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This is, admittedly, a difficult introduction to write.

It is difficult not only because Kristie Macrakis’s final work, *Nothing is Beyond Our Reach: America’s Techno-Spy Empire* elicited complicated responses from the reviewers in this roundtable. No, this introduction is particularly difficult because I find myself unable to divorce from the discussion my own personal experiences as Macrakis’s final doctoral advisee before her death at the end of 2022. I came to Georgia Institute of Technology in 2014 to study the history of East German technology under Macrakis, because the topic was the focus of roughly the first half of her research career. Macrakis was my advisor, a sort of academic parent, one that nurtures your thinking, corrects needless meanderings, helps make the contacts that will define the trajectory of your career. Kristie did all of these things for me with joy, and was genuinely proud of any progress I made. I will always appreciate all she did for me.

That being said, as her advisee, I also read all of Macrakis’s work, beginning with *Science Under Socialism* and ending, sadly, with *Nothing is Beyond Our Reach.* Throughout her work, Macrakis was always interested in the political designs and uses of technology and science, starting with Nazi Germany and East Germany, before turning her sights toward spy-craft in general. *Nothing is Beyond Our Reach*—to speak in broad strokes, as the three reviewers speak more to the specifics—is the joining of those two throughlines. The book attempts to draw out the effects of what Kristie calls America’s “technophilia” across the intelligence world, or, in other words, how the United States’ alleged obsession with technology has co-opted intelligence agencies from the Cold War up through the “Snowden era,” when former contractor and whistleblower Edward Snowden revealed the massive illegal technological spying of the National Security Agency (NSA). She argues that access to such powerful technology begets a need to use it, even when such a use is illegal or dangerous. This, she argues in her first chapter, was the case of flying U2 planes over the Soviet Union in the 1950s. From there, she follows a few different intelligence agencies, from the Central Intelligence Agency to the National Reconnaissance Office (NRO, whose motto gives the book its name), across different technophilic vignettes that serve to underscore her argument that the proliferation of spy technologies slowly became a solution in search of a problem, before the agencies themselves began to see all data as “nothing beyond their reach.”

How successful these sorts of vignettes were, or perhaps her whole argument on the United States’ technophilic empire, is up for debate amongst the reviewers. In my view, many of the criticisms (and praise) are valid. Since Macrakis is not here to answer these critiques, the editors have relaxed the usual rules for introductions and opened space for me to pen a response of sorts. It is not my intention to speak

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for Kristie, rather to attempt to offer some additional insights based on my knowledge and experience with how she worked and thought.

The first of the major criticisms of this book seem to be around the usage of the term “empire” to describe the United States. My understanding of Macrakis’s definition of “techno-spy empire” boils down to two overlapping mechanisms of power: the US collection of intelligence the world over in order to support both homeland security and military action abroad and the cultural imperialism of post-World War II America (14). This is of course a bold definition, one which begs the question of what defines an empire and how the United States functions like one. Is it the annexation of land and disparate people into the dominion of foreign rule like the Roman Empire? Perhaps we can look to the annexation of Hawaii or the continuous quasi-state status of Puerto Rico or American Samoa. Is it a continued military presence in a different country? What then, are we to make of the twenty-some years that US troops spent physically in Afghanistan only to leave the Taliban in charge once again? Or is it something newer, like the extrajudicial use of technology abroad, such as the drone strikes that have plagued Yemeni skies for decades? I don’t know the answer to the question of what defines an empire; my purpose is to suggest that a different definition of empire is possible, and that it was from this vista that Macrakis wrote.

The second major criticism of the book is that Macrakis conflates the ambitions of all intelligence agencies into one, overarching American intelligence impulse. Jon Lindsay notes that the CIA, the NSA, the NRO, and the National Geospatial-Intelligence Agency (NGA) are all separate institutions, each with their own individual priorities and roles. He writes,

> The NRO develops and maintains spy satellites, while other agencies like the National Geospatial-Intelligence Agency (NGA) and the NSA choose the targets for those satellites and analyze the data they collect. If nothing is beyond the NRO’s reach, the most interesting parts of the intelligence business are also beyond its authority and expertise.

Macrakis was interested in the complex nature of the intelligence business in the United States. Her point was that while these institutions do indeed have their own roles and priorities, but that US intelligence is a system. Yes, there are individual units, but they are all beholden to the larger intelligence goals of the US


government. The NSA uses the data collected by the NGA, the CIA acts upon data gleaned by the NSA. This book is focused on the big picture, and it argues that multiple, extremely well-funded, and internationally connected intelligence agencies could only result in a “techno-spy empire.”

