Technophilic Hubris and Espionage Styles during the Cold War

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ABSTRACT

During the Cold War the United States developed an espionage style that reflected its love affair with technology (*technophilia*) whereas the Soviet Union and the East Bloc continued a tradition of using humans to collect intelligence. This essay places the origins and development of these espionage styles during the Cold War in historical and social context, and assesses their strengths and weaknesses by drawing on examples from particular cases. While the United States won the Cold War, the East Bloc won the spy wars because of a more effective espionage style. I conclude with some reflections on the uses of history for future policy, and suggest areas for further study.

I N 1957, WHEN THE COLD WAR was in full swing, Ian Fleming published the classic spy novel, *From Russia with Love*. In a chapter titled *Konspiratsia*, a Soviet general discusses the strengths and weaknesses of various spy agencies and characterizes American intelligence as rich, technically excellent, but lacking in knowledge about spying: "The Americans have the biggest and richest service. . . .Technically. . . they are the best. But they have no understanding for the work." By contrast, Fleming (speaking through the general), describes the British Secret Service as excellent; they hired smart and well-educated men.[1] Like the British fictional world, the Soviet Bloc used humans to gather intelligence with great success, in fiction and in reality.

In this essay, I will demonstrate the way in which the East Bloc used human spies successfully to ferret out secret information while the United States, with numerous mishaps, predominantly employed technical means to learn about the secretive East Bloc. The rise of large-scale technical intelligence in the United States was part and parcel of Cold War science and technology. Intelligence needs stimulated and accelerated the development of Cold War technology like spy satellites, high-altitude planes, and nuclear-powered submarines.

The espionage styles of the Soviet Bloc and the United States were deeply imbedded in their respective cultures and attitude toward espionage and technology. While the Soviets had a long tradition of espionage dating back to the tsarist regime, the United States was relatively new to the business, and its motto, "gentlemen don't read each other's mail," reflected its abhorrence of spying. As a result, the United States and the Soviet Union were competing on a very uneven playing field when the espionage wars kicked off in earnest during the 1950s. It had taken the attack on Pearl Harbor for the United States to mobilize its resources to create new institutional forms like the Central Intelligence Agency (CIA) and National Security Agency (NSA); and it took the war on communism to learn how to fight fire with fire.

The Soviet Union and the rest of the East Bloc favored human intelligence—the use of agents to gather information—and the United States relied heavily on technology to gather secret information. Because of the United States' propensity for using technical solutions to solve problems, it developed a dizzying array of technological wonders to serve as mechanical eyes and ears abroad. Intelligence agencies planted spies in the sky, spies in the ether, spies underground, spies in the water, and spies in the mind. In fact, the United States had, and has, the whole globe covered with planes, satellites, unmanned aerial vehicles (UAV's), radios, electronics, tunnels, and submarines. It also steadily used codes, and even pharmaceuticals, in the service of espionage.[2]

In addition to having an old tradition of espionage, the Soviet Union's closed society prevented Western spies from gaining easy access to secret information whereas the United States' open society made it a soft espionage target. By the early Cold War the Soviet Union had already infiltrated its "main enemy"—the United States—with an army of spies in all sectors of society though they were particularly interested in science and technology. From the Rosenberg spy ring in science and technology in the 1950s, to the capture of Aldrich Ames in the CIA and Robert Hanssen in the Federal Bureau of Investigation (FBI) during the 1990s, Soviet spies made headline news.

In 1995, the NSA declassified the VENONA transcripts, a series of Soviet diplomatic cables intercepted and decrypted by the United Kingdom and the United States in the late 1940s. This material, along with memoirs, demonstrated that atomic espionage was even more widespread than the general public ever imagined. Prominent scientists like Klaus Fuchs, and the Harvard educated, intellectual prodigy Theodore Alvin Hall, proved to be even more important than Julius Rosenberg in acquiring and passing on atomic secrets. Unlike Fuchs and Rosenberg, Hall was never convicted of espionage though the government knew of his involvement through the VENONA intercepts. In addition to the sensational atomic spies, industrial espionage had been the bread and butter of Soviet intelligence for the whole twentieth century.[3]

