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Secret Communications

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There is no communications technology that does not raise epistemological, ethical, or aesthetic questions about secrecy and its history in relation to the (sometimes irreconcilable) demands of privacy, security, trust, or freedom of expression. This raises the methodological stakes for studying and teaching secret communication.

Keywords: secret communication, media history, encryption, cryptography, cryptanalysis

Media bring us closer to the secret
but continue to hold it just out of reach.

—Jodi Dean

The euphoria of secrecy goes to the head
very much like the euphoria of gadgets.

—CP Snow

It may seem paradoxical to approach human communication from the vantage point of secrecy, but from long before the earliest radio transmissions to long after the commercial union of technology and entertainment in television and networked computing, media history can plausibly be told as the story of secrecy.¹ Despite a Habermasian consensus that the public sphere first evolved to expose elusive issues to debate and then enabled mass media to use publicity to sell the agenda of secret interests, there is just as long a tradition of protecting and verifying trust and authenticity in human communication, both in the public sphere and in establishing and safeguarding privacy.² The Kamasutra recommended a mono-alphabetic substitution cipher around 400 BC, Julius Caesar deployed one in his correspondence in the first century BC, medieval traders and diplomats relied on nomenclators and code lists, and the mechanization of such systems had centuries of tradition before culminating in the transition from electromechanical devices to computing.³ On the other hand, governments and postal services have set up “black chambers” since the 17th century, employing professional codebreakers to examine the mail, and prompting legislation to protect communications. Along the same lines, communication online today is always at risk: people might pretend never to have sent a message, or never to have received it, and others might read, intercept, or fake your

¹ Beryl Bellman, “The Paradox of Secrecy,” *Human Studies* 4 (1981): 1-24.

² “At one time publicity had to be gained in opposition to the secret politics of the monarchs; it sought to subject a person or issue to rational-critical public debate and to render political decisions subject to review before the court of public opinion. Today, on the contrary, publicity is achieved with the help of secret politics of interest groups.” Jürgen Habermas, *The Structural Transformation of the Public Sphere: An Inquiry Into a Category of Bourgeois Society*, trans. Thomas Burger and Frederick Lawrence (Cambridge, MA: MIT Press, 1989), 201; compare Jodi Dean, *Publicity’s Secret: How Technoculture Capitalizes on Democracy* (Ithaca, NY: Cornell University Press, 2002), 34ff.

³ The canonical reference here is David Kahn, *The Codebreakers: The Story of Secret Writing* (New York: Macmillan, 1967), though it is an incomplete compendium.

messages. Cryptography enables secure transmissions and digital signatures that can authenticate messages or anonymize senders or receivers. Our culture today relies on it for communications among people and their banks, doctors, lawyers, business partners, and loved ones. Cryptography allowed the internet to become a mass medium.

Our understanding of the motivations for secure and secret transmission, storage, and processing, from assurances of communication integrity to various forms of authentication, needs to go beyond a naïve identification of concealment with security—and inversely beyond the equally naïve equation of secrecy with an authoritarianism to be challenged in the name of radical openness, denouncing privacy as a bourgeois phantasm.⁴ For an open press to function, we need to trust that journalists can work with confidential sources; for government to function, we need to trust in confidential negotiations. Yet there is a persistent myth that only radical openness can lead into the future. Indeed digital culture used to emphasize access, learning, privacy, and free speech. Then, in a sea change in popular opinion as well as legal and economic policy regarding network technology and education, digital culture began to demonize anyone who tried to access more than a restricted interface. We see this even in academic attempts to grapple with a burgeoning field of secrecy; the resulting studies are sometimes revelatory, but just as often they are gestures of populist protest, or even conspiratorial gestures that seek to provide speculative answers by pointing to purported secrets.⁵ A cult of secrecy leads to a global resurgence of irrational rumor; conspiracy theory must not take the place of critical computer culture. Historical models can help illuminate the often irreconcilable demands of privacy and trust, integrity and inspection, security and freedom of speech. But to compound the challenge in studying and teaching the history of secure communications, while it is evident that digital technology has accelerated developments, it also black-boxes them.⁶ Too few online customers reflect on how secure their financial or personally identifying data might be in quotidian transactions of e-commerce and entertainment, too few students can estimate the perils of unprotected internet use, too few citizens of the 21st century are literate about the risks inherent in digital communications; when institutions seek to cultivate

⁴ Clare Birchall, *Radical Secrecy* (Minneapolis: University of Minnesota Press, 2021).