The third major criticism in many ways hinges upon the prior two, that the US is not in any way an empire and that individual intelligence agencies are discreet units. If both of these arguments are true, it becomes much easier to de-systematize the real, physical violence that has defined the CIA from its very inception. As Amy Zegart argues, “In Macrakis’s reading, intelligence collaboration is the same thing as physical and political colonization, and global intelligence collection is tantamount to American global repression.” This is correct. Macrakis’s argument was that this intelligence collection and collaboration was meant to contribute to furthering American world dominance, and that this is the point of collecting intelligence: to play a role in the United States’ ongoing military actions abroad. In her view, the NSA, CIA, and (all working in concert, as an intelligence system) gathered intelligence that was used with an end result of violence, be that info from Human Intelligence, Technological Intelligence, or both. One need only read CIA Congo station chief Larry Devin’s braggadocios accounting of how US intelligence was used to topple and then murder the first elected post-colonial leader of the Congo, Patrice Lumumba, and replace him with the long-lived dictator Joseph Mubutu.4 But a more fitting example might be Eden Mediana’s Cybernetic Revolutionaries that demonstrates how technological embargos to Chile manifested as real economic violence and then the actual physical violence of the CIA’s assisted murder of democratically elected president Salvador Allende and his replacement by Augusto Pinochet.5

All of this is not to say this is a book without its flaws. Zegart’s point that “the individual pieces of this book are far stronger than the whole” is correct. While many of the chapters could have stood on their own as articles, they sometimes feel whipsitched together only by virtue of the shared topic of “intelligence.” However, even in this discontinuity, or perhaps exactly because of it, it is very Kristie. Those who worked with her could sometimes be tasked with the difficulty of following her staccato patterns of thought. And to that end, it is perhaps a very appropriate book to stand as her last. That said, book must be judged on its merits.

In the conversations I had with Kristie leading up to her death, she mentioned to me that she saw this book as the first of many on the topic. In a way, this book was the planned introduction to the rest of her career. I think it is fitting, to see the book as such, an introduction without a body, where gaps remain unclosed, questions unanswered, and further research incomplete. Her death is a shame for many reasons, and we are only left with small fragment of what was to come. I only hope, along with the other reviewers on this

4 Larry Devlin, Chief of Station, Congo: Fighting the Cold War in a Hot Zone, 1. ed (New York, NY: PublicAffairs, 2007).
round table, that others keep working with the fragments, and continue asking the questions she never got to ask.

Contributors:

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Jon R. Lindsay is an Associate Professor at the School of Cybersecurity and Privacy and the Sam Nunn School of International Affairs at the Georgia Institute of Technology. He is the author of Information Technology and Military Affairs (Cornell, 2020) and coauthor of Elements of Deterrence: Strategy, Technology, and Complexity in Global Politics (Oxford, 2024). His latest book project is Age of Deception: Cybersecurity and Secret Statecraft.

Amanda A. Ohlke is Director of Adult Education at the International Spy Museum in Washington, DC. She has been a key member of the Museum’s creative team since 2004, she helped develop and curate the museum’s exhibitions for reopening in 2019. She was also heavily involved in developing the Museum’s Exquisitely Evil: 50 Years of Bond Villains exhibit and Operation Spy immersive experience. She was the creative lead for the Museum’s “Spy in the City™ GPS-based interactive missions drawn from real spy cases, which guests ran in the streets of DC. Her paper on “Mata Hari: Ripe for Recruitment” will be published in an anthology later this year from the University Press of Kansas. She curates in-person and virtual public programs for the Museum. She has been a guest expert on “Mysteries at the Museum” numerous times as well as being featured on shows and podcasts for the likes of Galaxy Brains, the History Channel, and ZDF.

Amy Zegart is the Morris Arnold and Nona Jean Cox Senior Fellow at the Hoover Institution, Senior Fellow at the Freeman Spogli Institute for International Studies, and Professor of Political Science by courtesy at Stanford University. Her most recent book is Spies, Lies, and Algorithms: The History and Future of American Intelligence (Princeton University Press, 2022).
The title of Kristie Macrakis’s final book, *Nothing is Beyond Our Reach*, is taken from the logo of a patch commemorating the December 2013 launch of a US National Reconnaissance Office (NRO) satellite. The image on the patch shows a sinister octopus wrapping its tentacles around the Earth, perhaps an inopportune choice given the public furor around the leaks orchestrated by former National Security Agency (NSA) contractor Edward Snowden which happened at the same time. And yet, for the same reasons, it is an adorable reflection of the geeky, insular culture of the NRO. The NRO develops and maintains spy satellites, while other agencies like the National Geospatial-Intelligence Agency (NGA) and the NSA choose the targets for those satellites and analyze the data they collect. If nothing is beyond the NRO’s reach, the most interesting parts of the intelligence business are also beyond its authority and expertise. We should bear in mind that the octopus is also a furtive creature that hides in dark cracks to avoid ending up on a dinner plate.

