

Ingredients:

- 1/4 recipe book
- 1/4 puzzle book
- 1/4 colouring book
- 1/4 artistic research

On invisible inks and other invisible communication techniques.

Uses:

- ↳ Subvert surveillance;
- ↳ Bypass censorship;
- ↳ Make visible the struggles of marginalised cultures;
- ↳ Create new poetic and playful forms of communication to nurture social bonds.



ONOMATOPEE 155

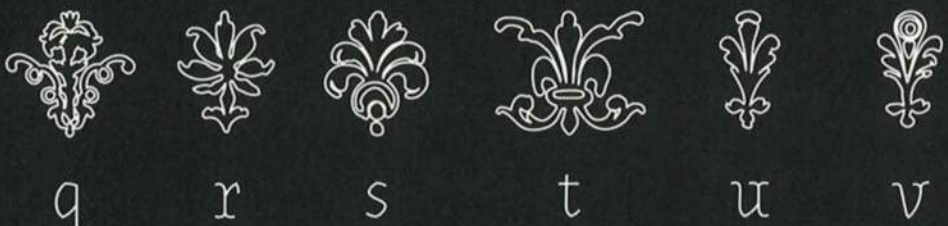
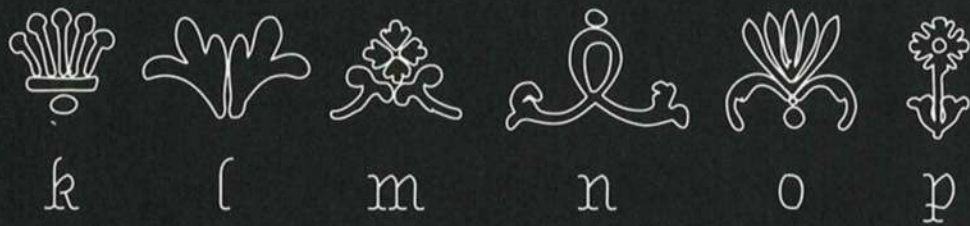
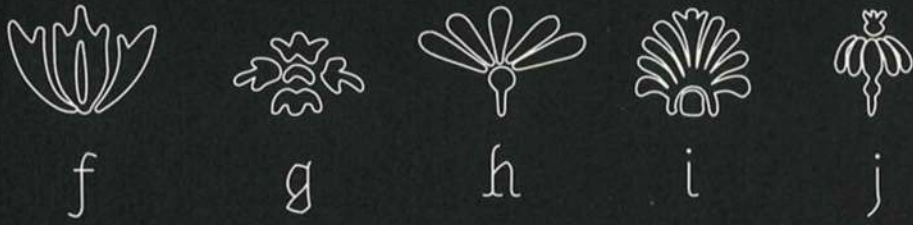


Writing
Bookbook
of
invisible
communication
Bookbook



Amy Suo Wu

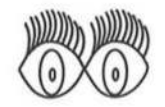




A Cookbook of Invisible Writing

Amy Suo Wu

ONOMATOPEE 155



start →



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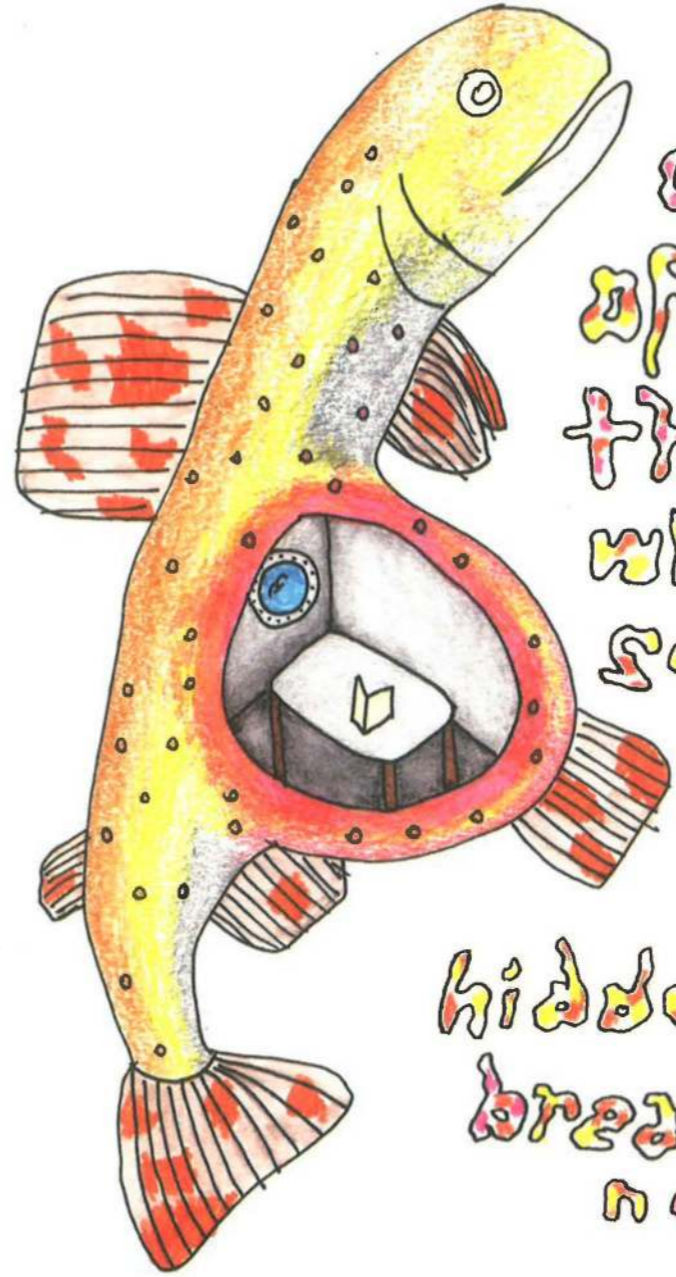
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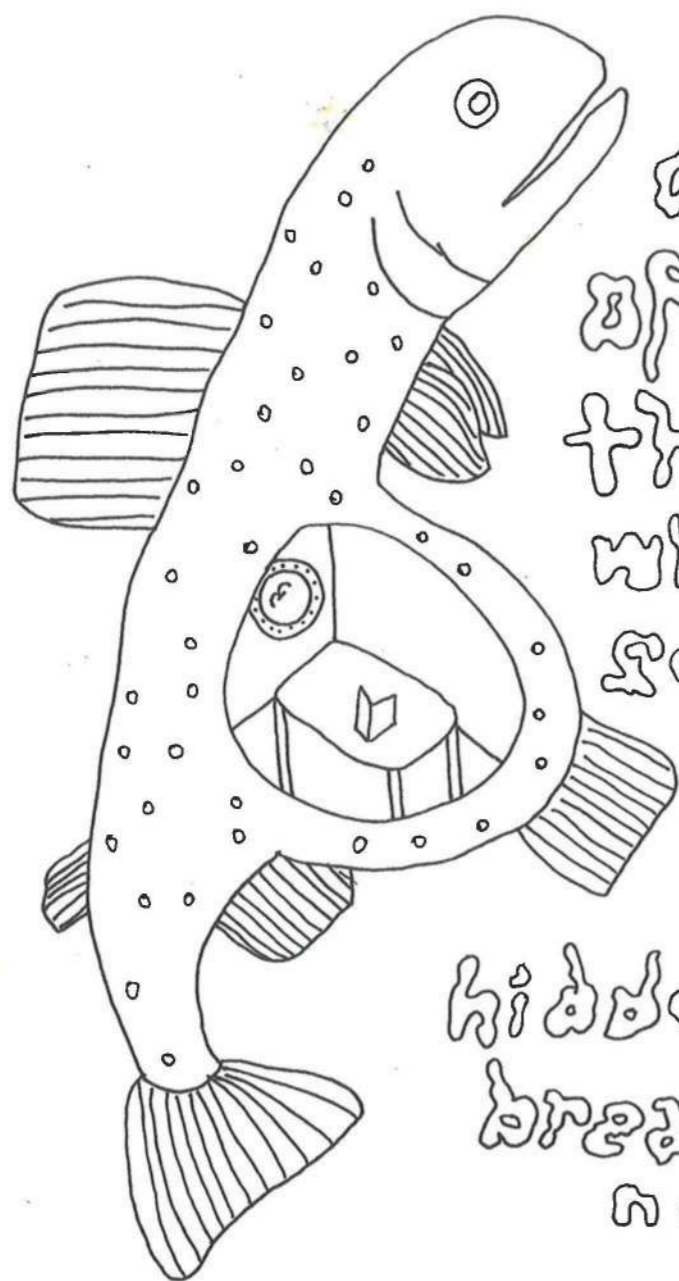
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The
abdomen
of a trout
thickens
when in crisis
so says the
captain's
logbook
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breakfast
nook



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About This Cookbook

Welcome to *A Cookbook of Invisible Writing*, an invisible ink colouring book, recipe book, puzzle book and artistic research book. The pages in your hands provide a broad introduction to analog steganography, a type of secret writing that hides messages in plain sight. As such, the Cookbook can be used as a starter pack for those interested in exploring alternative forms of communication.

A Cookbook of Invisible Writing provides a wide variety of invisible ink recipes and other communication techniques that may be used to subvert surveillance, bypass censorship and make visible the struggles of minorities and other marginalised cultures. Additionally, it aims to inspire communities to develop their own new poetic and playful forms of communication as a way of nurturing social bonds. Complimenting this interactive approach, I've designed and conceived of the book with the very techniques it reveals. Hidden in the pages is a secret writing trail with embedded messages waiting to be found. The entire book is also filled with illustrations that

are made to be coloured in with invisible ink. For this reason, it is printed on thick, unbleached paper. The thickness is there to absorb water-based, do-it-yourself (DIY) invisible inks in a way that minimises buckling and wrinkling, while the unbleached characteristic of the paper will ensure that UV inks become visible when activated.

Following in the footsteps of traditional esoteric manuals on the topic of secret writing, such as Giambattista della Porta's 1558 popular science book *Natural Magick*, the Cookbook channels a spirit of everyday access, easy distribution and informal sharing of practical knowledge as a means of introducing this somewhat obscure field to a wider audience.¹ Drawing from a huge array of sources and presented as a smorgasbord, the recipes provided in this Cookbook are designed to spark your curiosity for the world of invisible communication.

The Introduction tells how I became interested in the topic of steganography. Chapter 1, Tactics and Poetics of Invisibility, is a critical essay on the colonial history and modern-day applications of surveillance technologies. Chapter 2, Basics of Stegano-graphy, introduces several types of steganography. Chapter 3, Non-transferable Steganography, provides a collection of invisible ink recipes dotted with historical and contemporary uses. Chapter 4, Transferable Steganography, is a personal selection of code-based steganographic cases such as the Cardan grille, the null cipher, and embedded substitution ciphers. Chapter 5, Artistic Practice, describes how I have applied this research in the form of exhibitions, publications, interventions and workshops. The Conclusion provides a few final thoughts and possible future directions for me.

There is one important point that I feel I must address before proceeding any further. The somewhat naïve assumption that subversion and disruption are tactics employed

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THE
SIXTEENTH BOOK
OF
Natural Magick:

Wherein are handled secret and undiscovered Notes.

THE PROEM.

I Make two sorts of secret marks, which they vulgarly call Syfers; one of visible marks, and is worthy of a treatise by it self: another of secret marks, whereof I have attempted to say something in this present Volume, and what are the consequents thereof, for the use of great Men, and Princes, that take care for things absent, and write to some man that knows the invention. I shall set down plainly some examples: but these things, and the consequences of them must be faithfully concealed, lest by growing common amongst ordinary people, they be disrespected. This is that I shall publish.

CHAP. I.

How a writing dip'd in divers Liquors may be read.



Here are many, and almost infinite ways to write things of necessity, that the Characters shall not be seen, unless you dip them into waters, or put them near the fire, or rub them with dust, or smeer them over. I shall begin with them that are read by dipping them into waters. Therefore

If you desire that letters not seen may be read, and such as are seen may be hid,

Let Vitriol soak in boyling water: when it is dissolved, strain it so long till the water grow clear; with that liquor write upon paper: when they are dry, they are not seen. Moreover, grinde burnt straw with Vinegar; and what you will write in the spaces between the former lines, describe at large. Then boyl fowre Galls in white Wine, wet a sponge in the liquor: and when you have need, wipe it upon the paper gently, and wet the letters so long until the native black colour disappear, but the former colour, that was not seen, may be made apparent. Now I will shew in what liquors paper must be soaked to make letters to be seen. As I said, Dissolve Vitriol in water: then powder Galls finely, and soak them in water; let them stay there twenty four hours: filter them through a linnen cloth, or something else, that may make the water clear, and make letters upon the paper that you desire to have concealed; send it to your friend absent: when you would have them appear, dip them in the first liquor, and the letters will presently be seen.

That dipping a linnen rag in water, the letters may appear.

Dissolve Alom in water, and with it make letters upon white linnen, sheets, napkins, and the like; for when they are dry, they will presently vanish. When you will have them visible, soak them in water, and the linnen will seem to be darkned: but only where the Alom hath written, it will not: for the letters will grow so clear, that you may read them: for where Alom, Vitriol, and all astringents are dissolved, those parts will admit water fast. So

White letters are made with waters.

Li-

exclusively by the political left will hopefully have been put to rest by the rise of the alt-right, a relatively recent political sub-culture and movement in which subversive jokes and internet memes, as well as online trolling and other forms of harassment, have been weaponised to advance a far-right ideology. The reality is that tactical subversion can be practiced by anyone – by those at either extreme of the political spectrum and by everyone in between.

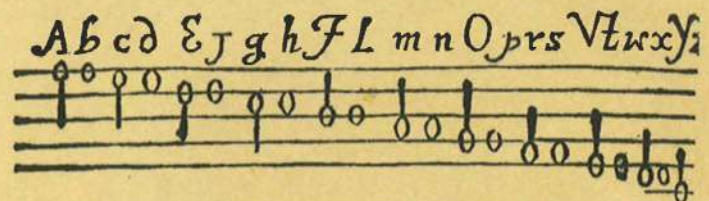
William Powell, author of *The Anarchist Cookbook* – a controversial 1971 manual on various topics including the manufacture of DIY explosives – later expressed remorse for the fact that his book had been linked to numerous acts of mass violence, including the Columbine High School shooting and the Oklahoma City bombing.² Now that the Cookbook is in your hands, you may well use it to affirm or perpetuate actions, thoughts and belief systems very different from my own. I hope that you will choose to use the techniques shared here in a responsible way.

1. Giambattista della Porta's book *Natural Magick* was one of the first major publications to include a number of simple recipes of invisible inks for use by the general public. Other important sourcebooks are *Subh-al-Ashka* (1412) by Shihab al-Qalqashandi; *Steganographia* (1499) and *Polygraphia* (1518) by Johannes Trithemius; and *Mercury or the Secret and Swift Messenger* (1641) by John Wilkins.

2. *American Anarchist* (documentary), directed by Charlie Siskel, 2016.

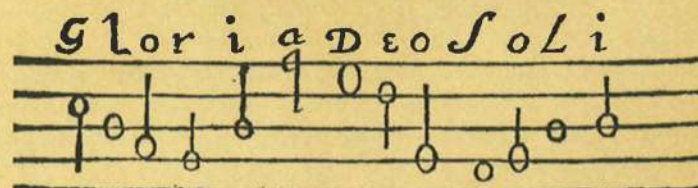


Page from *Steganographia* (1499) by Johannes Trithemius. Image source: Internet Archive



Where the five Vowels are represented by the Minnums on each of the five lines, being most of them placed according to their right order and consequence, only the letters K, and Q, are left out, because they may be otherwise expressed.

According to this Alphabet of Notes, these words, *Gloria Deo soli*, must be thus contrived.



By this you may easily discern how two Musicians may discourse with one another, by playing upon their Instruments

دار الكتب الخديوية

SUBH al-A'ŠHÁ

كتاب

صنيع الالهي

ناليف

الشيخ ابي العباس احمد القلقاشندي

al-QALQASHANDI AHMAD

17

الجزء السادس 106.6

حقوق إعادة طبعه محفوظة لدار الكتب الخديوية

طبع
بالمطبعة الأميرية بالقاهرة
سنة 1333 هـ
1915 م





Introduction

In June 2013, the former National Security Agency (NSA) contractor Edward Snowden leaked classified documents related to the NSA's surveillance programme PRISM, revealing the true extent of its online surveillance activities, including the involvement of major technology corporations and platforms such as Apple, Google, Microsoft, Facebook, Yahoo! and YouTube. The American journalist Glenn Greenwald broke the story in *The Guardian*. What ensued was a massive public outcry that enveloped the media and nation-states around the world. The unfolding revelations sparked a great deal of discussion and research on the topic of digital cryptography amid a broader debate on global surveillance.

In the Netherlands, the civil rights organisation Bits of Freedom organised 'digital self-defence' workshops titled Privacy Cafés to help citizens protect their personal information.¹ These events were inspired by the grassroots movement CryptoParty, which aims to increase the general public's awareness of technical topics related to practical cryptography, including key signing,

disk encryption, virtual private networks and Tor, an anonymity network.² In my hometown Rotterdam, the workshops took place at WORM, a centre for experimental, avant-garde and underground culture. It was at these events that I first encountered the world of cryptography in depth. However, attending a few of these sessions in 2014 and 2015 mostly left me feeling like a hopeless 'noob', a newcomer among proficient coders and geeks. Although the organisers did their best to reach a lay audience, much of what was discussed went over my head and I would leave feeling demoralised about the potential of digital cryptography as a viable solution for a wider public.

During this period I also came across two news articles reporting that the Central Intelligence Agency (CIA) had declassified a number of invisible ink recipes and other related technologies from World War I.³ The methods described in the articles struck me as extremely creative and resourceful – no doubt owing to the urgency of the wartime context. *The Daily Mail* reported that spies were instructed how to carry and transport invisible ink in their clothing, by soaking handkerchiefs in a mixture of nitrate, soda and starch and then drying the fabric. I read that the CIA had declassified the information as it no longer posed a threat to national security, since advances in digital encryption technology had made analog methods, such as invisible ink, obsolete.

However, a reader's comment made me wonder whether these old technologies were as irrelevant and innocuous as claimed in the articles. The reader flagged the weak spot of digital communication is its detectability, the possibility of interception. When an analog letter has been intercepted, the receiver will more likely notice if the envelope has been tampered with. In contrast, the reader pointed out, a digital message will not show signs of interception. I began to wonder

CONFIDENTIAL

REGRADED SECRET
Authority: **NNB 750065**
By: **CR/OT**, NARS, Date: **MARCH 15, 1976**
SECRET WRITING

EXEMPT from automatic declassification
per E.O. 11652, Sec. 5(E)(2)
Authority: **CIA** 28 JAN 1978
Name: **A** Agency: **DDO** Date:
Reason: **678-4791** Review on:

For Secret Writing can be used :

First : A solution of nitrate of soda and starch in water x / may be carried for example in handkerchiefs or starched collars, starched shirts or anything else starched. The things being laid in this solution and then ironed. The article thus treated is later on again put in water and a solution obtained which can be used for invisible writing. / The best means for developing are iodite of potassium.

Second: Sulphate of iron, developed preferably with ferro cyanite of potassium.

Third: Nitrate of silver developed preferably with ~~the~~ 2 or 4.

Fourth: Rice starch, developed with ink mixed with water.

Fifth: Lemon juice, developed with Ferro cyanite of potassium.

x A tumbler of water is boiled together with a table spoon of starch, allow to cool, and add ten grammes of nitrite of soda.

For developing secret writing is used:

1. Iodite of Potassium, /5 grams with 100 grams of water, 2 of tartaric acid added/
2. Sulpharated soda.
3. Ferro cyanite of potassium.
4. Ink, mixed with water / laid on with a brush/

Declassified World War I invisible ink recipes. Image source CIA archives

whether resorting to paper and invisible ink may indeed be a more secure option, for two reasons. First, because paper is not 'smart' – it doesn't send information back and forth to servers around the world, and thus cannot so easily be intercepted by third parties. And second, precisely due to the fact that it is now considered unthreatening, the exchange of encrypted communication on paper using mail delivery services does not draw attention to itself.

Steganography is the art and science of embedding secret messages within openly accessible information in such a way that the presence of a secret message is hidden. Invisible inks are one of the oldest forms of steganography, dating back to at least the fourth century BC.⁴ They can be made using both common household ingredients such as lemon juice, milk, starch, vinegar, ammonia, bleach and even bodily fluids, and more difficult-to-obtain chemicals such as iron sulphate, nitric acid, cobalt chloride, silver nitrate and sulphuric acid. As the name implies, invisible ink remains unseen until it is rendered visible through various activation methods.

Cryptography, another form of secret writing, uses mathematical methods to scramble and encrypt messages, which means you can always spot a cryptographic message through its nonsensical codes. In contrast, there are no obvious signs of a secret message in steganography. Cryptography, however, is much more commonly used. According to American historian Kristie Macrakis, the popularity of the mathematical endeavour of cryptography over the alchemically aligned steganography had to do with the scientific revolution and its bias toward a rational discourse.⁵ Steganography has been called 'cryptography's dark cousin'. Steeped in alchemy, magic and mystery, this elusive analog practice has flown under the public's radar.⁶ Consequently, resources on and research into analog stegano-

graphy are rare, which is what drew me to the practice.

In 2014, Edward Snowden advised digital cryptography or encryption as a solution to state-sponsored surveillance.⁷ Since the leaks, although some of the major internet companies such as Facebook's WhatsApp and Microsoft's Skype have made efforts to implement end-to-end encryption to thwart data harvesting by intelligence agencies, the problem of vulnerability for the individual user remains. The level of technical sophistication required to properly and consistently implement personal digital cryptography is too advanced for those who do not have a computer science background. The innovation of present-day digital cryptography techniques parallels the accelerating development of omnipresent surveillance technologies; the arms race between crypto-makers and crypto-breakers is evolving at such advanced levels of technical complexity that only computer experts are able to effectively protect themselves using secure technology – leaving others to rely on insecure technology, or on nothing at all. In a world in which the opportunities for off-the-grid communication are becoming scarce, anonymity has become a luxury commodity.

And so, when I first learned about invisible inks as an alternative to digital cryptography, I was thrilled with the possibilities presented by these substances. Eager to find out more on the topic, I started collecting invisible ink recipes, articles, historical references and literature. It was initially intended as a resource for my own artistic research, and as material for a hacking course I was teaching to art and design students at the Willem de Kooning Academy in Rotterdam. Invisible ink and secret writing seemed like a magical and very tactile way to engage students with the difficult subject of online surveillance and the often frustratingly impenetrable complexities

of computer cryptography. With steganography, I could share an obscure and underestimated technique that had a long, rich and intriguing history. In my classes, I used art and design principles such as camouflage, illusion, abstraction and imitation, concepts that also play an important role in practices of secret communication. These concepts then functioned as a bridge toward introducing lesser-known topics of practical chemistry, and the history of communications in warfare and science. This book is in fact the outcome of what I started at the beginning of my journey.

Since 2014, I've had the privilege of being one of the organisers of the Rotterdam festival Zine Camp, a unique event that gives space to on-the-spot zine-making, rather than merely the presentation and selling of zines. Here, I soon recognised the community-building potential of spending two days collectively working in a large hall with a simple set of analog materials like glue, paper, staplers and copying machines. The social value of such extended moments of physical presence should not be underestimated, particularly at a time when our interactions are more and more digitally mediated. In the papery mess of the Zine Camp, people from different walks of life come together, sit alongside each other, and make in an unpressured environment. Analog steganography can give people the same joy.

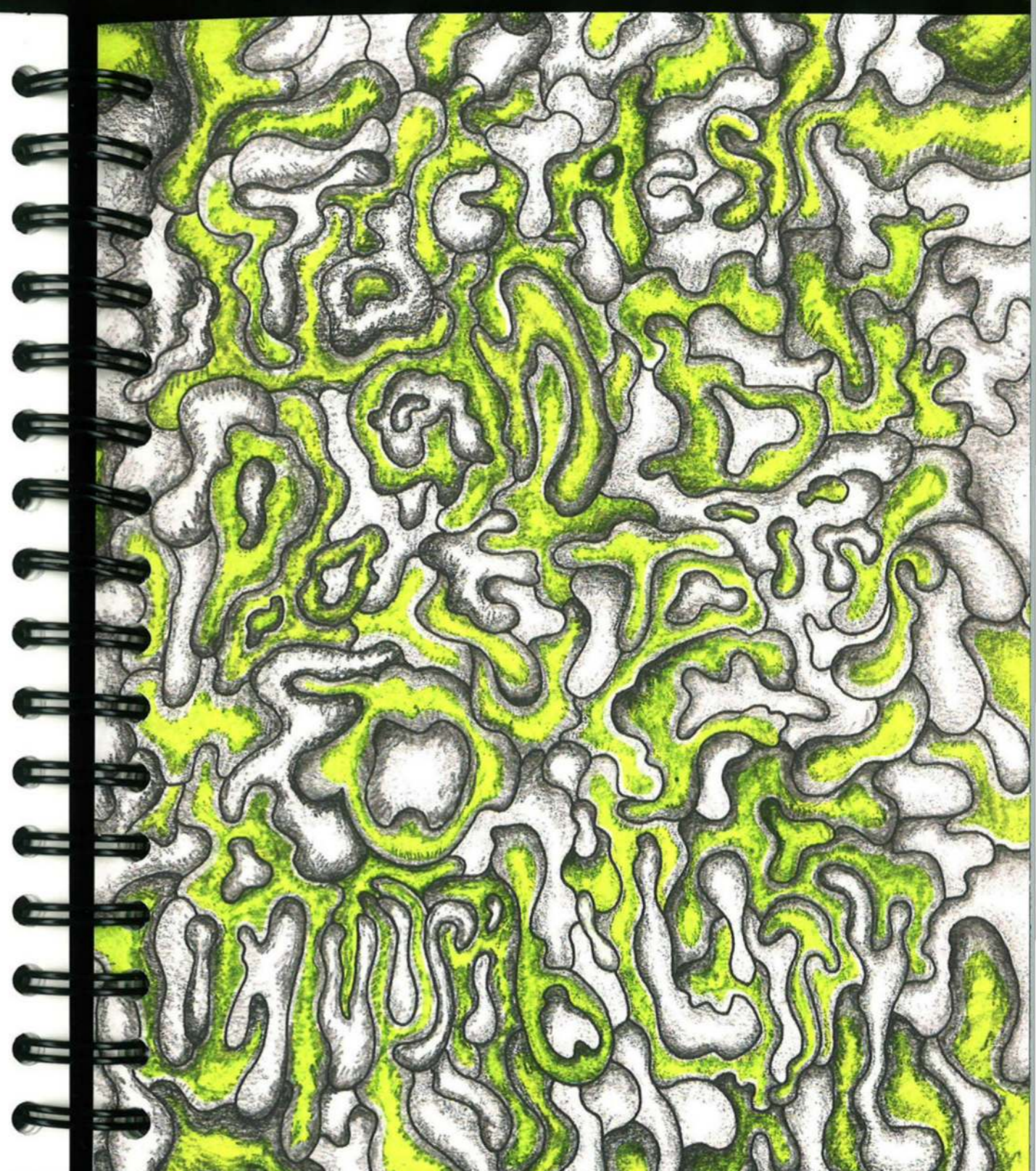
Over the years, invisible ink and other forms of analog secret writing have become tools that allow me to activate for others an inquisitiveness and experimentation through alternative modes of communication, and thus address high-tech surveillance using low-tech approaches.

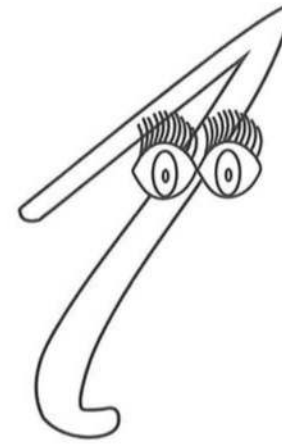
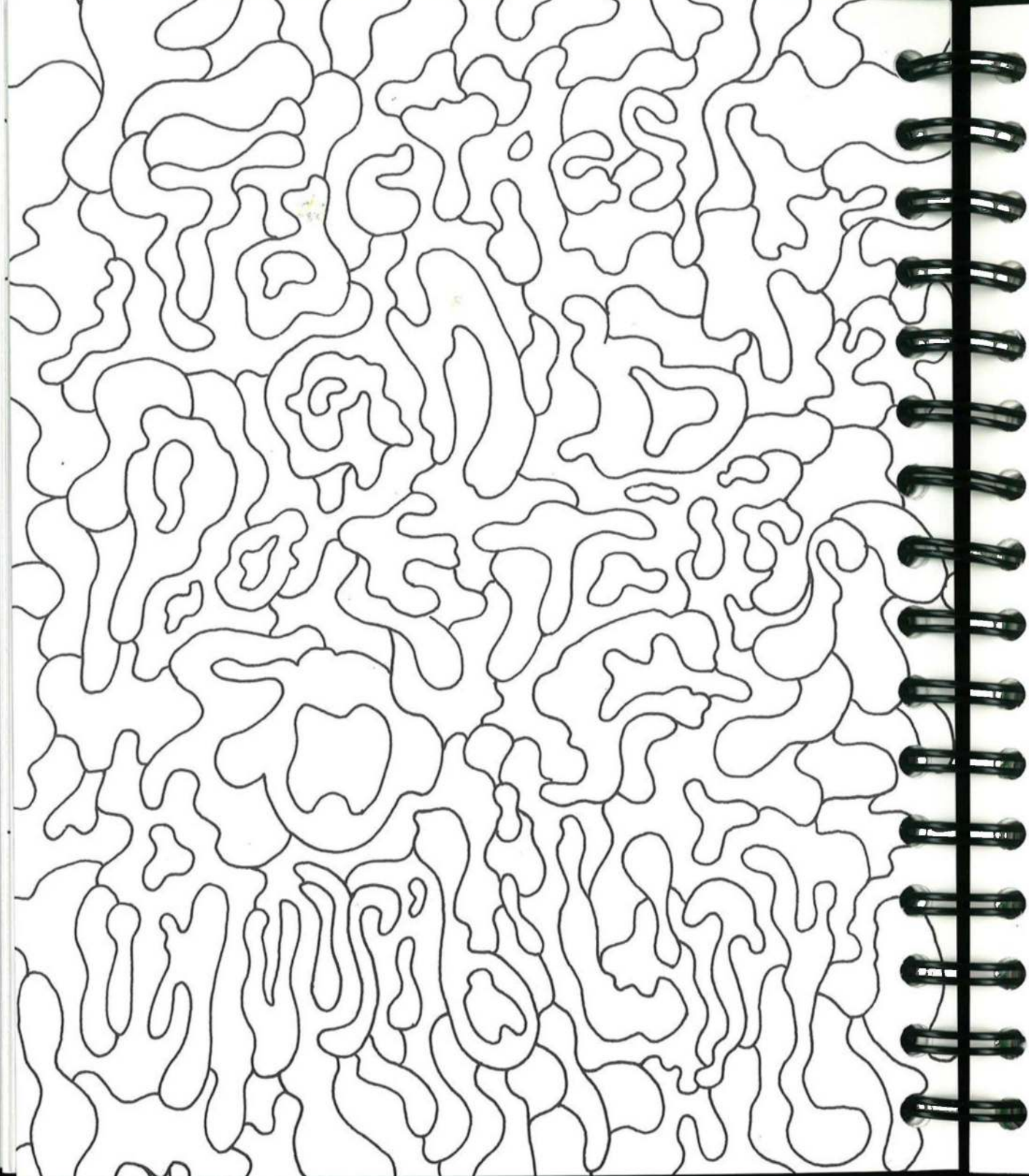
As I'll show later on, secret writing has also enabled me to cast a light on various tactical practices of minorities and other marginalised communities in response to what I see as rampant racism, misogyny and fascism.

My engagement with the topic within educational, artistic and community contexts has resulted in everything from workshops and lectures, to exhibitions, performances and publications. Consequently, this Cookbook is written from my perspective as a designer/artist/educator who is interested in the aesthetics of invisibility, the evasion tactics of communication and the social value of language. *A Cookbook of Invisible Writing* works as a foil to the traditional vantage point of the intelligence agent or law enforcement officer engaged in espionage.

Finally, while we're on the subject of spies, I would like to share a little fragment of history about the port city of Rotterdam, where this project was born. During World War I, Rotterdam was known as 'the spy capital' of the neutral Netherlands due to its importance as a major shipping hub and its close ties to both Germany and England.⁸ In his book *Spynest*, Dutch historian Edwin Ruis details the stories of secret agents from both sides of the warring nations operating from central locations in Rotterdam like De Boompjes, a quay on the northern side of the city's river, and Witte Huis, an Art Nouveau-style building constructed in 1889. These agents hired local men and women in their operations, often recruited from the criminal underworld. Ruis reminds us at the onset of his book that spy research is problematic and tricky precisely due to its very nature of secrecy and the practice of covering of its own tracks – that is why the spy accounts we know about today usually come from the spies who took a wrong step and got caught. The truly successful spies and their secret techniques, he tells, will remain unknown to history forever.⁹

1. 'Bits of Freedom', *Privacy Café*, accessed 1 March 2018, <https://privacycafe.bof.nl/>.
2. 'CryptoParty', *Wikipedia*, accessed 24 February 2018, <https://en.wikipedia.org/w/index.php?title=CryptoParty&oldid=827340749>.
3. 'CIA Declassifies World War I Recipe for Invisible Ink,' *Daily Mail Online*, accessed 1 March 2018, <http://www.dailymail.co.uk/news/article-1378741/CIA-declassifies-World-War-I-recipe-invisible-ink.html>; 'WWI Spy Secrets Revealed by CIA', *BBC News*, accessed 1 March 2018, <http://www.bbc.com/news/world-us-canada-13141473>.
4. Kristie Macrakis, *Prisoners, Lovers, and Spies: The Story of Invisible Ink from Herodotus to Al-Qaeda* (New Haven: Yale University Press, 2014) p. 10.
5. *Ibid.*, p. xii.
6. Conrad Jaeger, 'Learn to Safeguard Internet Privacy Like You're 007', *Occupy.com*, 24 October 2012, accessed 30 June 2018, <https://www.occupy.com/article/learn-safeguard-internet-privacy-youre-007>.
7. 'Edward Snowden Urges SXSW Crowd to Thwart NSA With Technology', *Wired*, 10 April 2014, accessed 21 November 2018, <https://www.wired.com/2014/03/edward-snowdens-tech-call-arms/>.
8. Macrakis, *Prisoners, Lovers, and Spies*, p. 129.
9. Edwin Ruis, *Spynest: British and German Espionage from Neutral Holland 1914 - 1918* (Gloucestershire: The History Press, 2016) p. 10.





If late twentieth-century preoccupations with power were atomic and ballistic, those of the twenty-first century are increasingly informatic.¹ Mark Andrejevic

White Spots is a mobile phone app that was featured in the 2016 Dutch TV documentary titled *Offline als Luxe*.² The app visually represents online connectivity around the world. Black spots indicate places with digital access, and white spots indicate the offline world, including places that are yet to be connected. The title of the documentary, which translates to 'Offline is the New Luxury', suggests that as offline spaces increasingly come into demand, they will be accessible only to those who can afford the new luxury. If one examines their map, one might conclude that the entire world will soon be blanketed in blackness. Tech giants such as Google, Facebook and Amazon will continue their digital colonisation of the globe, enmeshing it in technologies that soak up information and report it back to their data centres for as long as they can keep them running. In the face of this unprecedented industrial-scale mining of our behavioural and personal data, off-the-grid communication becomes an important alternative for facilitating political autonomy, individual will, collective organisation and creative expression. It was 1968 when Andy Warhol was quoted as saying that in the future everyone would be famous for fifteen minutes. In 2006, Banksy updated the statement in an installation piece bearing the sentence, 'In the future, everyone will be anonymous for 15 minutes'.³

1. Mark Andrejevic, 'Foreword', *Feminist Surveillance Studies*, eds. Rachel E Dubrofsky and Shoshana Anielle Magnet (Durham: Duke University Press, 2015) p. x.
2. 'Offline als luxe: VPRO Tegenlicht', *VPRO*, 8 May 2016, accessed 19 March 2018, <https://www.vpro.nl/programmas/tegenlicht/kijk/afleringen/2015-2016/offline-als-luxe.html>.
3. Banksy, *Barely Legal* (exhibition), Los Angeles, 2006.

Online information is by its very nature vulnerable: the personal data of civilians is collected, mined and analysed in order to map online behaviour and subsequently develop measures and methods of targeted marketing, governing and policing. Media critics Howard Rheingold and Eric Kluitenberg have argued that the internet, which once promised freedom and democracy, is in fact built on technologies that enable authoritarian control and fascism.⁴ Previously applied for military and political advantage in times of war (including the Cold War), surveillance technologies are now being used in times of peace.

In March 2018, *The New York Times* and *The Observer* reported that the British political consultancy firm Cambridge Analytica had been harvesting and analysing the personal data of millions of Facebook users in order to influence the outcome of elections, notably the 2016 US presidential election and the UK Brexit referendum in the same year.⁵ Established in 2013, the now-defunct Cambridge Analytica deployed a wide variety of seemingly harmless and playful quizzes, which had been designed to extract data from Facebook users and their circles of friends. The data was then analysed to target people's profiles with personalised political advertisements intended to influence opinion.⁶ According to Christopher Wylie, whistleblower and former employee of Cambridge Analytica, the company served as 'a full-service propaganda machine'.⁷ Wylie's comment points to how the company operated as an unethical tool in psychological and cultural warfare.

Using the analogy of the horizontal root system of certain plants, the French philosophers Gilles Deleuze and Félix Guattari have applied the term *rhizomatic* to describe a network of non-hierarchical nodes. They place this against the arborescent model, a hierarchical, vertical root system of a tree used to describe a centralised system.⁸ The media scholar and artist Henry Warwick, author of *Radical Tactics of the Offline Library*, has expanded this concept. Warwick claims that the once decentralised, rhizomatic structure of the internet has become increasingly centralised or arborescent. The internet landscape has transformed into a top-down system led by economic and juridical powers acting in the interests of capital and proprietarianism – driven by the desire to possess, own or hold exclusive rights to it.⁹ Evgeny Morozov expressed a similar perspective in his 2011 book on internet freedom, *The Net Delusion*. Morozov points out how contrary to the populist cyber-utopian belief that technology will empower the oppressed, dictators have instead learned to wield technology for

4. Howard Rheingold and Eric Kluitenberg, 'Mindful Disconnection', *Open: Cahier on Art & the Public Domain*, 1 November 2006, accessed 1 March 2018, <https://www.onlineopen.org/mindful-disconnection>.

5. Emma Graham-Harrison and Carole Cadwalladr, 'Revealed: 50 Million Facebook Profiles Harvested for Cambridge Analytica in Major Data Breach', *The Guardian*, accessed 17 March 2018, <http://www.theguardian.com/news/2018/mar/17/cambridge-analytica-facebook-influence-us-election>; Alex Hern, 'Number of Facebook Users Whose Data Was Compromised "Far More than 87m", MPs Told', *The Guardian*, accessed 17 April 2018, <http://www.theguardian.com/uk-news/2018/apr/17/facebook-users-data-compromised-far-more-than-87m-mps-told-cambridge-analytica>.

6. 'Revealed: 50 Million Facebook Profiles Harvested for Cambridge Analytica in Major Data Breach'.

7. 'What is Cambridge Analytica? The firm at the centre of Facebook's data breach', *The Guardian*, accessed 23 November 2018, <https://www.theguardian.com/news/2018/mar/18/what-is-cambridge-analytica-firm-at-centre-of-facebook-data-breach>.

8. Gilles Deleuze and Felix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia* (Minneapolis: University of Minnesota, 1987) p. 7.

9. Henry Warwick, *Radical Tactics of the Offline Library* (Amsterdam: Institute of Network Cultures, 2014).

propaganda purposes – instrumentalising it for sophisticated systems of surveillance and censorship.¹⁰ Like their cyber-utopian comrades, the cyber-feminists of the 1990s saw the internet as inherently revolutionary, with the capacity to sabotage existing power structures and central control, which they regarded as inherently male.¹¹

In the early years of the internet, there was in fact a great deal of optimism about this decentralised, non-linear technology. It was seen as a platform that might provide women and other marginalised groups with the means to radically counter gender inequality and become empowered through self-organisation. However, over the course of two decades, old modes of power relations and hierarchies have been reinstalled as a consequence of the commercialisation of the internet.