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[2] On satellites see Jeffrey Richelson, *America's Secret Eyes in Space: The U.S. Keyhole Spy Satellite Program* (New York: Harper Collins, 1990); William E. Burrows, *Deep Black* (New York: Bantam, 1988); Dwayne Day, *Eye in the Sky: The Story of the Corona Spy Satellites* (Washington, D.C.: Smithsonian Institution Press, 1998); and Kevin C. Ruffner, ed., *America's First Satellite Program* (New York: Morgan James, 2005). The fiftieth anniversary of *Sputnik* has spawned a number of recent releases: Thomas Graham, Jr. and Keith Hansen, *Spy Satellites and other Intelligence Technologies that Changed History* (Washington: Univ. of Washington Press, 2007); and Pat Norris, *Spies in the Sky: Surveillance Satellites in War and Peace* (Chichester, U.K.: Springer, 2008).

[3] Ronald Radosh and Joyce Milton, *The Rosenberg File,* 2nd ed. (New Haven: Yale Univ. Press, 1997). On Theodore Alvin Hall see Joseph Albright and Marcia Kunstel, *Bombshell: The Secret Story of America's Unknown Atomic Spy Conspiracy* (New York: Crown, 1997). The following books have sections on science and technology: John Earl Haynes and Harvey Klehr, *Venona: Decoding Soviet Espionage in America* (New Haven:

Uncovering Soviet Bloc spies on U.S. territory was only one problem. With the heating up of the Cold War, the United States began to fear a surprise nuclear attack from abroad. Unlike the Soviet Union's success in planting human spies abroad, the United States had few spies on Soviet territory to learn about their military capabilities and intentions. And because of the Soviet's closed society, it proved very difficult to develop American agents.

America has a long tradition of "technological enthusiasm," a phrase used by the eminent historian of technology, Thomas Hughes. Though Hughes was referring primarily to the era of great inventors like Thomas Edison, most historians would agree that America's love affair with technology, or "technophilia" as I call it (in contrast to technophobia), continues to our own day. In fact, by the time of the Cold War, technology had become a cure-all, a "fix" for numerous problems. Therefore, it should be no surprise that technological solutions were also applied to the intelligence problem of a closed society. The rise of the military-industrial-academic complex and growing technical capabilities during the 1950s facilitated this development.

Dwight D. Eisenhower's faith in science and technology helped launch America's unique technology-based espionage during the 1950s, especially in the area of spy satellites and planes. Eisenhower's scientific advisor, MIT president James Killian, and Polaroid's Edwin Land were pivotal in building relations among the military-industrial-academic complex, and for developing highly sensitive cameras and planes that would fly high enough to avoid detection.[4]

There is no doubt that space age technology was a boon to detecting some national security threats, but it was also very expensive. Researchers have estimated that about 70 percent of the (officially classified) intelligence budget was allocated to expensive technological systems like satellites. In short, they cost billions of dollars. Spy satellites were often touted by intelligence professionals as crucial in determining that the Soviet Union had placed missiles on Cuba in 1962. It was, in fact, a human source, the defector Oleg Penkovsky, the CIA's star GRU (military intelligence) source in the Soviet Union who first provided the CIA with this information. The satellite photo interpreters could decipher what they saw and provide additional visual evidence, but Penkovsky had given it context and meaning.

Although U.S. intelligence did not have many human spies in the Soviet Union, a sea of defectors, like Penkovsky, fell in their laps in the course of the Cold War. Despite this windfall of human intelligence, technical intelligence gathering continued to be U.S. intelligence's primary method for gathering information. Advocates of technical intelligence often argue that machines are less risky than humans: they do not lie, spend time in prison when caught, or betray their country. Because they do not possess a long list of human weaknesses, they also cannot be persuaded to betray their own country by the enemy.[5] But such blind optimism in the power of technology forgets that technology does not run or build itself. There are numerous Cold War examples of the way in which humans betrayed technical systems.