Yet, Macrakis pairs this image with a nineteenth century cartoon depicting the British empire as a greedy octopus with its tentacles all over the globe. The ominous implication is that “geopolitics, technology, and intelligence coalesced into a global espionage empire,” a shape-shifting octopus that “emerged in a piecemeal but ever-evolving way with no central blueprint” (237). To use another nautical image, the United States “created an intelligence leviathan, unwelcome once its secret powers were unveiled” (236). Macrakis argues that American technical intelligence (TECHINT) spends too much money, occasionally in collection schemes that fail, collects too much from those that succeed, cannot make sense of what it collects, and abuses its power and erodes public trust in the process. There is much to agree with for those who are already inclined to distrust the “deep state” or see conspiracy in the mere fact of secrecy, less so for those who suspect that spies have good reasons to keep secrets and are not surprised to read that spies spy, intelligence is uncertain, engineering is difficult, war is dangerous, great power politics are tragic, and the United States is a global hegemon.

Beneath the breathless rhetoric of “technophilic hubris” (5), the book gestures toward several interesting themes in intelligence history: the rise of TECHINT in the twentieth century, the importance of geographical infrastructure for technical collection, the analytical challenges of information overload, the fate of human intelligence (HUMINT) in a world of technology, and the democratic oversight of secret intelligence activities. Satellites, submarines, and servers now collect far more information than human spies ever could. The historical inflection point, as John Ferris has argued, was the emergence of modern signals intelligence (SIGINT) in the First World War, which dramatically changed the quantity and quality of information available to policymakers and commanders. As governments and militaries began to communicate through the wires and the air, the new potential for remote collection created new

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imperatives for operational security and professional organizations to penetrate that security. Specialized SIGINT agencies emerged in almost every major power to intercept foreign signals, break cryptographic codes, and analyze a growing flood of data. Compared to good old fashioned HUMINT, SIGINT required more technical expertise, expanded bureaucratic capacity, and extensive material infrastructure. These trends deepened throughout the twentieth century as spy agencies found new ways to steal secrets by land, through the air, under the waves, and in orbit, leading to new technical disciplines such as imagery or geospatial intelligence (IMINT or GEOINT), scientific measurement and signatures intelligence (MASINT) including undersea acoustic intelligence (ACINT), and the collection of SIGINT and open source intelligence (OSINT) through cyberspace.

Macrakis attributes the development of TECHINT to America’s “love affair with technology” (5), which is surely a contributing factor. But this cultural explanation does not explain why the SIGINT revolution began in Europe nor why so many Asian countries also invested heavily in modern technology-centric intelligence agencies. The obvious alternative, which gets little mention throughout the book, is that TECHINT was a functional response to the uncertainties of global politics in the twentieth century, the new opportunities for mitigating those uncertainties through remote collection at scale, and the considerable organizational challenges involved in realizing these opportunities. From this perspective, TECHINT is a response to grand strategic imperatives, not simply an accident of cultural hubris. The real tragedy of intelligence is not to be found in TECHINT, therefore, but in the geopolitical rivalry that made TECHINT necessary. From this perspective, TECHINT may even have averted some of the most tragic possibilities of superpower rivalry.

Macrakis instead “argues that the emphasis on technical intelligence and American technophilia had the unintended consequence of catapulting the United States into becoming a global espionage superpower” (6). This surely puts the cart before the horse. US policymakers pursued variations of a containment strategy toward the Soviet Union throughout the Cold War. While one might disagree with contemporary decisions to define American national interests in global terms, it was global interests that drove the growth of American intelligence, not vice versa. The global footprint of American intelligence infrastructure was hardly an “unintended consequence” but rather a deliberate strategic response to the global challenge posed by the Soviet Union during the Cold War.