Surveillance as discrimination

Tabita Rezaire once said, 'The Internet is exploitative, exclusionary, classist, patriarchal, racist, homophobic, transphobic, fatphobic, coercive and manipulative.'¹² The words of the Danish-French Guyanese video artist are hardly surprising, considering the fact that the internet was built upon existing structures that already exhibited such characteristics. To understand the notion of surveillance as discrimination, the feminist scholars Rachel E Dubrofsky and Shoshana Amielle Magnet expanded on the 'white supremacist capitalist heteropatriarchy' proposed by the American author and activist bell hooks, and instead suggest the term 'white supremacist capitalist heteropatriarchal surveillance'. This term captures 'the use of surveillance practices and technologies' and how they 'normalize and maintain whiteness, able-bodiedness, capitalism, and heterosexuality, [which are] practices integral to the foundation of the modern state'.¹³

Surveillance can be seen as the coupling of information collection and the use of power. In *Surveillance as Social Sorting*, David Lyon writes that 'surveillance is not itself sinister any more than discrimination is itself damaging. However, [he states] that there are dangers inherent in surveillance systems whose crucial coding mechanisms involve categories derived from stereotypical or prejudicial sources'.¹⁴ He argues that digital surveillance is not only a matter of personal privacy but of social justice. Discrimination happens when people are sorted into groups, with their worth or risk assigned in ways that have real-life consequences on the opportunities one receives. Can the act of record-keeping ever be neu-

10. Evgeny Morozov, *The Net Delusion: The Dark Side of Internet Freedom* (New York: PublicAffairs, 2012) p. xiv; Laurier Rochon, 'The Dictator's Practical Internet Guide to Power Retention', accessed 1 March 2018, http://assets.pwd.io/pwd/media/The_Dictator_s_Practical_Internet_Guide_Laurier_Rochon.pdf.

11. 'VNS Matrix / Cyberfeminist Manifesto', *Sterneck.net*, accessed 1 March 2018, <http://www.sterneck.net/cyber/vns-matrix/index.php>.

12. 'We've Become Cyber Slaves!': 'Web Warrior' Tabita Rezaire Wants The Internet To Be Safe Of E-Colonialism', *OkayAfrica*, accessed 4 January 2016, <http://www.okayfric.com/tabita-rezaire-cyber-warrior-e-colonialism/>.

13. Rachel E Dubrofsky and Shoshana Amielle Magnet, 'Introduction', *Feminist Surveillance Studies*, eds. Dubrofsky and Magnet (Durham: Duke University Press, 2015) p. 7.

14. David Lyon, *Surveillance as Social Sorting: Privacy, Risk and Digital Discrimination*, (London: Routledge, 2003) p. 2.



tral? What is the imperative behind data collection, whose interests are served by the data, and what are the consequences?

In *Discipline and Punish*, the French philosopher Michel Foucault described surveillance as an instrument of control for disciplinary measures derived from a traditional focus on Western criminology.¹⁵ But the problem of *digital* surveillance transcends this. It also concerns the alleged neutrality of the algorithm that obscures the forms of gendered, raced and classed surveillance practices that are perpetuated in the name of general interest and national security.¹⁶

The US-led 'war on terrorism' has paved the way for surveillance practices and pre-emptive security measures that disproportionately target people with a Middle Eastern name or appearance. In 2016, a man living in the Dutch city Roosendaal and identified only as 'Samir O' was wrongfully arrested on suspicion of being a terrorist and for possessing explosives, which turned out to be shawarma spices.¹⁷ In 2015, a fourteen-year-old student by the name of Ahmed Mohamed made a clock for a high school assignment in the US city of Irving, Texas. His teachers mistook it for a bomb, and he was removed from school in handcuffs.¹⁸ That same year, *Al Jazeera's* Islamabad bureau chief, Ahmad Zaidan, was misidentified by the NSA as a member of al-Qaeda and the Muslim Brotherhood, because his meta-data 'matched' their travelling patterns. This misidentification put his life in 'clear and immediate danger'; many before him have lost their lives due to the release of such fake information.¹⁹ With the emergence of technologies such as predictive policing algorithms that extend nation states' surveillance capabilities, it is no surprise that our prejudices, biases and preconceptions migrate into these algorithms. Mark Andrejevic has described this migration as an 'autonomization of our preconceptions and prejudices'.²⁰ Here we see how technology mirrors and advances a system in which power is already asymmetrical.

Since the 2013 Snowden leaks, national intelligence agencies' data collection practices and the right to privacy of citizens have become topics of international debate.

In the US, journalists Glenn Greenwald and Murtaza Hussain revealed in 2014 that a number of the NSA's targets of surveillance had been prominent Muslim Americans, and not one of these Americans had been charged with any crime.²¹ This news garnered less media attention than the NSA's unauthorised snooping of US citizens and foreign nationals' telecommunication. Arun Kundnani and Deepa Kumar highlight the double standards in their online article 'Race, Surveillance, and Empire'. While many people take issue with NSA's secret mining of private data on 'ordinary' citizens, this is not extended to Muslim

15. Michel Foucault, *Discipline and Punish*, trans. Alan Sheridan (New York: Vintage Books, 1995).

16. Andrejevic, 'Foreword', p. xii.

17. Hans de Zwart, 'Draconian Anti-Terrorism Measures Turn Us into Scared and Isolated People', *Bits of Freedom*, accessed 1 March 2018, <https://www.bof.nl/2017/07/31/draconian-anti-terrorism-measures-turn-us-into-scared-and-isolated-people/>.

18. 'Ahmed Mohamed: "Clock Boy" Seeks \$15m Redress', *BBC News*, accessed 1 March 2018, <http://www.bbc.com/news/world-us-canada-34904226>.

19. Ahmad Zaidan, 'Al Jazeera's A. Zaidan: I am a Journalist not Terrorist', *Al Jazeera*, accessed 1 March 2018, <https://www.aljazeera.com/indepth/opinion/2015/05/al-jazeera-zaidan-journalist-terrorist-150515162609293.html>.

20. Andrejevic, 'Foreword', p. xv.

21. Glenn Greenwald and Murtaza Hussain, 'Meet the Muslim-American leaders the FBI and NSA have been spying on', *The Intercept*, accessed 23 November 2018, <https://theintercept.com/2014/07/09/under-surveillance/>.

citizens who are seen to be reasonable targets of suspicion.²² All this begs the question, who fits into the category of an 'ordinary' person and who gets to decide? What is coming to the surface through all of this is that some bodies are deemed worthy of protection while other bodies are not. Racist ideas are the bedrock of the national security surveillance in the US, as they're deeply intertwined with colonialism and empire. Recalling Dubrofsky and Magnet, this example illustrates 'white supremacist capitalist heteropatriarchal surveillance'. Taking a feminist perspective, my feeling is that general discussions about the right to privacy often neglect the general lack of a right to privacy as well as the infringements upon this right for marginalised groups. Law professor Khiara M Bridges' argues in her book *The Poverty of Privacy Rights* that poor women in America do not have the privilege of privacy rights that others enjoy. They are subject to routine intrusions of their private spaces where they raise their children and have no say in the government's collection of their private information about reproductive and sexual choices.²³ The issue at hand in this text is how the poor are being policed and monitored. Rather than applying its resources toward addressing structural deficiencies, the US state has been instead seen to coerce poor women out of motherhood – where even the values that women impart to their children are being monitored.²⁴ Such surveillance measures are based on an understanding of poverty as an individual failure of the person, rather than as a structural failure of the system. In their book *Feminist Surveillance Studies*, the editors Dubrofsky and Magnet raise the following questions:

*Who is considered to have a right to privacy? Whose privacy is not a concern and why? And importantly, how might a focus on these questions shape the field of surveillance studies? For instance, many communities – including prisoners, those receiving certain forms of welfare from the state, people with disabilities living in institutional care, as well as immigrants and refugees – have historically had, and continue to have, their bodily privacy invaded, but there is almost no public discussion about the infringement of their rights to privacy.*²⁵

Following this line of thought, Dubrofsky and Magnet reflect upon Rachel Hall's contribution to the book, in which she suggests that the feminist intervention to surveillance is to move critical surveillance studies away from subjects concerned with privacy and security and instead address the ethical problems arising in light of new forms of discrimination-related privilege, access and risk. In other words, what happens to those who have

22. Arun Kundnani and Deepa Kumar, 'Race Surveillance and Empire', *International Socialist Review*, accessed 23 November 2018, <https://isreview.org/issue/96/race-surveillance-and-empire>.

23. Khiara M Bridges, cited in Tanvi Misra, 'Privacy Is Reserved for Women of Means', *CityLab*, accessed 19 April 2018, <https://www.citylab.com/equity/2017/07/dopoor-women-have-privacy-rights/534423/>.

24. Ibid.

25. Dubrofsky and Magnet, 'Introduction', p. 4.



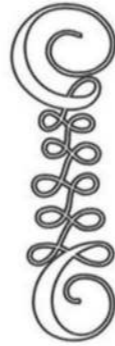
no access to privacy rights and what are they at risk of?

The project *Facial Weaponization Suite* (2011–14) by the artist Zach Blas exemplifies how discourse around surveillance technologies collides with the social inequalities they propagate. In the project, Blas develops four masks in order to problematise biometric facial recognition technology. Biometrics is the measurement of unique body characteristics. Perhaps the most iconic piece to have come out of the project is *Fag Face Mask*, a work that responds to the linking of sexual orientation to facial features. Another mask explores the inability of biometric technologies to correctly perceive dark skin. A third mask engages with face-veil legislation in France, considering how the state's demand for facial visibility operates as an oppressive force, while the fourth mask considers the relationship between nationalist violence and biometrics in the context of security technology at the Mexico–US border. Each mask makes visible how digital surveillance technologies perpetuate discrimination in different ways. At the same time, they conceal the human face from these very technologies to subvert and resist categorisation and profiling.

A brief history of surveillance technology

Developed in the late eighteenth century by the English philosopher Jeremy Bentham, the panopticon is an architectural system for a prison in which the inmates' cells are arranged in a circular fashion around a central watchtower. The layout allows for observation, by a single watchman, without any particular inmate knowing whether they are being watched or not, thus inducing what Foucault referred to as a 'state of conscious and permanent visibility that assures the automatic functioning of power'.²⁶ At the time, the panopticon was a technical innovation in the field of surveillance that reduced labour expenses while increasing the productivity of control through means of self-policing and preventive measures. Foucault used the panopticon as a metaphor for a critical analysis of institutions of power in the West. In fact, as noted by the anthropologist Martha Kaplan, early panoptical prisons with Bentham's design were not built in Britain, but in the beginning of nineteenth-century India under British colonial rule.²⁷ What this goes to show is how surveillance was inseparable and essential to colonisation. In *Post-Colonial Studies*, the three authors write the following:

One of the most powerful strategies of imperial dominance is that of surveillance, or observation, because it implies a viewer with an elevated vantage point, it suggests the power to process and understand that which is seen, and it



26. Michel Foucault, *Discipline and Punish*, trans. Alan Sheridan (New York: Vintage Books, 1995) p. 201.

27. Martha Kaplan, 'Panopticon in Poona: An Essay on Foucault and Colonialism', *Cultural Anthropology*, vol. 10, no. 1 (February 1995) p. 85–98.

*objectifies and interpellates the colonized subject in a way that fixes its identity in relation to the surveyor.*²⁸

European nations used their colonies as laboratories to test surveillance technologies for home use, according to the sociologist Elia Zureik in his 2013 essay on domestic spying and imperial histories:

*It is significant that the basic tools of surveillance as we know them today (i.e., fingerprinting, census taking, mapmaking and profiling), which include the forerunners of present day biometrics, were refined and implemented in colonial settings, notably by the Dutch in Southeast Asia, the French in Africa, and the British in India and North America.*²⁹

Feminist activist and academic Andrea Smith has argued that the colonial gaze is based on a logic of *not-seeing*.³⁰ It was precisely this not-seeing that allowed for colonial takeover in the first place – as exemplified by the British declaration that Australia was *terra nullius* ('nobody's land') at the time of settlement.³¹ As is becoming clearer, the European colonial project traces directly to white supremacy. Indigenous societies and other non-Europeans such as immigrants and the enslaved only became visible to the colonising state when they were regarded as threats to the project of colonial domination and state security.³² Thus, as Zureik argues, 'colonialism and imperialism provided the impetus for developing modern surveillance technologies'.³³

Many scholars of surveillance have shown that its origins are inextricably linked with imperial dominance over colonised 'others', and this link continues to shape modern surveillance practices of radicalised and marginalised populations as well as political dissenters.³⁴

Today, passport photographs are a standardised technique for connecting individual identity with the body and its representation. However, in the United States for example, the earliest implementation of the medium of photography for passports was tested on marginalised groups such as immigrants – beginning with Chinese women. According to the gender and women's studies scholar Eithne Luibhéid in her book *Entry Denied*, the sexuality of immigrant women was seen as a danger to the nation's security, a threat that elicited containment through strict border control.³⁵

28. Bill Ashcroft, Gareth Griffiths and Helen Tiffin, *Post-Colonial Studies: The Key Concepts* (London: Routledge, 2007) p. 207.

29. Elia Zureik, 'Colonial Oversight', *Red Pepper*, accessed 1 March 2018, <https://www.redpepper.org.uk/colonial-oversight/>.

30. Andrea Smith, 'Not-Seeing: State Surveillance, Settler Colonialism, and Gender Violence', *Feminist Surveillance Studies*, eds. Dubrofsky and Magnet (Durham: Duke University Press, 2015) p. 26.

31. Smith, 'Not-Seeing: State Surveillance, Settler Colonialism, and Gender Violence', p. 26.

32. *Ibid.*, p. 27.

33. 'Colonial Oversight'.

34. Simone Browne, *Dark Matters: On the Surveillance of Blackness* (Durham: Duke University Press, 2015); Dubrofsky and Magnet, eds., *Feminist Surveillance Studies*; Arun Kundnani and Deepa Kumar, 'Race, Surveillance, and Empire', *International Socialist Review*, accessed 1 March 2018, /issue/96/race-surveillance-and-empire; Christian Parenti, *The Soft Cage: Surveillance in America from Slavery to the War on Terror* (New York: Basic Books, 2004); Elia Zureik, 'Colonial Oversight', *Red Pepper*, accessed 1 March 2018, <https://www.redpepper.org.uk/colonial-oversight/>.

35. Eithne Luibhéid, *Entry Denied: Controlling Sexuality at the Border* (Minneapolis: University of Minnesota Press, 2015).

The Page Act of 1875 and the Chinese Exclusion Act of 1882 were some of the earliest examples of laws limiting the entry of immigrants to the US from Asia.³⁶ Photography, with its ability to record the uniqueness of individual bodies, proved to be a technology that could control an individual's mobility. Eithne Luibhéid again:

A photograph was attached to each woman's consular clearance, and another photograph was sent in advance of the ship, so that when the ship arrived, officials already had in their possession photographs of the women who had been approved for migration. Women who arrived without photographs, or who did not match the photographs that had been sent in advance, were detained and returned to Hong Kong.³⁷

These laws helped mould a system of border controls in the United States. They created categories of illegal immigration and 'aliens ineligible for citizenship', which in turn were used to deny voting rights and property ownership.³⁸ They also established principles of race-based immigration that the US Congress enforced through subsequent laws, such as the Trump administration's 2018 efforts to ban immigration from Muslim-majority countries.

In her book *Dark Matters: On the Surveillance of Blackness*, Simone Browne introduces the term 'racializing surveillance' as a way to frame surveillance as a technology of social control that produces norms related to race that define what is in or out of place.³⁹ Browne points out that these practices stem from plantation societies, repressive societies and anti-Black spaces. For instance, one of the earliest identification and surveillance systems in the United States was the 'slave pass'. Designed to monitor slaves and prevent them from escaping to freedom, the slave pass can be seen as an early example in the development of modern-day identification systems such as biometrics.

In *The Soft Cage*, the journalist Christian Parenti highlights how, although the intention of pass laws was to control the mobility of poor whites and Native Americans in the seventeenth century, the first pass law enacted in Virginia in 1680 exclusively targeted African slaves.⁴⁰ In 1687, it became illegal in South Carolina for slaves to travel without a note from their master.⁴¹ These notes or passes, which are early examples of identification, were written by plantation owners giving permission to slaves to travel beyond the plantation to which they belonged. Parenti describes the loopholes of the early passes: since they only recorded the times at which they could travel and not their physical characteristics, slaves who learned how to read and write could forge passes and manoeuvre around systems of control in order to gain freedom. In a time when black illiteracy was the rule, enforced as a measure of control, literate slaves were able to tactically evade the pass

36. 'The Page Act of 1875', Wikipedia, accessed 1 June 2017, https://en.wikipedia.org/wiki/Page_Act_of_1875; 'The Chinese Exclusion Act', Wikipedia, accessed 1 June 2017, https://en.wikipedia.org/wiki/Chinese_Exclusion_Act.

37. Luibhéid, *Entry Denied*, p. 45.

38. 'Alien land laws', *Densho Encyclopedia*, accessed 19 July 2017, http://encyclopedia.densho.org/Alien_land_laws/.

39. Simone Browne, *Dark Matters: On the Surveillance of Blackness* (Durham: Duke University Press, 2015) p.16.

40. Christian Parenti, *The Soft Cage, Surveillance in America, From Slavery to the War on Terror* (New York: Basic Books, 2003) ebook, p. 20.

41. *Ibid.*

system and escape while also enabling the liberation of others – notably the social reformer and former slave, Frederick Douglass.⁴²

As slaves found ways to resist and counter surveillance-mechanisms instated to curb any possibility of their freedom of movement, colonial overseers further developed surveillance strategies to gain back control. For example, paper passes were eventually replaced by metal tags that were more resistant to tampering and forgery.⁴³ Colonial overseers also improved identification and biometrics through the use of the wanted poster, describing specific body measurements and other physical indicators. For example:

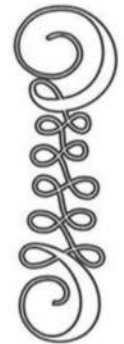
Negro man Slave named Bob, Copper color, high cheek bones, 5 11 inches high, weighs about 150 pounds, 22 years old very white teeth and a space between the center of the upper teeth. Had a blue blanket sack coat with red striped linsey lining.⁴⁴

To quote Kundnani and Kumar again:

This is as true today as it has been historically: race and state surveillance are intertwined in the history of US capitalism. Likewise, we argue that the history of national security surveillance in the United States is inseparable from the history of US colonialism and empire.⁴⁵

Returning to the present day, the sociologist David Lyon points out how surveillance in the West has gradually evolved from the top-down panoptic model to a model that envelops us as we actively engage and participate in it on a daily basis. Together with Zygmunt Bauman, in 2012 Lyon coined the term 'liquid surveillance' to describe how surveillance flows within and between organisations, fluidly encompassing our technologies, the means of social control and our culture at large.⁴⁶ By extension, liquid surveillance means that we watch our friends, colleagues and family on social media. We give away personal data to commercial companies such as Facebook, Twitter and YouTube, which then flows through data brokers that might end up being used for government or policing purposes.

Against the backdrop of advances in digital technology, the cat-and-mouse game of surveillance and counter-surveillance has become increasingly blurred and complicated. This relatively new concept of liquid surveillance means that traditional power relationships between



42. *Ibid.*, p. 22.

43. *Ibid.*, p. 24.

44. 'Broadside Offering Reward of \$2,500 for Return of Three Runaway Negroes, August 23, 1852', *Missouri History Museum*, accessed 13 November 2017, <http://collections.mohistory.org/resource/2166i0>.

45. Kundnani and Kumar, 'Race, Surveillance, and Empire'.

46. Zygmunt Bauman and David Lyon, *Liquid Surveillance: A Conversation* (Cambridge: Polity, 2012).



watcher and watched, oppressor and oppressed are collapsing and need to be reassessed.

Sousveillance: invisibility as a tactic

Given what we know about liquid surveillance, is it still possible to subvert and deflect surveillance in a world that is totally submerged in it?

The term *sousveillance*, coined by the media researcher Steve Mann, is based on the idea of watching those who are watching us. Similar to the word surveillance, which means 'watching from above' in French, *sousveillance* means 'watching from below', implying an effort by citizens to disrupt asymmetries of power. The split between surveillance and *sousveillance* echoes the dichotomy of the watchers and the watched, the strong and the weak, the powerful and the powerless.

The cultural theorist Michel de Certeau described a theoretical framework for understanding how the 'powerless' may appropriate, subvert and reclaim meaning from the 'powerful'.⁴⁷ In de Certeau's original formulation, written in 1980, *strategies* are seen as the weapons of the strong, accessible only to those who are in a position to define the environment and the conditions of the playing field – such as governments, corporations, the media, schools and the church. In contrast, *tactics* are the weapons of the weak. De Certeau identifies tactics with the creative consumer and rebellious participants, or rebellious 'users', who are able to take advantage of the strong. De Certeau's terminology provided the theoretical groundwork for the 'tactical media' practice of the 1990s. The people who took up this practice defined its identity against dominant structures and its actions challenged mainstream culture through subversive, grassroots and DIY production and distribution of media. In their seminal media theory essay from 1997, 'The ABC of Tactical Media', Geert Lovink and David Garcia reflect on de Certeau's writing:

*Setting up this dichotomy allowed [de Certeau] to produce a vocabulary of tactics rich and complex enough to amount to a distinctive and recognizable aesthetic. An existential aesthetic. An aesthetic of poaching, tricking, reading, speaking, strolling, shopping, desiring. Clever tricks, the hunter's cunning, maneuvers, polymorphic situations, joyful discoveries, poetic as well as warlike.*⁴⁸

For media activists and artists such as the Critical Art Ensemble, the Yes Men, and Eva and Franco Mattes of 0100101110101101.org, de Certeau's framework has been hugely influential.

In the present day media landscape, however, the strategies–tactics dichotomy has become inadequate. De Certeau's text also, of course, is unable to critically address the recent rise of the alt-right, in particular its online activity. As an extreme, neo-fascist group, the alt-right has weaponised internet meme-making and online trolling as a means

47. Michel de Certeau, *The Practice of Everyday Life*, trans. Steven F. Rendall (Berkeley: University of California Press, 2011).

48. Geert Lovink and David Garcia, 'The ABC of Tactical Media', *Nettime*, accessed 1 March 2017, <http://www.nettime.org/Lists-Archives/nettime-1-9705/msg00096.html>.

for spreading white nationalism, misogyny, homophobia, right-wing populism, racism and hate speech. Many of the methods practiced by tactical media activists have been absorbed by radical right-wing subcultures. For example the use of multiple-use names or anonymity pseudonyms, which are names used by many people so that they can remain anonymous. The names 'Luther Blisset' and 'Wu-ming', for example, were used by cultural activists and media pranksters in the 1990s for projects that wanted to challenge and experiment with forms of collective authorship and identity. A decade later, the Anonymous group, an online community of amorphous hackers, emerged on 4chan, an internet forum whose original function was to simply allow users to post images. 4chan has been the birthplace of many internet memes, and its participants are usually anonymous, owing to the fact that one doesn't need to register in order to post. And thus the Anonymous group adopted its name based upon this feature of anonymity.

4chan has been central to the rise of the alt-right. What was once a space for generally left-wing, anarchic rhetoric gradually shifted into one of militant, fascist, right-wing rhetoric. The uncomfortable uncertainty is whether or not the shift was a gradual evolution or a conscious takeover. In other words, are they the same people or different people? In part due to user anonymity and lack of accountability, the site provided a breeding ground for would-be trolls potentially harbouring neo-Nazi ideologies.

The reality is that the alt-right subculture and movement also operates under the libertarian premises of less surveillance, more privacy and freedom of expression. How do we reconcile the desire for freedom of expression with the neo-Nazi desire for freedom of expression to spread hate and advocate for white supremacy? Returning to de Certeau's notion of tactics as the weapons of the weak and strategies as the weapons of the strong, perhaps this binary has in fact depoliticised the issues at hand. Considering this possibility, I have taken to using the term 'tactical invisibility' to support and highlight the subversive practices of marginalised gender, ethnic and sexual cultures.⁴⁹

To understand surveillance from an Afro-American perspective, Simone Browne introduced the concept of 'dark sousveillance' to describe 'tactics used to render one's self out of sight'.⁵⁰ Building upon Steve Mann's idea of *sousveillance* as watching those who are watching us, Browne's 'dark' modifier comes from a place of critique but does so while also acknowledging the usefulness of the original term.⁵¹ Dark *sousveillance* is used to look at the ways that people living in anti-Black spaces might 'challenge repressive practices through their own experiences of counter-surveillance and surveillance'.⁵² Such experiences in turn produce a



49. This term was my own coinage. During my research for this book, I found that the term has precedents in the following publications: Karin L. Tamerius, 'Sex, Gender, and Leadership in the Representation of Women', in Mona Krook and Sarah Childs, *Women, Gender, and Politics: A Reader* (Oxford: Oxford University Press, 2010) p. 250.

50. Claudia Garcia-Rojas, 'The Surveillance of Blackness: From the Trans-Atlantic Slave Trade to Contemporary Surveillance Technologies', *Truthout*, accessed 14 March 2018, <http://www.truth-out.org/news/item/35086-the-surveillance-of-blackness-from-the-slave-trade-to-the-police>.

51. *Ibid.*

52. *Ibid.*

body of 'liberatory knowledge' in subversion, resistance and coping mechanisms for survival.⁵³

Tactics of Black resistance trace a long way back. From the seventeenth century, African slaves who resisted and escaped slavery from European colonisers formed autonomous communities throughout the Americas. In regions of the US, Suriname and Jamaica, escaped slaves were known as Maroons and formed new settlements in inaccessible and inhospitable environments where they could hide and defend their communities from colonial forces.⁵⁴ Surviving beyond the sight and control of the colonial officers meant that they were able to practice and maintain aspects of their ancestral languages, cultures and religions.⁵⁵

The Chinese phenomenon of *shanzhai*, meaning counterfeit consumer goods, may in a sense also be considered an invisibility tactic. The word *shanzhai* translates to 'mountain fortress' or 'mountain village' – referring to outlaws and bandits who lived remotely across China, beyond the reaches of official control. Inhabiting and operating in the blind spots of copyright protection of big multinational brands, *shanzhai* products are usually illegal and made in poor labour conditions. But the designs and the market evolve rapidly, giving life to unauthorised and strange electronic hybrid products such as Swiss Army-knife phones, shaver phones, lighter phones and pen phones. But *shanzhai* encompasses more than just phones. *Shanzhai* aesthetics usually mirror those of Western designs and products, such as fashion brands, European paintings, art exhibitions and entire villages made to look like European towns. Flying under the radar of global corporations, cheap knockoffs circulate the vast space of the 'grey market' – unofficial markets where goods are sold legally, but are unauthorised for sale by the official suppliers. Drawing from this cultural phenomenon, 'Second (Hand) Mountain (Fortress)' is a pirate publishing-project by Display Distribute, an artist-run publishing house based in Hong Kong. Channelling the energy of *shanzhai*, one of Display Distribute's publications is self-reflexively titled *Copycat*, and is an illegally reprinted chapter of *China in 10 Words* by the Chinese writer Yu Hua. The cover of the book depicts an enlarged text snippet from Yu Hua's book that describes the word copycat as having 'more of an anarchist spirit than any other word in the contemporary Chinese language'.⁵⁶

Taking the cultural phenomenon of *shanzhai* as an example, how then to apply this to communication technology? Where are the invisible cracks and mountain fortresses of digital media? According to the media theorist Wendy Chun, digital media not only facilitates leaks by whistleblowers, but also, the technology is itself 'leaky'.⁵⁷ In the wake of the Snowden leaks, Chun writes the following:



53. Ibid.

54. 'The Obscured History of Jamaica's Maroon Societies', *Jstor Daily*, accessed 30 November 2018, <https://daily.jstor.org/maroon-societies-in-jamaica/>; Gloria Wekker, *The Politics of Passion: Women's Sexual Culture in the Afro-Surinamese Diaspora* (New York: Columbia University Press, 2006) p. 58.

55. 'The Obscured History of Jamaica's Maroon Societies'.

56. Yu Hua, 'Copycat', *China in Ten Words*, (Hong Kong: 'Second (Hand) Mountain (Fortress)', 2016).

57. Wendy Hui Kyong Chun and Sarah Friedland, 'Habits of Leaking: Of Sluts and Network Cards', *differences*, vol 26, Issue 2 (2015): p. 1-28.

*Leaking information is framed paradoxically as both securing and compromising our privacy, personal and national. Thanks to these leaks, we now understand the extent to which we are under surveillance; because of these leaks, we are exposed.*⁵⁸

From a media theory perspective, Chun questions whether leaking information is an issue of personal human agency at all, and instead positions digital media's leakiness as a systematic vulnerability of networked technology. In the open waters of digital technology, communication is vulnerably 'visible' to potential human and non-human spies alike. As such, what constitutes invisible and leak-proof communication?

The option of going offline or off-the-grid is becoming increasingly relevant due to our digital vulnerability and unease generated around that reality. Such sentiments are mirrored by changes in consumer behaviour, such as demand for vintage communications devices. One local German publication reported that following the Snowden revelations, Bandermann and Olympia typewriter manufacturers were experiencing a customer surge.⁵⁹

The relative security of paper is also touched upon in the final scene of *Citizen Four*, a documentary film on Edward Snowden. In this scene, the journalist Glenn Greenwald resorts to paper and pen to communicate with Snowden.

The Chinese artist-run zine collective called Fong Fo harnesses the tactical nature of printed DIY zines. Running out of a home-studio in Guangzhou, Fong Fo prints, binds and distributes its work on paper in a conscious effort to circumvent stringent censorship measures and publish more freely in the government-restricted Chinese media landscape.

In the United States, against the backdrop of online trolling by the alt-right, self-organised spaces are opting to go underground and offline in search of safer forms of communication. In December 2016, the DIY venue Ghost Ship burned down in Oakland, California, sparking a public debate on the safety and legal status of these spaces.⁶⁰ Alt-right groups subsequently jumped in on the conversation, calling artist-run DIY spaces 'open hotbeds of liberal radicalism and degeneracy'.⁶¹ The contemporary art blog *Hyperallergic* reported:

The troll campaign against DIY music venues and live/work artists' spaces [...] emerged from /pol/, a 4Chan message board [...]. The anonymous posters adopted

58. Ibid.

59. Felix Reimer, 'Typewriter Manufacturers See Boom in Sales', *The Local*, accessed 21 July 2014, <https://www.thelocal.de/20140721/german-typewriter-manufacturers-see-sales-boom>.

60. Benjamin Freed, 'Alt-Right Trolls Are Targeting DC's DIY Music Houses', *Washingtonian*, accessed 28 November 2018, <https://www.washingtonian.com/2016/12/19/alt-right-trolls-targeting-dc-diy-music-houses/>.

61. Gabrielle Canon, '4chan Users Launch Campaign to Shut Down DIY Venues in Aftermath of Oakland Fire', *Vice*, accessed 1 March 2018, https://thump.vice.com/en_ca/article/d7jwdj/4chan-trolls-diy-spaces-oakland-fire.



the name 'Right Wing Safety Squad' – SS for short – and posted memes incorporating Nazi symbolism. They found lists online of DIY spaces across the country and scoured Facebook for venue names, addresses, and, in some cases, images of specific venues, using the information to call in anonymous complaints in an attempt to get spaces shut down over fire code violations and permitting issues.⁶²

As a consequence, some underground spaces have gone back to announcing their shows through word-of-mouth rather than online.⁶³ The same sentiment is echoed by Henry Warwick in *Radical Tactics of the Offline Library* when he proposes to abandon 'the online for more secure offline transfer'.⁶⁴

The fact that invisible ink recipes are now deemed obsolete and harmless makes these recipes steganography on top of steganography. Invisible ink is now overlooked, not only because the ink is invisible, but also because nobody expects this technique to still be used. From a media-archaeological perspective, invisible ink has been relegated to the status of 'dead media'.⁶⁵ Another way of looking at it is as 'zombie media', to borrow a term from media studies that explores the temporalities of media objects, planned obsolescence and electronic waste.⁶⁶ Analog steganography is a medium that I have attempted to resuscitated and reactivated. As such, it is my claim that invisible ink can be used tactically to oppose a commodity culture that focuses solely on the development of ever-newer media. It can push us backwards to explore forgotten-tech alternatives that have been underestimated, and are perfectly suitable for flying under the radar of detection. Another advantage of forgotten technology such as this is the fact that the modern equivalents have lost the ability to counter it.

This brings to mind a seemingly unrelated story about a thousand-year-old treatment for eye infection that was used to treat the notorious superbug Methicillin-resistant Staphylococcus aureus (MRSA).⁶⁷ In 2015, two scientists recreated a ninth-century Anglo-Saxon home remedy using garlic, onion, wine, cow bile and copper. To their surprise, the concoction wiped out ninety per cent of the MRSA bacteria in their sample test that at the time had developed a resistance to modern medicines. Because the bacteria had evolved over time, the scientists' hypothesis was that the bacteria had forgotten how to fight the Anglo-Saxon remedy since it had been so long out of circulation.

This anecdote challenges the narrative that human progress and innovation should always be looking toward the future. The past may also hold valuable answers for healing the present, potentially offsetting the 'arms race' between medicine and germs. In its own way, perhaps invisible ink may subvert the arms race of surveillance technologies.

62. Blair Murphy, 'From Texas to DC, Artists and DIY Spaces Struggle with Permits and Trolls,' *Hyperallergic*, accessed 1 March 2018, <https://hyperallergic.com/355219/from-texas-to-dc-artists-and-diy-spaces-struggle-with-permits-and-trolls/>.

63. "'Alt-Right' Trolls Are Targeting DC's DIY Music Houses'

64. Warwick, *Radical Tactics of the Offline Library*.

65. Bruce Sterling, 'A Modest Proposal and a Public Appeal', *Dead Media*, accessed 1 March 2018, <http://www.deadmedia.org/modest-proposal.html>.

66. Garnet Hertz and Jussi Parikka, 'Zombie Media: Circuit Bending Media Archaeology into an Art Method', *Leonardo*, vol. 45, no. 5 (5 July 2012) p. 424-30.

67. 'A Medieval Medical Marvel - Science Blog', *British Library*, accessed 1 March 2018, <https://britishlibrary.typepad.co.uk/science/2015/04/a-medieval-medical-marvel.html>.

The visibility paradox

The feminist project of making women and gender more visible within and across numerous disciplines and interdisciplinary studies is rendered especially contradictory when articulated in terms of a knowledge field that starts off from the problematization of visibility as a mode of subjection and regulation. Surveillance betrays and degrades the liberatory promise of visibility.⁶⁸ Laura Hyun Yi Kang

With temptation, if I can put it this way, we're crushed by twin pincers of nothingness. By not communicating, we're annihilated into the emptiness of an isolated life. By communicating we likewise risk being destroyed.⁶⁹ Roberto Esposito

Regimes of surveillance oppress with visibility, stripping naked their subjects and encroaching into societies' most intimate nooks and crannies. 'Glass is the enemy of secrets', wrote the philosopher Walter Benjamin who was himself persecuted by Nazi Germany.⁷⁰ To me, this conjures up a place where no one can hide or seek refuge. The term *gläserner Mensch* ('glass human' or 'transparent being') was used by West German privacy activists in the early 1980s during the Cold War and then retroactively applied to East German Ministry for State Security (Stasi) surveillance.⁷¹ The Stasi had unlimited state access to all information on all citizens, including medical records, financial records, insurance policies and bank statements.

On the other hand, visibility can also be seen as generating evidence – for example, a person's visibility can work to legitimise invisible and undervalued work that has historically been ignored. Within a feminist framework, the act of voicing or making visible violence that traditionally happens behind closed doors – the private sphere being the primary site of oppression and violence for women – can be liberating, as demonstrated by the Me Too movement in 2017. Marginalised groups have a long history of fighting for public visibility as a means of then gaining recognition from the state. Their battles, however, are due to their erasure by the same state. An example is the representation of ethnic minorities within the mainstream media, which also concerns visibility as a legitimizing, inclusive and empowering force. What comes to mind are indigenous Australians, and their ongoing fight to overturn the national day of 'celebration', a date that marks the invasion of their



68. Laura Hyun Yi Kang, 'Surveillance and the Work of Antitraficking', *Feminist Surveillance Studies*, eds. Dubrofsky and Magnet (Durham: Duke University Press, 2015) p. 40.

69. Roberto Esposito, *Communitas: The Origin and Destiny of Community*, trans. Timothy C. Campbell (Stanford: Stanford University Press, 2009) p. 146.

70. Walter Benjamin, 'Erfahrung und Armut', *Textlog*, accessed 1 June 2017, <https://www.textlog.de/benjamin-erfahrung-armut.html>.

71. 'Gläserner Mensch (Datenschutz)', *Wikipedia*, accessed 7 June 2018, [https://de.wikipedia.org/w/index.php?title=Gläserner_Mensch_\(Datenschutz\)&oldid=178101975](https://de.wikipedia.org/w/index.php?title=Gläserner_Mensch_(Datenschutz)&oldid=178101975).



land. To go back to the East German regime, it's important to note that in the aftermath, citizens occupied Stasi buildings to prevent the destruction of their files, so that the state could be held accountable for injustice.

To be visible is to be vulnerable to social control and surveillance. But visibility can facilitate public recognition, as well as cooperation, solidarity and community-building. This also applies to immigrants, prisoners and refugees who live simultaneously as hyper-visible to the monitoring gaze of the state, and yet remain socially invisible. How then do we negotiate the idea of visibility as a disciplinary and discriminatory measure and, at the same time, as a means of empowerment and accountability for those experiencing inequalities and discrimination?

In his essay 'The Fight over Transparency', the Swiss media theorist Felix Stalder describes visibility in today's neoliberal era as synonymous with institutional 'good practice'.⁷² Stalder names 'bottom-up visibility' as the instance in which communities and people demand visibility to structures of power for accountability. In this context, transparency can be empowering, such as former East German citizens demanding access to their files. However, 'top-down visibility', in which the state demands visibility, is a disciplinary measure of control that leads to what Stalder calls 'information asymmetry'. The question is how to remain invisible, while still being visible to our peers. Stalder's answer is to suggest particular forms of visibility for social solidarity, in which people can come to see one another, and experience zones of mutuality. Without horizontal transparency, social solidarity cannot take place, as I will show in the next section, which looks at how queer languages protect members of a group from potential aggressors while not rendering them complete invisibility to each other. Perhaps the issue at hand shouldn't be framed as one of visibility versus invisibility, but rather as a matter of our individual autonomy and sovereignty regarding this visibility.

Steganography as social glue

Although the Chinese linguistic phenomenon of Nüshu cannot definitively be labelled as steganography, it is nevertheless an interesting and relevant example that elucidates the potential of secret writing as a means of tactical solidarity. Nüshu (女书), meaning 'woman's writing', is perhaps the only known written script developed and used exclusively by women. Far away from the densely populated cities, Nüshu originated in Jiangyong county in the Hunan province of China, reaching peak usage during the latter part of the Qing Dynasty (1644–1912). The script itself is one that represents the local dialect of Jiangyong, and therefore is a syllabic script, meaning that each symbol represents a syllable. This contrasts with the official Chinese writing system known as *hanzi* (汉字), which uses



72. Felix Stalder, 'The Fight over Transparency: From a Hierarchical to a Horizontal Organization', *Open: Cahier on Art & the Public Domain*, no. 22 (2011) p. 22.

an extensive system of syllabic and logographic characters (with each symbol representing a word or phrase).

In this rural region isolated by mountains, traditional Confucian patriarchal ideals prevailed. As such, women were excluded at various levels of social interaction. Most significantly, their restricted access to formal education meant that women were usually illiterate in *hanzi* writing.

Interestingly, it has been said that Nüshu was forbidden during the Japanese occupation of much of China in the 1930s and 1940s, since the Japanese invaders feared that the Chinese could use it to send secret messages.⁷³ Although efforts have been made to preserve the script, the last writers who used it in their day-to-day lives died during the 1990s, leaving the legacy to only a very small number of scholars interested in the language. Indeed, much of the information detailed here was imparted to me in a conversation I had with Professor Liming Zhao, head of the Nüshu research project at Tsinghua University in Beijing, back in 2017.⁷⁴

It is quite remarkable that a community of women in Hunan were able to co-author a written language that allowed them to express themselves. What emerged was Nüshu poetry, song lyrics and biographies recorded in embroidery and in booklets usually written with sharpened bamboo dipped in ink – lending the calligraphy a thin and wispy aesthetic quality unlike the traditional brushstrokes of *hanzi*. One of the primary uses of Nüshu was to enable communication between 'sworn sisters' (*jiebai zimei*, 结拜姊妹), who were not biologically related. This sisterhood required them to pledge commitment to each other and included activities such as attending festivals and making textile arts and crafts together. These relationships were often closer than those with one's biological sisters.⁷⁵

In a male-dominated society, Nüshu helped to create a degree of social cohesion in which women could develop autonomous forms of belonging and a sense of community. Women developed an alternative script, not in order to undermine systems of oppression, but rather as a coping mechanism. In fact, Nüshu was never meant to be a secret or to explicitly exclude men. Rather, it was men in the community who were oblivious or indifferent to it. On a certain level Nüshu operated as steganography because, although it was there in plain sight, male onlookers were not aware or not interested. In this context, 'codes' or 'secrets' refer more so to a common understanding within a group and less to a deliberate withholding of information from outsiders. To quote Nüshu researcher Cathy Silber: 'When power is distrib-

73. 'Nüshu', *scriptsource.org*, accessed 3 September 2017, http://scriptsource.org/cms/scripts/page.php?item_id=script_detail&key=Nshu.

