waste -** The Department of Homeland Security is designated as the Sector-Specific Agency for the Nuclear Reactors, Materials, and Waste Sector.
Transportation Systems - The Department of Homeland Security and the Department of Transportation are designated as the Co-Sector-Specific Agencies for the Transportation	**Water and Wastewater Systems -** The Environmental Protection Agency is designated as the Sector-Specific Agency for the Water and Wastewater Systems Sector.

Figure 16. Sixteen Critical Infrastructure Sectors

The CISA has also identified what it refers to as National Critical Functions. These are: Connect, Distribute, Manage, and Supply[276]

The Critical Infrastructure Sectors all support the National Critical Functions. While these delineations are specific to the overall infrastructure network of the United States, it is a valuable framework that can be used for any nation. This categorizing of critical infrastructure also provides clear avenues for further study.

The purpose of this thesis is to identify the validity of sabotage in a multi-polar world. The case studies reflect this. However, the case studies in this thesis focus almost exclusively on the transportation and government facilities sectors and how they relate generally to the Distribute function. There remains ample room for continued study in this

[276] Cybersecurity and Infrastructure Security Agency, "National Critical Functions," October 21, 2020, https://www.cisa.gov/national-critical-functions.

venue alone. Within the Transportation sector, this thesis focuses solely on land-based transportation logistics. There remains a gap in understanding about the viability of transportation sabotage in the maritime and air domains. More importantly, there are an additional 14 sectors that remain unstudied. While not intended to, these two lists, developed by CISA, also indicate the breadth of sabotage effects that are potentially possible. It is recommended that further study place an emphasis on the sectors not studied herein, with a focus on the Distribute and Supply functions which directly affect military capabilities.

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V. ISSUES, THE FUTURE, AND FINAL THOUGHTS

A. THERE ARE NO PANACEAS

The world is a complex place full of complicated people; to believe that there is a singular answer to all problems is both ignorant and negligent. Operations and campaigns can be unsuccessful for a multitude of reasons, not least of which is the reality that the enemy always gets a vote. This thesis does not argue that sabotage is the ideal solution for all situations. Sabotage is a risky business. Saboteurs operate in hostile territory where both personal and operational dangers are high and legal protections are scant. Further, their operations often have strategic impacts and need to be carefully thought through before execution. In the positive, this occurred when Lawrence of Arabia's Bedouin forces successfully contained the Medina garrison. However, a sabotage campaign gone wrong can unduly shine light on covert government activities, harm alliances, and harden the resolve of competitors. Such was the case with the CIA mining of Nicaraguan harbors in early 1984.[277]

In the 1980s, the Central Intelligence Agency led and supported a number of covert action campaigns in Central America. Its largest campaign was against the Sandinista government in Nicaragua.[278] The CIA's Nicaraguan campaign was first authorized by President Jimmy Carter and later invigorated by President Ronald Reagan. The purpose of the campaign was to embolden democratic elements in Nicaragua and stop the flow of Soviet-supplied weaponry to El Salvador.[279]

As part of this campaign, in late 1983, the CIA planned to sabotage multiple harbors in Nicaragua using mines. The primary means of Soviet arms supply to Nicaragua was via ship. The CIA hoped that mining the harbors would discourage Soviet ships from docking

[277] Fred Hiatt and Joanne Omang, "CIA Helped to Mine Ports In Nicaragua," News, *Washington Post*, April 7, 1984, https://www.washingtonpost.com/archive/politics/1984/04/07/cia-helped-to-mine-ports-in-nicaragua/762f775f-6733-4dd4-b692-8f03c8a0aef8/.

[278] William J Daugherty, *Executive Secrets: Covert Action and the Presidency* (Lexington: The University Press of Kentucky, 2006), 204.