All intelligence disciplines depend on specialized infrastructure—safehouses and embassies for HUMINT, listening posts and processing centers for SIGINT, satellites and ground stations for GEOINT, underwater

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sensor arrays for ACINT, specialized sensors and platforms for MASINT, and surveillance software for

cyber exploitation. Macrakis looks askance at the global footprint of US intelligence infrastructure, the very
existence of which she interprets as a form of neo-imperialist conquest. The book does not address what
other factors might explain the geographical footprint of intelligence, nor ask about the counterfactual
implications of its absence in the Cold War and today. What would nuclear security competition between
superpowers look like without satellites and undersea sensors circling the planet? My guess is that there is a
much larger chance that none of us would be around to ask that question.

Macrakis highlights the global and technological manifestation of American intelligence in the twentieth
and twenty-first century. Yet, a compelling political and geographical history of intelligence infrastructure
has yet to be written. Such a history might ask, for instance, why countries with different geographical
constraints and strategic ambitions developed different mixes of intelligence capabilities. The Soviet
Union, for instance, put a greater emphasis on HUMINT than the United States, but its targets were open
democracies in adjacent European territories, along with domestic internal security imperatives. The
United States, meanwhile, struggled to understand a closed society on a different continent that was
bristling with nuclear weapons, while US policymakers also had democratic constraints on mobilizing
military manpower. TECHINT provided a way of mitigating these challenging and dangerous
uncertainties.

Macrakis takes the Central Intelligence Agency (CIA) to task in her first chapter for departing from its
founding emphasis on HUMINT to develop TECHINT capabilities like the Corona satellites and U-2
aircraft. These sources provided information about Soviet nuclear forces that the CIA could not otherwise
collect, which helped to relieve some of the overheated paranoia about a “missile gap.” A strong case can
even be made that satellite IMINT has contributed to more strategic stability in international politics than
there might otherwise have been, by removing dangerous uncertainties about the balance of power and
mitigating the temptation to plan surprise invasions.⁵

One of the greatest systematic intelligence advantages the United States enjoyed over the Soviet Union was
in the realm of ACINT, which enabled the US Navy to keep tabs on the detailed movements of Soviet
submarines through a network of undersea hydrophones (SOSUS), surface and space collection, and naval
intelligence processing infrastructure.⁶ And thus one of the greatest lost opportunities in the book is a
chapter entitled “Betrayal Under the Ocean,” which cherry picks a few technically challenged maritime
collection programs. The chapter concludes that “SOSUS, Ivy Bells, and other underwater technology
contributed to the United States as a global espionage power” (126). Macrakis does not mention that this

⁵ Bryan R. Early and Erik Gartzke, “Spying from Space: Reconnaissance Satellites and Interstate Disputes,”
⁶ Christopher Ford and David Rosenberg, The Admirals’ Advantage: U.S. Navy Operational Intelligence in World
War II and the Cold War (Annapolis, MD: Naval Institute Press, 2005).
same infrastructure contributed to keeping the Cold War cold, in effect using information to offset the “delicate nuclear balance” and enable proactive American deterrence policies.\textsuperscript{7}

The real pathologies of intelligence—ranging from groupthink to politicization—have less to do with technology or technophilia and more to do with domestic politics.\textsuperscript{8} Technology is at best an indirect cause here insofar as it is associated with the rise of well-funded secret bureaucracies. We must look to political and institutional conditions to explain when and why spy services with similar technologies become culprits of cognitive closure and policy entrepreneurship, or loyal agents of decision advantage in a dangerous world.\textsuperscript{9} There are real challenges with TECHINT, to be sure, with information overload foremost among them. This problem is so universal across intelligence agencies in every country that one suspects that overcollection is more of a structural feature of TECHINT than a cultural pathology of its practitioners.

Technology, furthermore, is sometimes part of the solution to the problems of intelligence. TECHINT sometimes provides more reliable information than human spies, who lie for a living, after all. Human sources have even been known to denounce their rivals as terrorists in order to liquidate personal grudges.\textsuperscript{10} The folly of relying too exclusively on HUMINT is exemplified by Germany in World War II. The British Double Cross counterintelligence program gained control over every German HUMINT asset on the Home Isles, while German intelligence underinvested in SIGINT under the mistaken belief that mechanical ciphers were unbreakable.\textsuperscript{11} German over-reliance on HUMINT and under-reliance on TECHINT were contributing factors enabling the Allies’ deception of Germany about the Normandy landing (Operation Bodyguard), while British SIGINT from Bletchley Park verified that German targets had swallowed the bait.\textsuperscript{12} HUMINT remains invaluable today, but it is best used as a complement to TECHINT, not as a substitute for it. TECHINT can vet and corroborate human sources, while human sources can emplace and support technical sensors.