Yale Univ. Press, 1999); John Earl Haynes, Harvey Klehr, and Alexander Vassiliev, *Spies: The Rise and Fall of the KGB in America* (New Haven: Yale Univ. Press, 2009); Christopher Andrew, *The Sword and the Shield: the Mitrokhin Archive and the Secret History of the KGB* (New York: Basic Books, 1999); and Christopher Andrew, *The World was Going our Way: The KGB and the Battle for the Third World* (New York: Basic Books, 2005). See also Kristie Macrakis, "Science and the Stasi," *Nature*, 2009, *46*:594–595.

[4] Philip Taubman, *Secret Empire: Eisenhower, the CIA, and the Hidden Story of America's Space Espionage* (New York: Simon and Schuster, 2003).

[5] Abram N. Shulsky and Gary James Schmitt, *Silent Warfare: Understanding the World of Intelligence*, 3rd ed. (Washington, D.C.: Brassey's, 2002), p. 165.

During the 1970s, the Soviets vastly improved their knowledge of American recon-naissance satellite technology through several American spies. Christopher Boyce, a young college dropout, and his drug-dealer accomplice Andrew Daulton Lee, sold the KGB classified TRW (Thompson Ramo Wooldridge)-CIA reconnaissance system infor-mation, taken from the black vault at TRW's California branch that was chiefly about the classified satellite system code-named RHYOLITE. They were caught and convicted in 1977. A year later, William Kampiles, a disgruntled former CIA employee, stole and passed on a top secret technical manual about the KH-11 imaging system, the successor to the satellite system code-named CORONA.[6]

One of the most spectacular cases of human betrayal of technology is the story of the Berlin Tunnel. The Berlin Tunnel operation was a joint British and American intelligence operation designed to tap into Soviet army landline communication cables beneath the streets of the Soviet sector of Berlin. From the time plans began in 1953, the tunnel had already been betrayed to the Soviets through the British mole, George Blake. Though the Soviets let the operation run for a few years to protect their source and to provide the West with trivial information (known as chicken feed in espionage jargon), it was finally publicly unearthed with much fanfare in 1956.[7]

The United States' most embarrassing case involving enemy detection of technological espionage was the shooting down of Gary Powers and his U-2 spy plane on 1 May 1960 in the Soviet Union. The incident occurred two weeks before the much-anticipated Big Four (Eisenhower, Nikita Khrushchev, General de Gaulle, and Harold Macmillan), East-West Peace summit in Paris, and created an international crisis contributing to the deterioration of U.S.-Soviet relations because Eisenhower refused to apologize to Khru-shchev for the spy plane incident; the summit never took place. While most studies concentrate on the technical aspects of the plane or on Gary Powers, presidential historian Michael Beschloss argues that the information provided by the U-2 plane helped allay U.S. fears of the Soviet Union because it showed how militarily weak they were.[8] Such reconnaissance also allegedly helped the United States see that the feared missile gap did not exist. However, human spies came to the same conclusion and could provide the discovery with context and meaning; machines said nothing about the *intentions* of Soviet leaders. The discovery of the U-2 did not halt reconnaissance flights, but rather led to the development of more stealthy planes that could fly faster and at higher altitudes (like the Blackbird SR-71), and to the mushrooming of what should be called the military-industrial-academic-*intelligence* complex.

Spies in the sky are probably the most well-known aspect of American technological espionage, but spies also lurked beneath, in the depths of the ocean. Curiously, the literature (and it is primarily popular) on submarine espionage is rather short on substance and long on anecdotes. We learn a lot about the ballads they sang and the risks they took. But what knowledge did they glean and how did it change the course and outcome of the Cold War? To be fair, we do learn that submarines carried out at least two thousand

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[6] Jeffrey T. Richelson, *A Century of Spies: Intelligence in the Twentieth Century* (New York: Oxford Univ. Press, 1995), pp. 344–347.

[7] See David Stafford, *Spies Beneath Berlin* (New York: Overlook Press, 2003); and David E. Murphy, Sergei A. Kondrashev, and George Bailey, *Battleground Berlin*: *CIA vs. KGB in the Cold War* (New Haven: Yale Univ. Press, 1997).