74. In typical Chinese fashion, I was invited to join Professor Liming Zhao for dinner afterwards as she had other visitors that day. Strangely enough, it turned out that one of her other dinner guests was the grandson of one of the last 'real' writers of Nüshu. He was in town for business related to his grandmother's use of Nüshu. During dinner, I learned how the culture around the script has become a commercial enterprise where the government and locals leverage it for tourism.

75. Orie Endo, 'Endangered System of Women's Writing from Hunan China', 1999, accessed 3 October 2017, <http://nushu.world.cocoon.jp/aas99.htm>.



uted unequally in a social relation, the impact of exclusion depends on which side is exercising it.'⁷⁶

Steganography relies on both invisibility and visibility, exclusion and inclusion. Like any other language, secret languages are social. Rules, conditions and systems need to be invented and established within a community. Steganography relies on the specificities of each community, and can thus be visual and tactile as well as linguistic. Secret languages manifest in myriad forms: from written scripts such as Nūshu to slang and colloquial language used to define and mark group identity; from argot, or a type of jargon, that is developed under scrutiny by groups who are oppressed or imprisoned, to non-secret yet specific vocabulary applied in specialised settings, such as professional jargon. What all of these in-group, collectively developed codes share is the function of strengthening community bonds, while also excluding outsiders or shielding members from oppression. An excellent example of this is the phenomenon called 'lavender linguistics', a strand of camouflaged vocabularies developed by queer communities to protect themselves from social persecution and judicial punishment: these include Kaliarda in Greece, Polari in England and Hijra Farsi in India.⁷⁷ Consider also the development of jargon codes in countries such as Syria and China, where the expression of political opposition can be extremely dangerous. What links Nūshu, Polari, Kaliarda, Hijra Farsi and other camouflaged languages is their shared function of facilitating and reinforcing social ties and relations. In Chapter 4, I will show how verbal and non-verbal forms of masked communication have been used as tools to mark identity, express political dissent, protect from incarceration, cope with oppression and even gain freedom. Steganography has the tactical potential to shield against surveillance and censorship, as well as the poetic potential to foster collective affinities.

76. Cathy Silber, 'Writing From the Useless Branch', Cathy Silber (blog), 2011, accessed 3 October 2017, <https://cathysilber.wordpress.com/writing-from-the-useless-branch-chapter-1-introduction/>.

77. Anna T., 'The Opacity of Queer Languages', e-Flux, no. 60 (December 2014), accessed 1 March 2018, <http://www.e-flux.com/journal/60/61064/the-opacity-of-queer-languages/>.



S	v	i	y	t	e	h	Y
n	m	d	s	f	s	H	o
B	b	e	c	u	P	S	
a	a	o	a	A	b	L	
A	s	d	s	R	q	t	
t	i	m	G	d	i	q	
S	t	c	O	F	r	t	
e	h	N	m	c	i	s	
I	k	A	e	m	w	v	
g	G	v	r	y	z	e	
C	E	o	e	d	R	i	
T	m	a	r	s	a	a	
s	h	e	L	L	o	o	



A poet is the most unpoetical of anything in existence, because he has no identity – he is continually [informing] and filling some other body.¹ John Keats

2.1 Camouflaged communication

Steganography provides secrecy by making messages invisible: it is the practice of hiding in plain sight, by concealing the very existence of a message. At the heart of this secret writing practice is the instrumentalisation of the seemingly innocuous. The protective exterior of a steganographic object blends in with its environment, deflecting the unknowing gaze of the

onlooker. (A steganographic object could be anything from a dead rat to an innocuous-looking graffiti piece in the background of a TV show.) Steganography can thus be seen as a practice of camouflaged* communication.

The other main type of secret writing, cryptography, applies mathematical formulas to encrypt messages. Generally

SECRET WRITING

STEGANOGRAPHY

- To hide messages
- Intended to provide secrecy, to conceal the presence of messages

CRYPTOGRAPHY

- To scramble messages
- Intended to provide privacy, through the use of codes and ciphers

TACTICAL NATURE OF PAPER AND INVISIBLE INK

STRENGTHS

- More secure carrier of information, because it is not connected to the internet.
- Easily destructible.
- Isn't as easy as making copies of digital information.
- Interception is possible, but time consuming.
- Easier to detect if/when intercepted by third party.

WEAKNESSES

- Slow communication.
- Local, smaller distribution circle.
- Time consuming.
- Postal services are becoming more expensive and run by private companies.

speaking, the visibly scrambled letters and numbers make cryptography easier to spot. For this reason, cryptography has been called 'overt secret writing', and steganography 'covert secret writing'.²

Kristie Macrakis' unique book *Prisoners, Lovers, and Spies* is the first book to trace the history of invisible ink. I will be sharing many historical anecdotes from her treasure trove of a work throughout this book. She highlights that the history of cryptography and steganography can be traced back as far as the Persian Wars (499–449 BC).³ Their best-known application is in the world of espionage in relation to military intelligence, counter-intelligence operations and whistleblowing. From the fourteenth century onward, steganography was used by alchemists and scientists who wished to keep secret their discoveries about the natural world.⁴ During the Renaissance, when an increasing reliance on mathematics propelled advances in cryptography, secret writing was used to conceal secrets of the state rather than secrets of nature.⁵ In the realm of interpersonal communication, secret writing also facilitated forbidden love and helped prisoners communicate. Today it is used to control the production of knowledge as well as trade secrets for commercial profit and copyright, but also used socially and politically by women, queer communities, prisoners, and those who live in places with restricted freedom of speech, to speak out in ways that offer some form of protection. More recently, right-wing politician Thierry Baudet, a rising star in Dutch politics who frighteningly won the provincial elections in March 2019, is said to have employed dog-whistle politics, encoding language in

such a way to speak to anti-immigration nationalists while sounding esoteric to a general audience.⁶ Similarly the US President Donald Trump has also been accused of racial dog-whistling to his alt-right supporters during his 2016 elections.⁷ To go back to de Certeau's terminology, secret writing has been used as a top-down strategy as well as a bottom-up tactic.

Despite the differences between the two categories of secret writing, there are many historical accounts of cryptography and steganography being used simultaneously for maximum effectiveness and protection. The Italian polymath Giambattista della Porta (1535–1615) believed invisible writing to be more effective when it was combined with some sort of cipher, offering 'great obscurity in affairs of the greatest moment'.⁸

The word 'secretary' originally denoted 'a person entrusted with a secret'. In the medieval Arab-Islamic world for instance, secretaries were responsible for the secure communication of state secrets.⁹ The techniques of cryptography were in fact pioneered in the Arab world, as were corresponding techniques of cryptoanalysis, the science of breaking codes. In 1412, the medieval Egyptian secretary Shihab al-Qalqashandi completed the *Subh al-Asha*, a manual for secretaries providing an overview of existing cryptographic methods (see page xv). One method instructs users to use invisible ink in combination with encryption.¹⁰

Such layering of techniques was used in the 1500s. While imprisoned by her cousin Queen Elizabeth I, Mary, Queen of Scots secretly communicated with her accomplices on the outside by using an encryption technique called substitution cipher written in an invisible ink made of

Price, saw how the peculiar combination of numerals and idiosyncratic details in the message might be used by spies to communicate secret information. The bulldog proved to be the catalysing event for the banning of lost-and-found announcements during World War II.

When using secret writing within digital or analog communication, one should weigh up the pros and cons. Though the principles of digital steganography are based on its analog predecessor, there are significant differences in both practice and technique. Digital networked media provide easy and instantaneous communication regardless of geographical distance, but are vulnerable to undetected spying and interception. On the other hand, analog media such as paper, invisible ink and covert objects circulating within physical spaces provide more control and security from inadvertent leaks, simply due to the fact that they are not connected to the internet. However, paper may also give a false sense of security since the contents can still be easily intercepted by the many cameras that saturate our living environments.

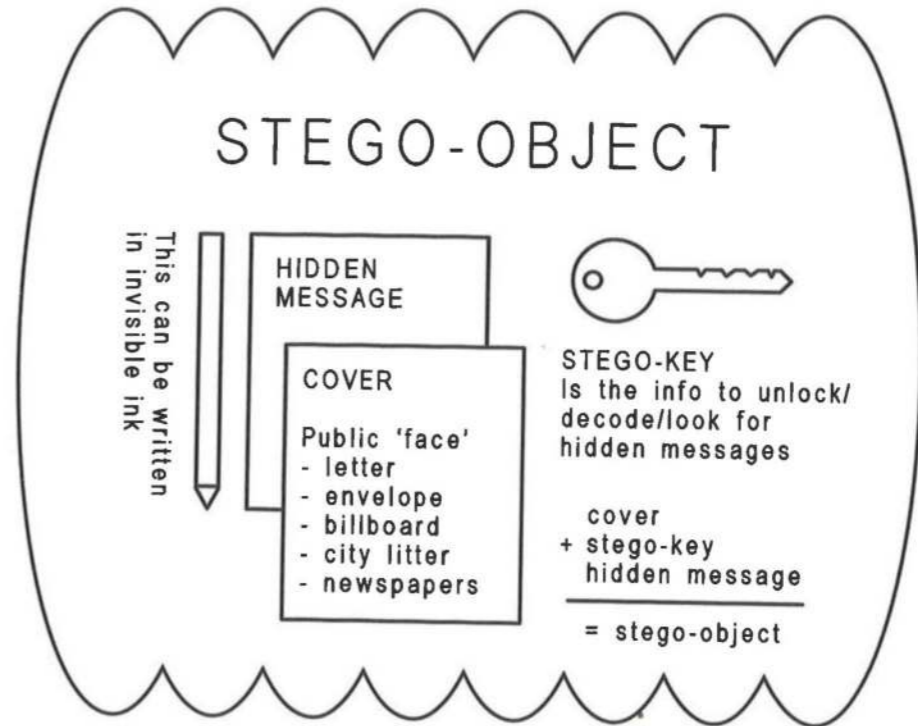
There is no such thing as absolute security. However, as we saw in the introduction, one advantage of paper is that it will more clearly reveal signs of interception and tampering. Replication of information on paper can be more readily controlled than the inherent 'leakiness' of digital information. Also, analog intercep-

tion and censorship is less common today than it was in the past. On the other hand, the slow speed of analog communication may be frustrating to generations who have grown up with and become dependent on instantaneous communication and light-speed connectivity. My feeling is that the time-consuming process is best approached on a smaller scale, operating within a shorter radius of distance for localbound communities.

* Although camouflage and steganography seem to have a lot in common, steganography can be understood as camouflage specific to the hiding of secret messages. According to Professor Ann Elias in her book *Camouflage Australia*, the history of military camouflage throughout World War I and World War II was an interdisciplinary effort between military science, zoology and art. Theories of dazzle patterning, like other forms of military camouflage, drew on ideas of aesthetics from natural history, perceptual psychology and modern art - including cubism, surrealism and abstract painting. While avant-garde artists and designers used these principles in their own aesthetic developments, modernist artists such as Max Dupain and Frank Hinder were employed by the Australian military because they had a working knowledge of two very important principles - abstraction and illusionism. These correspond with the two camouflage principles of concealment and deception. Artists had the opportunity to apply their knowledge of abstraction for concealment and visual misinformation, and their knowledge of illusionism for deception. As I learned from Elias' writing, the history of camouflage is controversial, as it is as entangled in the aesthetic world as it is in a world of war and violence.¹⁸ However, what is even more disturbing is the gendered and racialised perspective of camouflage. For the Australian military during World War I and World War II, achieving invisibility through camouflage was considered to be 'effeminate and decorative'. Within the extremely masculine context of military culture it also 'signified passivity, weakness, timid-

ity, cowardice, even unfair combat'.¹⁹ As such it was considered a 'hobby' compared to more serious instruments of war. Furthermore, qualities such as subterfuge, cunning and guile were linked to 'primitive' attributions belonging to the 'tribal minds' of indigenous Australians, qualities that the Anglo-Saxons apparently had lost due to their 'civilisation'.²⁰ This incredibly racially insensitive belief was held by zoologist and academic William Dakin, who was motivated to observe the 'advantageous' methods of indigenous Australians and go on to develop a modern camouflage technique that was used in war time.²¹

2.2 General principles



Within the professional literature of cryptography and computer security, the convention for explaining basic principles is to refer to 'Alice' and 'Bob' as placeholder names for the sender and receiver of a message respectively. In this fictional world with a cast of around thirty characters,

'Eve' stands for a passive eavesdropper, 'Mallory' stands for a malicious attacker and 'Trudy' stands for an intruder.²² In the computer security world, these characters are often placed in the setting of a prison to clarify certain concepts of steganography. Effective as these science and engineering

traditions may be, I will use an alternative scenario to introduce some terminology and concepts that will be relevant in the following sections and chapters. I recontextualise the terminology not only to break away from this traditional model but also to inspire you to come up with your own ways of understanding the terms.

The following speculative scenario was conceptualised by myself together with members of Q-Space, a queer and feminist community centre based in Beijing:

Q-Space has organised a life-drawing session and wishes to exhibit the works, which depict realistic images of queer sex positions. The action is fuelled by the desire to promote alternative images of love and sexuality in a non-male-dominated, non-pornographic, intimate experience. Q-Space would like this exhibition to take place at their local bar, a space that is familiar but also open to the general public. However, faced with censorship and surveillance within an authoritarian political climate, the exhibition needs a degree of invisibility to protect members of the Q-Space community from potential persecution and arrest.

We came up with the idea of drawing or printing the life-drawing sketches onto existing printed materials such as posters and flyers, with invisible ink to be activated by UV light. Visitors of the bar need to be 'in the know' in order to reveal the hidden but public images. In our scenario, there is a password that visitors need to say to the bartender. Once the password is verified, the visitor is given a UV torch to activate the drawings, and a floor plan mapping out the location of each drawing within the premises of the bar.

As the *Investigator's Guide to Steganography* was one of the first books that introduced me to this subject in a clear and simple manner, I will use the terminology to describe the scenario we developed:

- The *cover object* is the item that can be publicly seen, and that carries the secret message in plain view. In this case, the cover objects were the posters and flyers at the local bar.
- The *secret message* is the content embedded within the cover object. In this case, the drawings that were made using invisible ink activated by UV light.
- The *stego-key* is the piece of information that will be used by visitors to extract the secret message. Stego-keys come in many forms, such as a password or an agreed-upon place to look for the hidden message. In this particular case, the password, UV torch and floor plan together constitute the stego-key.
- The *stego-object* is the combination of cover object, secret message and stego-key: in this case, the posters and flyers, the invisible ink drawings, and the password, UV torch and floor plan constitute the stego-object.²³

2.3 Types of Steganography

As I discovered during my research of the professional literature, steganographic methods are traditionally categorised as either *technical* or *linguistic*.²⁴ This differentiation presumably originated in the world of secret services, as a result of the work practices of these agencies. In these categorisations, technical steganography refers to a tool, device or method used to conceal the message, such as invisible inks, microdots and concealment objects. Linguistic steganography refers to the use of natural language in order to conceal the existence of the hidden message in such a way that the very act of secret communication is undetectable to outside observers. Linguistic steganography can be further categorised as semagrams or open codes.²⁵ Open codes include grille ciphers, null ciphers, and jargon code (see diagram on page 42). There are also some examples of hybrid approaches, combining a few or more of these techniques together with cryptography.

From a media theory perspective, however, the computer security categorisations fall short, since language can also be considered a technical method. Another way of considering the difference between the original definitions of technical and linguis-

tic is to consider the difference between the *material* level and the *code* level.

Technical steganography involves embedding secret information into some material or physical structure, such as invisible ink on writing paper, microdots on photographic paper and hidden messages in concealment objects. If one were to photocopy a piece of paper with a message written in invisible ink, for instance, the message would not be transferred to the photocopy.

Linguistic steganography, in contrast, integrates the message into the content of the letter; it is coded. If one were to photocopy a letter written using linguistic steganography, the message would be transferred.

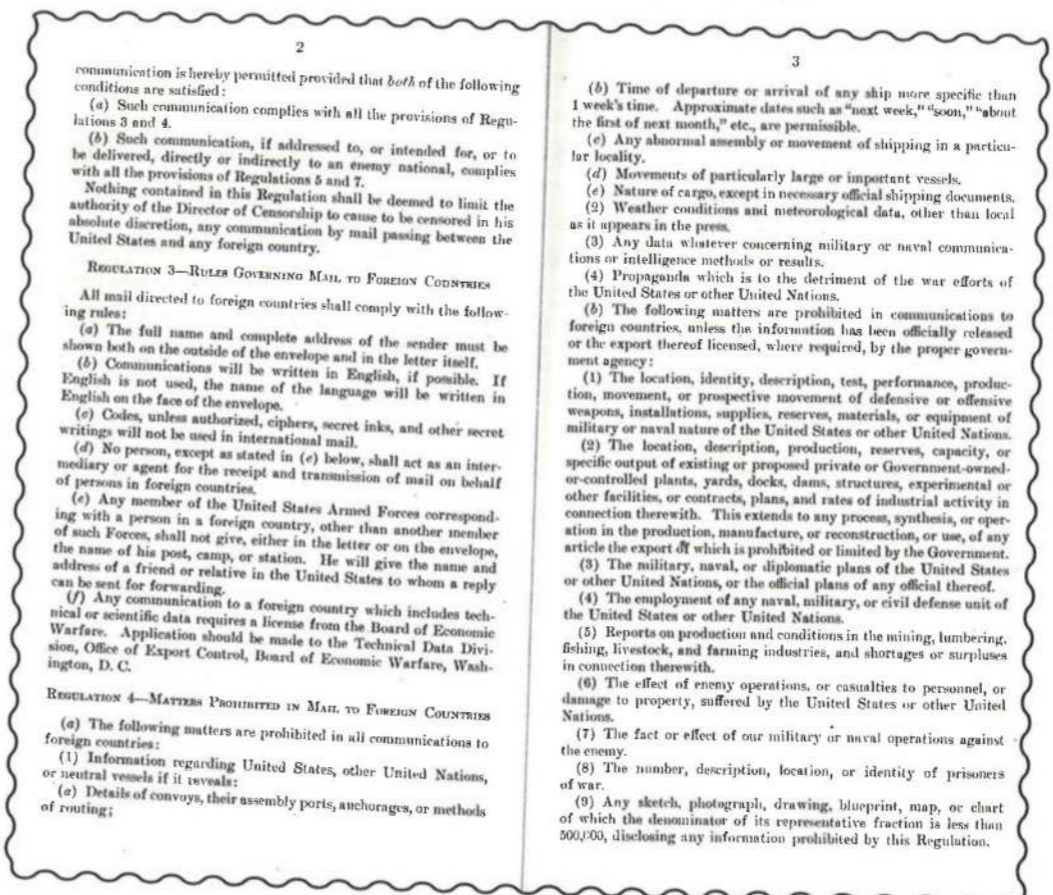
With this information in mind, I would like to propose a provisional framework of *transferability* versus *non-transferability*, which I believe is a terminologically clearer differentiation. In this Cookbook I have used the terms 'non-transferable steganography' to replace the concept of technical steganography, and 'transferable steganography' to replace the concept of linguistic steganography.

The American philosopher Nelson Goodman's distinction between *autographic* and *allographic* art may also be of use here.²⁶ Goodman classified painting

and sculpture as autographic, where each artwork is a unique object made by the artist's own hands. In contrast, sheet music is allographic because the artist only provides instructions for others to perform or create, for example the American artist Sol LeWitt's instruction-based artworks. So an autographic work is structurally non-transferable, while an allographic work is always transferable.

These are not fixed categories. Goodman uses the example of jazz musicians reading sheet music. They are functioning autographically, since they improvise and significantly personalise the sheet score, but they are departing from an allographic work.

Future technologies will certainly shift these definitions, changing how they are understood, and how artworks and other objects or performative gestures are produced. Within a new technological landscape, we might imagine a scenario in which scanners can provide sufficient resolution to copy and transfer a message hidden within a microdot, or the 3D scanners and printers of the future can reproduce a message written in invisible ink on paper, so that what is now considered non-transferable may be rendered transferable.



Pages from US Postal Regulations 1942. Signed by Byron Price, the director of US Office of Censorship during World War II, approved by President Franklin D. Roosevelt. Image source: Internet Archive

TAXONOMY OF STEGANOGRAPHY

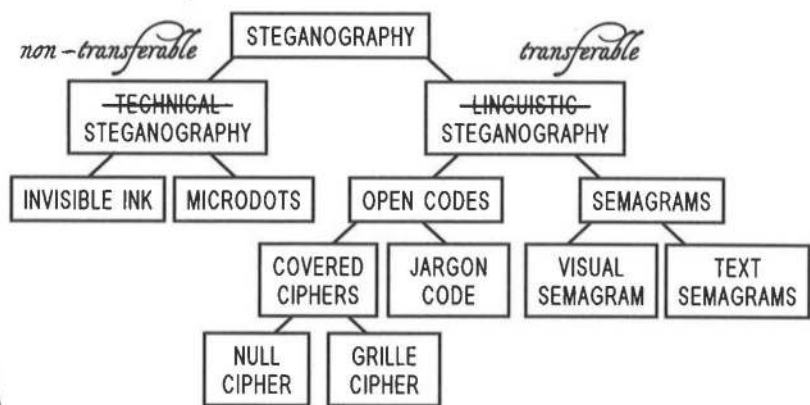
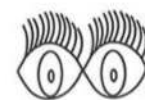


Image shows the usual taxonomy of steganography (Arnold et al. 2003; Bauer 2002). Amendments show my own categorisation of steganography



non-transferable

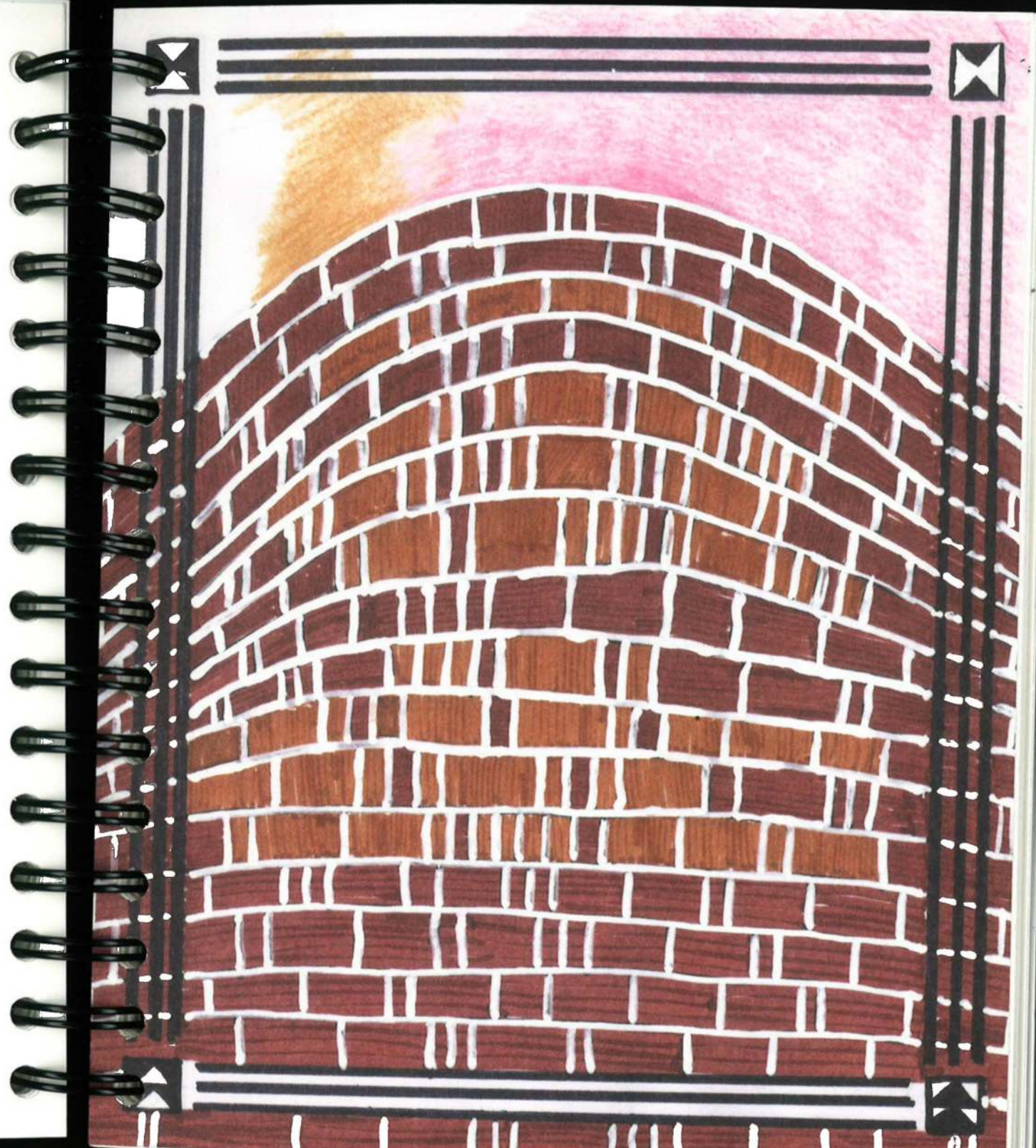
- ↳ *Invisible inks* are inks that can be made visible through various chemical, optical, thermal or mechanical processes. They can be produced using a wide variety of ingredients, ranging from the readily available and low-tech to the more chemically advanced and high-tech formulas.
- ↳ The *microdot* is a type of microphotography that is reduced in size to prevent an unintended recipient from reading its contents. It requires specialised equipment such as microphotography cameras and darkroom equipment.
- ↳ A *dead drop* is a concealment device or hiding place that is used in the process of passing messages between sender and receiver at a secret location without the requirement that sender and receiver are together at the same place and time.

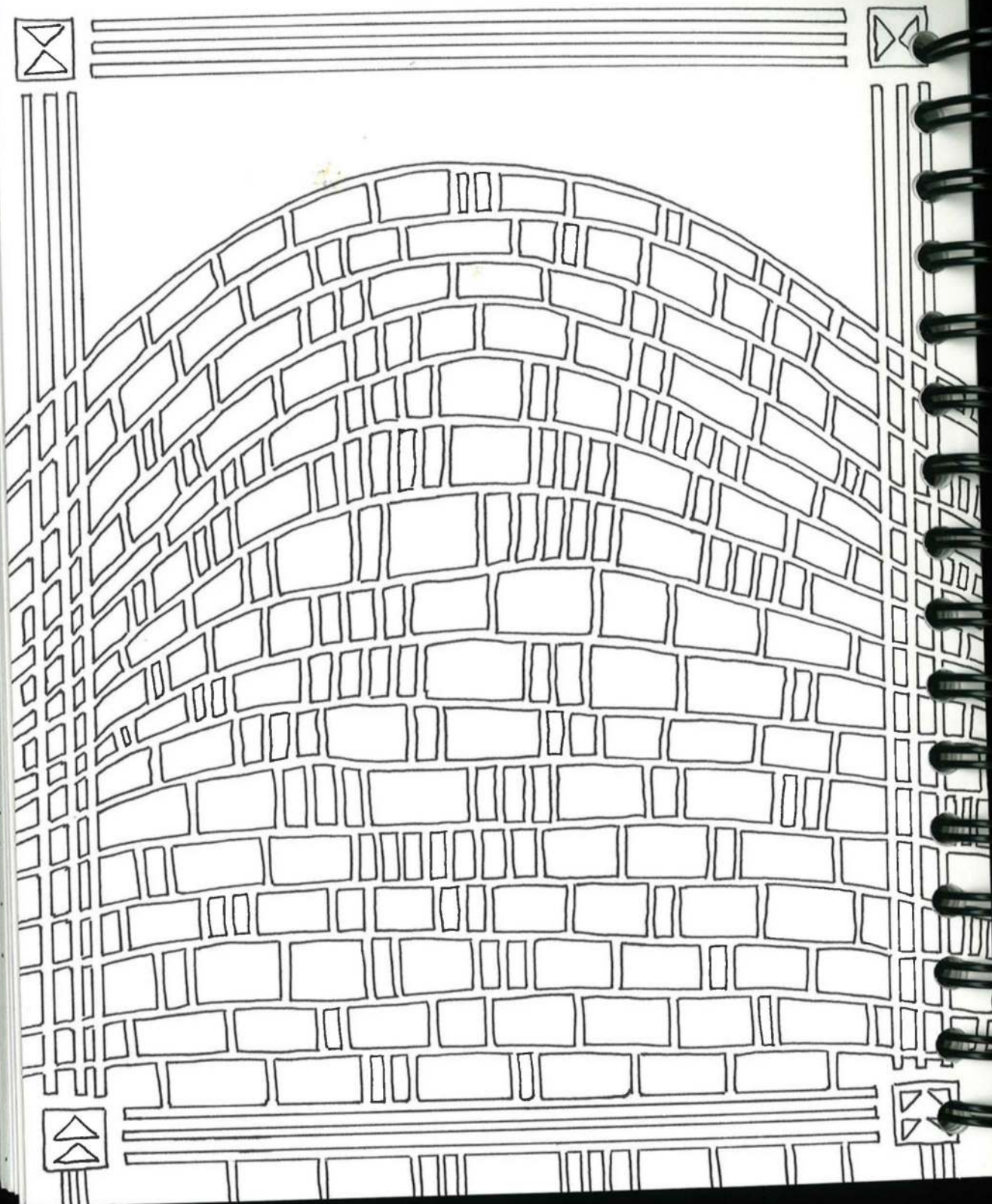


transferable

- ↳ A *semagram* is a sign or symbol containing hidden information. A visual semagram hides a message by using innocent-looking and quotidian objects such as a map, painting or blanket as a cover. A text semagram encodes the secret message into the carrier text by way of subtle adjustments in font size, type, extra spaces or typographic flourishes in the handwritten or typed out correspondence.
- ↳ A *jargon code* is language that is used and understood by a community of people but is meaningless and nonsensical to others. Slang is such an example.
- ↳ A *phonetic code* employs homonyms which are letters, syllables or words that sound the same but have another meaning, to mask one meaning for another. For example, the word 'bank' can mean the land alongside a river or a place to deposit money.
- ↳ A *grille cipher* is a 400-year-old method of writing secret messages using a grid made of paper, card or metal with holes cut in it. When the grille is placed over a larger message, the holes line up with specific letters in the message, revealing the embedded message.
- ↳ A *null cipher* is an unencrypted message embedded in such a way that the actual message is camouflaged within a larger, innocuous message. One uses a pre-arranged set of rules, such as 'read every fifth word' or 'look at the third character in every word' to decode it. A null cipher can also include riddles, acrostics (acronyms) and lipograms (leaving out certain letters).
- ↳ A *camouflaged code* is when a cipher such as Morse code is disguised using methods such as knitting, cross-stitching or eye blinking.

1. John Keats, 'Letters of John Keats to His Family and Friends', *Project Gutenberg*, ed. Sidney Colvin, accessed 10 April 2018, <http://www.gutenberg.org/files/35698/35698-h/35698-h.htm>.
2. Friedrich Ludwig Bauer, *Decrypted Secrets: Methods and Maxims of Cryptology* (Berlin: Springer, 2002) p. 24.
3. Kristie Macrakis, *Prisoners, Lovers, and Spies: The Story of Invisible Ink from Herodotus to Al-Qaeda* (New Haven: Yale University Press, 2014) p. 4.
4. *Ibid.*, p. 48.
5. *Ibid.*, p. 48.
6. Sebastiaan Faber, 'Is Dutch Bad Boy Thierry Baudet the New Face of the European Alt Right', *The Nation*, accessed 29 March 2019, <https://www.thenation.com/article/is-dutch-bad-boy-thierry-baudet-the-new-face-of-the-european-alt-right/>.
7. Cheryl Greenberg, 'Donald Trump's conspiracy theories sound anti-Semitic. Does he even realize it?', *The Washington Post*, accessed 29 March 2019, https://www.washingtonpost.com/posteverything/wp/2016/10/26/donald-trumps-conspiracy-theories-sound-anti-semitic-does-he-even-realize-it/?utm_term=.9839ee3322c2.
8. Macrakis, *Prisoners, Lovers, and Spies*, p. 23.
9. Macrakis, *Prisoners, Lovers, and Spies*, p. 14.
10. Macrakis, *Prisoners, Lovers, and Spies*, p. 15.
11. Simon Singh, *The Code Book: The Secret History of Codes and Code-Breaking* (London: Fourth Estate, 2002), p. 13.
12. The Kana Sutra of Vatsyayana (Translated From The Sanscrit In Seven Parts With Preface, Introduction and Concluding Remarks), *Project Gutenberg*, accessed March 2019, <http://www.gutenberg.org/files/27827/27827-h/27827-h.htm>.
13. Macrakis, *Prisoners, Lovers, and Spies*, p. 199.
14. 'Return to Sender, U.S. Censorship of Enemy Alien Mail in World War II', *National Archives*, accessed September 2018, <https://www.archives.gov/publications/prologue/2001/spring/mail-censorship-in-world-war-two-1.html>.
15. Michael S Sweeney, *Secrets of Victory: The Office of Censorship and the American Press and Radio in World War II*, (University of North Carolina Press, 2001), p. 104.
16. *Ibid.*, p. 101.
17. *Ibid.*, p. 105.
18. Ann Elia, *Camouflage Australia: Art, Nature, Science and War* (Sydney University Press, 2011) p. xv; 'The Forgotten History of How Modern Art Helped Win World War II', *Gizmodo*, accessed 19 November, 2017, <https://gizmodo.com/the-forgotten-history-of-how-modern-art-helped-win-worl-1002161699>.
19. Ann Elia, *Camouflage Australia: Art, Nature, Science and War*, p. 97.
20. *Ibid.*, p. 15.
21. *Ibid.*
22. 'Alice and Bob,' *Wikipedia*, accessed 24 March, 2018, https://en.wikipedia.org/wiki/Alice_and_Bob.
23. Gregory Kipper, *Investigator's Guide to Steganography* (Boca Raton: Auerbach Publications, 2004) p.7.
24. Gary Kessler, 'An Overview of Steganography for the Computer Forensics Examiner', accessed 24 January 2019, https://archives.fbi.gov/archives/about-us/lab/forensic-science-communications/fsc/july2004/research/2004_03_research01.htm and https://www.garykessler.net/library/fsc_stego.html.
25. *Ibid.*
26. 'Goodman's Aesthetics', *Stanford Encyclopedia of Philosophy*, September 2018, <https://plato.stanford.edu/entries/goodman-aesthetics>.





Non-transferable steganography is dependent on material manipulation that will be lost if one technically reproduces it. As explained in the previous chapter, non-transferable steganography relates to technical steganography. Having said that, there are always loopholes. Allow me to share this anecdote. On entering a certain nightclub in Beijing in 2017, a mysterious stamp, undetectable to my eye, was pressed on the inside of my wrist, presumably indicating I was authorised to enter the premises. But

what had been invisible to the eye outside the club fluorescently glowed upon stepping into the club, which was lavishly decked out in UV lights.

Although there was no need at the time, hypothetically speaking, I could have quickly pressed the not-yet-dry stamp directly on the wrist of my friends helping them in without paying the entrance fee. This potential hack shows that the categorisation of non-transferable is not a fixed and immutable principle.

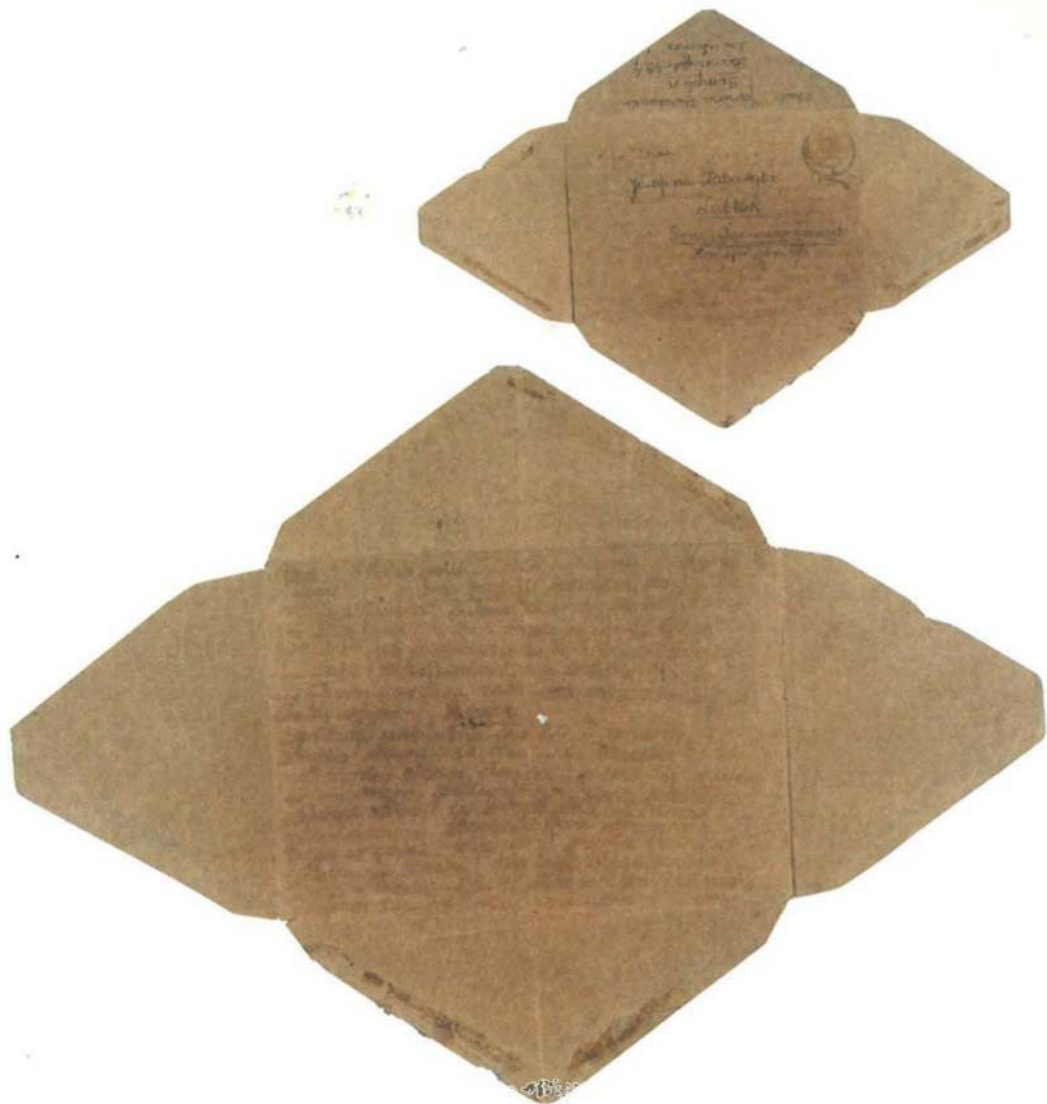
3.1 Invisible ink

Like UV-sensitive ink, invisible ink is a type of ink that cannot be seen until a certain activation treatment causes the ink to become visible. The use of invisible inks can be traced back to the third century BC, when Philo of Byzantium first described a sophisticated method of invisible writing with crushed nutgalls or gallnuts – abnormal swellings of plant tissues formed on trees containing tannin, which is a substance found in red wine, tea and unripened fruit.¹ Writing with this substance remains unseen until it comes into contact with a second ingredient containing iron sulphate that renders the writing black. This recipe played an important role for the British and American military during the American Revolution in the late eighteenth century.

Before radio waves, electrical currents and the locomotion, the body was the primary medium that moved through geographical space to carry messages. In these times, when the delivery of a message was inseparable from the human body, the body became the site upon which hidden messages were also embedded. Such is the example detailed later in this chapter of a fourteenth-century recipe written by an Egyptian scribe that instructs the reader to use a lemon-based mixture that curiously worked to invigorate hair growth where the

message had been written. Although not an invisible ink, it is nonetheless an ingenious recipe for invisible writing. It calls to mind the better known story of Histiaios, the sixth-century-BC Greek ruler. Legend goes that he tattooed the word ‘revolt’ on the shaved head of his slave messenger and waited for his hair to grow back before sending him to the recipient.² Later, in the year 2 AD, the Roman poet Ovid recommended that lovers write their clandestine messages on the skin of the messenger with fresh milk to evade the watchful eye of their parents. A few decades later in the year 77 AD, Pliny the Elder reported how illicit lovers corresponded with the milk of the tithymalus plant or goat’s lettuce juice, on the body, which could then be seen only after dusting the skin with ash.³ It is beautiful to see how the desire for connection can move lovers to create innovative ways to communicate in times when forbidden love is fraught with danger.