\textsuperscript{10} Stathis N Kalyvas, \textit{The Logic of Violence in Civil War} (New York: Cambridge University Press, 2006).


I hope that *Nothing is Beyond Our Reach* will encourage international relations scholars to delve deeper into the history of TECHINT. This book raises a number of issues that deserve further study, ranging from the role of technological enthusiasm in intelligence culture and the relationship between espionage methods and formal or informal empire. Future work could contribute to the newly burgeoning literature on intelligence and political secrecy, by using the questions raised by the book to encourage more systematic exploration of archives within a more balanced explanatory framework. One might set out to explain, for instance, whether and how the global infrastructure of US intelligence contributed to strategic stability, influenced alliance politics, or hindered decolonization in underappreciated ways. One might also test cultural explanations for US reliance on TECHINT against geopolitical imperatives by examining TECHINT in other national and historical contexts. With the increasing availability of archival sources on Cold War intelligence, the title of this book might even be read as a call for scholars to go out and study the self-hiding phenomena of governmental secrecy: with a little persistence (and some helpful archivists), nothing is beyond our reach.

Kristie Macrakis invited me to give my first talk at Georgia Tech, on the subject of Bletchley Park and its lessons for modern cybersecurity. It was a virtual talk during the pandemic, and she was a kind and engaged virtual host. Perhaps this appearance contributed to a subsequent invitation to give a talk that landed me a job at Georgia Tech, so I may owe her a further debt of gratitude. I regret not being able to meet her in person, as our overlap at Georgia Tech in different departments at the opposite ends of campus was too brief. In light of all this, I regret writing a less-than-glowing review of her final work, and I especially wish she were able to respond to these critiques to push the conversation forward. As intelligence and technology become more central to international security, we need more voices like hers to explore its origins and implications. I hope that other scholars will be inspired to pick up where she left off.

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It was a pleasure and a great sadness to read *Nothing Is Beyond Our Reach: America’s Techno-Spy Empire*. To read it was to step into Kristie Macrakis’ active and sweeping mind and appreciate the connections she drew from so many different sources to tell the story of the United States’ embrace of technology in the intelligence world. From vicariously biking along with her in New Zealand to enjoying the relish with which she shared the most perfect and pithy of quotations, it is an intelligible and pleasurable read on a complex subject. The sadness is, of course, that she is no longer with us to provide these rich insights in person.

At the Spy Museum in Washington, DC, I had the pleasure of working with Macrakis over the years on a variety of programs connected to her interesting publications. My favorite of the Macrakis-Spy connections was a case she sought to crack with our former Director of Youth Education, Jacqueline Van Eyl. Eyl had for many years tried to figure out how exactly the storied method of secret writing on the shell of a hardboiled egg worked. When done correctly the message appears on the egg white when peeled, but not on the exterior of the egg. When Macrakis wrote *Prisoners, Lovers, and Spies (2014)*,¹ she began pursuing the solution of the egg case with her chemist collaborator. The originator of the idea, Giambattista “della Porto was one of Renaissance Italy’s greatest scientists and polymaths, full of youthful enthusiasm for the wonders of nature. He was also the first to publish a major book on cryptography, and invisible ink.”² Macrakis even posted a reward on her website for anyone who cracked this case. Eyl teamed up with her to promote the opportunity through our KidSpy programs and activity sheets. As Macrakis noted, “Even though della Porta was enthusiastic about using an egg for secret writing, it has been very hard to get this kitchen experiment to work.”³ Macrakis was also very supportive of Eyl’s efforts to try out George Washington’s sympathetic stain (invisible ink) recipe and eagerly awaited the results. The energy and passion that Macrakis exerted around this topic was typical of her approach and is very much in evidence in this new book.

Macrakis organized the book as a “three-act story about the ascent of the US intelligence community from its nascent period in the early 1950s using traditional human espionage methods into a behemoth spanning the globe with powerful technology during the post 9/11 war on terror” (8). From the tech to the staffers to internal graphic design, Macrakis finds broad support for her thesis that the search for intelligence had become all-encompassing for the agencies. The quest for more data grew beyond the capacity to analyze it and became an end in itself. You can feel her palpable delight as she dissected the logos of various agencies and how evocative they are of her thesis. She used the very telling “film-choked eagle” from the seal of the National Photographic Interpretation Center to illustrate that the intelligence community very early arrived at the point where there will always be more film to review than time or people to review it (198). She finds the notes of the staff who approved the NROL-39 patch featuring an octopus encircling the world