[8] Michael Beschloss, *Mayday, Eisenhower, Khrushchev and the U-2 Affair* (New York: Harper and Row, 1988). On the CIA and the U-2 Program see Norman Polmar, *Spyplane: The U-2 History* (Osceola, Wisc.: Zenith Press, 2001).

missions to keep track of Soviet submarines. The Soviet "boomers" were longer than football fields and carried as many as twenty ballistic missiles that could launch ten nuclear warheads each.[9]

The American submarines were just as frightening. One of the most disturbing stories surrounds the mysterious disappearance in 1968 of the USS *Scorpion*, a nuclear-powered attack submarine. When the submarine was finally found, investigators determined that an explosion caused the submarine to sink and to kill all ninety-nine crew members. But the cause of the explosion was never discovered and speculations swirled about a Soviet attack or an explosion of one of the nuclear-tipped torpedoes on board. If the Soviet attack theory is correct, researchers hypothesize that daily cryptological keys from John Walker's spy ring (Walker was a KGB agent who walked in to the Soviet embassy and volunteered to spy) allowed the Soviets to monitor the movements of U.S. Navy ships and submarines.[10] Whatever the reason for the loss of the submarine, it was not an isolated example. Like other espionage technology debris, it contained dangerous nuclear material and lies in the ocean as a relic of the Cold War.

Unlike innovations and breakthroughs in large-scale spy technology, the CIA considered tradecraft—the tools with which one conducts espionage—old-fashioned by 1962. Operatives were using the same standard issue spy gear as they did during World War II. Improvements were based on reactions to cases where the technology had failed to protect the agent. A turning point came after Penkovsky was caught through a sophisticated KGB technical surveillance operation, tried in public with prominent display of his old-fashioned Minox spy camera, and secretly executed by the KGB. After the loss of Penkovsky, the CIA's Technical Services Division (later the Office of Technical Service) began developing hi-tech spy gear for agents. They particularly focused on improving secret communication equipment and developed more sophisticated spy cameras like the T-100, an easy to hide, pen camera. In addition to developing lifesaving technology for the agent, the technical services division was given a license to play. One of the most bizarre gadgets developed was acoustic kitty, a failed attempt to implant a listening device in a live cat during the mid-1960s. Though the doctored cat worked in the restricted environment of a laboratory, it could not be controlled in real life.[11]

One of the CIA's most egregious attempts to harness science and technology to control human agents were the notorious mind control experiments carried out during the 1950s and 1960s. In addition to experimenting with LSD on unwitting subjects, the CIA financed and used the results of personality assessment, brainwashing, and de-patterning research to cleanse and re-program people's minds.[12]

While the CIA was busy developing large-scale technology that served as mechanical eyes in the sky, the National Security Agency (NSA) was working on developing big ears in the ether. By the end of the Cold War, American and U.K. signals intelligence spanned the globe and software was developed that could intercept all mail, fax, telephone, and Internet communications. Despite this chilling global surveillance, the NSA was unable to thwart the terrorist 9/11 attack on America. Although the NSA had intercepted commu-

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[9] See especially the Prologue in Sherry Sontag and Christopher Drew, *Blind Man's Bluff: The Untold Story of American Submarine Espionage* (New York: Public Affairs, 1998).

[10] This is the interpretation in Ed Offley, *Scorpion Down: Sunk by the Soviets, Buried by the Pentagon: The Untold Story of the USS Scorpion* (New York: Perseus Books Group, 2007).

[11] Robert Wallace and H. Keith Melton, *Spycraft: The Secret History of the CIA's Spytechs from Communism to Al-Qaeda* (New York: Dutton, 2008), pp. 25–80, 200–203.

[12] See John Marks, *The "Manchurian Candidate": The CIA and Mind Control* (1979; New York: Norton, 1991).

nications by two of Osama Bin Laden's confederates, they did not act on the information. Specialist James Bamford has pronounced the NSA the "largest, most costly, and most technologically sophisticated spy organization the world has ever known."[13]

A COOL HEAD AND A HOT HEART

Orbiting satellites, high-altitude spy planes, submarines gliding beneath the ocean, and big ears in the ether epitomized the American style of espionage. Nefarious spies like those in the Rosenberg Ring and the Cambridge Five, as well as Aldrich Ames and Robert Hanssen, lurked in key Western institutions and exemplified the East Bloc style of intelligence gathering. Not only were human spies used extensively, but they were glorified as heroes when successful. It is telling that Richard Sorge, the spy who warned Russia of Germany's surprise attack in 1941, adorned a postage stamp issued in 1965. "A hot heart, a cool head and clean hands" is the chant of the Soviet chekists, epitomized by Richard Sorge. The Cheka was the first Soviet intelligence and security agency, headed by the Polish-born Felix Dzerzhinsky.[14]