However, it wasn’t until the twentieth century that invisible ink developed through more complex and elaborate chemical processes.⁴ Espionage operations during World War I, World War II and the Cold War provoked a sort of ‘arms race’ of invisible inks. During this century, secret communication was the most important



Envelope of Auschwitz prisoner Janina Iwańska who sent a letter to her father Bolesław Iwański with a secret message written in urine inside of the envelope. Here is the translation of the hidden message written on 6 May 1943: 'Bola! 5 female Polish political inmates have escaped. We are preparing a new escape. Send in a parcel: a compass, an accurate map of Germany, two false identification documents with photographs that are not especially characteristic. As much Reichsmarks as possible and some jewelry (gold!). Send to: Krzysio Starszy in the Generalguvernementet, possibly through the organization. Comfortable shoes, 2 sponges. The mission is issued until June 20th, please hurry. Krysia knows nothing yet. Address the parcel to me. The map, identification documents and money, you should send in a strong, double-bottomed box. You have to do it very skillfully, carefully and invisible ... underneath a jar of jam, a secret message tucked in a tube of toothpaste. At the bottom a rusks box. Sender: Agnieszka Kopertowska, Krakowskie Przedmieście 26.4. Destroy the letter, in case anything happens, you know nothing. M.' Image and translation source: The Polish Research Institute collection, Lund University Library

and yet most vulnerable part of the work, where often the materiality of the medium itself was the secret as well.

Postal censorship during World War I became a major part of Britain's counter-espionage activity. Being caught with invisible ink and other secret writing materials such as ballpoint pens or unglossed paper could land you in jail – or worse, as in the case of the 'Lemon Juice Spies', described on page 54.⁵ This is why, during World War I, British intelligence experimented with bodily fluids like blood, saliva, urine and semen – all readily available substances which can be used on human skin, paper and cloth.⁶ The use of bodily fluids had the advantage that one could not be incriminated for having it in possession. Simple organic inks were frequently used by prisoners of war for writing about the conditions of their captivity. Although not as secure as chemically activated invisible inks, they were often used because they were readily available.

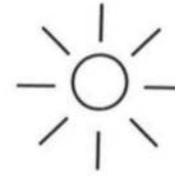
Much like the NSA today, the British system of censorship during World War I was (by the standards of its age) all-pervasive. Its imperial tentacles stretched out from England and Europe to the British colonies in the Caribbean and Bermuda, in the Horn of Africa, in Australia and the Middle East. Although black chambers – state-run communication centres such as post offices set up to conduct secret interception and surveillance of correspondence – had existed in Europe since the 1600s, the British postal censorship during World War I was an extensive system of global mail and cable interception. By looking for secret messages in suspicious mail and intercepting or destroying these messages, it served as an

instrument of surveillance for purposes of counterespionage. Imperial Censorship, as the British censorship bureau came to be known, expanded and set up code-breaking and secret-ink research laboratories to assist censors in examining suspect letters.⁷

During World War I, massive teams of women in Bermuda would sift through letters sent from the United States to Great Britain, searching for secret messages. In *Prisoners, Lovers, and Spies*, Macrakis details how women were hired not only because so many men had been drafted into the army and female labour was cheaper, but also because women were believed to possess a special 'sixth sense for detecting suspicious letters'.⁸ Today, this manual work performed by women has been replaced by algorithms scanning customer emails.

Invisible inks can be made with an array of different substances. As well as body fluids, one can also use fruit and vegetable juices, chemicals that are acidic and basic, as well as various soap solutions, glues and adhesives. Household ingredients that can be used as invisible ink include vinegar, citrus fruit juices, baking soda, salt, sugar, rice, water, aspirin, gum Arabic, boric acid, starch, ammonia, Epsom salts, silver nitrate and many others.⁹

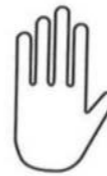
Invisible inks can be classified according to the substance used, the methods required to activate it, and even whether the sender is a prisoner or a free person.¹⁰ I found the PrintWiki entry on 'Sympathetic Ink' to be particularly useful when choosing how to categorise invisible inks, and so follow their classification system based on particular activation methods.



→ An *optical* method pertains directly to how we see the message. For instance, it uses infrared or UV lighting. Optical activation can occur when a message is seen at a specific angle, or viewed using special materials.



→ A *thermal* method relies on heat to expose the substrate. One can use an open flame, hot iron or heat gun to activate the ink.



→ A *mechanical* method refers to the use of a physical substance to activate it. For example, dusting the encoded surface with a fine powder such as graphite or ash, and moistening the surface with water or a dye solution.



→ A *chemical* method exposes the invisible ink by employing a chemical process. Some chemicals include pH-sensitive red cabbage juice, iodine or ammonia vapour, and other procedures reminiscent of photographic developing.¹¹



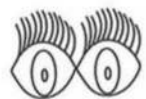
(4) Testers at Work.

Postal Censorship during World War I, April 1919. Image source: National Archives

3.2 Invisible ink recipes and historical uses

Among the ways of making invisible ink visible, the *chemical* method used by Philo of Byzantium has one of the oldest traditions, going as far back as the third century BC. *Thermal* and *mechanical* methods were described by Giambattista della Porta in *Natural Magick* in 1558. The *optical* method, however, is a relatively recent invention from World War I. This method involves the use of a quartz lamp or a UV lamp to make UV-sensitive invisible ink visible. Prisoners' inks such as milk, lemon juice and bodily liquids become fluorescent when exposed to UV light and become invisible again when the light is switched off.

Note: in section 3.3 on page 73, I detail various invisible ink application methods, what surfaces to write onto, and I go into the pros and cons of each method and surface outlined in the book. In contrast to a conventional cookbook, I include a separate section because the materiality of paper - its density, thickness, opacity, gloss etc. - varies immensely, meaning that I cannot tell you decisively what method to use for which material. Invisible inks are only effectively invisible if the paper can absorb the liquid without wrinkling, because if there are signs of water damage, then your game is up, so to speak. Therefore, it is crucial that invisible inks are adjusted according to the kind of paper you are using. I encourage you to flick backwards and forwards in the book, and to experiment to find what tools and methods work best for you in achieving different levels of invisibility.



Tonic water

During World War II, Nickolay Hansen, a Norwegian coal miner who spied for the Abwehr, the German military intelligence, hid a small bag of quinine that worked as secret ink inside one of his teeth.¹⁹ British dentists found the parcel when removing a filling and passed it to the coordinating officer at MI5, the British security service who also led the secret-ink department.

Method:

Use pre-made tonic water, which contains a substance called quinine that is UV-sensitive.

Developing method:

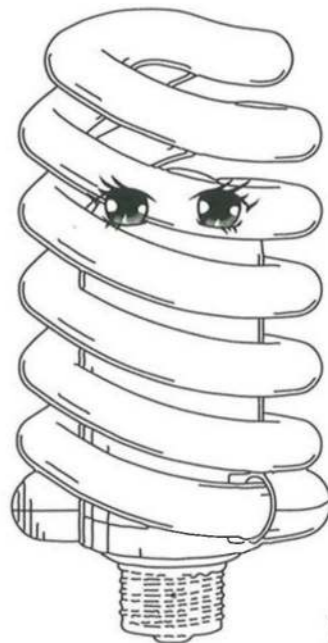
Optical: Place under UV light.

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OPTICALLY ACTIVATED LAUNDRY POWDER + UV

INVISIBLE INK # 4



THE
POETICS
OF

A RESEARCH PROJECT ON ANALOG
STEGANOGRAPHY AND ALTERNATIVE
FORMS OF COMMUNICATION IN THE AGE
OF PERVASIVE DIGITAL SURVEILLANCE.
INVISIBILITY

METHOD:

Use commercially-packaged laundry powder containing bleach, which is UV-sensitive. Mix the laundry powder with a little warm water, until it is dissolved to a thickish paste. But be sure to experiment with different viscosities in relation to the type of paper you use. Apply the ink onto unglazed and unbleached paper such as these pages with a paintbrush or cotton swab. Be careful to avoid using very white paper such as office paper, as it already contains bleach and will cancel out your laundry powder ink.

DEVELOPING METHOD:

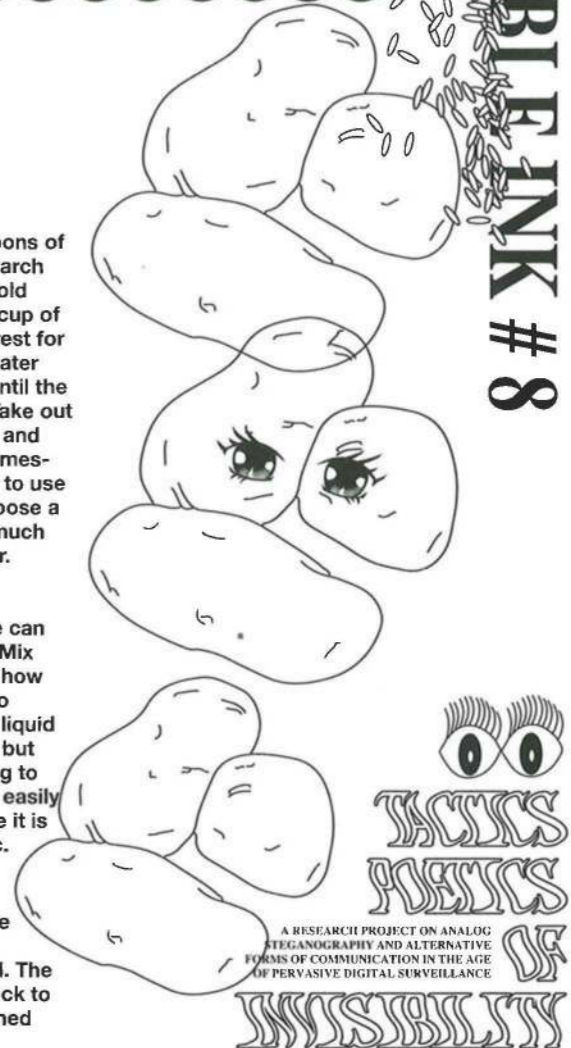
Optical: Place under UV light.

MORE WAYS TO APPLY INK:

- Empty marker
- Silkscreen
- Stencil

CHEMICALLY ACTIVATED STARCH + IODINE

INVISIBLE INK # 8



METHOD:

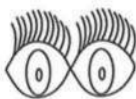
For starch ink, mix two tablespoons of potato-, corn-, wheat- or rice-starch powder in two tablespoons of cold water and stir well. Bring half a cup of water to the boil and then let it rest for a minute. Pour the starch and water mix into the hot water and stir until the liquid turns opaque and pasty. Take out your preferred brush, or a stick, and substrate and write your secret message. Allow to dry. If you decide to use paper for this ink, be sure to choose a paper that doesn't contain too much starch, for example brown paper.

DEVELOPING METHOD:

Chemical: For this recipe, iodine can be used to reveal the message. Mix iodine with water depending on how dark you want the invisible ink to appear. Generally speaking, the liquid should have a dark amber tone, but you can adjust the mix according to your preferences. Iodine can be easily bought at most drugstores since it is commonly used as an antiseptic.

HOW IT WORKS:

When starch is mixed with iodine in water, an intensely coloured starch/iodine complex is formed. The colours can range from blue-black to green when the starch is combined with the iodine.



Starch developed by iodine solution

Today, counterfeit banknote detection pens use iodine to determine the authenticity of banknotes. If you use this pen on regular paper, which will most likely contain starch, the ink will turn dark brown. However, genuine banknotes are typically printed on paper based on cotton fibres and will only display a light mark.

INVISIBLE INK # 9

CHEMICALLY ACTIVATED IRON + TANNIN



The following instructions are adapted from Kristie Macrakis' book *Prisoners, Lovers, and Spies*. But please note that I haven't tested this recipe myself.

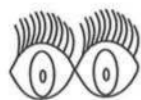
METHOD:
Iron sulphate ink: You can buy the pure crystals online or in gardening stores, or you can buy iron sulphate tablets in health food stores in the US. For the iron sulphate tablets, please rub off the coating on the surface with a damp paper towel first, making sure to wear gloves. Dissolve three or four cleaned tablets in a shot glass of water that is two-thirds full. Let it rest for twenty minutes so that the insoluble material sinks to the bottom of the glass. The top layer containing the iron sulphate can be used as the invisible ink.

DEVELOPING METHOD:
Tannin-based reagent: Simply use red wine directly from the bottle, or make a strong cup of tea with two black tea-bags to activate the iron sulphate ink. When in contact, the ink should turn black in colour.



A RESEARCH PROJECT ON ANALOG STEGANOGRAPHY AND ALTERNATIVE FORMS OF COMMUNICATION IN THE AGE OF PERVERSIVE DIGITAL SURVEILLANCE

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Iron sulphate developed by tannin-based inks

The first instance of this ink was described by Philo of Byzantium (ca. 280 BC–ca. 220 BC), a Greek engineer who provided military advice on delivering a message into a besieged town:

*One writes this letter on a new hat or on human skin with crushed gallnuts dissolved in water. When the writing is dry it will become invisible. Then soak a sponge with vitriol [iron sulfate], and rub it over the invisible writing and it appears.*²⁵

Two millennia later this invisible ink recipe of tannic acid and iron sulphate was used again by the American politician James Jay to write letters to his brother John Jay, a founding father of the United States, during the American Revolution (1773–83).


















For centuries in the West and Middle East, black ink was made with iron sulphate combined with tannic acid squeezed out from abnormal outgrowths of trees called 'galls', 'gallnuts', 'nutgalls', or 'oak apples'. Although high concentrations of tannins exist in gallnuts, there are other common ingredients that also contain them, like black tea and red wine. Magically this ink is also reversible, which means that you can also write with tannin-based liquids and activate them with iron sulphate.²⁶

◆◆♣● ◆✠◆⚡□◆◆ Ωℳ✠■γ♭ ◆ℳℳ■□

Ωℳ✠■γ♭ ◆ℳℳ■□

↑

OVERVIEW OF INKS

	Chemical	Thermal	Mechanical	Optical
Cow's milk				
Vegetable juices				
Alum				
Body fluid				
Tonic water				
Waterproof spray				
Starch - iodine				
Acid/alkaline - red cabbage juice				
Iron sulfate - gallnut				
Lead nitrate - Sodim iodine				
Lemon juice - Iodine				
Laundry detergent and soap				
Vitamin B-12				

3.3 Applications of invisible ink

L 4 J

40. A German Formula. Take one ounce of alum and one ounce of white garlic juice. Write with a quill and upon heating the paper the letters become very legible and can not be removed by salt water application.

41. A late formula is to use alternately two chemicals in code work. A figure is written in cobalt chloride solution and the next figure is written with platinum-cyanide solution. Moisture will bring out the second and heat will bring out the first.

42. Disappearing ink. Take a weak solution of starch, tinged with a little tincture of iodine. This bluish writing will soon fade away.

43. Writing done with a solution of ammoniacal solution of silver nitrate will be made legible by exposing the writing to the sunlight.

44. How to make microscopic writing on a 2-cent red U. S. postage stamp. Take a crow quill pen, write with orange colored drawing ink very thin finely shaded letters across the face of the stamp. To read the writing on this stamp, interpose a ruby glass on the stamp, which will make the stamp invisible and the writing legible.

45. Examine fruit leaves, palm-trees, etc., for writings cut with knife or other sharp points.

46. Messages are painted on the human body with invisible ink. To make them appear, develop a suitable reagent sprayed with an atomizer. To destroy messages, the body should be scrubbed, and then wash with lime or lemon juice, to eradicate all tracings or markings.

47. Letters, circulars and leaflets can be photographed without the camera by contact on a photographic sheet of paper, exposed and subsequently developed and fixed, and made to disappear with bi-chloride of mercury solution and made to reappear by dipping paper in hypo solution. Of course, the original writing or printing must be on one side of the paper only.

48. Suspect freshly-painted metal walls on ships, etc. Often, freshly-painted surfaces cover communications scratched on the underlying metal surfaces, which communications are made legible by the removal of the thick paint, by the use of turpentine, etc.

49. Type-writers sheets, printed music, printed newspapers and pamphlets, should be carefully scrutinized for invisible writing. Examine suspected paper in sunlight; if any traces or suspected markings are noticeable, resort to the heat test, or get an expert's aid.

50. There are a number of other methods used by spies and smugglers, according to the skill and education of the criminals, such as placing writings under postage stamps, wrapping messages in medicine capsules, and engraving messages and credentials on toe-nails, which latter are made visible with powdered charcoal.

The rule is to suspect and examine every possible thing. The war between the spy or forger and the expert is continually bringing out new methods.

Printed by the San Francisco Division for the information of Post Office Inspectors. 1918.

**INVISIBLE PHOTOGRAPHY AND WRITING,
SYMPATHETIC INK, ETC.**

CONFIDENTIAL NOT FOR PUBLICATION.

Information Compiled by THEODORE KYTKA, Handwriting Expert, San Francisco, Cal.

Invisible Photographs of writings and printing.—Make a silver print, fixed and bleached in mercury chloride. To make visible, dip in hypo.

1. Sympathetic Ink—Chloride of Cobalt—bring out with heat.
2. Cobalt acetate and saltpeter—(heat).
3. Cobalt Chloride and nickel chloride mixed—(heat).
4. Nitric Acid—(heat).
5. Sulphuric Acid—(heat).
6. Sodium Chloride—(heat).
7. Saltpeter—(heat).
8. Copper Sulphate and ammonium chloride—(heat).
9. Silver Nitrate—(expose to sunlight).
10. Gold (trichloride)—(sunlight).
11. Ferric sulphate—(bring out with infusion of gall-nuts or ferrocyanide of potassium).
12. Copper sulphate—(bring out with ferrocyanide of potassium).
13. Lead vinegar—(bring out with hydrogen sulphide).
14. Mercuric Nitrate—(bring out with hydrogen sulphide).
15. Starch water writing—(bring out with tincture of iodine or re-sublimiate of iodine wafers). (fumes)
16. Cobalt sulfate—(bring out with acetic acid).
17. Soda lye or sodium carbonate—(bring out with phenol platinum).
18. Starch writing on linen, after it becomes dry, is made visible by fumes of iodine or by solution of potassium iodide. The writing becomes blue and disappears again by washing paper with a very weak solution of hypo sulphate of soda.
19. Letters written with a weak solution of the soluble chloride of platinum or iridium develop black when fumed with mercurial vapor. This ink is used for marking linen and is called iodolite. This ink is sold in large bottles to laundries, etc. It is often used for smuggling information across the frontier, when the writing is put on handkerchiefs, shirts, underwear, or on paper surfaces.
20. Sulphate of copper, much diluted, used in writing with a soft tooth pick between printed lines. This is developed by fumes of strong ammonia, which makes the invisible writing appear bluish.

EXEMPT from Declass. For E.O. 12055, Sec. 1.059, Pg. 707, 10/1/83

Declassified document Invisible Photography and Writing, Sympathetic Ink, etc. Compiled by Theodore Kytko, handwriting expert. Printed by the San Francisco Division for the information of Post Office Inspectors, 1918. Image source: CIA archives

METHODS

One-time applications

PAINTBRUSH, COTTON SWAB

PROS:

- DIY, can easily be done at home;
- Not limited to any particular place, can easily be done on the move;
- Timeless technique that works in many different environments;
- Can use DIY inks.

CONS:

- Time-consuming for a single application.

REFILLABLE MARKERS & PENS

PROS:

- DIY, can easily be refilled at home;
- Not limited to any particular place, can easily be done on the move;
- Technique that works in many different environments;
- Can use DIY inks.

CONS:

- Time-consuming for a single application;
- Suitable for liquid inks such as lemon or milk but not starch inks as they don't easily pass through the tips of the markers or pens.

Mass reproduction

STENCIL

PROS:

- DIY, can easily be done at home;
- Timeless technique that works in many different environments;
- Perfect for visual images;
- Can use DIY inks that are water-based and non-water based;
- Ideal for waterproof spray.

CONS:

- Low resolution, thus potentially unsuitable for paragraphs of text;
- Can be time-consuming to cut the stencil, depending on the message or image. However, to get around this, you can make a stencil using a laser cutter.

SILKSCREEN

PROS:

- Can use DIY inks that are water-based;
- Fairly accessible;
- Stable technique;
- Better resolution than stencil.

CONS:

- Generally it is harder to change the design (image and text) compared to the method of paintbrush, markers and stencil.

DIY INVISIBLE-INK PRINTER

PROS:

- Use or reuse of a printer that might otherwise be obsolescent;
- Visual images and text can be changed quickly.

CONS:

- Requires specific technical knowledge;
- Every printer is unique so a 'hack' that works on one printer may not work on another.

If you are interested in modifying your old printer, *Make* magazine has published a tutorial on how to do this.²⁷

SURFACES

Rough paper

Rough, untreated and uncoated white paper is best for invisible inks since it absorbs liquids well. Wrinkles should be avoided because these are signs that the paper has been tampered with. Traditionally, after scribbling a message with wet ink, writers would slightly dampen the paper and re-steam it to remove the bumps.

Brown paper

Brown untreated or unbleached paper is ideal for invisible inks that can be optically activated with UV light. Writing on white copy paper is not so effective, because most copy paper is brightened with fluorescent brightening agents - so the glow of UV inks will be drowned out by the glow of the brighteners.

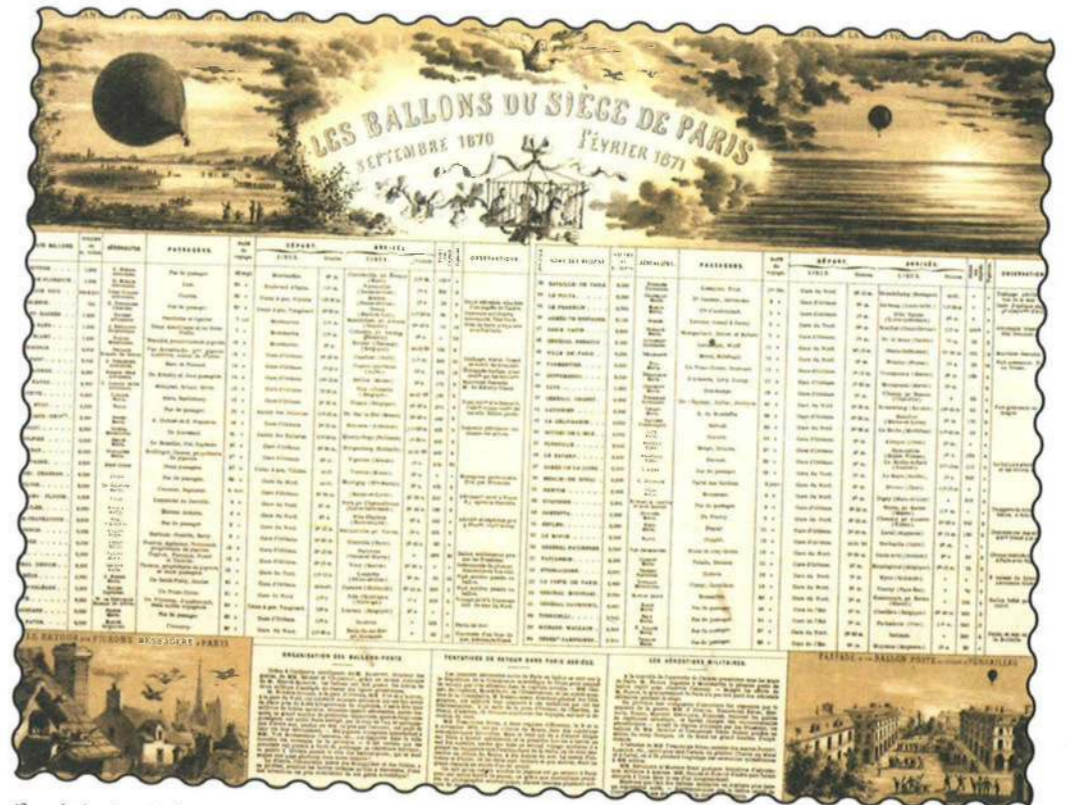
Glossy paper

Glossy paper such as cheap flyer and brochure paper is best for water-proof spray.

Skin, stone, textile

Although I've mainly tested invisible ink on paper and to a lesser extent on skin, it is also possible to use other surfaces. Invisible ink has been found on the handkerchief of the Nazi spy George Dasch, detailing the addresses of his co-conspirers²⁸ and even writing on stone was mentioned by Giambattista della Porta in his book *Natural Magick*.²⁹ During my invisible ink workshops, some of the participants used starch ink on skin activated by iodine. However, the problem with starch ink on skin is that it turns white and flaky once it dries up, rendering the marks quite visible.

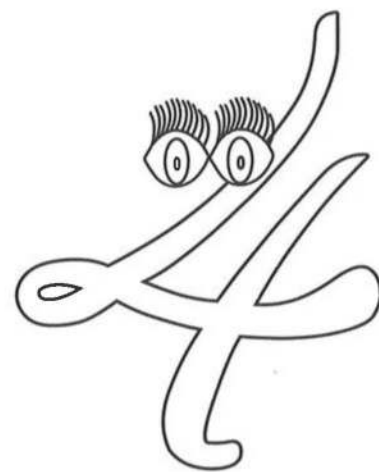
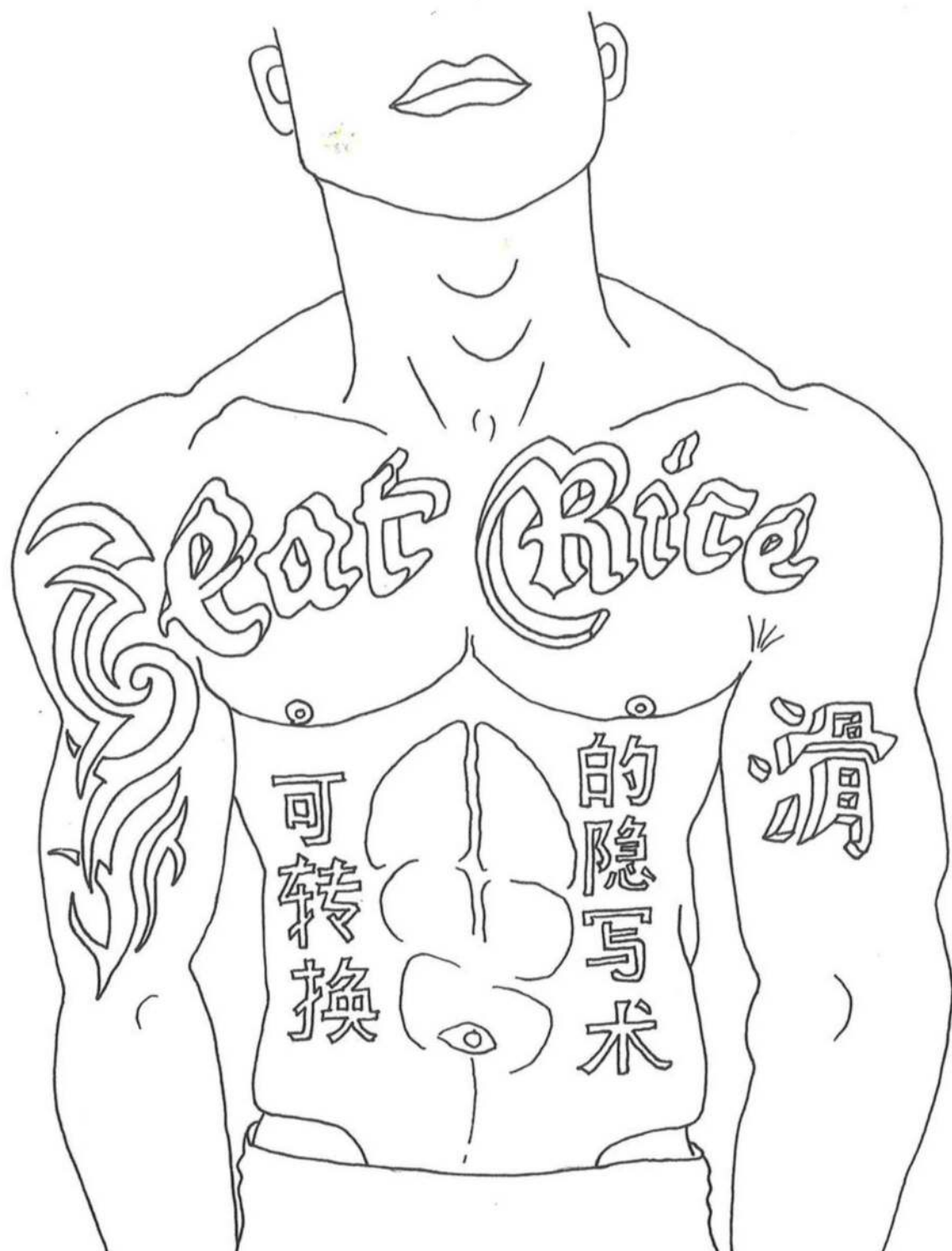
3.4 Other non-transferable techniques



Broadside about balloon events during the Siege of Paris, 1870-1871. Includes a list of balloons that left Paris, with categories for name of balloon and balloonist, date and time of departure and arrival. Image source: Wikimedia Commons

1. Kristie Macrakis, *Prisoners, Lovers, and Spies: The Story of Invisible Ink from Herodotus to Al-Qaeda* (New Haven: Yale University Press, 2014) p. 11-13.
2. Robert B. Strassler, Herodotus, and Rosalind Thomas, *The Landmark Herodotus: The Histories*, trans. Andrea L Purvis, reprint edition (New York: Anchor Books, 2009) p. 381.
3. Kristie Macrakis, *Prisoners, Lovers, and Spies*, p. 3.
4. *Ibid.*, p. xii.
5. *Ibid.*, p. 156.
6. *Ibid.*, p. 152.
7. *Ibid.*, p. 145.
8. Macrakis, *Prisoners, Lovers, and Spies*, p. 127.
9. 'Sympathetic Ink', PrintWiki, accessed 1 March 2015, http://printwiki.org/Sympathetic_Ink;
10. 'Invisible Ink', Wikipedia, accessed 1 March 2015, https://en.wikipedia.org/wiki/Invisible_ink.
11. 'Sympathetic Ink'.
12. *Ibid.*
12. C E Bosworth, 'The Section on Codes and Their Decipherment in Qalqashandi's *Subh Al-A'sha*', *Journal of Semitic Studies*, vol. 8, no. 1 (1963) p. 23.
13. Macrakis, *Prisoners, Lovers, and Spies*, p. 128.
14. 'Secret Message with Lemon Juice', Steve Spangler Science, accessed 6 June 2016, <https://www.stevespanglerscience.com/lab/experiments/secret-lemon-juice-messages/>.
15. Macrakis, *Prisoners, Lovers, and Spies*, p. 2.
16. *Ibid.*, p. 3.
17. *Ibid.*, p. 151.
18. *Ibid.*, p. 152.
19. *Ibid.*, p. 230-31.
20. Rainworks, accessed 20 March 2018, <https://rainworks/>.
21. Giambattista della Porta, 'Of Invisible Writing', *Natural Magick*, 1680, p. 343, archive.org, accessed 1 March 2018, <https://archive.org/details/naturalmagick00port/page/342>.
22. *Ibid.*
23. Macrakis, *Prisoners, Lovers, and Spies*, p. 147.
24. *Ibid.*, p. 148, p. 157.
25. *Ibid.*, p. 12.
26. *Ibid.*, p. 308.
27. For more information see <https://makezine.com/projects/invisible-ink-printer/> and download the PDF: <https://cdn.makezine.com/make/2011/04/InvisibleInkPrinter-Voll16p92.pdf>.
28. Gary Cohen, 'The Keystone Kommandos', *The Atlantic*, February 2002, accessed 16 October 2018, <https://www.theatlantic.com/magazine/archive/2002/02/the-keystone-kommandos/302405/>.
29. Giambattista della Porta, 'Of Invisible Writing', *Natural Magick*, 1680, p. 343, archive.org, accessed 1 March 2018, <https://archive.org/details/naturalmagick00port/page/342>.
30. Macrakis, *Prisoners, Lovers, and Spies*, p. 205.
31. Bruce Sterling, 'Media Paleontology', *Book of Imaginary Media*, ed. Eric Kluitenberg (Rotterdam: NAI Publishers, 2006) p. 67.
32. Wilson Rothman, 'CIA Animal Tech: Bats, Cats and Rats As Covert Operatives', *Gizmodo*, accessed 5 March 2018, <https://gizmodo.com/392735/cia-animal-tech-bats-cats-and-rats-as-covert-operatives>; 'Concealments', *Crypto Museum*, accessed 5 March 2018, <http://www.cryptomuseum.com/covert/deaddrop/>.





Transferable steganography is steganography that can be transferred and applied to other media. As mentioned in Chapter 2, Basics of Steganography, transferable steganography corresponds with the linguistic, and non-transferable corresponds with the technical. In the field of intelligence and secret services, two types of steganography are conventionally differentiated – linguistic and technical. While the differentiation can be confusing, the important difference between linguistic and technical steganography is that the former will survive transfers to another media – such as jargon code written on a letter that is photocopied – while the latter

doesn't, as with invisible ink on a sheet of paper that is photocopied.

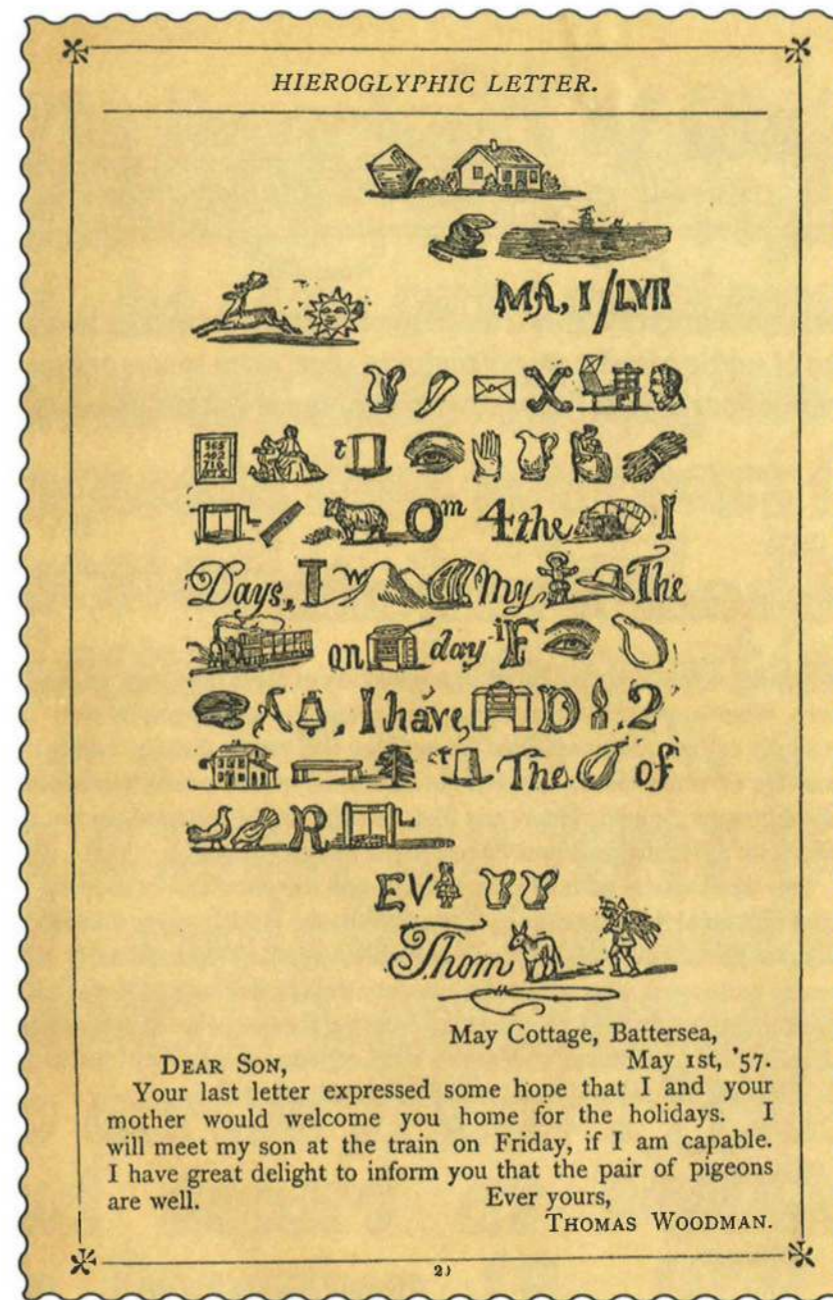
With this in mind, I would now like to break down how transferable steganography works. It can be further categorised as either a semagram or an open code.

A *semagram* is a sign such as a word, a sentence, or an image that has been internally manipulated to hide a message. An example of a visual semagram is the rebus, and another example is a messages in symbols hidden in maps and paintings.

An *open code* is an unencrypted code. Unlike cryptographic code, these are codes that are not encrypted by a mathematical

formula but lay out in the open. For instance, jargon code like slang, riddles, acrostics (acronyms) and lipograms (leaving out certain letters). The keys to decode transferable steganography range from an instruction or a pre-arranged set of rules through to cultural (mis)understanding.

In this chapter, I provide you with a personal and incomplete catalogue organised according to the Taxonomy of Steganography chart in Chapter 2 containing my favourite stories and histories that shed light on specific techniques of transferable steganography. Collected over the years through word-of-mouth cases, articles and books, they represent an hors d'oeuvres platter designed to stir up your investigative appetite. Since transferable steganography is primarily a cognitive process rather than a material step-by-step process like with invisible inks, I hope these stories can stimulate and encourage the formation of your own tactical ideas. Many of the examples illuminate the conditions and struggles of particular communities living under oppressive regimes needing to escape enslavement or prison, or to communicate within contexts where censorship and surveillance are inevitable.



Page from 'Guess me : a curious collection of enigmas, charades, acting charade, double acrostics, conundrums, verbal puzzles, hieroglyphics, anagrams, etc' by Frederick D. Arros Planché, New York, 1879. Image source: Internet Archive

..//./...-//./.-//...//..//.-.-//

4.1 Text semagram

A text semagram encodes a secret message into the carrier text by way of subtle adjustments in font size, type, extra spaces or typographic flourishes in the handwritten or typed-out correspondence.

MARGARET THATCHER

Typesetting is the arrangement and composition of fonts on a page or on screen. When applying textual semagram techniques to typography, you can subtly embed additional data, for instance this can be done by taking advantage of white spaces between the individual letters, words, sentences and paragraphs. Specific letters and their spacing can be adjusted, so that the letters with deviating positions then reveal a hidden message.

This technique is uniquely identifiable, and therefore can be used as a kind of textual 'watermarking'. In the 1980s, the British prime minister Margaret Thatcher used this type of invisible watermarking to identify government employees who were anonymously leaking documents to the press. Thatcher apparently took measures by ordering the use of word processors that encoded the employee's identities within the word spacing of the text, thus allowing the disloyal ministers to be quickly spotted.¹

//.-//./...- //...//.-.-//

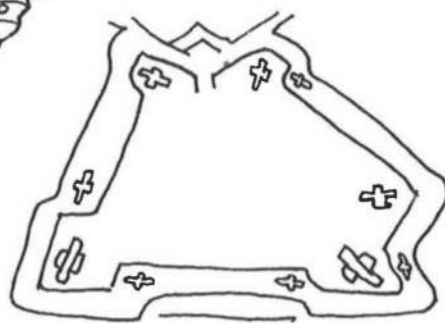
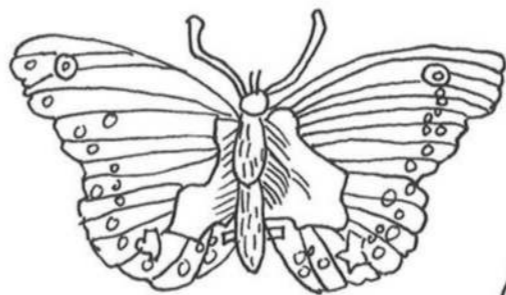
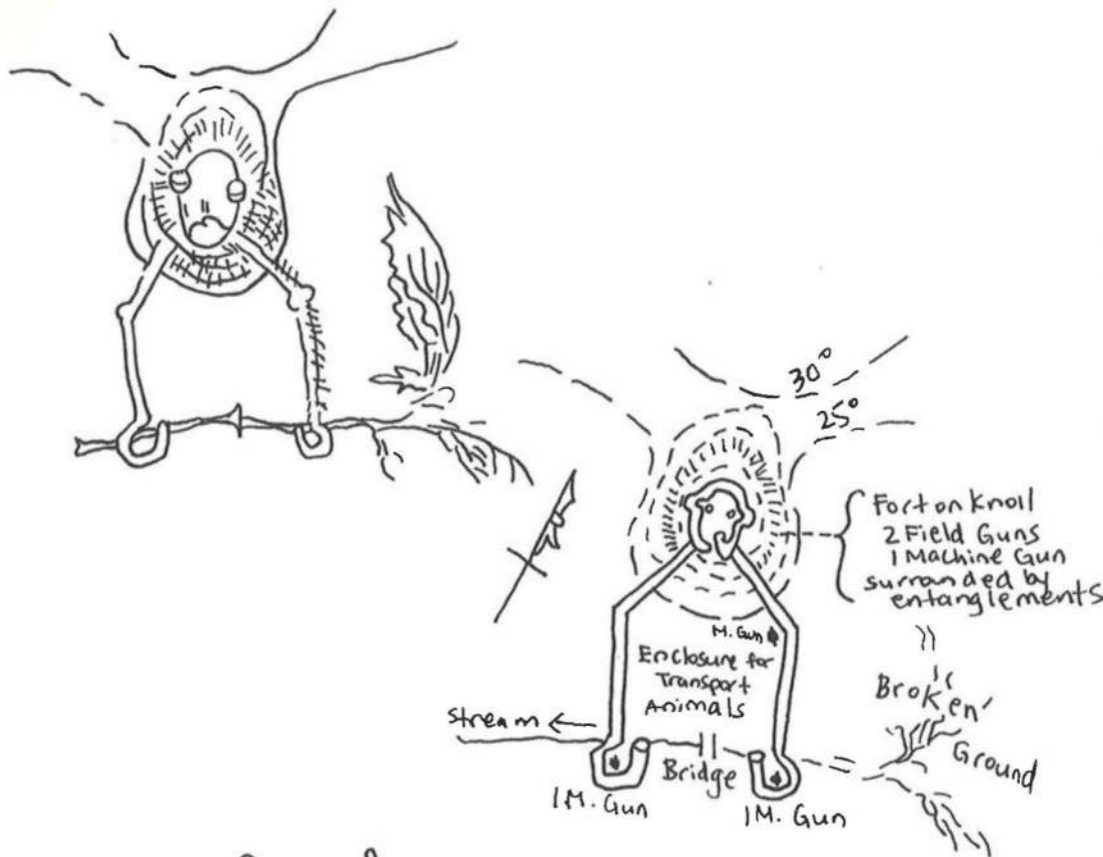
"The Department of State considers this flight to be in our national interest and, therefore, requests that you grant it permission to land. The aircraft transporting Mrs. Thatcher is a royal air force VC-10, registration number ASCOT1173, and is expected to arrive JFK at 1535GMT and depart at 0400GMT on December 19, 1979."