⁵ Jack Bratich, "Popular Secrecy and Occultural Studies," *Cultural Studies* 21, no. 1 (2007): 42-58; compare Jack Bratich and Craig Scott, "Revealing challenges of teaching secrecy," *Secrecy and Society* 2, no. 2 (2021): 1-23.

⁶ On uncanny aspects of digital secrecy, see Peter Krapp, "On Menwith Hill," *Oxford Literary Review* 42, no. 2 (2020): 224-228.

cybersecurity awareness, they scare people by invoking extreme examples of identity theft.

While the omnipresent sensurround of technical media seems to promise instant disclosure, their structure also harbors at its core the asymmetries of privacy and monitoring, of surveillance and its screening over, of archives and their preservation. The dynamic of secrecy has to be decoded differently from the way it is encrypted. The excluded must be represented in the interior, as the mark of exclusion. Although often articulated as a lesson of computing in wartime, this insight is not new: the social power of secrecy, of preserving and sharing insights into the structure of our media world, also marks a continuity of all so-called new media with the oldest stories known to humanity. Moreover, the history of communication media is not merely about transmission but equally about storage or processing.⁷ We may distinguish (the storing, transmission, or processing of) messages of knowledge, of desire, and of sensations—call them indicatives, imperatives, and exclamations; questions ask for replies in one of those three modes.⁸ This traditional classification holds that the first type is epistemological, and its ideal is truth; the second type ethical and its ideal, the good; and the last type is aesthetic and its ideal, beauty.⁹ Abstractly, one might say research pivots around the first type, politics around the second type, and art around the third type of communication, though in reality they not only commingle but masquerade as each other, making it necessary for media studies to meticulously unmask them.

Consider “Kryptos,” a 1990 public art installation at CIA headquarters, with an unsolved encrypted inscription taunting puzzlers: is this sculpture serving recruitment, motivation, ornamentation?¹⁰ Or consider a conceptual art work. In 1972, Icelandic artist Hreinn Fridfinnsson was invited to contribute to the Dutch magazine *Fandangos* at the Jan van Eyck Academie in Maastricht. In the second issue of the journal, he inserted a handwritten ad (it was reprinted in the third edition, though this time typed), stating boldly, “I collect personal secrets. Please send yours to me, I am looking forward to learn them and I will keep them carefully. Hreinn Fridfinnsson,

⁷ Friedrich Kittler, “The History of Communication Media,” in *On line: Kunst im Netz*, ed. Helga Konrad (Graz, Austria: Steirische Kulturinitiative, 1993), 66–81 (and at <http://hydra.humanities.uci.edu/kittler/comms.html>).

⁸ Vilem Flusser, *The Surprising Phenomenon of Human Communication* (Berlin: Metaflux, 2018).

⁹ Sissela Bok, *Secrets: On the Ethics of Concealment and Revelation* (New York: Pantheon, 1983).

¹⁰ Elonka Dunin, “Kryptos: The Unsolved Enigma,” in *Secrets of the Lost Symbol: The Unauthorized Guide to the Mysteries Behind The Da Vinci Code Sequel*, eds. Daniel Burstein & Arne de Keijzer (New York: Harper Collins, 2009), 319–326. Compare AJ Jacobs, “The Online Community Obsessed with a CIA Puzzle,” *The Wall Street Journal*, April 23, 2022, <https://www.wsj.com/articles/the-online-community-obsessed-with-a-cia-puzzle-11650686460>.

Kerkstraat 413, Amsterdam Holland.” Since the art magazine had rather limited circulation, hardly any secrets were received—until in July 2009 another magazine reprinted the ad. This time, hundreds of responses were received by the magazine *Points d'Ironie*—but contrary to the invitation, they were actually never opened or “learned” but kept in a vault and eventually shredded to assemble the final version of the work, “I Collected Personal Secrets,” in 2015.¹¹ Without dwelling on the fact that those who accepted his invitation to confess had their submissions nonetheless merely stored and shredded, the delay of three decades radically reframes the concept of media collecting readers’ secrets, which we now have come to accept many online media do by default, whether overtly or covertly. Or consider a third example: “Secret Power,” a multimedia art installation by Simon Denny.¹² Featuring works with titles like “Modded Server-Rack Display with Some Interpretations of David Darchicourt Designs for NSA Defense Intelligence,” it was first displayed in the *Biblioteca Nazionale Marciana* in 2015 when Denny represented New Zealand at the 56th Venice Biennale; it has since been acquired by MoMA.¹³ Denny deploys graphics, charts, and other images culled from the Snowden leaks, which he argues had “retroactively become some of the most important artistic images created today.”¹⁴ Intrigued by such images used by NSA and other agencies, Denny found examples of Darchicourt’s work on freelancer graphics sites, and even commissioned new images (including a map of New Zealand) from the graphic designer in Maryland; Darchicourt had indeed worked as NSA graphic designer for a number of years, among other projects creating images for a series of “CryptoKids” cartoon characters between 1994 and 2012.¹⁵ Invoking the history of Venice in espionage, Denny reflects on the visual culture of the Five Eyes intelligence alliance (which includes New Zealand).¹⁶ While Darchicourt said that he

¹¹ Andrea Bellini and Krist Gruijthuisen, eds., *Hreinn Fridfinnsson: Works 1964-2019* (London: König, 2019), 42-43, 292.