By contrast, spies are not glorified in America and have never reached an iconic status to adorn a postage stamp like statesmen, artists, or musicians. Stamps in the United States, however, do contain orbiting satellites, one of our symbols of international preeminence in technology, but not in the context of espionage. In 1960, about five years before the Sorge stamp, the U.S. Post Office issued a stamp illustrating the passive communications satellite, Echo I.

Soviet and East Bloc spies were better at their craft—recruiting and planting agents at key institutions, acquiring secret information, and especially developing the fine art of double agents. In fact, the East Bloc's great success in using double agents turned into the CIA's most appalling blunder. At the end of the Cold War, the CIA discovered that all of its East German and Cuban agents were, in fact, double agents working at the behest of East German or Cuban foreign intelligence. As former CIA chief historian Benjamin B. Fischer writes, this rendered "the CIA deaf, dumb and blind" in East Germany. Further, "the East Germans, as well as the Soviets, ran circles around SE [the CIA's Soviet-Eastern European Division], neutralizing its operations and tying it up in knots with double agents who fed it disinformation."[15] The double agent fiasco occurred, in part, because of U.S. intelligence's dependence on technological espionage and its lack of skill in human intelligence. In a sense, the East Bloc won the spy wars but lost the Cold War.

HISTORY LESSONS FOR POLICY AND DESIDERATA

Given the failures of technological espionage, it is surprising that former CIA inspector general Frederick Hitz still advocates using technological espionage against the Internet in our own age. It apparently continues to be a "bromide in the intelligence world that

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[13] James Bamford, *The Shadow Factory: The Ultra-Secret NSA from 9/11 to the Eavesdropping on America* (New York: Doubleday, 2008), p. 1.

[14] On the Cheka see Christopher Andrew and Vasili Mitrokhin, *The Sword and the Shield: The Mitrokhin Archive and the Secret History of the KGB* (New York: Basic Books, 1999), p. 23.

[15] Benjamin B. Fischer, "Deaf, Dumb, and Blind: The CIA and East Germany," in *East German Foreign Intelligence: Myth, Reality and Controversy*, ed. Thomas Wegener Friis, Kristie Macrakis, and Helmut Müller-Enbergs (London: Routledge, 2009), pp. 48–69, on pp. 48, 69.

America's competitive advantage lies in its extraordinary technological competence."[16] Given that each methodological approach has its strengths and weakness, it would make sense to draw on the best of both worlds as policy makers confront new intelligence problems. If intelligence must be conducted at all, and if the twelve sprawling bureaucratic entities in the American intelligence community continue to exist, then they should aim to develop tradecraft in which technical and human intelligence gathering is used in a complementary way. Balancing the use of human and technical intelligence methods has a very successful precedence in intelligence history. During World War II, British intelligence turned Nazi spies into double agents while intercepting, listening in on, or reading their secret communications through technical means.[17]

Even with these suggestions, it is difficult to come away from a study of Cold War espionage without asking the question: *quo bono*? Why invest so much time and energy into a game with such little useful outcome? One of the questions to consider in future studies is whether the investment is worth the return, either financially or in terms of manpower hours and materials. All spy agencies were seduced by the potential of secrets to solve problems and became caught up in a spy game obsessed with bureaucratic secrecy.[18]

During the last decade, important studies have been written on Soviet espionage in America, Europe, and the Third World. There is also some emerging work on the United States' use of technology in intelligence. However, much work needs to be done to assess American-style technological espionage during the Cold War more fully, particularly and from the perspective of the history of science and technology. To what extent did intelligence needs stimulate the development of the large-scale technology that led to spin-offs in the commercial sector? Would we have been left in the technological stone age without the national security needs or would the same developments have happened in a slower fashion? After all, innovative technology has been a hallmark of America's achievements.