4.2 Visual semagram

A visual semagram is the use of signs or symbols on innocent-looking or everyday physical objects to hide messages, such as in paintings, maps or quilt covers.

BUGGED MAPS

The founder of the internationally recognised Boy Scouts organisation, Robert Baden-Powell, was also a lieutenant-general for the British Army and engaged in espionage during World War I. In his 1915 DIY manual on spying *My Adventures as a Spy*, Baden-Powell writes in the section titled 'The Value of Being Stupid' how someone with the appearance of having nothing below the surface can be a huge advantage. He describes how he posed as a wandering oddball artist and botanist in order to conceal 'maps and diagrams of enemy fortifications' within entomological drawings of butterflies and plants.² Baden-Powell's appearance, as a 'harmless lunatic' helped him fly under the radar and foreign officials failed to observe 'that the delicately drawn veins of the wings were exact representations, in plan, of their own fort, and that the spots on the wings denoted the number and position of guns and their different calibres'.³





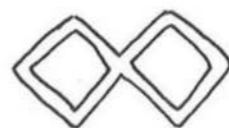
THE ART OF INDIRECTION

According to Maxwell Hearn from the Department of Asian Art at The Met, New York, Chinese landscape paintings were often used by 'scholar-officials' to express opinions that included subtle political criticism.⁴ When scholar-officials were banished or removed from office, they sometimes resorted to painting to ventilate. However, even when shrouded in symbolic language, those opinions could induce punishment as they did for Su Shi, an eleventh-century official who was almost executed for writing poems that were regarded as defiant. Thus, it comes as no surprise that these scholars sharpened their finesse and became very skillful in the art of indirection. For example, the scholar-official Zhao Mengfu painted an image of a groom and horse.⁵ In the early Yuan period of China (1271–1368), the ability to judge horses was analogous to the ability of recruiting talented men as government officials. When an emperor fails to improperly value his officials, one can express it as failure to make good use of the horse. As such, Zhao's paintings may be interpreted as a critique to rulers suggesting that they take better notice of the talents of their officials and make good use of them in the government. The painting's message indirectly attempts to remind emperors to properly value their officials.



WARChALKING AND 'HOBO SYMBOLS'

Warchalking was a flash-in-the-pan tech-fad developed in 2002, in which chalk markings were used in public spaces to signal the existence of open wireless network. While warchalk symbols didn't stick around, it's interesting to note that they were inspired by 'hobo symbols', a visual code developed in the mid-nineteenth century by itinerant and migrant workers travelling on trains across the United States looking for work. The numbers of itinerant workers greatly increased after the Great Depression in the 1930s. Surviving the precarity involved ingenuity though. So itinerant workers developed a system of symbols to help each other navigate the associated uncertainty and risk. Chalk and coal were often used to provide direction, information and warning to other hobos – at least, this is one account of how this popular legend is told. Another version of the story goes that itinerant workers actually used the mythology of the code as a cover to divert the public's attention in order for them to remain hidden.⁶



Keep Quiet



A judge
lives here



Doctor here
won't charge



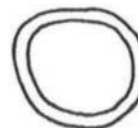
This is not a
safe place



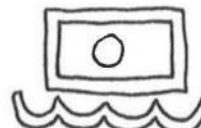
Kind woman lives
here. Tell a
pitiful story



Trolley
stop



There is
nothing to be
gained here



Bad water



This owner
is in



This is a
well guard-
ed house



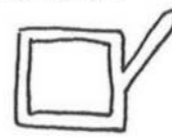
Man with a gun
lives here



Hit the road



A kind lady
lives here



Alcohol in
this town



Halt



Fresh water.
Safe campsite



Religious talk
will get you a
meal here



Be ready
to defend
yourself



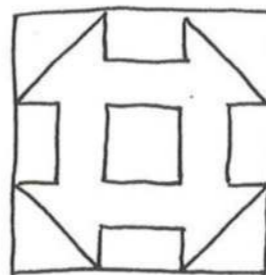
Vicious dog
here



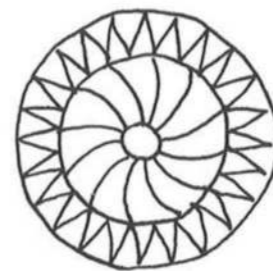
Courthouse

UNDERGROUND RAILROAD QUILT CODES

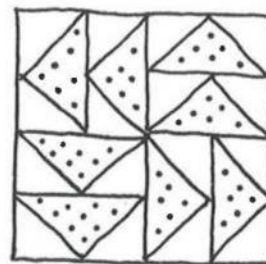
In *Hidden in Plain View*, Raymond G Dobard and Jacqueline Tobin present the oral history of a secret communication system that used quilts to help African slaves escape the bonds of slavery in nineteenth-century America. The Underground Railroad was a vast network of people, secret routes and safe houses established in the US to help fugitive slaves escape to the northern states and to Canada. The authors describe the Underground Railroad as a 'compelling story of resistance and struggle of slaves in their quest for freedom, incorporating every route, every person, every place, and every act taken by or on behalf of the enslaved.'⁷ Stitched in the quilts were secret codes that provided navigation information. Based on their conversations with Ozella McDaniel Williams, an African-American quilter, the authors suggest that the coded quilts were hung outside of slave housing to inform other slaves of particular messages. Different patterns had different meanings. For example, the 'monkey wrench' image signalled to gather tools and belongings and to get mentally and physically ready for the journey ahead. The 'wagon wheel' signalled to pack everything that would be used in transit, and when the 'tumbling boxes' appeared, it was time for the slaves to escape.⁸ The authors are certain that a sampler quilt was used in order to memorise the whole code system. Traditionally used to teach pattern piecing, these sampler quilts functioned as a kind of glossary that included all the patterns arranged in the order of codes.⁹



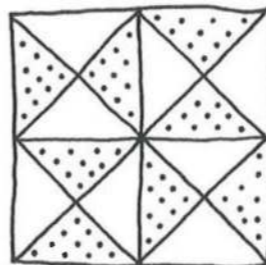
Monkey Wrench:
Gather tools



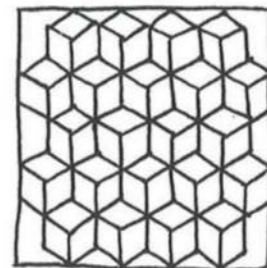
Wagon Wheel:
Pack things for
wagon or transit



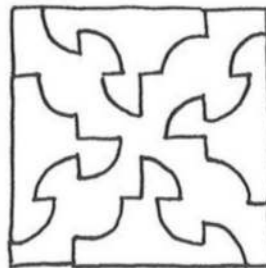
Flying Geese:
Follow the mi-
grating geese
north to Canada



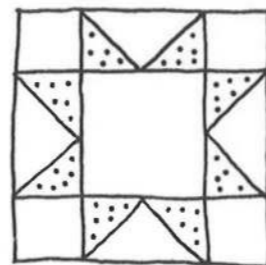
Bow Tie:
Dress up to dis-
guise as a freed
slave



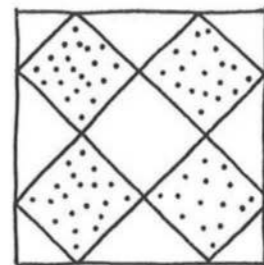
Tumbling Boxes:
Time to escape



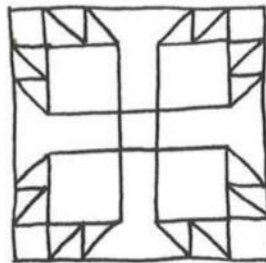
Drunkard's Path:
Travel in zigzag
fashion to confuse
slave catchers



North Star:
Follow this star
to Canada



Crossroads:
Cleveland, Ohio
as the point to
escape to Canada



Bears Paw:
Follow the trail
of a bear's
footprints

BAN NIANG WU - FEMALE SOS SYMBOLS

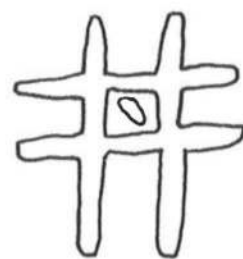
In Hunan province in China, the same region that Nüshu originated, live the Yao minority group who developed their own distinct symbol system. The symbols could be used as distress signals, for example when women needed to reach out to their own family for protection in times of difficulty with their husband's family. This form of SOS messaging was called *ban niang wu* (搬娘屋) or 'support from maternal family'. The same symbols were also used to write prayers, exchange messages between families, warn of impending robbery, record lyrics and document lawsuits. Although the origins of the Yao symbol system are unknown, it was used from the late Ming dynasty (1368-1644) right through to the early Qing dynasty (1644-1912). A large part of the system was lost during the Qing dynasty due to the prohibited use of written languages from ethnic minorities. Reportedly, it was still used during the Cultural Revolution.¹⁰

Here are the translations of the symbols in Chinese from the book *The Mystery of Nü Shu - The Women's Script* 奇特的女书, 全国女书学术考察研讨会文集.

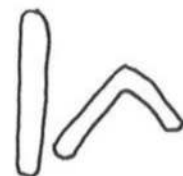
1. 强盗来了, 快上山
2. 要紧
3. 先下; 不行, 上坡再过
4. 打官司要一路走
5. 来了要走
6. 来了六个人
7. 你们几个人到这里来, 累不累?
8. 北京嫂嫂来了, 有什么事?
9. 跑下



1.
Robbers come, go
into the mountains!



2.
Important



3.
Go down; if
doesn't work, go
up the pass



4.
Let's go through
the lawsuit together



5.
Came, now
leaving



6.
Six people came



7.
How many of you
came? You must
be tired?



8.
Sister from
Beijing
came, what
happened?



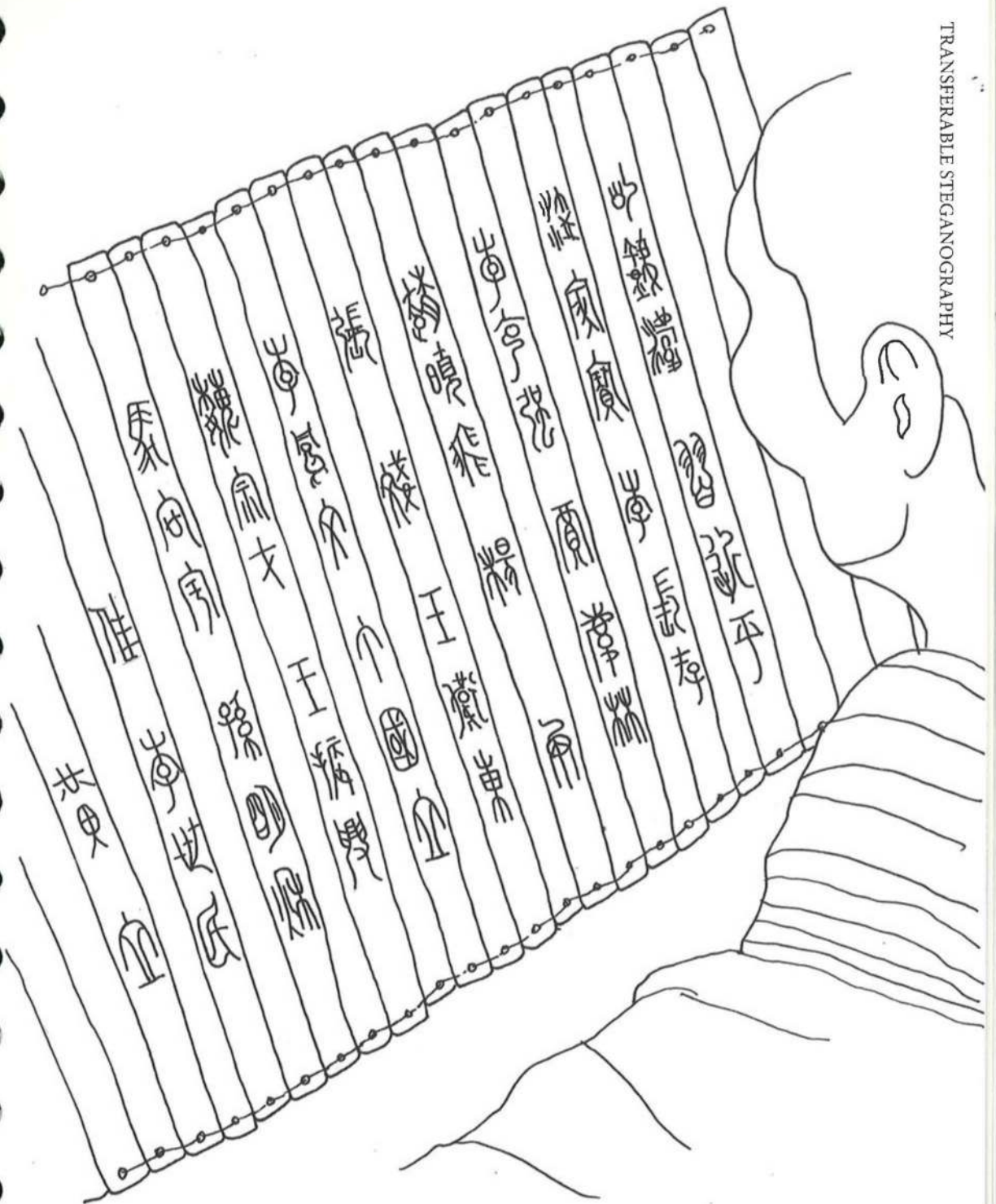
9.
Run away

4.3 Jargon code

A jargon code is language that is used and understood by a community of people but is meaningless and nonsensical to others. Slang is such an example, where members of the group use underground terminology in an innocent conversation to communicate something specific that can only be deciphered by the speakers. In many ways, a jargon-coded message follows the same principle as a substitution cipher, where each letter is substituted for a different letter or number. However, instead of replacing individual letters with a corresponding number (a:1, b:2, c:3), the words are substituted with other words or phrases.

ANCIENT CHINESE SCRIPT

In a scene of a popular 2017 Chinese historical drama TV show called *The Qin Empire*, the names of the show's antagonists appear to be written in an archaic form of Chinese calligraphy on a bamboo scroll. Unbeknownst to the censors due to this ancient script, the names of these villains were actually the names of the ruling elite of the Chinese Communist Party, including the current and former presidents, premiers and secretaries. Only after a few weeks of airtime did the censors spot the hidden offence and remove the scene from the show.²² By using the ancient script, *The Qin Empire* was able to manoeuvre around contemporary censorship filters and send a tongue-in-cheek message to its seasoned audience.



LAVENDER LINGUISTICS

An argot is a secret language used to obscure a conversation in order to deliberately prevent outsiders from understanding its meaning. Artist and scholar Anna T. writes in a 2014 *e-flux* journal article, 'The Opacity of Queer Languages', that queer communities have been creating their own camouflaged languages since the sixteenth century.¹³ Lavender linguistics, as it is called, encompasses different forms of queer dialects, slang or argots. While it is not exclusive to any geographical or cultural region, one constant and common factor behind the creation of these is 'the production of safer spaces of communication and contact between members of marginalized minoritarian groups who have traditionally been persecuted or faced legal punishment, or the threat of medical correction.'¹⁴

An example of queer slang is the Greek Kaliarda. Using a mix of Greek, English, Italian, French, Turkish and Romani, the Kaliarda lexicon has more than 6000 documented words. The extensive vocabulary is imbued with social satire:

With terms like 'the Vatican' (Βατικανό) to mean a gay men's brothel; a word referring to London that translates as 'faggville'/'sisterville' (αδερφοχώρι); Moutsemeni (Μουτσεμένη), a word referring to the Virgin Mary as having been naively tricked; and 'smartasses' gangbang' (φαεινοπαρτούζα), referring to a political party; and the Acropolis being referred to as 'tourist trap' (τουριστόφακα).¹⁵

Similarly, Polari, used in England, was a jargon code originally used by circus performers, sailors, sex workers and criminals. More recently, Polari was spoken by gay men and actors before homosexuality between men was decriminalised in 1967.¹⁶ Polari is a potpourri of languages, blending Italian, Romani, Yiddish, London slang and elements of a seventeenth-century secret language used in Great Britain called Thieves' Cant. Amy T. details a number of other languages, including Pajubá, used in Brazil by the queer community among others, the Filipino Swardspak/Beki, the Indonesian Bahasa Binan, the South African IsiNgqumo and Gayl, and the Turkish Lubunca.¹⁷



Tagalog:

rain = clean

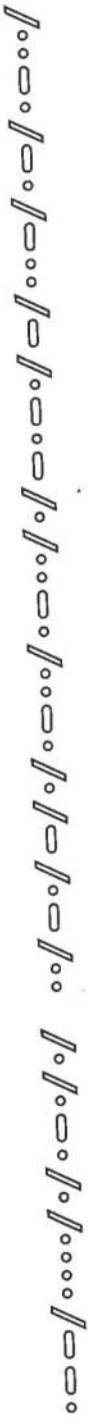
Beki:

rain = Julian's Marisette

HIJRA FARSI

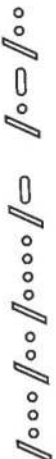
Hijra Farsi is spoken by the traditional transgender community in India. According to a member of this community interviewed for *The Times of India*, the reason for the development of this language was for self-preservation during the British Raj, when India was under British control.¹⁸ Himardri Roy, a professor at the School of Gender and Development Studies at IGNOU notes that Hijras once held the privileged positions of controlling harems in ancient India, before they were criminalised under British rule.¹⁹ Echoing the constants in lavender linguistics, Hijra Farsi was created for protection and a survival mechanism for their community. The fact that the language exists today testifies to the Hijra's continued persecution. Professor Roy also states that Hijra Farsi is like any other language in that it possesses nouns, verbs, adjective, adverbs and other parts of speech. Here are a few words: *janani* means a very feminine Hijra and *janana* a very masculine Hijra. *Koti* refers to being effeminate and *satta* refers to feminine clothes. *Panthe* means a masculine partner.²⁰





SOCIAL STEGANOGRAPHY

'Social steganography' is a term coined by the technology and social media scholar Danah Boyd in 2010 to describe the coded language used online by teenagers to prevent their parents from spying on them. She illustrates an example of a young girl who just broke up with her boyfriend and posts on Facebook the lyrics to Monty Python's 'Always Look on the Bright Side of Life'. Although the lyrics may appear to be happy, the song is played when people are killed in the movie. She uses this double connotation to communicate to her friends her sadness while simultaneously diverting her mother's concern. The mother interpreted the lyrics as meaning everything was fine; the girl's friends, however, understood the cultural reference and realised she was upset. (For readers confused as to why her mother did not understand the Monty Python reference, my guess is that her mother didn't grow up in the West with access to British TV shows.) Teenagers thus write messages that can be understood in one way by those in the know and read differently by those who are not. What they practice is the idea of security through obscurity – a type of protection that is technically weak but still effective because few people are aware of it.²¹ In fact, analog invisible inks are one example of this practice.



A GOOD STUDENT

During the civil war, Syrian citizens have used jargon code to mask political content to evade surveillance and censorship. In her 2013 paper 'Syria's Arab Spring', Nassima Neggaz, assistant professor of religion and Islamic studies at New College of Florida, writes about the innovative codes that Syrian communities have developed since the 1970s in order to discuss forbidden subjects such as politics under the al-Assad regime.¹¹ Due to the Mukhabarat, a vast security and intelligence apparatus that operates at every layer of society, often including neighbours, the local grocer and sometimes even relatives, these codes were developed and customised behind closed doors and used only within small tight-knit circles of highly trusted family and friends. Over four decades, this code has been passed down from generation to generation. Expressions such as 'We're having a party' are used to communicate that a protest is happening. 'Heavy rain' is used to refer to gunfire from Syrian forces. If a person expresses that 'one has one week left before coming out of the hospital', it means that they are emerging from hiding.¹² Although many of these codes were invented before the widespread use of internet, many of them are now used in similar ways on social media and email.

A good student

Someone hiding from the regime

HEAVY RAIN

Gunfire from Syrian forces

*Having beautiful
handwriting*

An informant

WE ARE HAVING
A PARTY

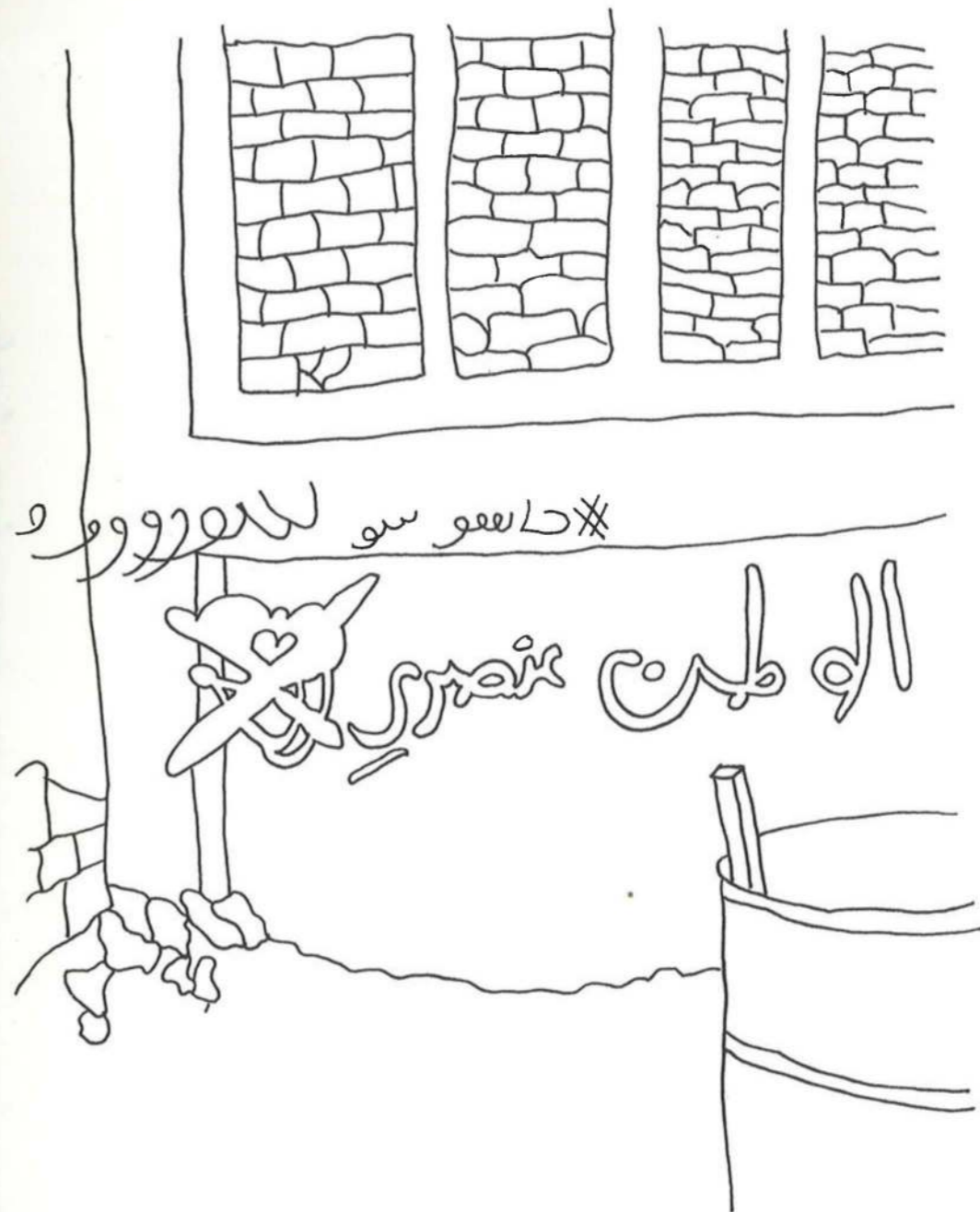
A demonstration is going on

'HOMELAND IS RACIST' GRAFFITI

Perhaps you have heard about this one already – when three street artists were hired by the American TV show *Homeland* to provide ‘apolitical background graffiti for the set of a refugee camp’.²³ The artists Heba Amin, Don Karl and Caram Kapp took advantage of the lack of oversight on set – and the crew’s unfamiliarity with Arabic script – to write the subversive statement: ‘Homeland is racist’. The fact that their work was presented as graffiti-cum-décor is the reason why the writing was able to go to air. In their statement, the artists said the following:

*The content of what was written on the walls, however, was of no concern. In their eyes, Arabic script is merely a supplementary visual that completes the horror-fantasy of the Middle East, a poster image dehumanizing an entire region to human-less figures in black burkas and moreover, this season, to refugees.*²⁴

Instrumentalising this fact, the artists were able to voice their political discontent with *Homeland* and the ‘highly biased depiction of Arabs, Pakistanis, and Afghans, as well as its gross misrepresentations of the cities of Beirut, Islamabad – and the so-called Muslim world in general.’²⁵



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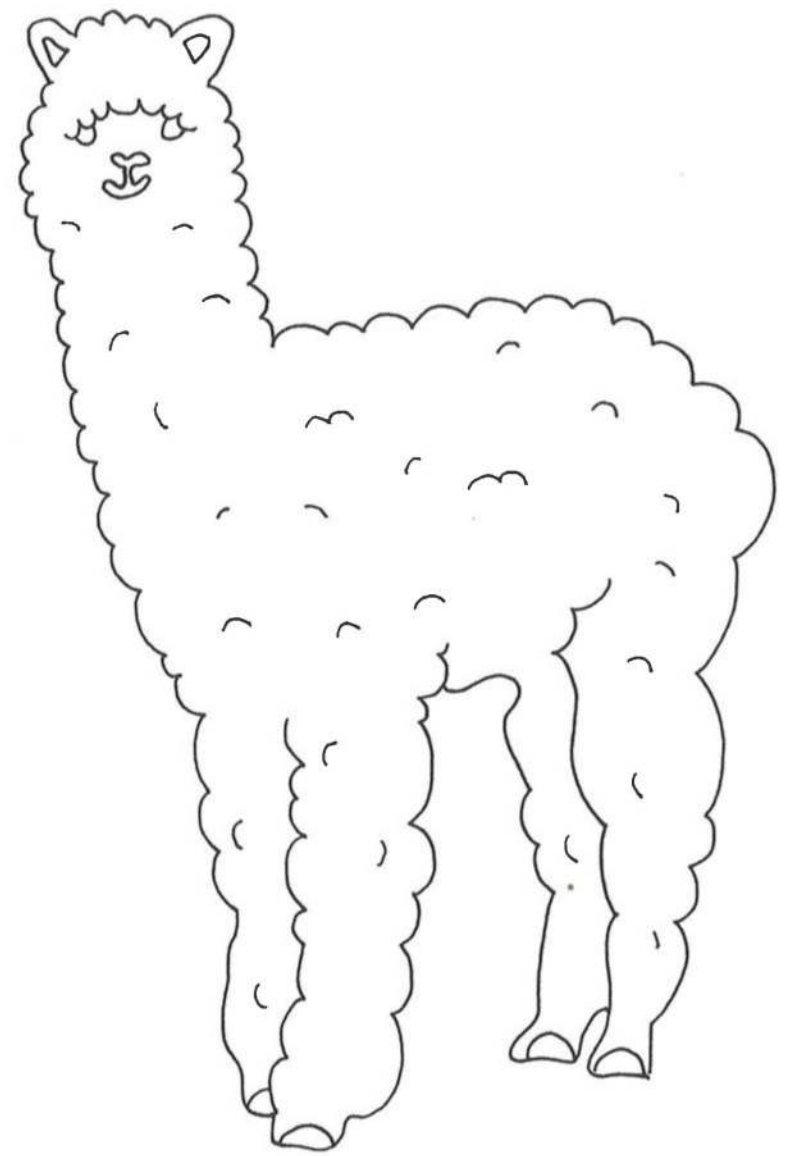
4.4 Phonetics

CHINESE POLITICAL MEMES

Chinese is a tonal language, meaning that the same word can take on different meanings when pronounced with a different emphasis and pitch. This tonal feature of spoken Chinese produces many homonyms, and has been the source of a rich culture of wordplay, poetry and humour. In response to the government's clampdown on online political expression in 2009, a wave of Chinese political memes exploited this linguistic feature to evade digital censorship.

An early meme from that time was *cao ni ma* or 'grass-mud horse' (草泥马). When pronounced one way, it refers to an innocuous mythical animal that is apparently related to the Bolivian alpaca. However, when pronounced another way, it means 'fuck your mother' (你妈) and in the context of the meme is understood as a curse against government censorship policies, which were euphemistically called 'harmonisation' policies. By masking subversive content in a string of seemingly absurd and unrelated words, one can see this as phonetic steganography. The word for 'harmony' pronounced differently means 'river crab', which became yet another meme coined by Chinese internet users in reference to the government's justification of censorship as an essential ingredient in achieving former president Hu Jintao's 'harmonious society'. In pre-internet language, a crab is also a bully. In Chinese internet mythology, the river crab threatens the habitat of the grass-mud horse, which has since risen to the status of a symbol of online deviance and resistance. The grass-mud horse meme was able to both mock and bypass the regime's policy of censorship. This was a grassroots form of political parody by internet users who became infuriated with their freedom-of-speech restrictions. Undetected, this mythical creature went viral and was appropriated in countless ways – in cartoons and a children's song on YouTube, in a nature documentary about its habits, and in everything

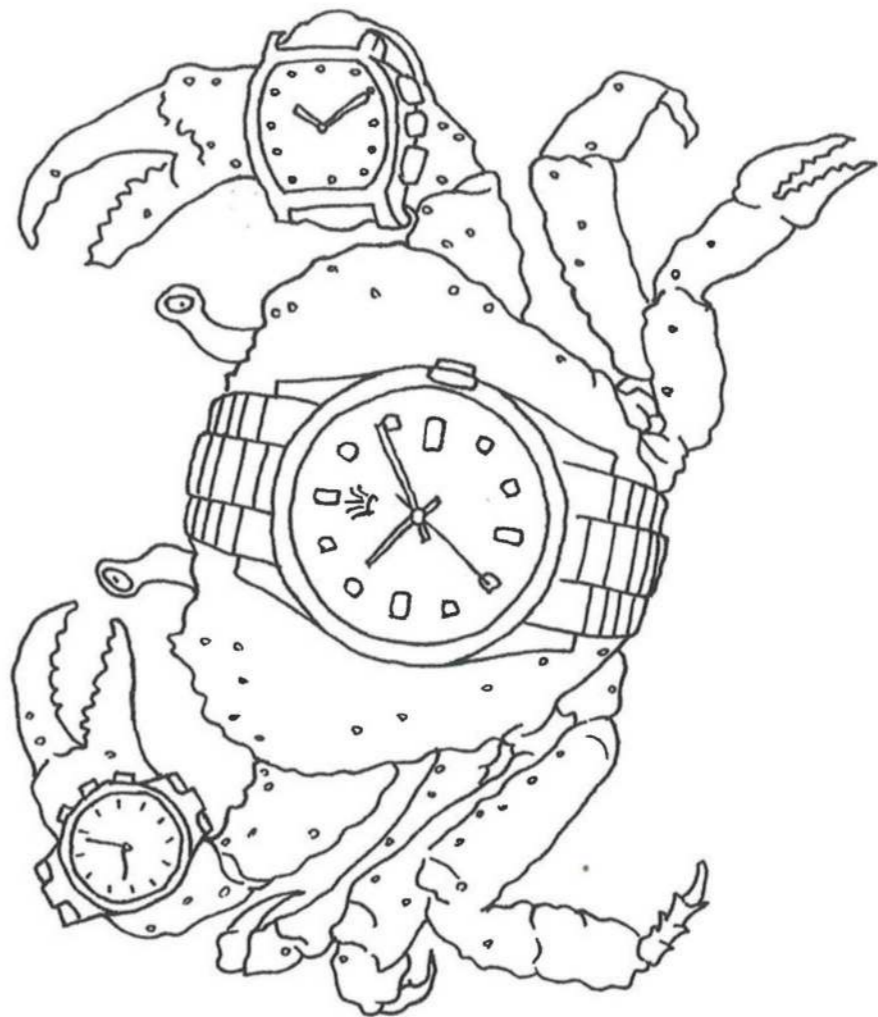
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from grass-mud-horse currency, to poems, t-shirts and emblematic logos.

While the Chinese regime had invested millions in research, advanced technology and systems to enforce a brutal censorship policy, this linguistic loophole was all it took to collapse the firewall momentarily. Many more memes have since been constructed in a similar fashion, creating an 'ecology' of mythical creatures. There exists, for instance, the 'yax lizard', the 'valley dove', the 'poison jackal' and the 'watered weasel-ape'. To learn more, I recommend you check out the grass-mud horse lexicon put together by *China Digital Times*. It is also a news website focusing on items that have been censored, blocked or deleted by the Chinese state. The lexicon is available as a wiki and as a free downloadable PDF document.²⁶

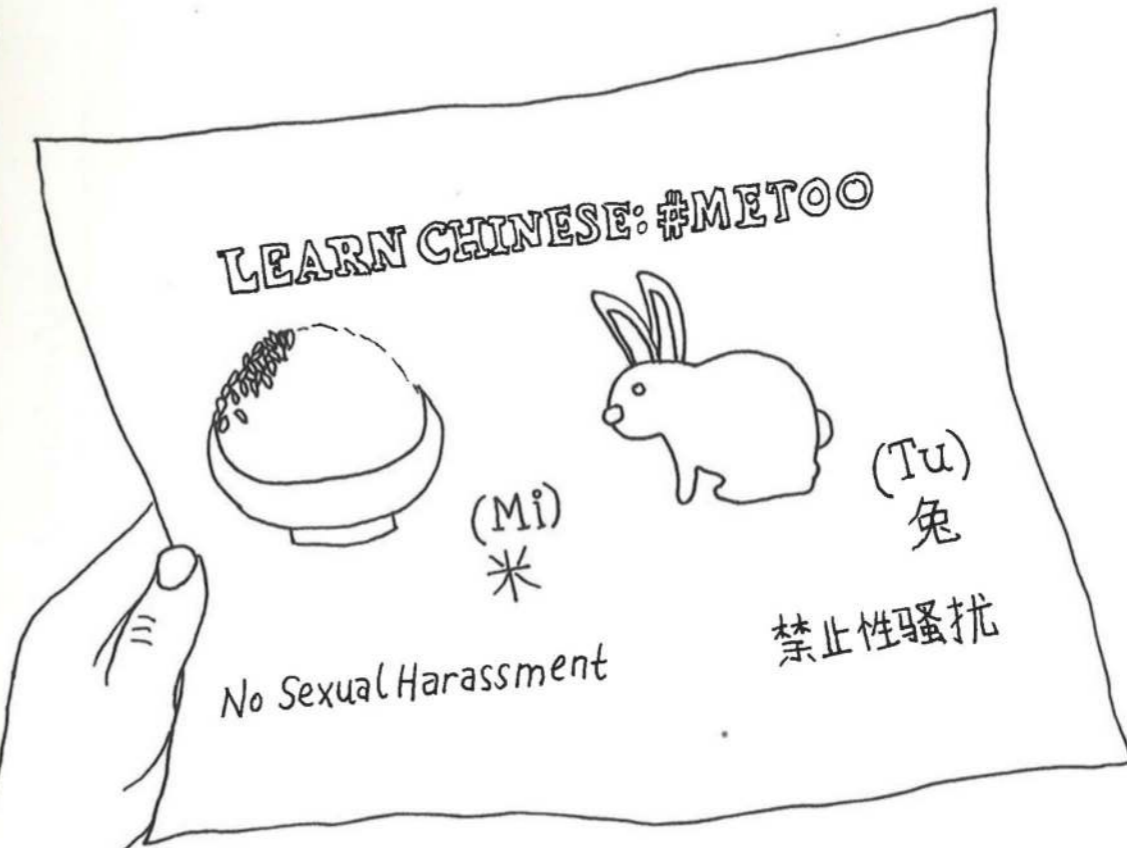
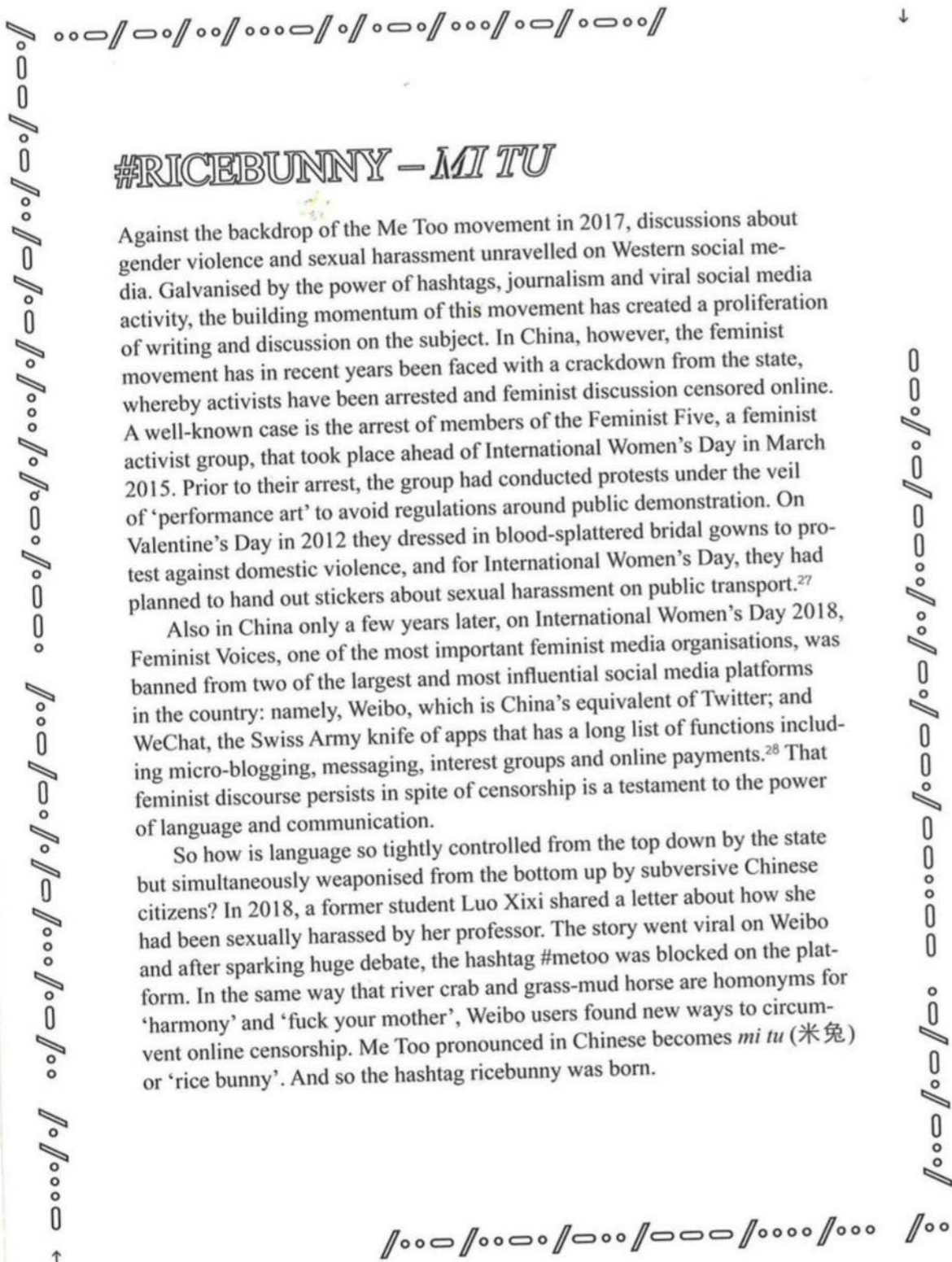


#RICEBUNNY - MI TU

Against the backdrop of the Me Too movement in 2017, discussions about gender violence and sexual harassment unravelled on Western social media. Galvanised by the power of hashtags, journalism and viral social media activity, the building momentum of this movement has created a proliferation of writing and discussion on the subject. In China, however, the feminist movement has in recent years been faced with a crackdown from the state, whereby activists have been arrested and feminist discussion censored online. A well-known case is the arrest of members of the Feminist Five, a feminist activist group, that took place ahead of International Women's Day in March 2015. Prior to their arrest, the group had conducted protests under the veil of 'performance art' to avoid regulations around public demonstration. On Valentine's Day in 2012 they dressed in blood-splattered bridal gowns to protest against domestic violence, and for International Women's Day, they had planned to hand out stickers about sexual harassment on public transport.²⁷

Also in China only a few years later, on International Women's Day 2018, Feminist Voices, one of the most important feminist media organisations, was banned from two of the largest and most influential social media platforms in the country: namely, Weibo, which is China's equivalent of Twitter; and WeChat, the Swiss Army knife of apps that has a long list of functions including micro-blogging, messaging, interest groups and online payments.²⁸ That feminist discourse persists in spite of censorship is a testament to the power of language and communication.