¹² <https://www.simondennysecretpower.com/>.

¹³ <https://www.moma.org/collection/works/199053?locale=en>.

¹⁴ Ryan Gallagher, “Inside the Secret World of NSA Art,” *The Intercept*, June 11, 2015, <https://theintercept.com/2015/06/11/secret-power-nsa-darchicourt-art-denny/>.

¹⁵ Chris Kraus, “Here Begins the Dark Sea,” in *Simon Denny: Secret Power*, eds. Robert Leonard and Simon Denny (Cologne: Walther König, 2015), 19–25; Anthony Byrt, *This Model World: Travels to the Edge of Contemporary Art* (Auckland University Press, 2016); Ian Duncan, “Former NSA Illustrator Finds His Work the Focus of a Major International Art Show,” *Baltimore Sun*, May 5, 2015, <http://www.baltimoresun.com/business/federal-workplace/bal-former-nsa-illustrator-finds-his-work-the-focus-of-a-major-international-art-show-20150505-story.html>; compare Hans Ulrich Obrist’s 2016 interview with Simon Denny in CURA21: <https://curamagazine.com/a-transcribed-conversation-between-simon-denny-and-hans-ulrich-obrist/>.

¹⁶ *Secret Power* is also the title of a 1996 book by Nicky Hager that reveals New Zealand’s international intelligence collaborations in the Five Eyes agreement: https://www.nickyhager.info/Secret_Power.pdf.

had not personally designed any of the PowerPoint slides Snowden leaked, he confirmed to newspapers that he had designed logos used internally at the NSA, such as the one for the program POISON NUT.¹⁷ Commenting on the visual language of surveillance, Denny points out that the leaks featured images evoking the *Terminator* series' Skynet in the TREASUREMAP net mapping program, wizards used as icons for the phone-tapping program MYSTIC, and images evoking the game *Shadowfist* on slides describing QUANTUM (an NSA attack program that duplicates Internet traffic). What do we need to know in order to understand the epistemological, ethical, and aesthetic facets of this kind of intervention?

Humanities expertise in translation, linguistics, and communications used to play a leading role in cryptology. Secretaries and translators developed secure correspondence systems and invented frequency analysis to crack simple substitution ciphers, while nomenclators and book codes aided trade and diplomacy. If code breaking became fashionable in the 19th century after Champollion's success with Egyptian hieroglyphs, there is no reason cryptanalysis should not also help tackle undeciphered scripts such as the Phaistos Disk of Crete, the Indus script of Pakistan and India, the Isthmian script of Mesoamerica, or Linear A from the eastern Mediterranean. Critical modes of reading and parsing served cryptanalysis well, until data processing at Bletchley Park, England, and Dayton, Ohio, initiated a decisive shift to mathematics and automation. This need not force us to abandon philological virtues in pursuit of digital humanities.¹⁸ Still, when doctors, detectives, and semiotic scholars decipher based on clues while hewing to a conjectural paradigm ("around the hypothesis that apparently negligible details could reveal profound phenomena"), they introduce elementary statistics into the human sciences.¹⁹ While appreciating warnings that in parsing digital culture, we may be little more than a lesser Amazon or a lesser Equifax, we nonetheless need to help bridge the gulf between technology and interpretation, between quantitative and qualitative approaches, and this is especially important for media studies and the history of communications.

¹⁷ Charlotte Higgins, "The Artist Who Did Reverse Espionage on the NSA," *The Guardian*, May 5, 2015, <https://www.theguardian.com/artanddesign/2015/may/05/edward-snowden-nsa-art-venice-biennale-reverse-espionage>.

¹⁸ Brian Lennon, *Passwords: Philology, Security, Authentication* (Cambridge, MA: Harvard University Press, 2018).