As this essay has hinted, journalists and former practitioners have largely written the history of Cold War espionage. This does not detract from their significance or quality, but the distance of time and historical perspective should allow us to sift the minutiae of agent recruitment from the larger historical questions about the use of espionage in global affairs. The studies by Cambridge University Professor Christopher Andrew, U.S. historians Professor Harvey Klehr and John Earl Haynes, and the political scientist Jeffrey Richelson in America, are exceptions, though all their books emphasize the details instead of the bigger picture. Another question to consider would be whether secret intelligence can only flourish in a closed, secret, and totalitarian regime.

More generally, students would profit from examining the development of intelligence in world history to determine how important it is in influencing the outcome of wars and the conduct of diplomacy. In contrast to the hundreds of years preceding the Cold War, the period since 1945 witnessed the emergence of lumbering and bloated intelligence bureaucracies to add to existing governmental officialdom. As a result, intelligence bureaucracies have taken on a life of their own and lost sight of the espionage goals.

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[16] Frederick P. Hitz, *Why Spy? Espionage in an Age of Uncertainty* (New York: Thomas Dunne Books, 2008), p. 152.

[17] For the fascinating story regarding the Nazi spies see J. C. Masterman. *The Double-Cross System: The Incredible True Story of How Nazi Spies Were Turned into Double Agents* (1972; New York: Lyons Press, 2000).

[18] Kristie Macrakis, *Seduced by Secrets: Inside the Stasi's Spy-Tech World* (New York: Cambridge Univ. Press, 2008). This notion can be applied to all spy agencies.

During the last decade a plethora of books have been written about the failure and failures of American intelligence. The most widely read book of this kind, *Legacy of Ashes,* written by the *New York Times* Pulitzer Prize–winning journalist Tim Weiner, documents sixty years of failure for the CIA.[19] One of the reasons commentators view the past through the lens of failure is because the intelligence community did not thwart the surprise attack on America on 11 September 2001. Damage assessment reports were also written about other failures in order to prevent future problems. This raises the disturbing question about how good U.S. intelligence is compared to that in other countries. Or is the United States' open democratic society that demands transparency incompatible with secret intelligence? Whatever the reasons for the critical attitude, no one points to technology as the source of failure, though an over-reliance on technology should certainly be considered.

As part of a research program using history lessons in policy making, I would love to see a detailed cost-benefit analysis of the intelligence gained from technical sources. Such an analysis would include information gathered from satellites, planes, submarines, and the electronic Echelon program. The study could gather the major concrete information gleaned from each technology and ask how important it was for national security. A political economist of science could analyze how much money was spent on the technology and calculate its percentage in the intelligence budget pie. Questions to ask would include: How valuable was the information given the costs? Is passive surveillance of the globe necessary for national security? Does global surveillance threaten democracy?

It would also be exciting to link studies of technological determinism with empire studies.[20] The notion of technophilic hubris can also be applied to other episodes during the twentieth century and beyond. When Eisenhower drew on the United States' technical capabilities to help warn him of surprise attack from a closed society, he probably never imagined that these technologies would span the globe in an empire of surveillance. Whether America's technophilic hubris leads to our undoing as a democracy, or whether democratic institutions keep their eye on freedom, will be documented by future historians.

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[19] Tim Weiner, *Legacy of Ashes: The History of the CIA* (New York: Doubleday, 2007); Charles S. Faddis, *Beyond Repair: The Decline and Fall of the CIA* (Guilford, Conn.: Lyons Press, 2009); John Diamond, *The CIA and the Culture of Failure: U.S. Intelligence from the End of the Cold War to the Invasion of Iraq* (Stanford: Stanford Security Studies, 2008); and Ishmael Jones, *The Human Factor: Inside the CIA's Dysfunctional Intelligence Culture* (New York: Encounter Books, 2008).

[20] See Merritt Roe Smith and Leo Marx, eds., *Does Technology Drive History? The Dilemma of Technological Determinism* (Cambridge, Mass.: MIT Press, 1994); and Michael Adas, *Dominance by Design: Technological Imperatives and America's Civilizing Mission* (Cambridge, Mass.: Harvard Univ. Press, 2006).