So how is language so tightly controlled from the top down by the state but simultaneously weaponised from the bottom up by subversive Chinese citizens? In 2018, a former student Luo Xixi shared a letter about how she had been sexually harassed by her professor. The story went viral on Weibo and after sparking huge debate, the hashtag #metoo was blocked on the platform. In the same way that river crab and grass-mud horse are homonyms for 'harmony' and 'fuck your mother', Weibo users found new ways to circumvent online censorship. Me Too pronounced in Chinese becomes *mi tu* (米兔) or 'rice bunny'. And so the hashtag ricebunny was born.

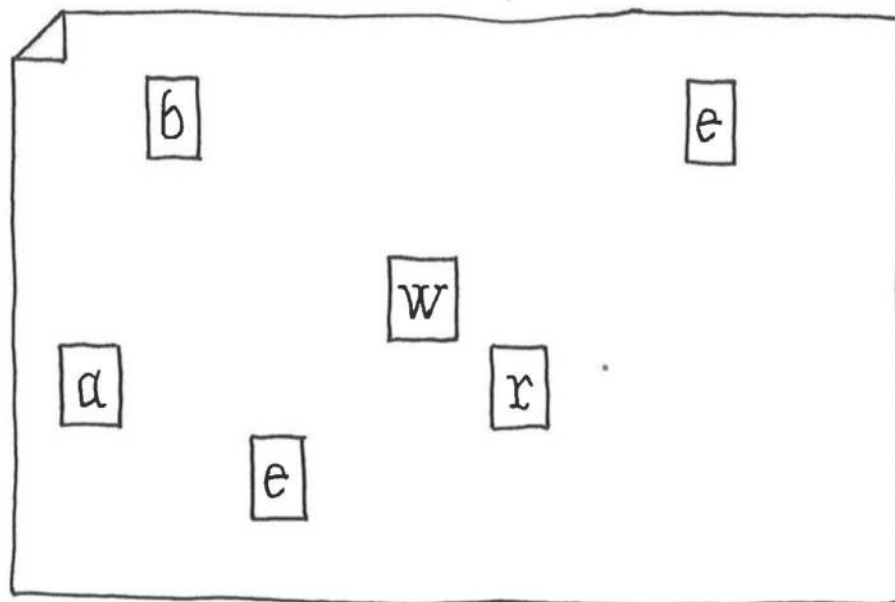


4.5 Grille cipher

CARDAN GRILLE

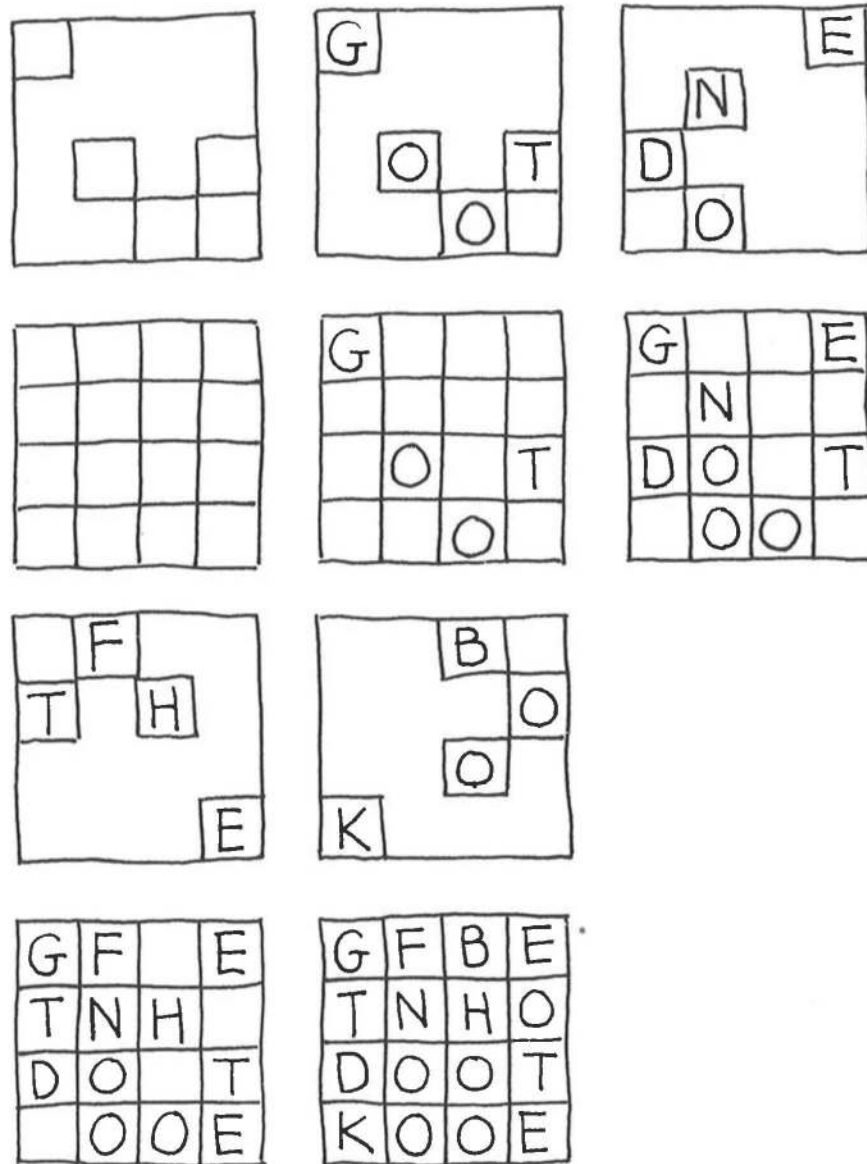
Named after its inventor, Gerolamo Cardano (1501–76), the Cardan grille is a 400-year-old method of writing secret messages using a grill made of sheet material such as paper, cardboard or metal with holes cut in it. The sender of a message places the grill on the piece of paper and writes the message through the holes. After the grill is removed, the hidden message is filled in with an ordinary sounding message. The letter and grill are sent separately to the receiver. When the receiver places the grill over the 'cover' message, the holes line up with specific letters, revealing the hidden message within. Intercepting these messages becomes very difficult, because the longer cover message, which often takes up a page, completely obscures the shorter secret message. The Cardan grille is widely considered to be one of the safest ways to transmit a secret message.³¹ When I told a friend in Rotterdam about this method, she recalled that her Dutch bank sent security pin codes to her this way, up until the 1980s–90s. I was surprised to hear that this method was being used so recently.

Noble vestments woven using an ancient method. Those who wear such robes are known to bring miracles in their wake.



TURNING GRILLE

As an enhancement of the Cardan grille, the turning grille was used in the eighteenth century and adopted by the German army during World War I. It looked like a regular grille: a square sheet of cardboard divided into cells, some of which were punched out. To use the turning grille, the sender places it over the blank page and writes the first sequence of letters of their secret message onto the paper below. The sender then rotates the turning grille ninety degrees and writes the second sequence of letters, and so on, rotating it after each sequence until the matrix is filled with letters, as shown in the illustration on your right. The French military was able to devise an attack against this system, so the German military's usage therefore only lasted four months.³²



4.6 Null cipher

A null cipher is an unencrypted message embedded in such a way that the actual message is camouflaged within a larger, innocuous message. A set of rules, such as 'read every fifth word' or 'look at the third character in every word' is required to create the code as well as for the recipient of the message to decode it.³³ One drawback of the null cipher is that it may read clumsily. Such an example can be found in Florian Cramer's essay 'Hiding in Plain Sight', written to accompany my exhibition *The Kandinsky Collective*.³⁴ Cramer uses an acrostic method, taking the first word of each paragraph, to embed the hidden sentence. The following is the first sentence of the sixth paragraph: 'True, cryptography is digital by definition, whereas steganography can be both digital and analog.' You can see that in order to keep the first word in place, he needs to work around conventional grammar.

Here is another example from Gregory Kipper's *Investigator's Guide to Steganography*:

News Eight Weather: Tonight increasing snow. Unexpected precipitation smothers eastern towns. Be extremely cautious and use snowtires especially heading east. The [highway is not] knowingly slippery. Highway evacuation is suspected. Police report emergency situations in downtown ending near Tuesday.

By writing down the first letter of each word, the hidden message is revealed:

*Newt is upset because he thinks he is President.*³⁵

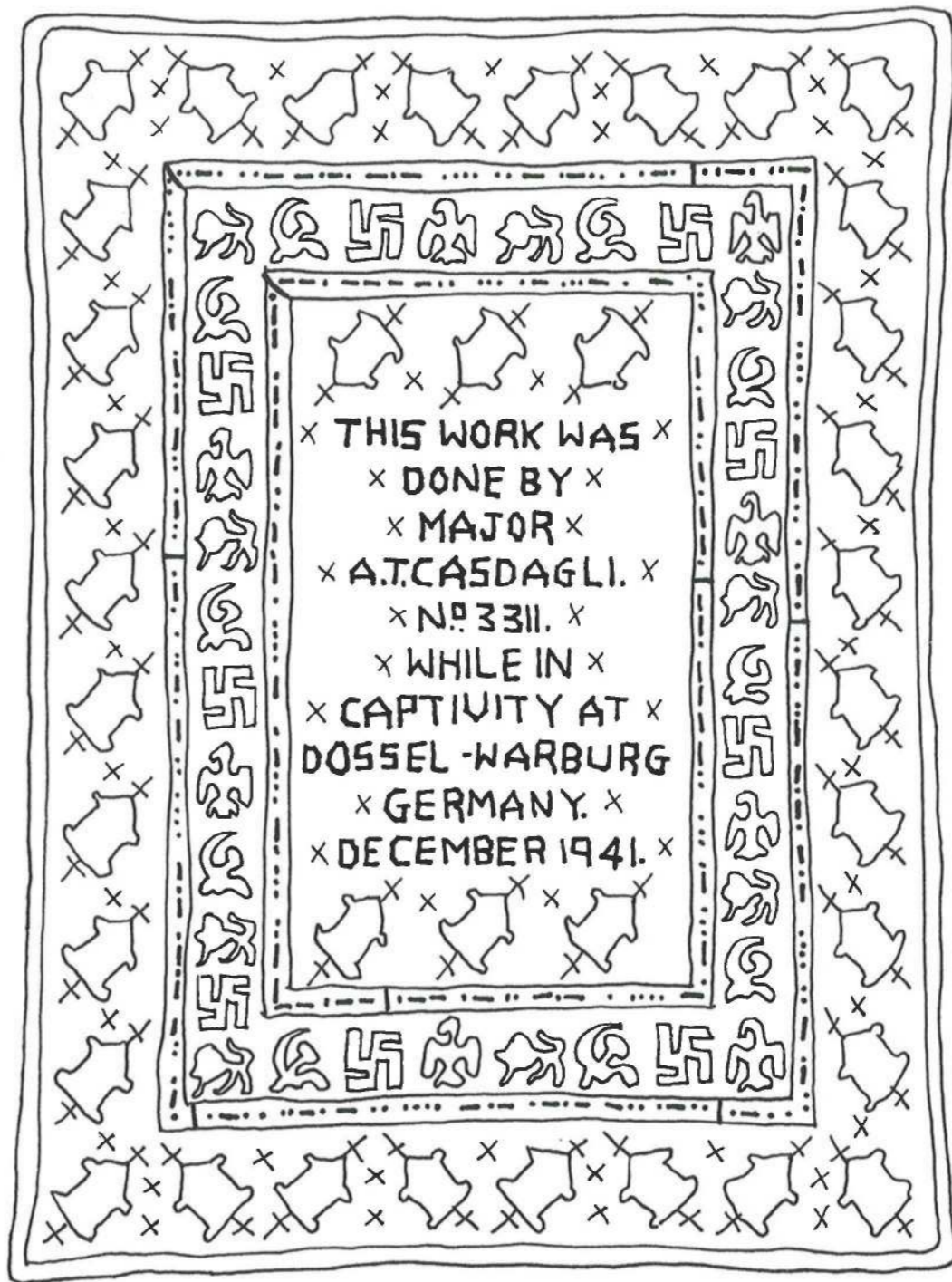
Susan sAys
GaI1 Lies.
MAtt 1eTs
Susan fEel
joVial. Elated
(or) aNgry?

Using the pattern 1,2,3,1,2,3 of each letter in each word, gives the message:

"SAIL AT SEVEN"

SUBVERSIVE DECORATION

When he was a prisoner of war, imprisoned by the Nazis for four years in World War II, Major Alexis Casdagli created cross-stitch samplers to keep himself busy. The decorative pattern that Casdagli stitched into the frame is in fact a secret message in Morse code spelling out 'God save the King' and 'Fuck Hitler'. Casdagli's son spoke about his father's subversive stitches as giving him pleasure when the guards were doing their rounds. According to him, 'He would say after the war that the Red Cross saved his life but his embroidery saved his sanity.'³⁶ The secret message in his needlework was never spotted by his Nazi captors. Casdagli's hybrid technique of camouflaged Morse code is an example that I'm particularly attracted to because it shows how ornament as subversion can be lifesaving. Furthermore, it also challenges the assumption that decoration, seen to be primarily a female preoccupation, is frivolous and a waste of time.

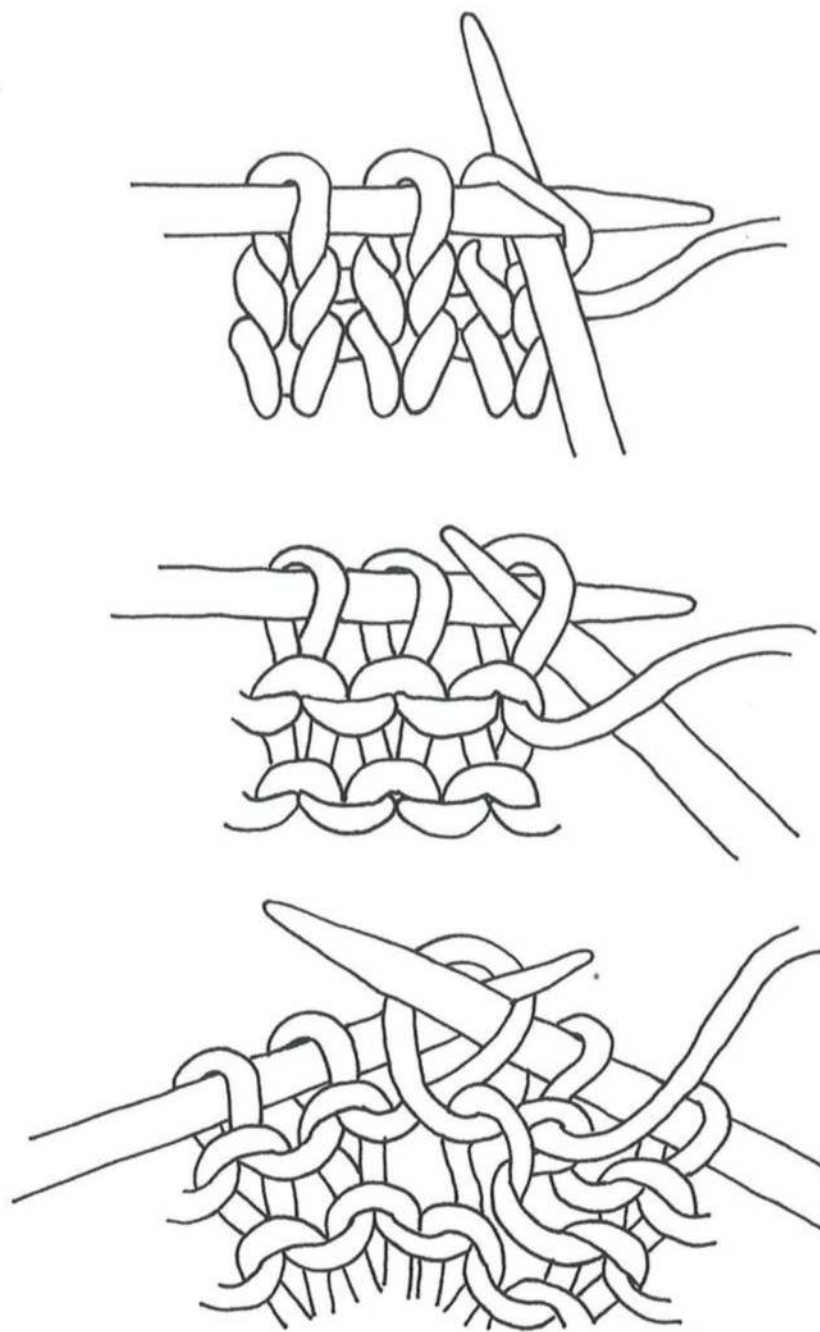


KNITTING AND ESPIONAGE

One of the most interesting things I've found during my research for this book is the history between spies, steganography and textile-making.³⁸ During covert operations, female spies used to embed coded messages in knitting, embroidery and hooked rugs. The World War II secret agent Phyllis Latour Doyle used the innocent stereotype of a knitting woman to sneak information to the British. She also hid silk yarns ready to be filled with secret knotted messages, which she would later translate using Morse code equipment. In 2014, she told the *New Zealand Army News*, 'I always carried knitting because my codes were on a piece of silk – I had about 2000 I could use. When I used a code, I would just pinprick it to indicate it had gone. I wrapped the piece of silk around a knitting needle and put it in a flat shoe lace which I used to tie my hair up.'³⁹

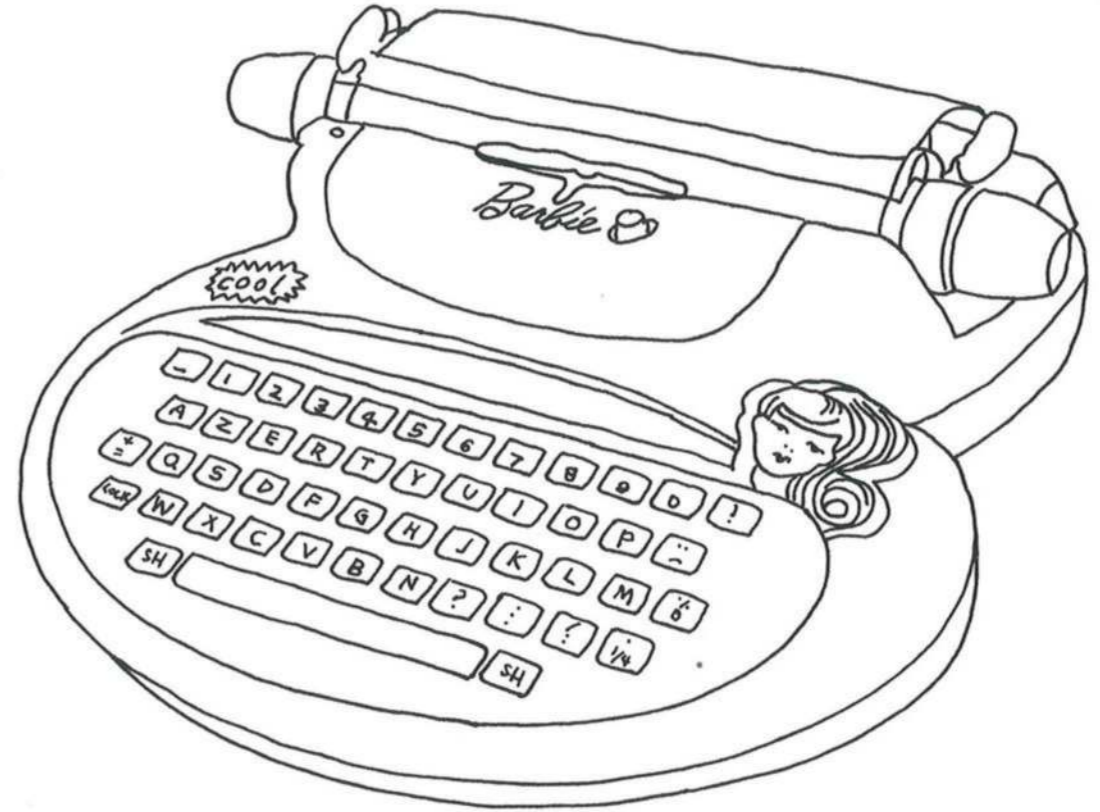
An American spy by the name of Elizabeth Bentley, who worked for the Soviet Union and later became a US informant, used her knitting bag to smuggle early plans for the B-29 bombers and information on aircraft construction. Knitting was still tightly monitored for containing secret messages within its stitches, although this steganographic technique was much less common than the use of knitting to disguise suspicious activity. The posting of knitting patterns abroad was banned by the British Office of Censorship for fear that coded messages were being stored in knitting instructions.⁴⁰

Another fascinating account from World War II relates to the Belgian Resistance, that recruited women who lived close to the rail yard to note the movement of German trains. Using different stitches, such as the drop and purl stitch, these women recorded the passing trains into their knitting. As such, the Belgian Resistance was able to track the logistics of the enemy.⁴¹



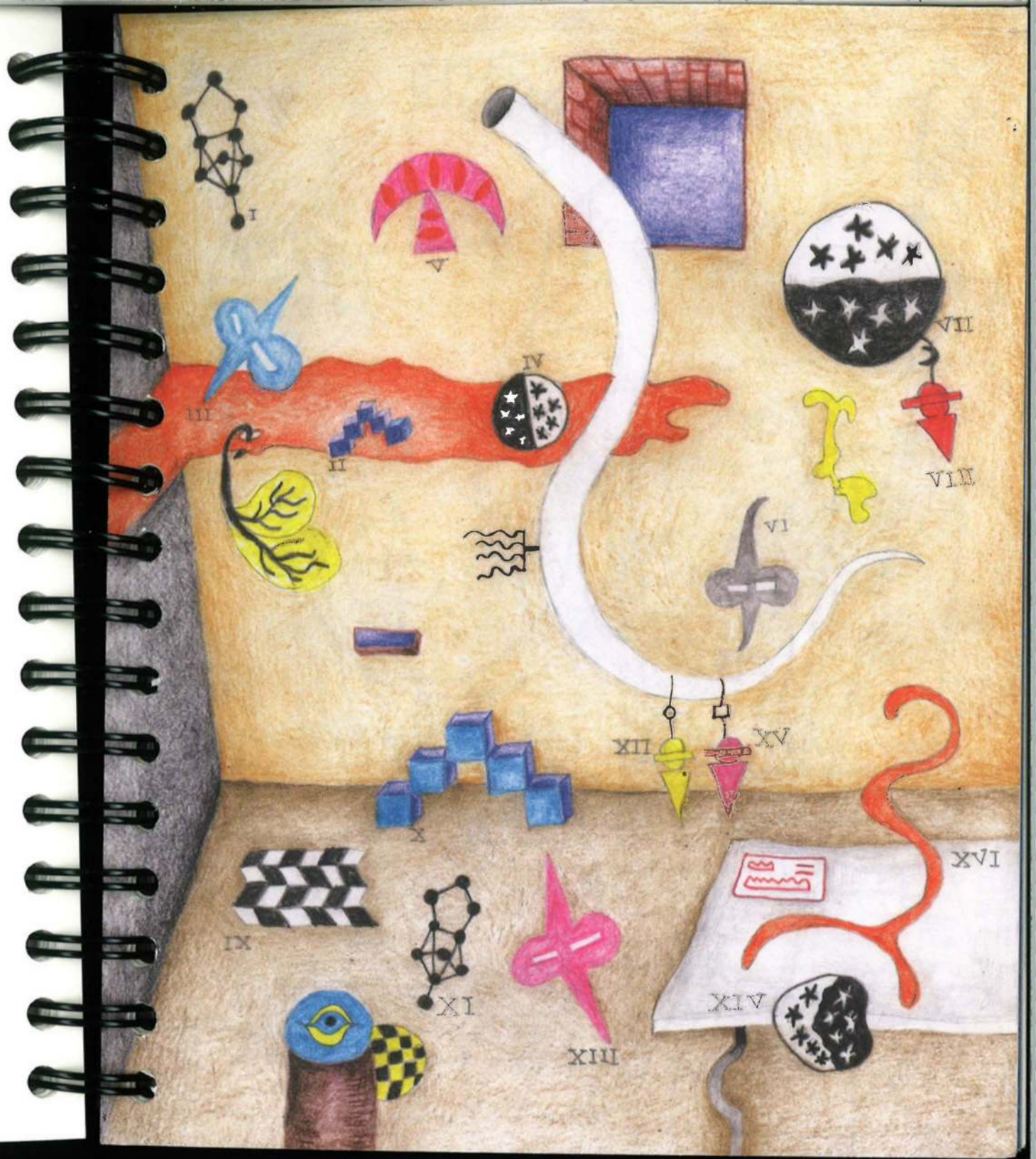
BARBIE TYPEWRITER

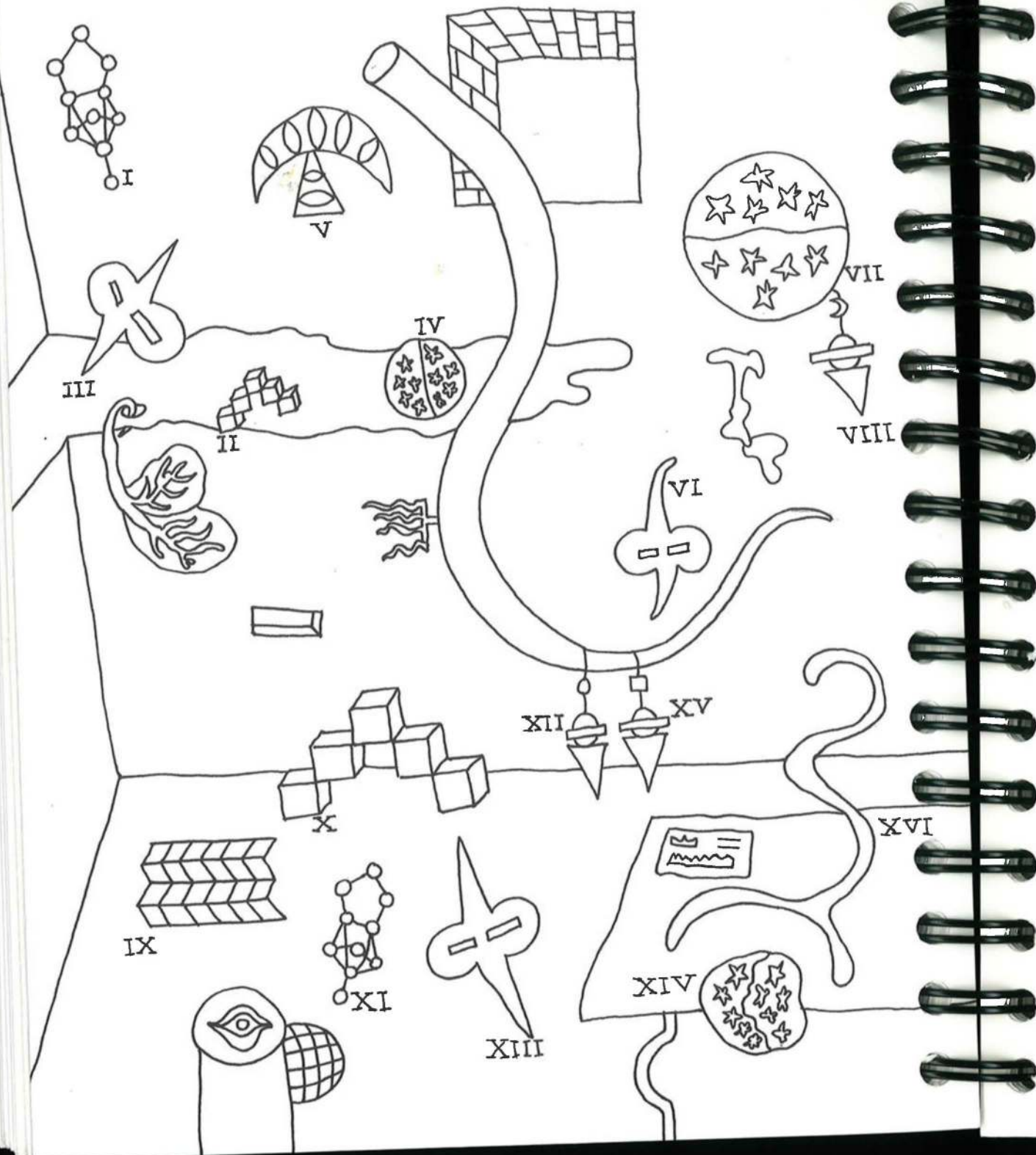
In 1998, the Slovenian toy company Mehano developed a low-cost electronic typewriter for children. This toy also contained a simple substitution-cipher feature capable of encoding and decoding secret messages.⁴² Essentially a cryptographic machine, this built-in capability had four cipher modes that could be activated by entering a special key sequence on the keyboard. When bought by the American toy company Mattel, marketing executives coated the typewriter in pink, splashed a Barbie logo on it and omitted the cryptographic function from the manual and pamphlet, thinking that secret writing facilities would not appeal to young girls.⁴³ This can be read as an account of how, under patriarchy, an industry such as the toy industry shapes, reaffirms and demarcates binary gender roles. Perhaps Mattel's marketing of this product wasn't specifically about covering up the cryptographic function in a Barbie veneer. However, as a steganography object, the typewriter in this story reveals something about the way in which assumed perceptions of innocence, in this case in young girls, divert attention from hidden potentials or agendas, whether these potentials and agendas are malicious or not.



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Whether in the form of art works or interventions, each of the projects detailed in the following pages shows my attempts to resuscitate one or more steganographic technique. In the first part of the chapter I present ways in which I have revived these techniques through speculative proposals, performances and publishing actions.

The second part of this chapter details workshops and demonstrations I've developed and facilitated over the years. The workshops were designed to think through subjects relating to surveillance, censorship and marginalised cultures using the

framework of steganographic techniques. The technical knowledge became a tool to talk about the implications of visibility and invisibility as both an oppressive and a liberatory practice. This cookbook can be seen as the documentation of the workshops or even an extension of it, in which you, dear reader, can also host your own. I encourage you to take what seems useful and adapt to your own purposes. You might follow the timeframe and formula I've outlined in the coming pages, or you might take inspiration from the text and develop your own.

5.1 Art works and interventions

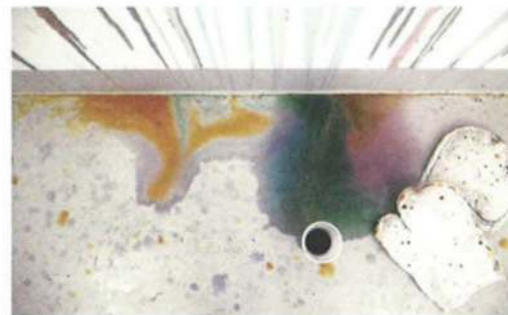
A MEDIA ARCHAEOLOGY OF STEGANOGRAPHY



A Media Archaeology of Steganography is an interactive poster printed in three different types of invisible ink made of milk, potato starch and a combination of hydrochloric acid and baking soda. In order to uncover the whole message, visitors reveal the poster using three corresponding activation methods: a heat gun, iodine spray and red cabbage juice. When activated, the poster uncovers writing about steganography's tactical and strategical use throughout history. It is a self-reflexive work that excavates the media archaeology of invisible ink through its own medium.

Exhibited at:

- *The Work of Art in the Age of Technical Remediation*, curated by Darija Medić at Kulturni Centar, Požega, Serbia, 2015
- *Therapy Session*, curated by Jesse van Oosten and Niekolaas Johannes Lekkerkerk at TENT, Rotterdam, the Netherlands, 2016
- *Escaping the Digital Unease*, curated by Raffael Dörig, Domenico Quaranta and Fabio Paris at Kunsthaus Langenthal, Switzerland, 2017.





The title *TLTRNW* is a netspeak acronym for 'too long to read and write', a phrase that speaks to our supposed shortened attention spans caused by the internet. When we use certain styles of texting, twittering, internet slang, acronyms, and emoticons and emojis, we put into practice forms of shorthand or stenography. These writing methods are compressed and abbreviated. The work in *TLTRNW* is a self-invented language that investigates shorthand throughout the ages and its close relationship to technology. Shown on four large Rosetta Stone-like slabs, *TLTRNW* translates internet slang into Ford shorthand, a simplified modern shorthand designed in 2012 for coding personal journals, which is then re-arranged and re-enacted to form a new emoji system. Interrupting the monolithic forms are three videos that function as a manual to the language, and explore the tactical applications of the encoded emojis. For instance, one of the videos is staged as a TV news report whereby the new reporter uses this new emoji system to communicate the real story with her face while she reports a different story with her words. This work also bridges two words that are often mixed up with each other –

stenography, meaning shorthand, and steganography, meaning hidden writing. *TLTRNW* turns stenography into steganography: shorthand co-opted to conceal information. The increasing popularity of emojis questions the ways we consume and produce information. For example, are we entering an ideogram-like chapter of literacy? What does this mean for our cognition, our ability to research and make work? Aside from the discussion regarding its detrimental effects, what possibilities does this new configuration hold? Can we take advantage of the slippery modes of meaning in emojis to bypass surveillance and the quantification of our data? Taking cues from Jeremiah Denton's facial choreography in which the words coming from his mouth overshadowed the signals coming from his blinking eyes, *TLTRNW* explores ways of using the face as a way to mask itself.

Exhibited at:
 - *Spending Quality Time with my Quantified Self*, curated by Jesse van Oosten and Niekolaas Johannes Lekkerkerk at TENT, Rotterdam, the Netherlands, 2016.



LMAO

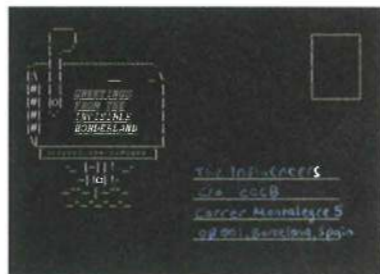
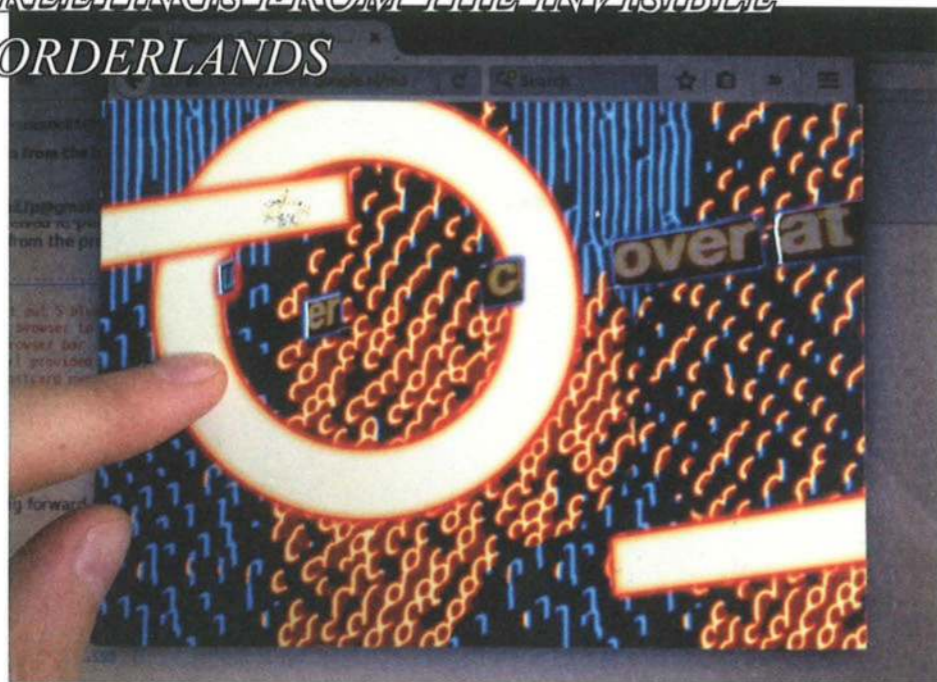
Laughing My Ass Off

(~ ^ α

(~ ^ α



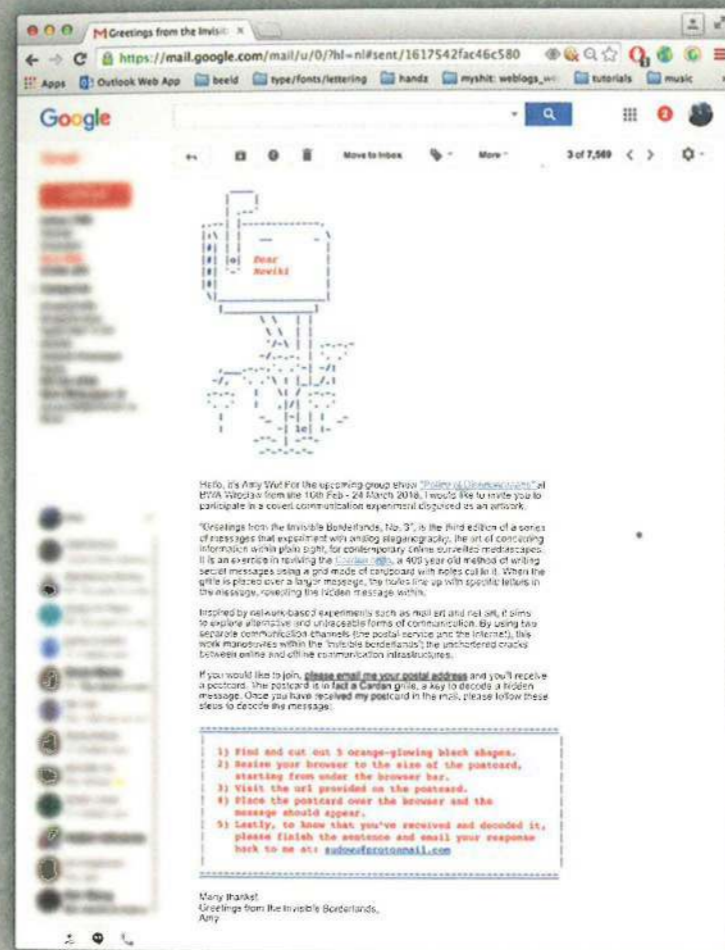
GREETINGS FROM THE INVISIBLE BORDERLANDS



Greetings from the Invisible Borderlands is a series of messages that experiment with analog steganography. The work is an exercise in reviving the Cardan grille. The exercise begins when a postcard is posted to interested participants. That postcard is in fact the grille, the key that unlocks an embedded message on Google Maps. By using two separate communication channels, the postal service and the internet, this work manoeuvres within the 'invisible borderlands', the uncharted cracks between online and offline communication infrastructures. Inspired by network-based experiments such as mail art and net art, it aims to explore alternative and untraceable forms of communication.

- Exhibited at:
- Crypto Design Challenge, Amsterdam, the Netherlands 2016
 - *The Kandinsky Collective*, curated by Janez Janša, Aksioma - Institute for Contemporary Art, Ljubljana, Slovenia 2017
 - *New Imaginaries for Crypto Design*, NeMe, Cyprus, 2018
 - *Policy of Disappearance*, curated by Noviki (Marcin Nowicki and Katarzyna Nestorowicz) Wrocław, Poland, 2018.

Based on the Cardan grille, the message is split and sent over two different channels for extra security



THE KANDINSKY COLLECTIVE



The Kandinsky Collective uses speculative fiction as a strategy to shed light on how art, graphic design and media activism can be used to address surveillance and privacy. The solo exhibition departs from a rumour that during World War II, the British Intelligence recruited the artist Wassily Kandinsky to smuggle military secrets by way of encoding messages into his abstract artworks. Whether or not this actually took place, *The Kandinsky Collective* exhibition turns this hearsay into a staged reality. It seeks to explore the subversive potential of using the formal language of contemporary 'high' art as a means to embed hidden messages. Set in the near future when privacy has become a crime, *The Kandinsky Collective* is in fact an orchestrated exhibition of privacy activists posing as a contemporary art collective. They co-opt abstract art as a cover to form an underground communication channel.