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with the slogan “nothing is beyond our reach” (3). The slogan of course became this book’s name, and it fully captures the staggering scope of collection the US intelligence community seeks to capture. Intriguingly, the patch gave none of the reviewing staff pause, although Macrakis found that one anonymous person noted it was “a little Sinister” (205). Her careful explanation of how the US was able to use the holdings of the waning British Empire to secure access for intelligence collection around the world after World War II is beautifully summed up with the observation that, “combining Britain’s real estate with American global aspirations helped create a technology that covered the globe from world-circling satellites from above to fiber optic cables under the ocean” (142-3). The illustration she included of the “Eastern Telegraph Company submarine telegraph cable routes, showing the global reach of telecommunications, c. 1901” makes it clear how encircled the globe was already over a century ago (173). That the US built upon the remnants of empire with ever fresher technological applications is the sort of heavyweight “fun fact” Macrakis’s work yields, and that I have enjoyed sharing with my friends.

Many of the projects she explored and people she wrote about are individuals I have personally known from my twenty years working at the Museum, but the book offers a deeper understanding and contextualization of missions and players, integrating known episodes with new material in surprising ways. Her discussion of Project Azorian, a daring mission led by the CIA to retrieve a sunken Soviet submarine from the bottom of the Pacific Ocean in the early 1970s is familiar to me; we have artifacts from this mission on display at the International Spy Museum, and I curated our small exhibit on it. I am always delighted when I get to tell visitors about how the CIA commissioned a huge ship, the Glomar Explorer, to retrieve the sub, and persuaded billionaire Howard Hughes to become the cover story for the mission. This episode is worthy of a film treatment. Hughes gamely proclaimed that he was using the ship to mine for manganese in the Pacific. There was even a media reception where it was announced “that Howard Hughes is ready to go mining, hopefully by the summer of 1974.”* When the press began to suspect that this was not a mining ship, but a covert operation, the US government had to craft a careful response. Most people know the phrase associated with this mission, “I can neither confirm nor deny…” but few know that it was written by the associate general counsel of the CIA to keep the whole project secret. Macrakis’s take on the story gave me fresh insight into how the sunken K-129 was located by the Navy’s hydrophones which had been in place since the late 1950s.

I also was delighted by the additional information Macrakis provided about an operation we included in the main exhibition at the original International Spy Museum. As our exhibition label stated:

> In the early 1970s, the U.S. government learned that the Soviet Union had constructed an undersea cable between two major naval bases. Although a network of sound detection

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* Josh Dean, *The Taking of the K-129: How the CIA used Howard Hughes to Steal a Russian Sub in the most Daring Covert Operation in History*, New York, New York: Dutton, 2017), 164).
devices protected the area, the Navy could not pass up the chance to intercept a goldmine of Soviet intelligence.

A team of combat divers worked with attack submarines to tap the undersea cable. They installed a tiny waterproof device that recorded all communications passing through the line. Every six to eight weeks, a submarine would return to collect the recording. This mission, Operation Ivy Bells, continued until its discovery by the Soviets in 1981.  

Macrakis revealed how “the navy’s chief underwater spy” James F. Bradley, Jr. found the Soviet underwater cables that were tapped in Operation Ivy Bells (115). Bradley purportedly remembered that in his boyhood in Missouri there were “signs that said to watch for underwater cables” along the rivers (120). He set about looking for similar signs on the Soviet coastline.

Although Macrakis’s text discusses technology, she never forgot to include the human element. Her efforts to highlight the “lost” work of human spies in the 1962 Cuban Missile Crisis explained both why these individuals were not revealed sooner and how the U-2 spy plane became the star of the show. We are familiar now with how public perception is shaped quickly, the overflight photos shaped public opinion of how intelligence was gathered during the Crisis. As Macrakis writes “the iconic black-and-white aerial photographs of the missiles in Cuba displayed on the briefing boards in President Kennedy’s Cabinet Room and the more extensive images viewed by millions at the Adlai Stevenson UN briefing” made them the memorable piece of the story (97). Macrakis deftly explains the deeper story and how it connected to the endless pursuit of more technological innovation. As she noted, the “CIA… knew that U-2 spy plane overflights wouldn’t last forever. Fortuitously, the agency had also been exploring satellite reconnaissance” and so it continued with new technology replacing the old (213).