[279] Daugherty, 203–4; Daugherty, 190–91.

in Nicaragua and stem much of the arms flow. The purpose of the mines was to discourage shipping rather than destroy ships.[280] Further, the CIA believed that mining the harbors would be economically crushing to the Sandinista government. This economic downturn would force the Sandinista government to negotiate with the U.S.-backed Contra guerrillas in Nicaragua.[281] In January and February of 1984, the CIA placed a large ship 12 miles off the Nicaraguan coast as a base of operations. From this, they deployed multiple smaller speedboats that carried anti-ship mines. These small speedboats then emplaced mines in multiple Nicaraguan harbors. The mines were handmade and designed to explode loudly but with limited explosive effect. According to the CIA the mines were unlikely to sink a ship.[282]

On March 5, 1985, the *Los Angeles Times* succinctly described the operation as "a fiasco."[283] The mines were indiscriminate and did not discourage shipping; rather, they encouraged an international outcry. Seven internationally flagged civilian cargo vessels were damaged by CIA mines, including ships from the Netherlands, Japan, Russia, and Britain.[284] The CIA's involvement was almost immediately discovered. The U.S. congress viewed the operation as a wild escalation of U.S. involvement and shut down funding for all covert operations in Nicaragua.[285] Then Senator Joseph Biden publicly rebuked the CIA, saying

> On the question of whether or not anyone should be mining the harbor, the answer is no… I think it is outrageous. There is no reason to mine the

[280] "U.S. House of Representatives - Congressional Record," Congressional Record (Washington, D.C: U.S. House of Representatives, April 11, 1984), https://www.cia.gov/library/readingroom/docs/CIA-RDP87B00858R000200170022-2.pdf.

[281] Doyle McManus and Robert Toth, "Setback for Contras : CIA Mining of Harbors 'a Fiasco,'" *Los Angeles Times*, March 5, 1985, https://www.latimes.com/archives/la-xpm-1985-03-05-mn-12633-story.html.

[282] "U.S. House of Representatives - Congressional Record."

[283] McManus and Toth, "Setback for Contras."

[284] Hiatt and Omang, "CIA Helped to Mine Ports In Nicaragua."

[285] McManus and Toth, "Setback for Contras."

> harbor. It is an act of war. These are not things that people should be condoning.[286]

U.S. allies viewed it as a threat to international shipping. Britain lodged an informal complaint against the United States, and France went so far as to offer demining assistance to the Soviet-supported Sandinista government.[287] While the CIA's sabotage plan was well intentioned, in direct support of the Reagan Administration, it was not well targeted. The mines acted without regard for friendly or enemy vessels in an area where discrimination was needed. Further, the striking of allied civilian vessels was egregious, while the striking of Soviet vessels was not harsh enough to discourage them. Additionally, the nearly overt nature of the mining could have accidently escalated competition with the USSR rather than decrease it. The mining of Nicaraguan harbors was a scandal for both the Reagan administration and the CIA. It serves as a benchmark for how not to employ sabotage as a strategic tool.

B. THE FUTURE IS DIFFERENT?

Many experts harangue that the future is in cyber warfare.[288] Beginning in 1992, John Arquilla argued that disrupting battlefield communication systems using cyber-attacks would have detrimental effects on militaries world-wide.[289] Since then, myriad experts have expanded this argument to say that cyber warfare can affect all aspects of modern life. In 2011, the U.S. Department of Defense declared cyber a warfighting domain along with air, land, sea, and space.[290] The 2007 cyber-attack on Estonia and the 2010 Stuxnet attack on the Iranian nuclear program are cited as proof that cyber warfare is here

[286] James Rowley, "CIA Press Release," Press Release (Washington, D.C: Central Intelligence Agency, April 7, 1984), https://www.cia.gov/library/readingroom/docs/CIA-RDP90-00552R000303570109-5.pdf.

[287] Rowley. "CIA Press Release"

[288] Brandon Valeriano, Benjamin M. Jensen, and Ryan C. Maness, *Cyber Coercion: The Evolving Character of Cyber Power and Strategy* (New York, NY: Oxford University Press, 2018), 4–5.

[289] John Arquilla, "Twenty Years of Cyberwar," *Journal of Military Ethics* 12, no. 1 (April 1, 2013): 80–87, https://doi.org/10.1080/15027570.2013.782632.