Essentially, *The Kandinsky Collective* is two exhibitions for the price of one. As a visitor, you first experience the immediate 'cover' exhibition that appears to be a generic art show made by *The Kandinsky Collective*. Taking advantage of the cliché and stereotype that art is vague and

abstract, the overt layer adopts a visual language that is striking but apolitical. The colourful and bombastic ornamentation, functioning as a shield and aesthetic trap, serves to distract viewers from searching further for the hidden messages. These messages are hidden on a second layer through which visitors can uncover and find the truth about the privacy activists. As you move through the space, clues or 'keys' help reveal the artwork.

Bit by bit, embedded words will appear out of the six cover artworks. When read together, they spell out a full sentence. In an 'escape room'-like frenzy, stimulated by the atmosphere of the opening event, visitors are encouraged to work together to reveal the truth of the show but also the technical inner-workings of steganography and how it can be used. Through this collaborative action, they become familiarised with the techniques, as well as the historical and political context of steganography.

This solo exhibition was curated by Janez Janša at Aksioma - Institute for Contemporary Art, Ljubljana, Slovenia, 2017.





1.

The show is divided into four kinds of works that are interwoven together to form one narrative:

THE SIX COVER ARTWORKS

- The *visible layer* is eye candy of sorts, a mixed media installation that includes video, print and textile.
- The *invisible layer* contains hidden words created with various steganography techniques – the Cardan grille, substitution ciphers, camouflaged objects and camouflaged text within text – in combination with invisible inks. Each artwork contains one word, so when all the artworks are read together, they form the following sentences: 'Weaponise the innocuous. Reclaim the obsolete.'

1.

Cover artwork name: *Stripped*

Cover artwork: Curtains depicting Kandinsky-esque images, which are actually coded letters.

Steganography technique: Substitution cipher inspired by the camouflaged Morse code cross-stitchings of Major Alexis Casdagli, detailed in Chapter 4.

Hidden word: 'weaponise'

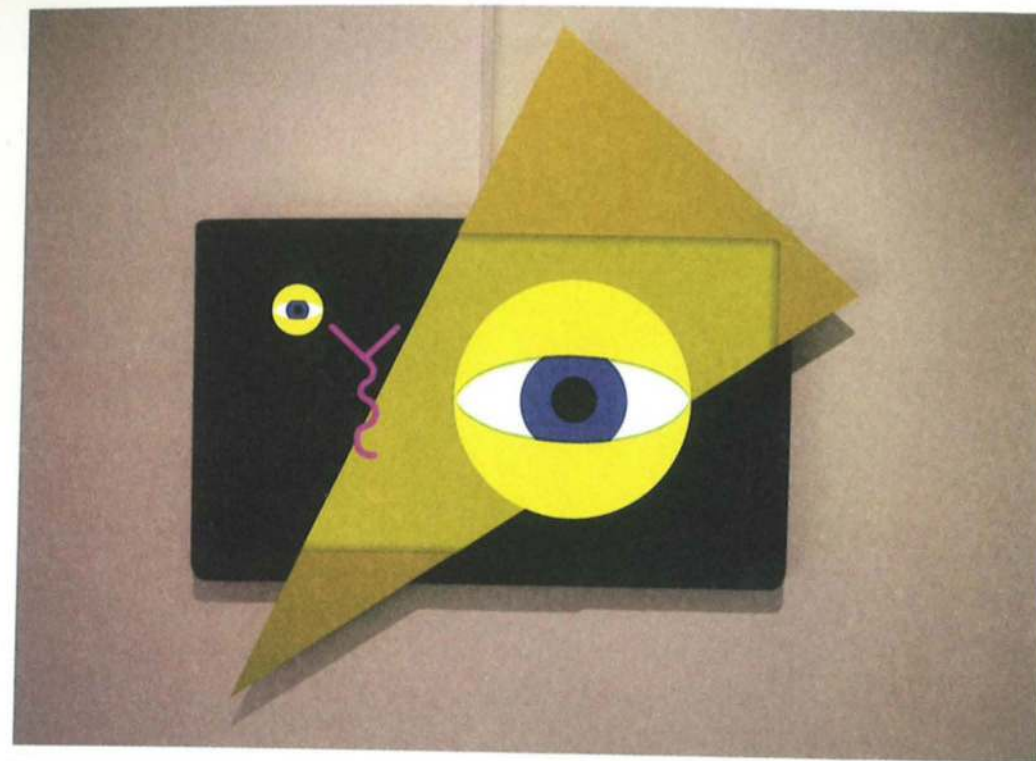
2.

Cover artwork name: *Private Ritual*

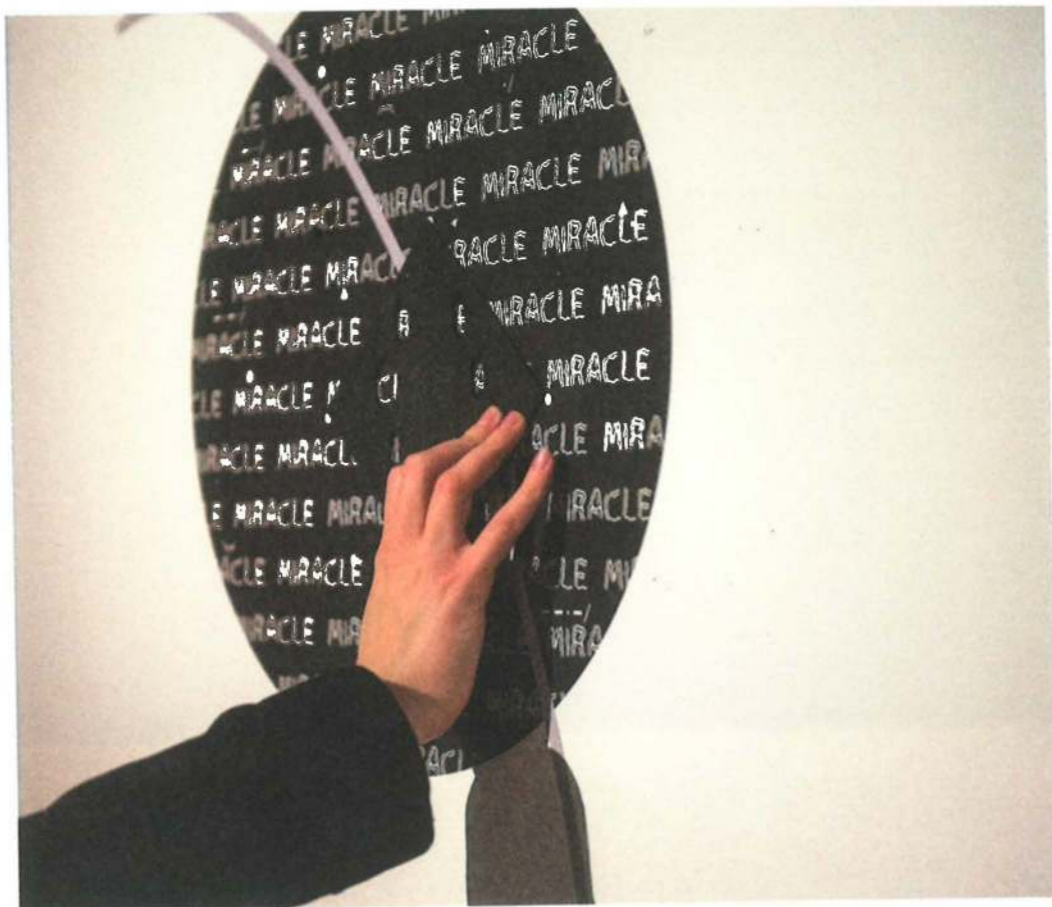
Cover artwork: Video animation of an eye blinking the word 'the' in an endless loop.

Steganography technique: Morse code/camouflage inspired by Jeremiah Denton's eye blinks during the Vietnam War, detailed in Chapter 4.

Hidden word: 'the'



2.



4.

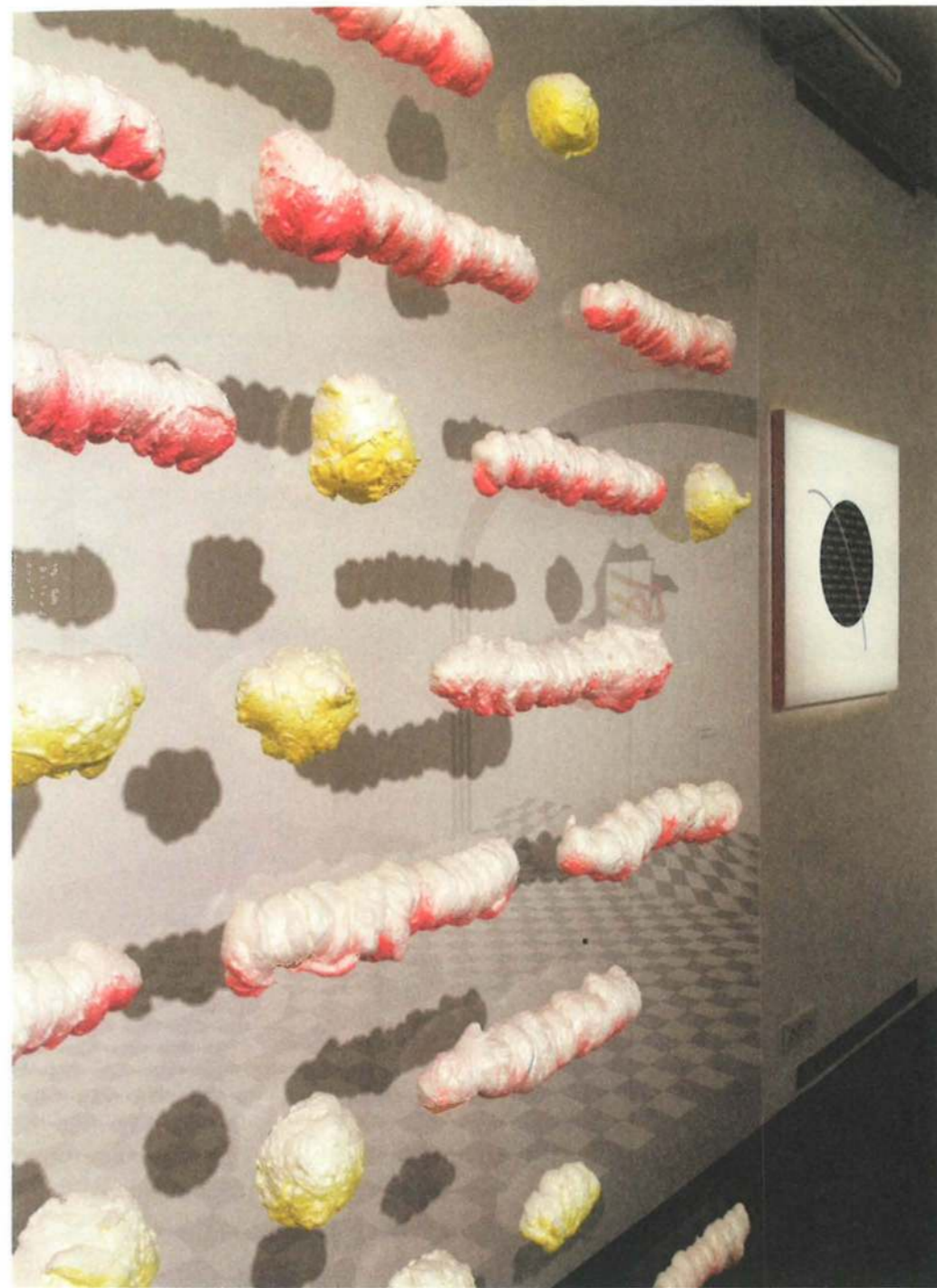
3.

Cover artwork Name: *Pseudo Absence*

Cover artwork: Floating cloud sculptures made of spray foam mounted on a 3 x 2 metre Perspex panel. It was placed 50 centimetres from the wall so that it could cast a shadow of Morse code.

Steganography technique: Morse code, again inspired by the Morse code cross-stitching of Casdagli, detailed in Chapter 4.

Hidden word: 'innocuous'



3.

4.

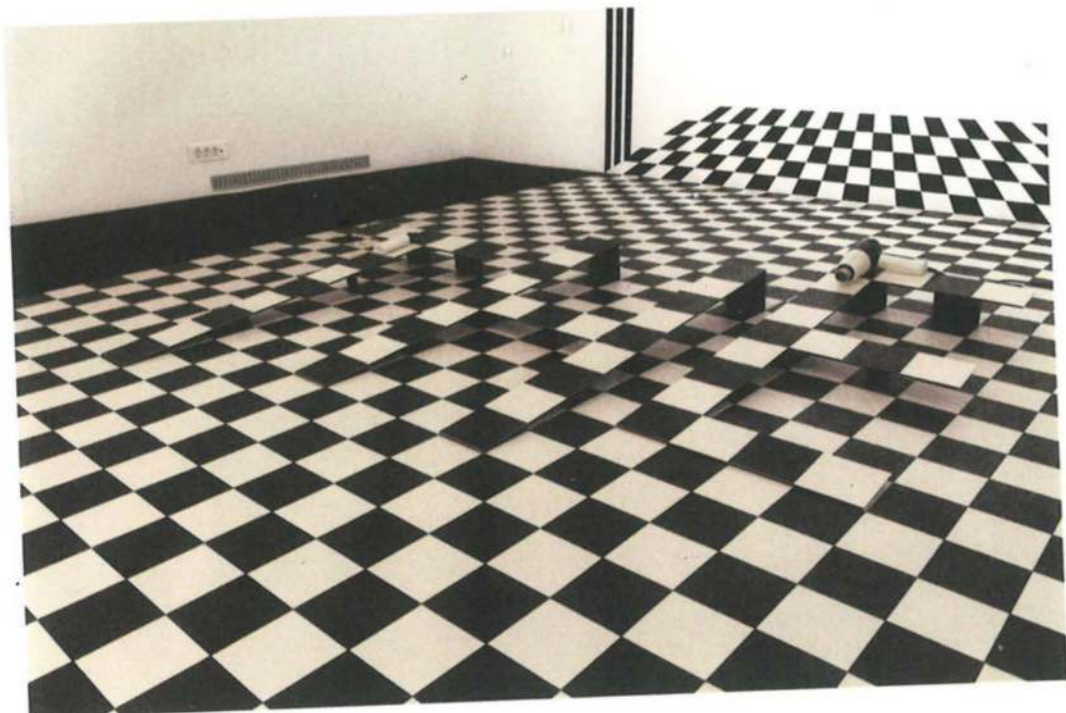
Cover artwork name: *Miracle*

Cover artwork: Printed canvas, depicting the word 'miracle' over and over.

Steganography technique: Cardan grille.

The letters M-I-R-A-C-L-E rearranged by the Cardan grille read out R-E-C-L-A-I-M.

Hidden word: 'reclaim'



5.

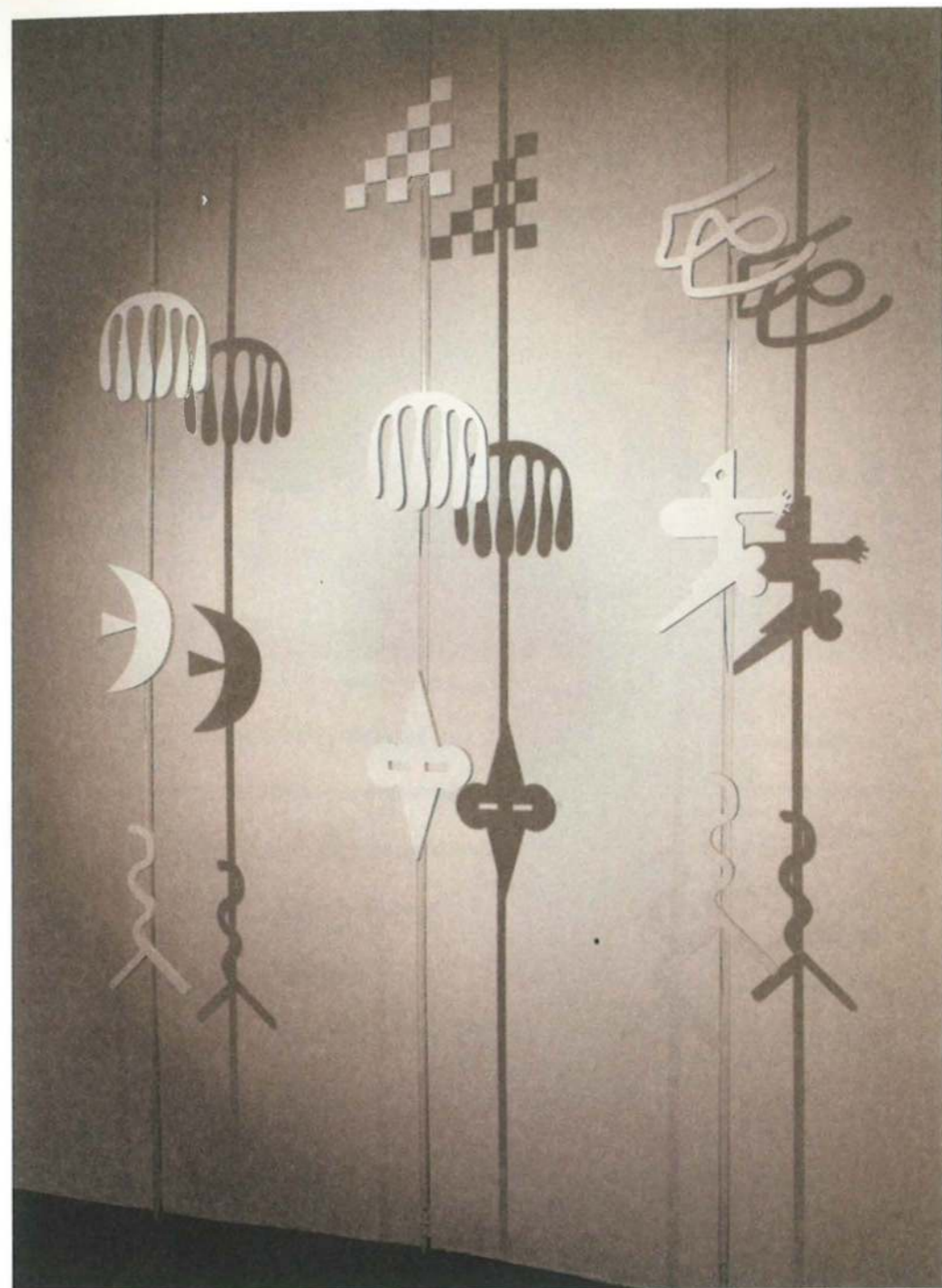


5. Cover artwork name: *Triality and Balance*

Cover artwork: A sculpture, which also functions as the plinth for the activation tools needed to unlock all six art works – a heat gun, bottle with iodine, and Cardan grille.

Steganography technique: Camouflage

Hidden word: 'the'



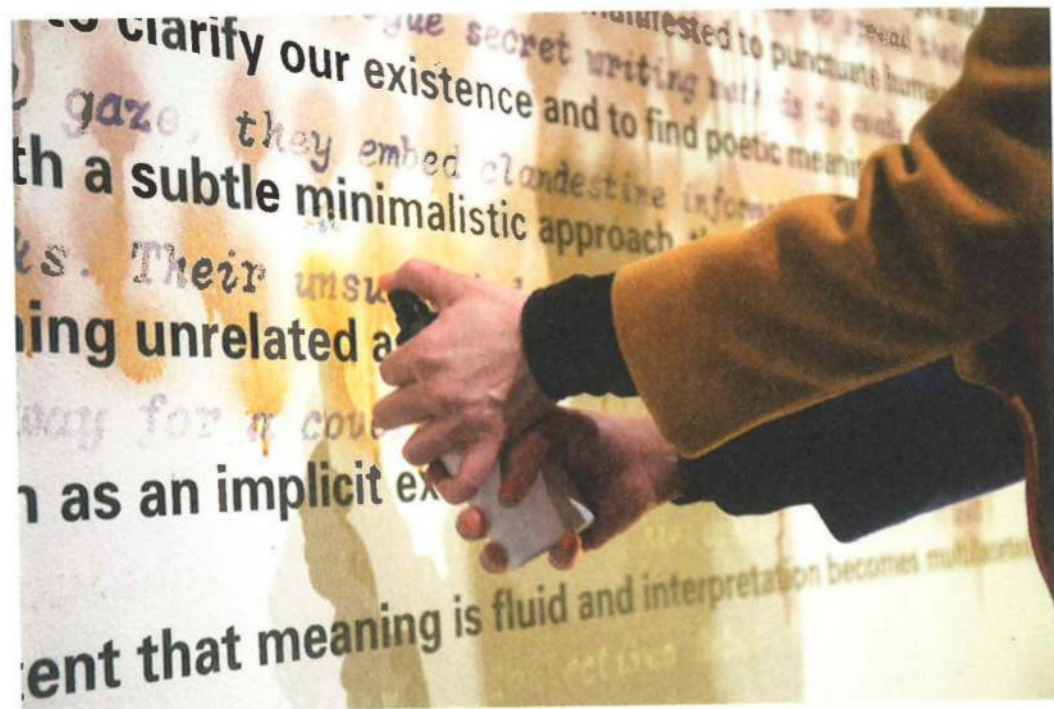
6.

6. Cover artwork name: *Kandy's Ghost*

Cover artwork: Suspended sculptures are painted in the same shade of white as the gallery walls to blend in. When the light hits the sculptures, it casts their silhouettes against the wall.

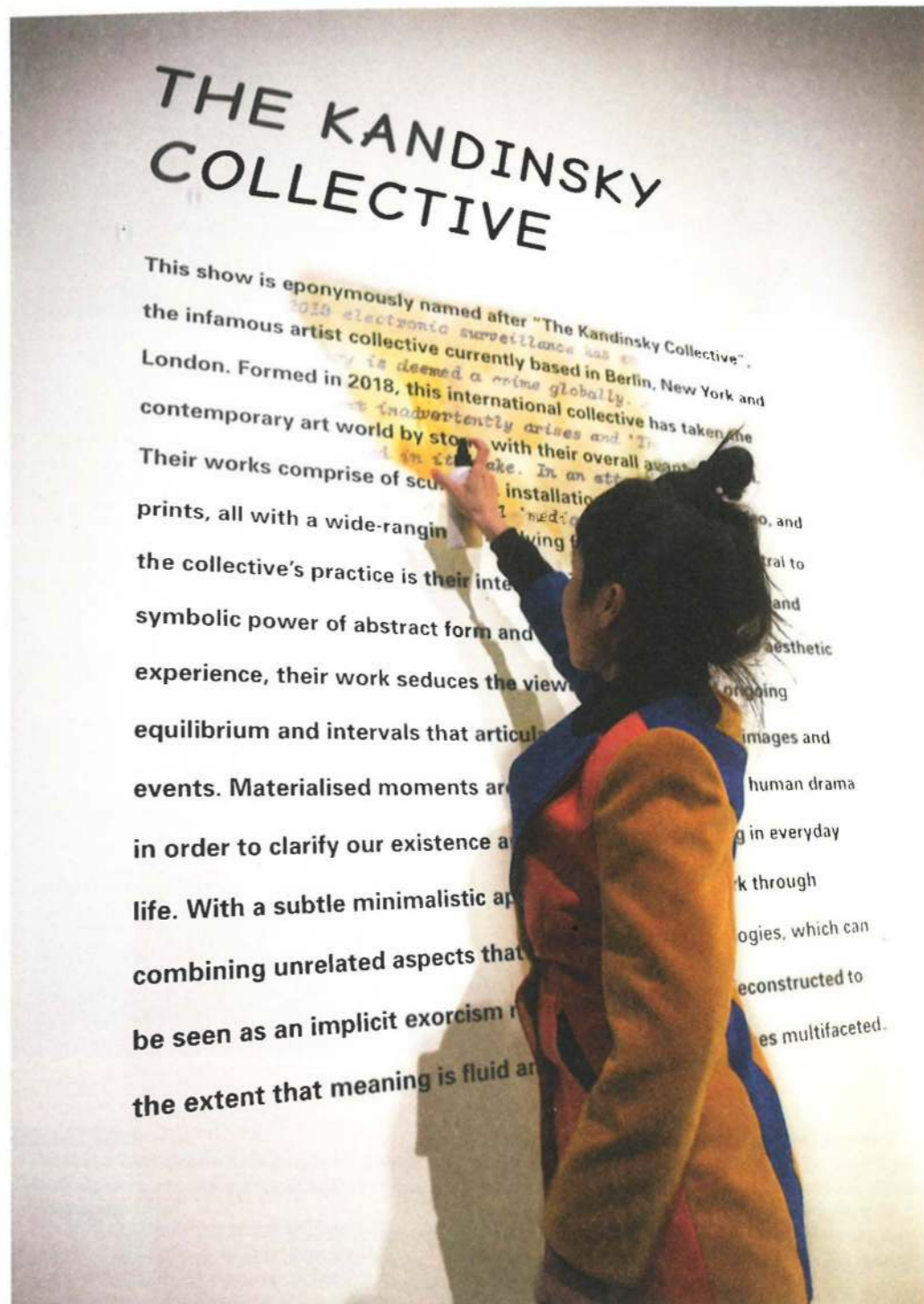
Steganography technique: Substitution cipher.

Each figure stands for a letter in the hidden word.
Hidden word: 'obsolete'



THE GENERAL WALL TEXT

- The *visible* layer is a generic description of the show and the art collective's biography.
- The *invisible* layer, written with invisible ink, reveals the premise of the show – that *The Kandinsky Collective* is actually a group of underground privacy activists who pose as artists.



THE KANDINSKY COLLECTIVE

This show is eponymously named after "The Kandinsky Collective", the infamous artist collective currently based in Berlin, New York and London. Formed in 2018, this international collective has taken the contemporary art world by storm with their overall aesthetic. Their works comprise of sculptures, installations, prints, and all with a wide-ranging practice is their interest in the symbolic power of abstract form and experience, their work seduces the viewer with equilibrium and intervals that articulate human drama in order to clarify our existence and life. With a subtle minimalistic approach combining unrelated aspects that can be seen as an implicit exorcism to the extent that meaning is fluid and

3. Pseudo Absence, 2018

Perspex, expandable foam, light
Copyright © 2018 The Kandinsky Collective
Courtesy of the Centre Pompidou



E

3. Pseudo Absence, 2018

Perspex, expandable foam, light
Copyright © 2018 The Kandinsky Collective
Courtesy of the Centre Pompidou



4. Miracle, 2018

Print on canvas
Copyright © 2018 The Kandinsky Collective
Courtesy of Kunsthalle Hamburg

HE

4. Miracle, 2018

Print on canvas
Copyright © 2018 The Kandinsky Collective
Courtesy of Kunsthalle Hamburg

1. GO TO LETTER 'E', FIND & PICK UP A LOOSE BLACK SQUARE (CARDAN GRILLE)
2. PLACE BETWEEN THE 4 DOTS ON THE CANVAS. A WORD SHOULD APPEAR
3. ONCE DECODED, PLACE THE CARDAN GRILLE BACK ON A BLACK SQUARE ON THE LETTER 'H'

HE

6. Kandy's ghost, 2018

Perspex, light
Copyright © 2018 The Kandinsky Collective
Courtesy of the Guggenheim Museum

T

6. Kandy's ghost, 2018

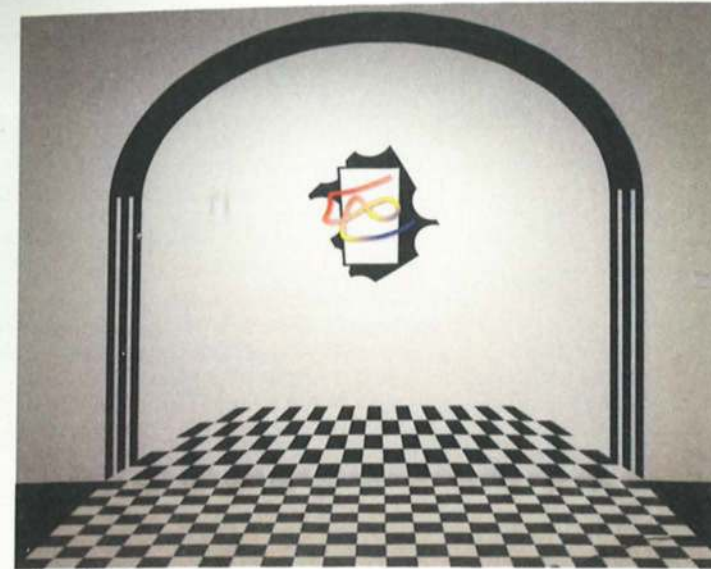
Perspex, light
Copyright © 2018 The Kandinsky Collective
Courtesy of the Guggenheim Museum



EXHIBITION LABELS

- The *visible* layer shows specific information about each fictitious artwork on display: name, date, medium, etc.

- The *invisible* layers reveal ways to further decode each work on display. The information is printed in various types of invisible ink, requiring different methods for activation.



THE LEGEND

- The *visible* layer appears to be an esoteric, pseudo-occult diagram, something that you might see in a Freemasonry temple.
- The *invisible* layer, printed with a combination of invisible inks made out of milk and potato starch, lemon juice and baking soda, reveals a floorplan of the gallery and legend of how to decode the whole

exhibition. Another feature of the wall legend is the key to a substitution cipher – in graphic design jargon called a 'dingbat font' – created from glean-ing the shapes from Kandinsky's paintings. In an extension of my earlier work *A Media Archaeology of Steganography*, the wall documents historically important cases of steganography.

THUNDERCLAP

Thunderclap employs steganography to publicly redistribute the suppressed work of Chinese anarcho-feminist He-Yin Zhen (1886–1920) through the medium of clothing accessories. The work I made was designed to camouflage into the streets of Beijing by co-opting *shanzhai* fashion, the Chinese phenomenon that features nonsense English together with a QR code, as a covert system to publish sensitive knowledge that is designed for a Chinese context.

He-Yin was a theorist who figured prominently in the birth of Chinese feminism in the early twentieth century. The ribbons and embroidered patches contain translated English quotes taken from He-Yin's essays and are nested around the QR code. When passersby scan the code, they can download her original Chinese writing.

Through the use of these 'politically harmless' accessories, knowledge of He-Yin – considered too radical in her lifetime – can circulate and her work can resist further erasure from historical records. He-Yin's writings remind us that feminism is not only a contemporary concept or a Western movement but also one that was articulated in imperial China. By embedding these contemporary accessories with quotes from largely forgotten feminist texts, this act of embodied publishing attempts to reinstate He-Yin's writing back into the public arena.

Central to the *Thunderclap* project is the practice of using one thing to achieve another.

Firstly, clothing was my medium of choice because it instrumentalises and subverts mainstream beliefs that clothing and fashion are superficial. Fashion scholar Sophie Woodward points out how popular and academic discourse treats clothing and fashion as unimportant because it is linked with how the philosophy of the body in the West divides the inner intangible 'self' from the frivolity of the surface. Thus fashion and clothing as material objects worn on the body are considered less significant pieces of culture.

Secondly, I wanted to piggyback on fashion to create a 'walking zine'. The idea here is that fashion accessories act as an alternative publishing medium. They bring the public and the private together – worn on the body, the ribbons and patches are intimate, but worn in the streets their message is distributed to the masses.

Thirdly, *shanzhai* fashion is ripe for steganographic instrumentalisation. Its English characters are not designed to be read but rather

to function as an ornament and value signifier of Western culture, embodying 'high culture', 'edginess' and 'coolness'. However, for English readers, texts may appear as Dada poetry, accidental wisdom or absurd word salads. An inverted equivalent is Asian-looking tattoos in the West, where Asian characters are often hilariously misspelled. In this case, the tattoos' connotation is usually the 'exotic', 'mysterious' and 'spiritual'. Although this trend had its peak in 2000s, Ariana Grande brought it back in 2019 with her inadvertently misspelled tattoo that read 'small charcoal grill' in Japanese. *Thunderclap* takes advantage of the illegibility of English in the context of its use as ornamentation, reclaiming the aestheticisation of foreign language as a steganographic cover. Meanwhile the popularity of the English-language trend helps to further the products' distribution and circulation.

Another tactical site for steganography is the QR code, a technology made massively popular in China thanks to the QR scanner built into WeChat, the nation's most widely used app. Just to give you an idea of its level of ubiquity – informal street vendors and beggars use QR codes as modes of transaction. In light of QR's pervasive visual presence, it inadvertently provides guileless disguise for sensitive knowledge to travel.

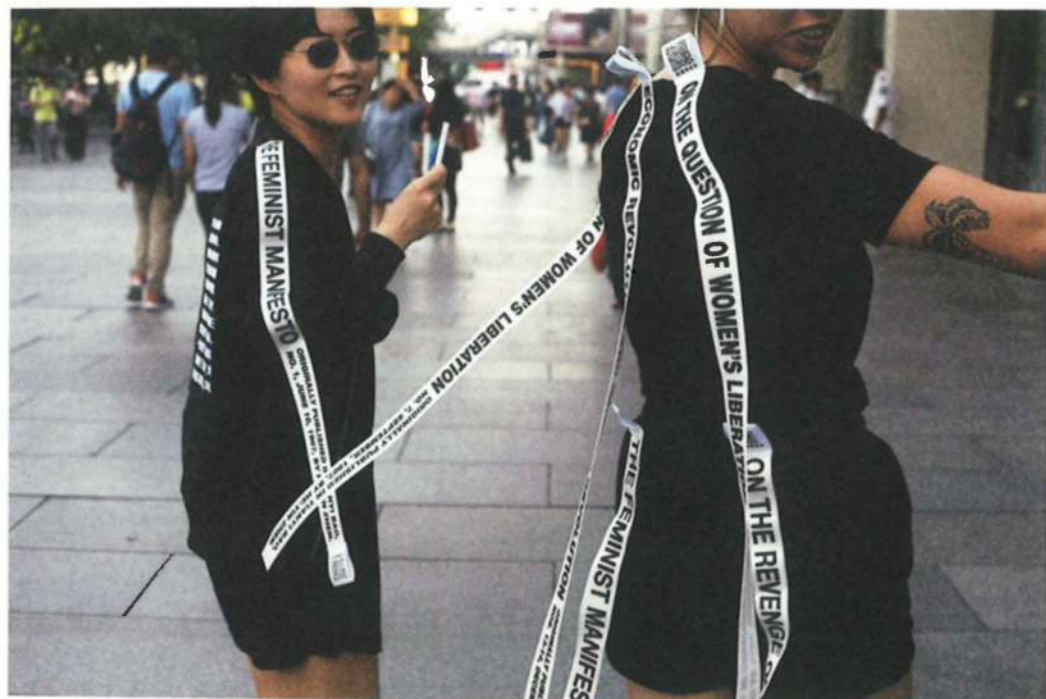
Finally, *Thunderclap* exploits fashion's popularity, so that trends become a sort of 'safety measure' for people distributing He-Yin Zhen's words on their bodies. My decision to use English instead of Chinese was also because it masks statements that may otherwise attract unwanted physical contact. In this way, the work negotiates and balances visibility and invisibility, exclusion and inclusion, online and offline environments, and subversion and innocence.

Solo exhibitions of *Thunderclap* are presented as part-shop, part-sewing workshop and part-exhibition, where visitors can purchase *Thunderclap* accessories onsite. By sewing the accessories onto items that visitors bring from home, I invite everyone to embody He-Yin's texts.

Exhibited at:

- *Thunderclap*, curated by Anna Eschbach and Antonie Angerer, at I:projectspace, Beijing, China, 2017
- *Thunderclap*, co-curated by I:projectspace, the Feminist South project (Kelly Doley, Antonie Angerer and Anna Eschbach) and Talia Linz, at Artspace Ideas Platform, Sydney, Australia, 2019

你好中国读者



壯于奴產主此愈進之以之金一然以非竟狀係



以承歡。此則記載
育制度之起源，與
故羣婚制度與共
宛力之強弱而區為
之男子所壓制。由
而貧富之級遂以
之制，由農奴之制
之制，由賣買結婚
于弱者之位置，則
生產；復出其無用
由腕力之強權易為
隸制之變相；今日
述其故如左。

結婚之制，亦仍
子握金錢之權，可
謂之“財婚”，亦
“近世之結婚，畢
男子則量其經濟

一、凡父母為女擇配，必
子終身計，果能受男子之贍養
官發財與否。蓋以男子能升官發財

二、凡貧家之女，或無父

① “役”，原本誤作“設”，據文義
② “女”，原本誤作注文，據文義
③ “氏”，原本誤作“民”，據文義
1828—1906），著名挪威劇作家，所作社
《社會之敵》，今譯作《人民公敵》。

④ “才貌”，原本誤作“財貌”，據前文改。

“童養媳”

以後始有

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“童養媳”
以後始有
于鄉鄰之
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Thunderclap in I:projectspace, Beijing



《禮記·經》
“吾今
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致一切之感
感情結合，即
錢。金
之感情，以行
界革命，
男女革命，可
行女界革命，
？即顯

出于自
大羞。以其
革命之
潔之婚姻也

節
名譽之主張
及私
間。若平民
欲消滅

則紳士之家族制亦當消滅。而
在紳士閥之視其妻，特
公用使用之說，則對於婦人，
此時或羣起而呼曰：“然則，
然共產黨之目的，則以
其形式，固非彼等意料所及
雖然，彼紳士之誣共產
可嗤也。夫婦人共有制，固
即如彼等紳士，于普通
妻子，猶不滿足。其尤甚者
紳士閥之結婚，其實際所行
張，即如彼等所言。然其
而代彼等偽善陰密之婦人
總之，共產黨人欲禁



與國會政策

卷合刊“社說”欄，一九〇七年
三十一，署“申叔”，題下注
n”^②，文末有“未完”二字；“目
政策”，署名同。續載於第十五

mentarism”。下同。

Thunderclap in Artspace Ideas Platform, Sydney



- ③ “歷史”，原本作“曆史”，據文義改。
- ④ “肄習”，原本作“肆習”，據下文改。

有迷已之十家想更道然者改習規繪非者出



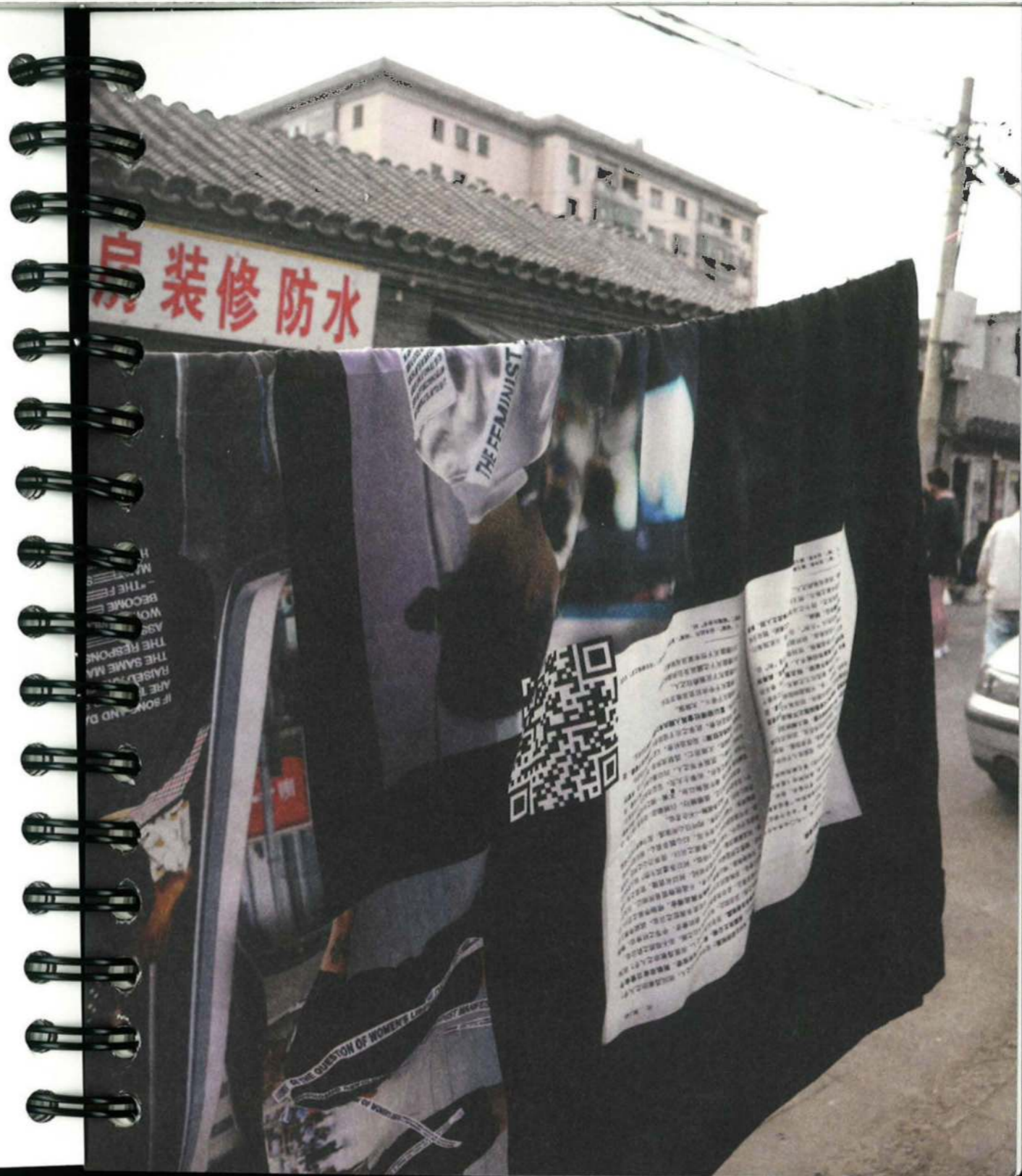
THUNDERCLAP BLANKET



Besides developing *Thunderclap*, during my I:projectspace residency in Beijing, I also printed He-Yin Zhen's words onto a blanket cover. In the traditional courtyard residences called *hutongs*, Beijingers hang up their blankets to air on makeshift clothing lines tied to whatever structure lends support. Lamp posts, trees, electricity posts and the neighbours' air conditioning unit all become extensions of their homes, blurring the boundaries between the public and private space. Seeing the blankets every day reminded me of the Underground Railroad quilt codes used by the enslaved in the US to gain freedom and of *han niang wu*, the SOS symbols used by women in Hunan province, China. This made me think that blankets could be used as a covert publishing platform within the streets of the *hutong* neighbourhoods.