¹⁹ Carlo Ginzburg, "Clues: Roots of an Evidential Paradigm," in *Clues, Myths, and the Historical Method*, trans. John A. Tedeschi and Anne Tedeschi (Baltimore: Johns Hopkins University Press, 1993), 96-125. A more explicitly cryptological version of this essay was published as Carlo Ginzburg, "Morelli, Freud, and Sherlock Holmes: Clues and Scientific Method," in *The Sign of Three: Dupin, Holmes, Peirce*, eds. Umberto Eco and Thomas A. Sebeok (Bloomington: Indiana University Press, 1983), 55-80.

Academic expertise in the history of secret communications (as distinct from applied expertise in cryptology today) is not easily come by. Beyond expanding the conceptual scope of research, it is not simply a matter of applying interdisciplinary insights until one achieves a certain depth and precision. Experts are well aware how quickly one reaches the limits of public knowledge about codes and ciphers, and how feasible it is that unknown information turns up (whether in historical archives or in declassified methods) that can change the practical or even the theoretical basis for current work. We know only with hindsight that Charles Babbage boasted in his private correspondence about breaking the supposedly unbreakable Vigenère cipher in 1854; the method would not be shared publicly until Prussian infantry officer Friedrich Kasiski published his two decades later. Or consider the vaunted discovery of public-key encryption by Diffie and Hellman as published in 1976 and still widely used in Internet protocols today: in 1997 it was shown to have already been discovered on behalf of GCHQ in 1973. Yet another example is the notorious delay of knowledge about WW2 decryptations by the Allies, keeping them secret not only from the Russians but from almost everyone for half a century—which also was among the factors allowing two CIA front organizations ostensibly based in Switzerland (Crypto AG and OmniSec) to sell compromised crypto equipment to at least 62 countries around the world for decades.²⁰

Working your way into this field of historical and comparative knowledge is made more difficult by three main obstacles: access, context, and technical skill. Knowledge about cryptology is rather closely held, and even historical techniques for encryption and decryption continue to be classified. Archives of secret communications are often not publicly accessible, and declassification of secrets only happens with significant delays. Secondly, while cryptographic knowledge for a very long time used to be a rather interdisciplinary field, drawing on linguistics, statistics, translation, puzzling, and combinatorial play, since the 1940s it has rapidly become a field dominated by special-purpose computing and number theory, as it draws on advanced probability, factoring of prime numbers, and testing algorithms. Even the contemporary study of historical ciphers from a pre-computer era is now inflected by high-tech methods such as the CrypTool software.²¹ Thirdly, even when access is granted and sufficient interdisciplinary skill is secured, this need not mean we have the historical context needed to successfully evaluate the challenges posed by an unsolved encryption, let alone to draw on its context to help solve the riddle.

²⁰ Greg Miller, “The Intelligence Coup of the Century,” *The Washington Post*, February 11, 2020, <https://www.washingtonpost.com/graphics/2020/world/national-security/cia-crypto-encryption-machines-espionage/>

²¹ <https://www.cryptool.org/en/>.

But it should not be said that entry into this intriguing field of research requires prior acquisition of esoteric knowledge before one tackles a practical problem—you can approach it not only by using published scholarly information, but by simultaneously consulting heterogeneous other sources: from museum exhibits to serendipitous conversations, from journalistic coverage of high-level investigations into encryption policy to academic syllabi in various fields. This is what one might label “crypto-cultural capital”: unequally distributed and not always easily acquired, unless the researcher is already a participant in how certain institutions go about storing, processing, and transmitting this formal and informal knowledge about secrecy.²² Often the key to scholarly intuition is belonging to a group of people who have some access to reliable information; this may be more important than a knack for puzzles. However, a lot of the information about secret communications in popular culture, whether in potboilers or on television, in spy films or in the newspapers, can be spectacularly misleading.²³ At least when authors like Arthur Conan Doyle, Jules Verne, or Edgar Allan Poe fantasized about ciphers, they relied on real cryptologic concepts. Yet countless TV shows and movies get encryption and secret communication wrong because they want to glamorize the actions of a person in front of a computer, and they try to visualize the flow of data in networks in a ludicrous manner. Retracing secret communication from ancient times to today also involves reflection on how we portray computer networks and cybersecurity issues; addressing the stakes of encryption today requires critical appreciation of its popular misrepresentations. The main problem with audiovisual representations of cybersecurity in particular and computer networks in general is that they are often caricatures. But even outside the cyber-schlock genre, there are problems: consider how Harry Potter books model two-factor authentication—the combination of something you have (e.g., a wand) or something you are (not a “muggle”) and something you know (a passphrase) for common-room access at Hogwarts. Facing these challenges, the so-called digital humanities may not serve us best, and methods foregrounding continuity with historical knowledge fare better.²⁴

Exploring the history of mechanical, electromechanical, and digital devices deployed in secret communications, some learners will benefit from hands-on

²² Friedrich Kittler, “NSA: No Such Agency”, *Fragmente* 32/33 (1990): 287-292; Stanton K. Tefft, “Secrecy, Disclosure, and Social Theory,” in *Secrecy, a Crosscultural Perspective*, ed. Stanton K. Tefft (New York: Human Sciences Press, 1980), 35-74.