[290] Dan Goure, "A New Joint Doctrine for an Era of Multi-Domain Operations," U.S. Army Training and Doctrine Command, October 11, 2019, https://www.tradoc.army.mil/Publications-and-Resources/Article-Display/Article/1987883/a-new-joint-doctrine-for-an-era-of-multi-domain-operations/.

and is destructive.[291] Similar to sabotage, cyber-attacks commonly target the infrastructure backbone of a system. If these cyber weapons are the future, why then waste time on physical sabotage when a computer program can do the same thing?

The answer is that cyber-attacks are generally boutique custom operations that lack repeatability. While Stuxnet, for example, was operationally successful, it is likely non-repeatable.[292] The vulnerability that was identified and used to damage Iranian centrifuges no longer exists. Once a cyber weapon is used, it becomes obsolete. Hardware and software manufacturers and technicians develop fixes to whatever malady the cyber weapon has imposed on the system.[293] Further, cyber weapons are difficult and complex to produce. They require large amounts of time, effort, and inside knowledge of the target. Additionally, they can be difficult to employ, and their effects are generally less devastating than anticipated.[294] This all means that cyber weapons are a potential option for a specific single use. This does not mean that they are inconsequential; it simply means that they are not easily manufactured or employed and generally lack repeatability. Conversely, the use of dynamite, explosives, and kinetic weapons for sabotage is timely, cheap, and highly repeatable.

In contrast to Stuxnet take the 2013 physical attack on the Metcalf, California, transformer station. In April 2013, saboteurs used .30 caliber rifles to kinetically attack the 500Kv transformer station in Metcalf, which supports electricity to the San Francisco Bay area. The saboteurs struck the radiators for the station, causing to them spill their cooling oil. This caused the transformers to overheat and become inoperative.[295] The attack lasted 19 minutes and used approximately 100 rounds of rifle ammunition. In total, 17

[291] John Arquilla, "Cyberwar Is Already Upon Us," *Foreign Policy*, February 27, 2012, https://foreignpolicy.com/2012/02/27/cyberwar-is-already-upon-us/.

[292] John Lindsay, "Stuxnet and the Limits of Cyber Warfare," *Security Studies* 22, no. 3 (August 1, 2013): 365–404.

[293] Thomas Rid, "Think Again: Cyberwar," *Foreign Policy*, February 27, 2012, https://foreignpolicy.com/2012/02/27/think-again-cyberwar/.

[294] Rid. "Think Again: Cyberwar"

[295] Parfomak, "Physical Security of the U.S. Power Grid: High-Voltage Transformer Substations," 7.

transformers were damaged which took 27 days to repair, and cost of $15 million.[296] To highlight how easy the sabotage was to conduct, John Lightfoot, the head of the FBI's counterterror task force in San Francisco, said

> it doesn't take a very high degree of training or access to technology to carry out this attack.[297]

While the electric grid did not fail because of the attack, Pacific Gas and Electric, who owns the Metcalf station, was forced to emergency re-route power and increase power production at multiple other stations, which caused further stress on the grid until Metcalf was repaired.[298]

The Metcalf sabotage, along with several smaller similar incidents across the U.S., caused a complete congressional review of the physical security of the U.S. electric grid, as well as the proposing of several pieces of legislation to support physical security (HR 4298 and S. 2158).[299] The findings from this review found that the sabotage of high voltage transformers is extremely easy to conduct, requires little to no training, and is almost impossible to prevent. Specifically, puncturing the 5/8 - to 3/4- inch steel tank that houses a transformer can short circuit and completely destroy it. Additionally, draining the insulating oil will damage the transformers and potentially cause them to explode. A 2005 rifle attack against a transformer in Florida did exactly this, blowing up the transformer station and causing a blackout.[300] Additionally, industry experts described the difficulty that exists in replacing high voltage transformers. They are usually custom designed and cost between $3 and $5 Million. This makes the storing of replacement transformers prohibitively expensive and, due to their custom nature, often untenable. The transportation

[296] Mark Memmott, "Sniper Attack On Calif. Power Station Raises Terrorism Fears," news, NPR.org, February 5, 2014, https://www.npr.org/sections/thetwo-way/2014/02/05/272015606/sniper-attack-on-calif-power-station-raises-terrorism-fears; David Baker, "FBI: Attack on PG&E South Bay Substation Wasn't Terrorism," News, SFGate, September 11, 2014, https://www.sfgate.com/business/article/FBI-Attack-on-PG-amp-E-substation-in-13-wasn-t-5746785.php.