The most impressive part of the book is a “find” that Macrakis relished. The menu of the dinner that British cryptographer Edward Travis shared with American code breaker William Friedman at Bletchley Park to celebrate VE day, May 1945 was playful. The sense of joy that these two men experienced as things trended better for the Allies could not be more clearly depicted than with the whimsy of their menu which included Potage Ultra and Poulet Arlington. The soup “referred to the Ultra secret; chicken Arlington, to Arlington Hall, the US code-breaking building” (148). The deft way that Macrakis uses the material to humanize these men and share their celebration makes the book a delight. It was a pleasure to read the book, one that was unexpected based on the subtitle “America’s Techno-Spy Empire.” Macrakis would never have written a dry and unintelligible work. I can highly recommend this for the non-expert who wants to know a lot more about how the United States’ intelligence community became glutted with data drawn from around the world. Macrakis strongly supported her “three-act story” with data, anecdotes, and illustrations, but more importantly to me, she tells a riveting story as only a fine storyteller can (8).
It is difficult to read Kristie Macrakis’s book without thinking about her tragic and untimely passing. This is an unusually personal and unconventional project that is part spy-history travel guide, part technology deep dive, and part ideological screed.

For Macrakis, history was everywhere, not just in the archives, and she wanted to see it all. She began by traveling to San Cristóbal, Cuba to learn whatever happened to the Soviet nuclear missile sites that triggered the 1962 Cuban Missile Crisis. Macrakis found an overgrown landscape where the only remnants of the world’s most dangerous nuclear showdown are a faded marble plaque, a small piece of a launch pad, and chicken coops and pigpens that local farmers had built out of repurposed missile site metal and concrete. Her captivating description sets the tone for the book: without attention to the past, lessons can be learned and then lost. The jungle grows back, and history moves on.

Macrakis takes readers to other stops on her American spy history world tour, from National Geospatial-Intelligence Agency headquarters—where readers learn that the large outdoor pond is not cosmetic, it is used to pump 31,500 gallons of chilled water per minute to cool all of the high-powered computers inside—to New Zealand, where giant white radomes rise above local vineyards, intercepting global communications for the US and its closest intelligence allies. Her vivid descriptions of these and other sites highlight the juxtaposition of the mundane and the exotic, secrecy and openness, pastoral settings and dangerous work, that characterize American intelligence history. In intelligence, the truth often is not what it seems.

Most of the book is devoted to recounting the greatest hits of American spy technology history, including the development of the CORONA satellite and the U-2 spy plane; construction of the ill-fated eavesdropping tunnel under divided Berlin in the 1950s (which was betrayed from the start by a Soviet mole); the CIA’s AZORIAN covert operation to hoist a sunken Soviet nuclear submarine from the bottom of the Pacific Ocean by posing as a Howard Hughes-sponsored deep-sea mining expedition; the John Walker spy ring and other human betrayals that ended up compromising the effectiveness of even the best spy technologies; the growth of the “Five Eyes” partnership between the US, United Kingdom, Canada, Australia, and New Zealand; the on again-off again development of armed drones which eventually took flight after the 11 September 2001 terrorist attacks; and the dramatic expansion of National Security Agency (NSA) activities as revealed by former NSA contractor Edward Snowden in 2013.

Although all of this ground has been well covered by others, Macrakis provides a concise and well-written overview with an eye to the interaction between machines and humans that highlights the overlooked role of human assets in the Cuban missile crisis and in targeting lethal drone strikes against suspected terrorists after 9/11.¹

¹ See for example Philip Taubman, Secret Empire: Eisenhower, the CIA, and the Hidden Story of America’s Space Espionage (New York: Simon & Schuster, 2003); David H. Sharp, The CIA’s Greatest Covert Operation (Lawrence, KS:
The discussion of early Cold War intelligence technology is perhaps the strongest part of the book. Macrakis mines archival materials and secondary sources to recount the crucial role of the Technological Capabilities Panel (TCP), a special advisory group to President Dwight Eisenhower that was led by MIT President James R. Killian. Formed in 1954, Killian’s Panel involved more than three dozen leading scientists to study offensive technology, defensive technology, and intelligence. The intelligence work was highly secretive, limited to just six members, and led by Edwin “Din” C. Land, the president of the Polaroid Corporation who would go on to become, as Macrakis put it, “an evangelist of science and technology at the CIA” (25). Land’s group recommended that the CIA develop a high-altitude airplane to better ascertain Soviet military capabilities—which became the U-2. Macrakis notes that the intelligence group’s reports were so secret that they were not even included in the TCP’s final report. Instead, they were sent directly to offices with a need to know and then shredded.