²³ Eva Horn, *The Secret War: Treason, Espionage, and Modern Fiction* (Evanston, IL: Northwestern University Press, 2013).

²⁴ Compare Brian Lennon, “The Digital Humanities and National Security,” *differences* 25, no. 1 (2014): 132-155; and Peter Krapp, “Comunicação secreta e história da criptologia: um desafio para as Humanidades Digitais,” *Revista Digital de Tecnologia Cognitivas* 21 (2020): 146-165.

experience with cipher wheels like the one invented by 3rd US President Thomas Jefferson, slides and code squares deployed in the American Revolution, or mechanical Mexican army ciphers. It is piquant that the German Enigma machine from WW2 should serve as a preeminent example, as it actually failed to protect its users. Other machines from the same era (such as the SIGABA deployed to secure conversations between Churchill and Roosevelt, a particularly apt illustration of Claude Shannon's famous "mathematical theory of communication" diagram) ought to be more famous, since their encryption was not broken in their own time. But the fact remains that the Enigma is the most popular example, as we see in film and television, in museums and popular culture and journalism. The Enigma may also owe its notoriety to the (much delayed but momentous) revelation of its decryption by Alan Turing and others at Bletchley Park, now estimated to have ended WW2 earlier than could have been possible otherwise.

Although over 200,000 Enigma machines were in circulation in the 1940s, they have since become collector's items. Museums display them to help illustrate communications history, the history of computing, the history of WW2, the history of encryption and secure communications, and the history of diplomatic and trade relations. The most recently found Enigma machines were pulled out of the North Sea last year; a full restoration of these seven Enigma machines, after over seven decades in the ocean, is not feasible. When well-preserved or perfectly restored examples come to auction, they fetch prices that make them all but unaffordable to individual collectors or educational institutions. This means that for most people, exploring the inner workings of such a machine is impossible, as museums and collectors jealously protect their vulnerable artifacts; but it is feasible to 3D-print a fully functioning replica.²⁵ These electromechanical devices, on the cusp of digital computing, are handy illustrations of the principles of encryption and decryption, short of entering into the realm of higher mathematics.

Secrecy in communications has long been neglected.²⁶ If recurring structures of the cover-up punctuate all media technologies, then the dynamics of spilling or keeping secrets ground our investigations into the intransparency of communications; privacy and secrecy are born of the separation established when someone is shut off from that truth. The knowledge and the secret of the self derive each from the other.

²⁵ See <https://enigma.hdm-stuttgart.de/> for more info. On the virtues of exact replicas, see also Garrett Graff, "I'd Never Been Involved in Anything as Secret as This," *Politico*, April 30, 2021, <https://www.politico.com/news/magazine/2021/04/30/osama-bin-laden-death-white-house-oral-history-484793>.

²⁶ Agnes Ku, "Boundary Politics in the Public Sphere: Openness, Secrecy, and Leak," *Sociological Theory* 16, no. 2 (1998): 172-192.

The ambivalence of secrets revolves around a balance of sharing and keeping, and the pressure exerted by possession and the temptation to spill, as the moment of disclosure not only attracts attention but also offers relief in the sacrificing of defenses. If cryptanalysts keep their successful code breaking secret, the world hears nothing of some of the most successful decryptions, which may endanger the progress of cryptanalysis; their task is to retain enough of the secret dynamic to remain independent, while becoming enough of a sharer of secrets to be capable of relating to others. This is rooted in our stories of a post-Edenic capacity for secrecy: as Adam and Eve eat from the tree—although they were admonished in Genesis 2:17, “of the knowledge of good and evil you shall not eat”—they acquire not only the capacity to make distinctions between their genders, which makes them ashamed of their nakedness, or between good and evil, which might have prevented them from transgressing the commandment, but also a desire to distinguish between veracity and mendacity. Access to concealed knowledge is possible only in breaking illusions that position that object outside discourse. The veiling mode of controlling access is power; its side effect is the desire to preserve the identity of the secret while knowing about it. Media studies survey technologies of the sign from software engineering as information hiding to the split screens of our divided attention, concealment from Turing games to the use of avatars in virtual worlds, and data integrity from espionage and signal intelligence to secure e-commerce.

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