[297] Baker, "FBI: Attack on PG&E South Bay Substation Wasn't Terrorism."

[298] Memmott, "Sniper Attack On Calif. Power Station Raises Terrorism Fears."

[299] Parfomak, "Physical Security of the U.S. Power Grid: High-Voltage Transformer Substations," 2.

[300] Parfomak, 7.

of high voltage transformers also requires the use of specialized rail cars, of which there are fewer than 20 in the United States. Movement of high voltage transformers over roads is possible, but even fewer trucks exist that can haul such a load, and most roads cannot handle the weight of the transformers. Interestingly, the congressional report also states that electric infrastructure worldwide is designed similarly to the U.S. but usually less robust.[301]

This simple comparison between contemporary cyber and physical sabotage operations shows that both offer capability to their employers. There is little doubt that cyber warfare serves a specific purpose in competition. However, physical sabotage provides a timeliness and more importantly a repeatability that cyber-attacks simply do not provide. Perhaps as final proof of the difficulty in securing physical infrastructure and the repeatability of physical operations, it is worth noting that Pacific Gas and Electric invested $100 million in security upgrades at its transformer stations after the Metcalf sabotage. Despite this, just over a year later, in August of 2014, burglars broke into the Metcalf station and stole $40,000 in equipment without arousing security personnel on site.[302]

C. FINAL THOUGHTS AND CONCLUSION

Does sabotage and more specifically sabotage campaigns serve as a means to deter, deny, coerce, and impose kinetic costs on competitors in a multipolar world? Yes. However, with that said, a myriad of questions surrounding sabotage remain unanswered. Some that quickly come to light are: What organization, unit, or person is best suited to conduct such acts in today's world? What are the moral and ethical ramifications and concerns regarding infrastructure sabotage? Does a modern legal framework exist to support the employment of sabotage? Will the development of genetically engineered anti-material weapons cause a revolution in military capabilities and become what dynamite

[301] Parfomak, 7–8.

[302] Herman Trabish, "CA Regulators Fine PG&E $50K for Lax Security in Metcalf Substation Burglary," Utility Dive, September 2, 2015, https://www.utilitydive.com/news/ca-regulators-fine-pge-50k-for-lax-security-in-metcalf-substation-burglar/404977/.

was to T.E. Lawrence?[303] These and many other unstated questions regarding sabotage should be both asked and answered. Practitioners, scholars, and leaders should leave no stone unturned in exploring the possibilities and complexities of interstate competition. This thesis has only partially overturned a stone.

This thesis has argued that sabotage is ultimately a violent kinetic business for the purpose of denying an enemy access to a capability or resource. Further, sabotage operations have an extremely broad scope. History shows that one operation can be a kinetic raid while another is completely surreptitious. Enemy forces or civilians could be killed during one operation and there could be no collateral damage in another. It is a complex job with long-lasting implications. However, the campaigns of Lawrence of Arabia, the Greek Guerrillas, and the Weather Underground, as well as the multiple smaller operations discussed herein, show both the viability, flexibility, and impact that sabotage can have.

The fact that the world still relies on the same infrastructure backbone that existed when all these acts occurred further bolsters the argument that sabotage remains a valid and viable means to impose kinetic costs on competitors. Additionally, the increasing reliance on this infrastructure to enable and employ advanced military technology exposes a critical vulnerability in modern militaries. While the evidence for sabotage serving as an escalation control measure is mixed in the case studies examined, during an outright conflict, the evidence seems to show that sabotage campaigns can reduce the duration of a conflict, as well as the number of casualties. Additionally, sabotage campaigns serve as valuable economy of force operations by utilizing small groups of saboteurs, which allows for the preservation of friendly combat power. In a multipolar environment, it is paramount to possess a comprehensive deterrence and compellence strategy. The historical evidence points to the fact that sabotage campaigns can serve as a valuable component of a robust strategy for winning in Great Power Competition.

[303] Gross Flottbeker Strasse, "Non-Lethal Weapons Research in the US," *The Sunshine Project*, March 2002, 1–8.

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