Making use of documents that were declassified in 2017, Macrakis also reveals that the Soviets did not, in fact, surprise American intelligence agencies or policymakers when they launched the Sputnik satellite on 4 October 1957. Intelligence agencies were tracking the development of the satellite program for years. The public was stunned, but officials in Washington were not. Indeed, a few months before Sputnik, the CIA’s Current Intelligence Weekly Summary of 27 June 1957 noted, “Since the USSR has committed itself publicly to launching an earth satellite within the next few months and is well aware of the psychological and political advantages of a ‘first’ in this field, a major effort on its part toward this end is expected.”

Macrakis could have delved more into these more recently declassified documents and what they reveal. The book’s claims would have been better served by paying more careful attention to original sources elsewhere. For example, she writes, “It should be remembered that there was a pronounced climate of fear surrounding a surprise nuclear attack during the mid-1950s” (31). Her evidence is that “Half of all American adults apparently felt that they were more likely to die in a Soviet nuclear attack than from diseases caused by old age, according to a poll” (31). This is an important and intriguing empirical claim. I wanted to see the actual poll to learn more. But Macrakis does not cite it. Instead, the footnote cites Skunk Works by Ben R. Rich and Leo Janos, which was written nearly four decades after the poll was taken. They don’t have a citation to find the poll, either, just a short description of the results. But their description is not the same as Macrakis’s description of their description. They write, “a national poll of adult Americans indicated that more than half the population thought it more likely that they would die in a thermonuclear war than of


old-age diseases.” In their telling, the poll showed that Americans were worried about thermonuclear war in general, not a Soviet surprise nuclear attack specifically. This is a substantive difference.

The individual pieces of this book are far stronger than the whole. Macrakis notes that she set out to tell the history of intelligence technology from the foundations set in the 1950s to the behemoth American intelligence enterprise of today. But the narrative often veers from that path. She devotes a chapter to the CIA’s sordid past of using mind-altering drugs on unwitting American citizens in the 1950s and waterboarding suspected terrorists after 9/11—which has no thematic connection to technology but does offer a pointed criticism of the CIA. Throughout, Macrakis argues that America’s use of intelligence technology amounts to a global “empire” that has “colonized” the world. These claims are distracting, unsupported, and at times just plain illogical. She writes, for example, that “although the United States did not mimic the Roman, British, and French Empires in controlling other nations or possessing large overseas landmasses, it had its own unique form of empire, colonizing other countries with American companies and consumerism, from IBM to McDonald’s….” (4). Left undiscussed is how exactly the purchase of a hamburger or a business computer is equivalent to subjugating and enslaving entire populations, what evidence there is to support such a claim, and what any of this has to do with the development of American spy technology.

In Macrakis’s reading, intelligence collaboration is the same thing as physical and political colonization, and global intelligence collection is tantamount to American global repression. These are logical and empirical stretches. She notes, for example, that New Zealand’s spy facility is “…a visible reminder of technological spying in a techno-colonized country” (xxiii). She does not note that the United States never “colonized” New Zealand. The British did. New Zealand is one of the Five Eyes partners that closely share intelligence. Macrakis uses the word “empire” repeatedly but never defines it, asserting only that whatever it is, it is obvious, bad, and created by US spy agencies.

Also disappointing is Macrakis’s decision to halt the story of how technology has influenced the development of American intelligence a decade too soon—in 2013, with Snowden’s revelations about NSA surveillance programs. The following decade is quite one to have missed. The past ten years have brought an historic technological moment of reckoning for American spy agencies. The Internet now connects two-thirds of the world, up from less than one percent in the mid-1990s. Cyberspace has emerged as a critical battleground for spying as well as stealing, destroying, disrupting, and deceiving. Artificial intelligence is supercharging both insight and deception. And the proliferation of commercial satellites is fueling an open-source intelligence revolution, offering low-cost eyes in the sky for everyone, not just secret superpower spy agencies with massive budgets. For all of Macrakis’s concern about the concentration of intelligence power

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by the United States and its Five Eyes partners, intelligence capabilities have never been more democratized worldwide. Anyone with a cell phone can now collect, analyze, and disseminate intelligence—sometimes faster and better than governments. Far from finding these trends assuring, I find them alarming. They confront US spy agencies with more threats, more speed, more data, more customers outside of government (like voters and tech executives who need intelligence to protect elections and critical infrastructure from adversaries), and more competitors in the race for insight. But whatever one thinks of the implications, the emergence of these technological trends is unmistakable and important. I wish that Macrakis had covered them. Most of all, I wish we could have debated these and other issues of her book together.