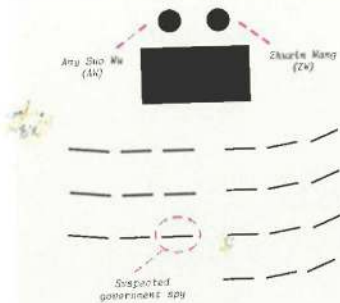
In many cultures, quilts are traditionally the result of women's labour, and a symbol of domesticity and female community born of the often collective making-process. By

repurposing the quilt medium for a publishing action, the *Thunderclap Blanket* attempts to reclaim that space. Within the *hutongs*, blankets are a mundane household item that moves inside and outside the house without raising any alarm bells. They can be read as a transgressive object, migrating between public and private spheres. The blanket is a perfect cover, literally speaking, but also figuratively as an unsuspecting agent that can smuggle and 'air out' private information into the public space. Metaphorically, laundry carries a similar connotation. The term 'launder' is used to refer to the act of legitimising illegally obtained money – to wash away its questionable traces. In contrast, to 'air out dirty laundry' is analogous to disclosing secrets publicly. **The former speaks about erasure, removal, suppression and censorship**, and the latter refers to revelation, communication, going public, leaking and publishing. Because they are mundane, blankets can be used to embed hidden messages in plain sight.



THE CHOICE OF A TRANSLATOR

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Floorplan of event at I:projectspace, Beijing



Photo of the event

Suspected government spy

2

On 22 May 2017, at the end of my artist-in-residency in Beijing, I presented my work in an artist talk. During the residency, I developed the projects *The New Nüshu* and *Thunderclap* to investigate feminism, language politics, steganography, censorship and publishing in the context of China. Just as the event was about to start, a suspected government spy entered the premises and sat down among the audience. Tensions began to grow.

The artist talk was in both English and Mandarin. For every passage of English I spoke, my assistant Zhuxin Wang accordingly translated my words into Mandarin. The audience was made up of those who predominantly understood English or Mandarin, but also some who were fluent in both languages. In an attempt to disarm the suspected government spy who we believed didn't understand English, Zhuxin Wang modified, simplified and omitted some

of the content of the talk through the process of translating. Simultaneously, she skillfully translated enough information into Mandarin so as not to alienate the rest of the Chinese-speaking audience. This transcript reveals how the translator reshapes and depoliticises content, positioning the act of translation as a tool for censorship and steganography. The work is documentation of a live case of evasion tactics enacted during a talk about evasion tactics.

Exhibited at:
- *Hutong Whispers*, curated by Davor Mišković, at Drugo More, Rijeka, Croatia, 2018
- *Thunderclap*, co-curated by I:project space, the Feminist South project (Kelly Doley, Antonie Angerer and Anna Eschbach) and Talia Linz, at Artspace Ideas Platform, Sydney, Australia, 2019



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What you are about to read is documentation of a live case of evasion tactics enacted on a talk about evasion tactics.

1

323 AW: Born in 1886 and
324 lived in Imperial China
325 until she died around
326 1920. He Yin Zhen figured
327 centrally in the title
328 of *Qilunuo* (Qilunuo). She
329 was a theoretical scholar
330 and co-editor of *Tianqi*
331 Bao or *Natural Justice*, a
332 magazine which featured
333 writings of many women
334 and scholars. Many of her
335 male peers were recognized
336 in history, however He Yin
337 Zhen is relatively unknown
338 in China and abroad. This
339 action aims to reinvent He
340 Yin Zhen's writing back
341 into Chinese history and
342 public knowledge, because
343 her *Qilunuo* writings were
344 considered radical (and
345 dangerous) for her lifetime
346 and not recorded well in
347 history. Furthermore, her
348 writings reminds us that
349 feminism is not only a
350 contemporary (Western)
351 consciousness but also one
352 that was articulated pre-modern
353 China.

ZW: Born in 1886 and lived
in Imperial China until
she died around 1920. He
Yin Zhen figured centrally
in the birth of *Qilunuo*
magazine. She was a scholar
and co-editor of *Tianqi*
Bao or *Natural Justice*, a
magazine which featured
writings of many women
and scholars. Many of her
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and not recorded well in
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writings reminds us that
feminism is not only a
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consciousness but also one
that was articulated pre-
modern China.

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134
135
136
137
138

The left column is spoken
in English. The voice is
Any Suo Wu (AW).

The right column is the
Chinese translation of
AW, translated back into
English. This voice is
Zhuxin Wang (ZW).

EDIT LEGEND

modified
cut-out
depoliticisation

modified
cut-out
depoliticisation

3

1473 AW: When developed an alternative system not to
1474 challenge status quo, but
1475 rather as a coping mechanism, by giving themselves
1476 a tool to maintain their mental health and release
1477 emotional turmoil accumulated by living in an unequal
1478 social structure. Even though this written language did
1479 not challenge anything, it was a great support for the
1480 local women. Nüshu was never meant to be a secret
1481 per se, in the sense that it wasn't designed to exclude
1482 men - rather men knew very little about it or were
1483 uninterested in it. In this context, 'code' or 'secret'
1484 refers to the unknown and less about the deliberate
1485 withholding of information.

ZW: When developed an alternative system not to
challenge status quo, but
rather as a coping mechanism, by giving themselves
a tool to maintain their mental health and release
emotional turmoil accumulated by living in an unequal
social structure. Even though this written language did
not challenge anything, it was a great support for the
local women. Nüshu was never meant to be a secret
per se, in the sense that it wasn't designed to exclude
men - rather men knew very little about it or were
uninterested in it. In this context, 'code' or 'secret'
refers to the unknown and less about the deliberate
withholding of information.

(no translation)

1499 To quote Nüshu researcher,
1500 Cathy Silber, "Nüshu was
1501 not a distributed equality
1502 in a social relation; the
1503 impact of exclusion depends
1504 on which side is benefiting
1505 it."
1506
1507 Nüshu being drawn to
1508 Nüshu's subversive/tactical
1509 potential as a code to evade
1510 censorship and social police
1511 is to form community, how
1512 was it actually Nüshu about
1513 that issues of gender and
1514 Chinese feminist needed to
1515 be addressed in combination
1516 with the former-top threats

33

HUTONG WHISPERS



The exhibition *Hutong Whispers* is a steganographic catalogue of steganographic publishing projects camouflaged as a laundry line. Building on the work of *Thunderclap* and the blanket developed in 2017, this exhibition co-opts three omnipresent elements of the Chinese urban landscape – bedsheets, *shanzhai* fashion and QR codes. *Hutong Whispers* explores the potential of these elements as covert media to publish sensitive and suppressed knowledge. This installation work was designed to eventually be placed back into the traditional *hutongs*, or residential alleys of Beijing, so that it may return to its natural habitat – the context by which it was originally inspired.

Inside the *hutongs*, bedsheets and blankets are hung on laundry lines that stretch from entrances of homes onto the street. They can be read as transgressive objects because of their migratory nature trespassing the lines between public and private. Bedclothing is also perfect cover, literally and metaphorically. The blanket is a nondescript agent, detectable but unremarkable.

Because of its ordinariness, it is free from suspicion and can smuggle (air out) private information to the public setting.

Hutong Whispers reconfigures *Thunderclap* and *The Choice of a Translator* into hidden information. It also includes its genesis, a selection of tactical and strategic uses of steganography that inspired the exhibition. As a whole, the project functions as a basic technical primer on steganography as a type of secret writing. Last but not least, the show includes related projects and references submitted by Clara Balaguer (Hardworking Goodlooking), Dušan Barok (Monoskop), Kelly Doley, Jessie Yingying Gong, Linda Zeb Hang, Elaine W Ho, Janez Janša (Aksioma Institute), Woodstone Kugelblitz, Javier Lloret, Silvio Lorusso, Nadine Stjins and Nathalie Wuerth.

This solo exhibition was curated by Davor Mišković, at Drugo More, Rijeka, Croatia, 2018.





5.2 Workshops



Where: Hacking elective, Willem de Kooning Academy, Rotterdam, the Netherlands, 2015
Duration: 7 days

Workshop outline:

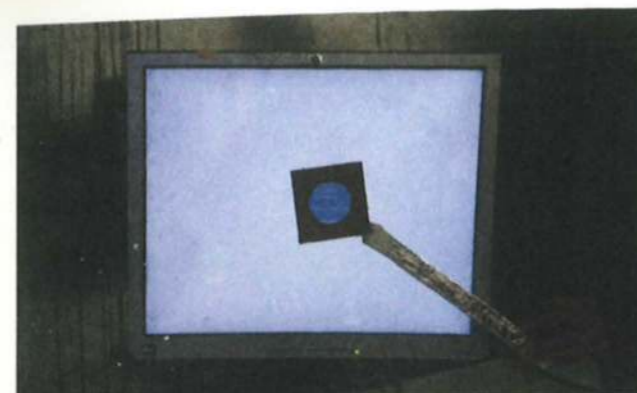
In the book *The Crying of Lot 49* by Thomas Pynchon, the central mystery is the symbol of the muted horn, a sign for an underground mail system known as W.A.S.T.E.

Imagine you find yourself being monitored and your group needs to communicate to each other. In groups of four or five, develop your own alternative communication method and distribution channel or piggyback on an existing communication channel, e.g. flyering, postal, private courier services. For example, in Rotterdam there are many former Willem de Kooning Academy students who are work as

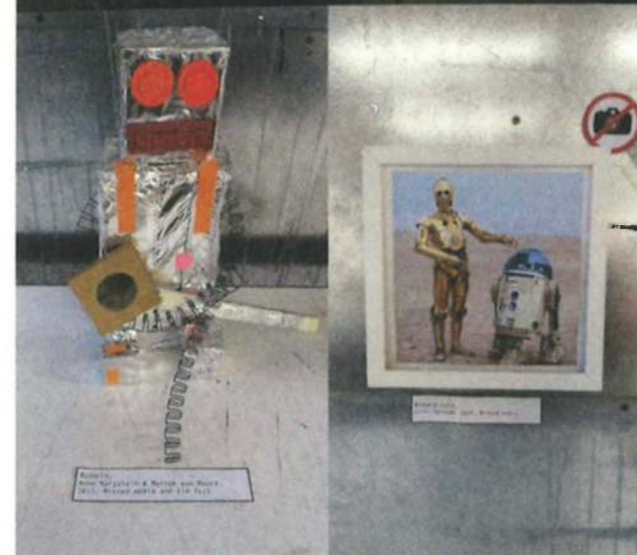
post officers. It could be interesting to ask them to collaborate in creating an underground system within the postal service to help grow a network carrying hidden messages. Within the given time, you are to test and prototype your method. Present documentation on the final day.

Things to consider:

- What kind of group are you?
- What/where are your meeting places?
- What kind of communication channels/platforms do you use?
- Do you use a specific language?
- Where does your communication take place, online or offline?
- Are these public or private spaces?
- What forces govern these spaces?



'Our group started the infrared project from a thought process linked to the invisible ink lesson, invisible ink is not visible for the human eye, and from this we thought of other things invisible to the human eye. Infrared being one of them. And like invisible ink, there are ways of making it visible, which made it perfect for cryptographic experiments.'



We started by looking into infrared itself, how does it work? How can we use it within a context? What message do we want it to send? Because we all did different research we all came up with different ways of implementing the infrared. This is how the scavenger hunt came to be: adding all our pieces to make one quest for the viewer. [We used] infrared in the first picture [to signal a] binary coded message, which gave the key to the second image, a sculpture of a robot. This robot had braille lighting, which gave the key when decoded to the third piece, which could only be viewed with the tool in the hand of the robot.'

The Infrared Scavenger Hunt group



Infrared Scavenger Hunt, Jordi Verbaan, Steven van der Gaarden, Marish van Meurs, Belinda van Booma and Anne Marjolein Pink

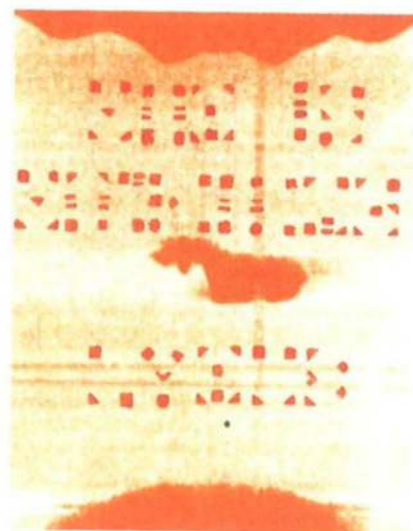
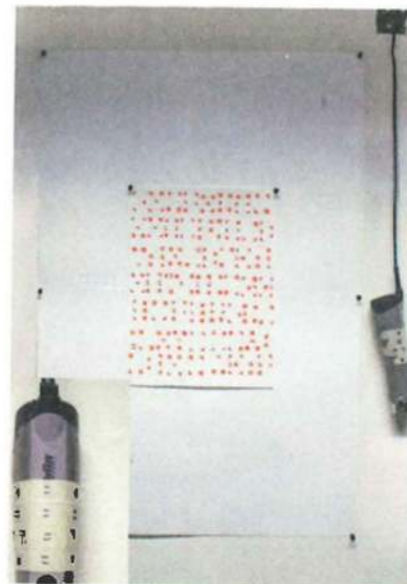
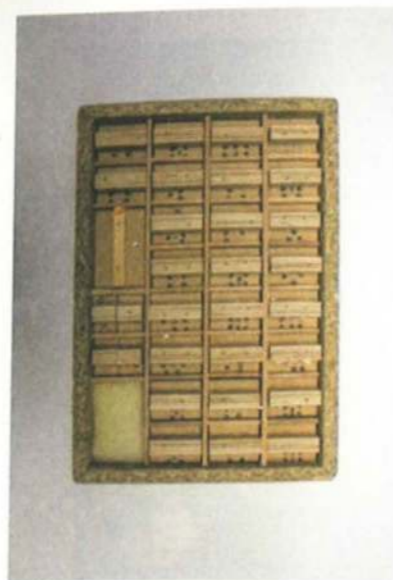




Invisible ink exercise, Ines Falcao Ferreira



Camouflage exercise, Esmee Verheijen and Suzette Silvy



Substitution cipher stamps printed with thermal ink, Sarah Amrani, Job Bos, Veerle Kluijfhout and Eva Bomert

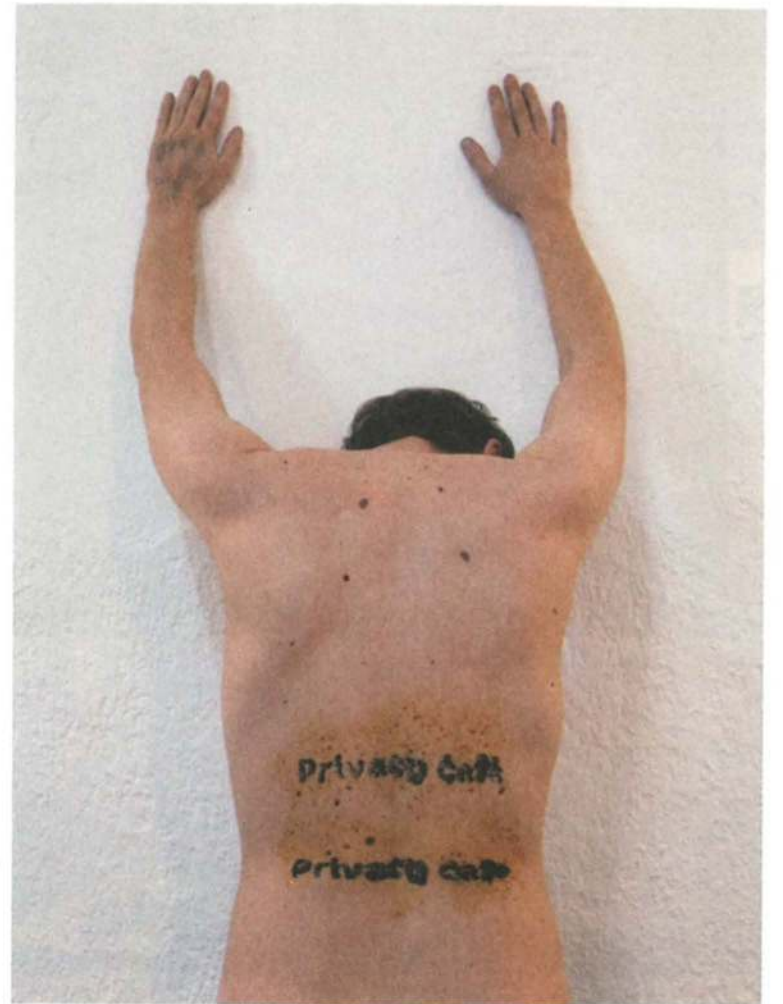


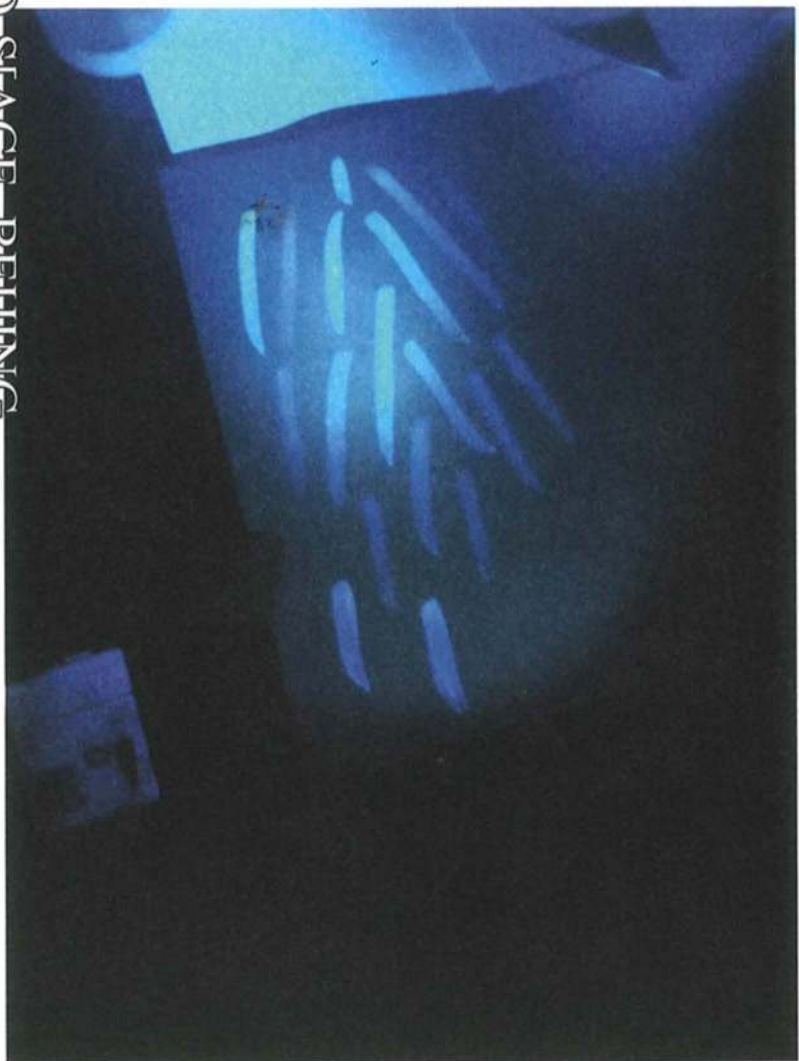
Where: Mine, Yours, Ours Festival, Rijeka, Croatia, 2016
Duration: 3 hours

Workshop outline:

This is a workshop on how to make, apply and activate various kinds of invisible inks such as lemon juice, starch, milk, baking soda and saliva. Prior to commencing this workshop, I printed three invisible ink recipes in their corresponding invisible inks and posted them up in the vicinity of the festival grounds. As a workshop organiser, do the same in a high-traffic area. I handed participants the locations marked on a printed map. However, you can

also choose to communicate the whereabouts of the posted recipes in less obvious ways such as with a riddle. Divide into two groups (if your group is larger than twelve people, divide into four smaller groups) and go out and search for the invisible ink recipes posted around the area. On the posted recipe written in invisible ink there is a visible key that tells you how to activate the ink. After activation, follow the recipe to make your own invisible ink. Try to experiment with this technique by communicating with the other group through the medium of invisible ink.





*Where: Q-Space, Beijing, China, 2017
Duration: one afternoon*

*Workshop outline:
An informal presentation
accompanied by a demonstration
of invisible ink. At Q-Space
headquarters, a queer/feminist
space, we used laundry powder as
an optically activated invisible
ink and were thrilled to see that
it worked beautifully.*





*Where: The Influencers,
Barcelona, Spain, 2017
Duration: 3 hours*

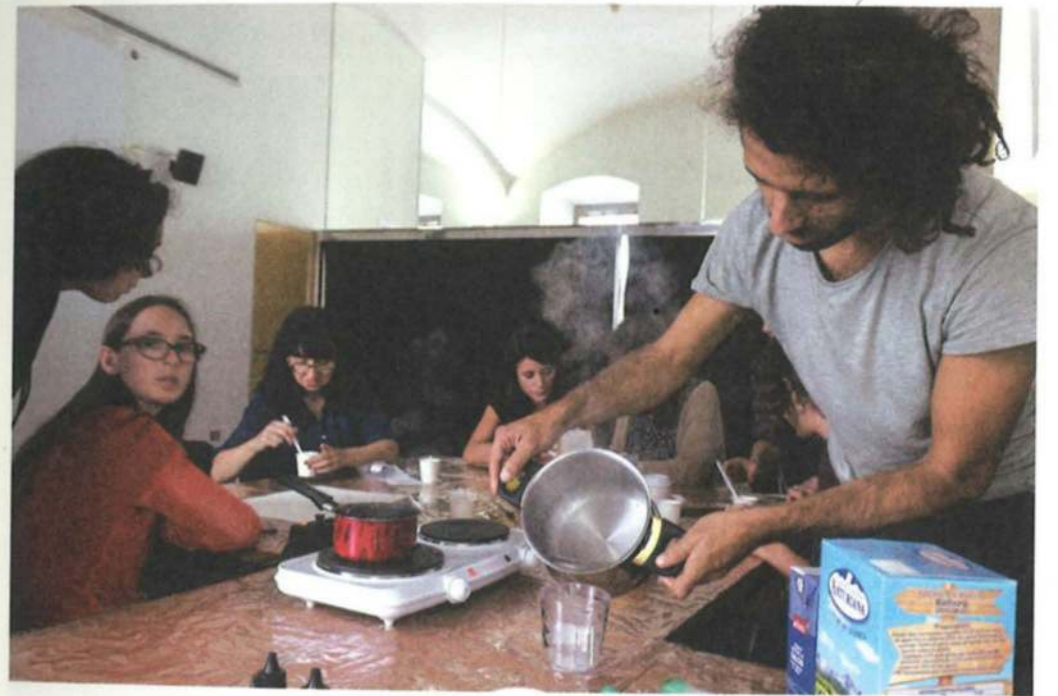
Workshop outline:

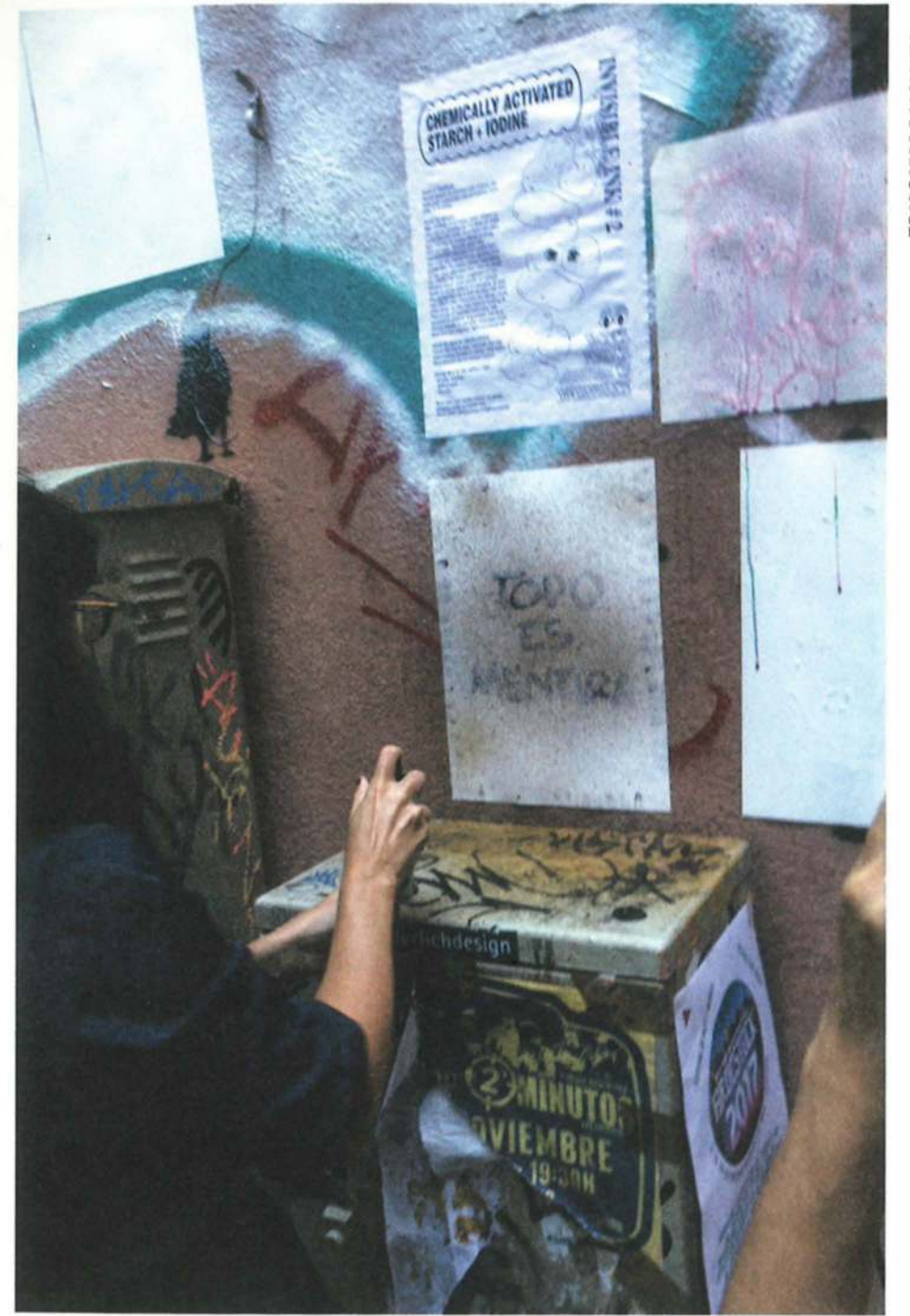
The goal of the workshop is to make street posters using invisible ink. When I ran the workshop, the invisible ink recipes were printed in regular black ink on posters that were placed up around the streets in the area. Maps of the posters' city locations were handed out. Participants were to take a photo of the different recipes when they

found them scattered in the city. They were to use these invisible ink recipes to make their own street posters. Since this workshop was in the midst of the Catalonia independence movement of 2017, I invited them to reflect on the political landscape in the spirit of the time.

Once the posters were made and dry, we put them up in the public sphere and marked them on a map.

Finally, we walked through the city and activated all the posters together. You may choose to work individually or in groups.





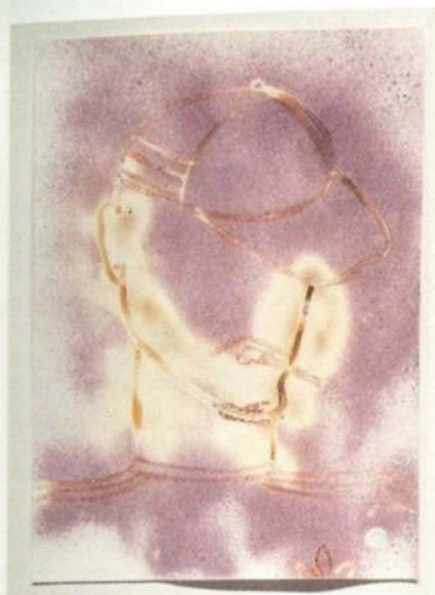


Exercise 1 by Yassemin Vafa and Sonia Nikolaeva

Where: Project week at The Royal Academy of Art (KABK), The Hague, the Netherlands, 2018
Total duration: 4 days

Exercise 1: Vulnerable groups. After material experimentations with various invisible inks in the morning, I introduced this exercise in the afternoon: some groups are more likely to be

placed under surveillance than others. Pick one vulnerable group and research why it is so. Using invisible ink, create portraits in the broadest sense of the meaning (icons, drawings, lists of actions, etc.) that represent your chosen group/community. Use the properties of the various invisible inks to help tell your story. Work in pairs.



Exercise 1 by Merel Meijer and classmate



GAIT ID, Rebecca Joly and Clara Lezla

'This project is the reflection of our research into GAIT, a surveillance system created in China assessing the way you walk. The system can identify people based on the way they walk. Researchers in Japan have designed an improved gait recognition method to identify people from video surveillance records. The GAIT system identifies terrorist profiles. Our project is critical of the way that people can be misidentified as potentially dangerous.'



Grocery memories, Zahari Dimitrov and Selina Landis

'Reflection on the case where the information collected through the customer card of [Dutch supermarket chain] Albert Heijn leaked and has been used to discriminate against its customers. In one case a woman saw her social assistance [low-income welfare] cancelled because she was accused of buying products out of her price range, such as premium steaks.'



Exercise 2: Forbidden words.

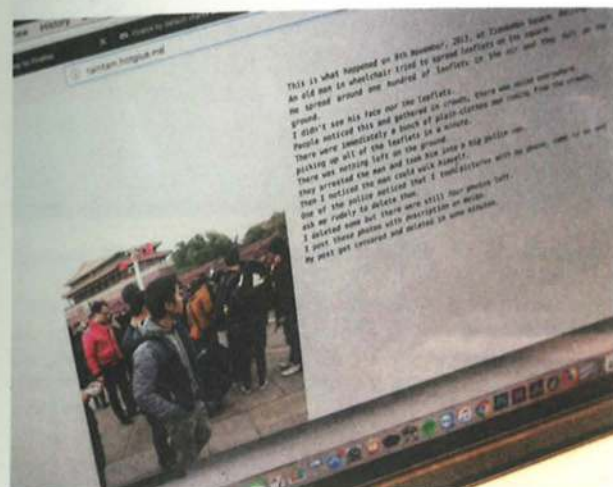
In 2017 under the Trump administration, the Department of Health banned particular words from appearing in budget proposals from the leading national public health institution, Centers for Disease Control and Prevention. Among those words were 'vulnerable', 'entitlement', 'diversity', 'transgender', 'fetus', 'evidence-based' and 'science-based'.¹

The ban brought to mind George Orwell's dystopian novel 1984 and the concept of 'Newspeak'. According to Wikipedia, 'Newspeak is a controlled language, of restricted grammar and limited vocabulary, meant to limit the freedom of thought - personal identity, self-expression, free will - that ideologically threatens the régime of Big Brother and the Party.'²

The aim of Newspeak is to narrow the range of critical reflection and action. Such language prohibition promotes

the use of doublespeak, which is euphemistic language obscuring and distorting meanings. According to Macquarie Dictionary, doublespeak is 'convoluted speech which attempts to alter the usual connotations of the words being used, often under a mask of technical jargon.' In pairs, pick one word from Trump's list. Develop a substitute work in doublespeak and a short written definition about what it means or how it can be used. Embed doublespeak words and meanings within the physical space of the school environment or online sphere. Use transferable steganographic methods such as the Cardan grille or null cipher and design the key for another group to unlock. Short presentations at the end of the day.

Looking back on this assignment, I think there were too many steps and that made it unnecessarily complex. However, I leave it here because the work and conversations generated by the students were valuable and productive.



Work by Kexin Hao

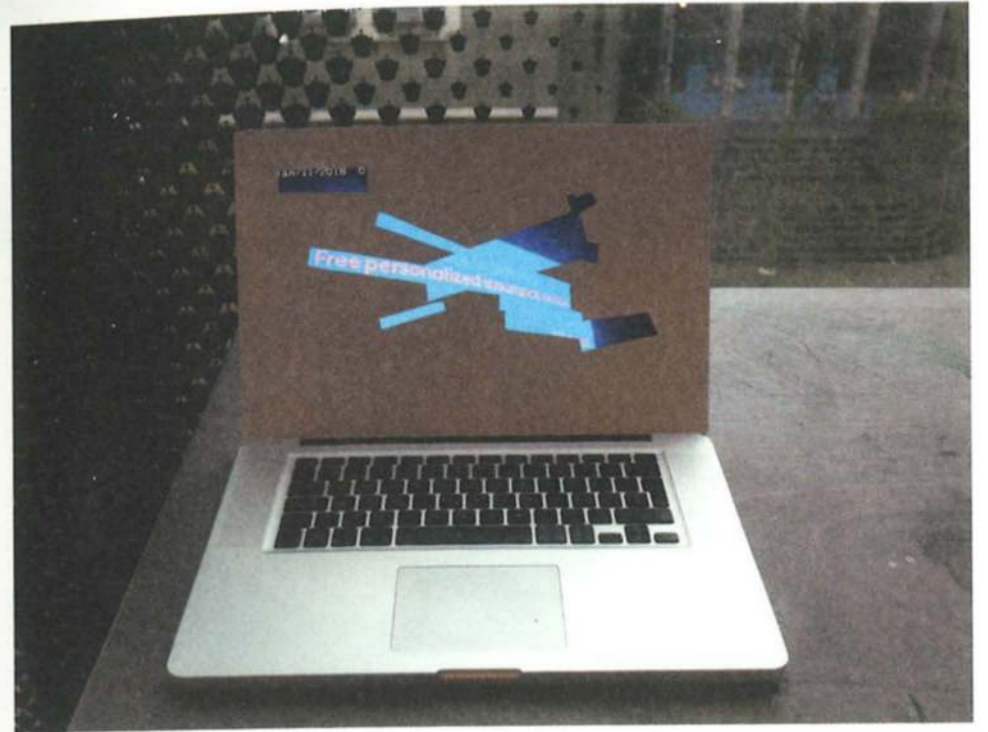
'This steganographic method combines a colouring game with a QR code that leads [the user] to content blocked by Chinese media censors. The QR code is widely used in China in everyday life. It makes online payment and access to online media super easy. I think it would be interesting to use the QR code as a method to link to stuff that has been blocked, but only with the effort from yourself - you have to solve this puzzle by colouring the map according to certain numbers. By inviting people to "unblock" the sensitive content in a hard way, I want to show how intense it might be to live under the media censorship, and [explore] the potential of steganography.'





Trump Tweets by Radek Górnjak and Aliz Soós

'We came up with a definition of "transgender" that would not use words that Donald Trump has banned: "misaligned identifiers - individuals whose gender identity does not match their birth one" and then we used the fact of how much useless information Trump is tweeting all the time. The cards that we have made shows a timestamp of a specific tweet, so if you hold it against a screen, it shows only a short word out of the whole text. Combining all of the cards spells out our alternative definition.'



Zahari Dimitrov and Selina Landis

'Although not directly related to newspeak, we appropriated words from billboards found on free webcam streams. By cutting out the exact angles for each word we composed new sentences.'



1. 'How CDC's Forbidden Words Will Harm Public Health And Research', *Forbes*, accessed 1 December 2017, <https://www.forbes.com/sites/judystone/2017/12/22/how-cdcs-forbidden-words-will-harm-public-health-and-research/#1e62797d4e91>; 'Forbidden Words: Censorship at the C.D.C.?', *The New York Times*, accessed 1 December 2017, <https://www.nytimes.com/2017/12/22/opinion/censorship-cdc.html>; 'Up-roar Over Purported Ban at C.D.C. of Words Like 'Fetus'', *The New York Times*, accessed 1 December 2017, <https://www.nytimes.com/2017/12/16/health/cdc-trump-banned-words.html>.
2. Newspeak, Wikipedia, accessed 17 January 2018, <https://en.wikipedia.org/wiki/Newspeak>; list of newspeak words https://en.wikipedia.org/wiki/List_of_Newspeak_words.

PHOTO CREDITS

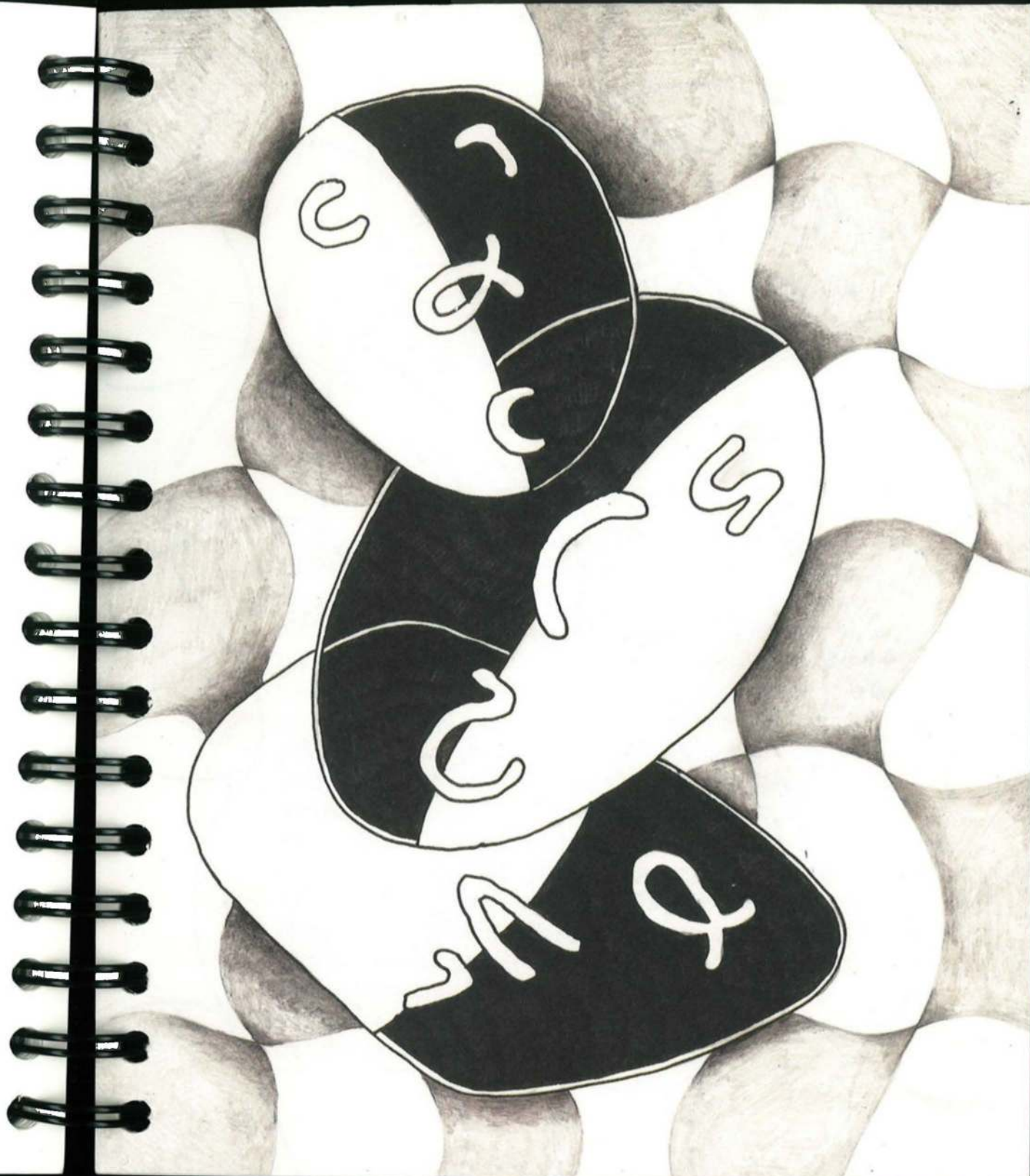
Art work

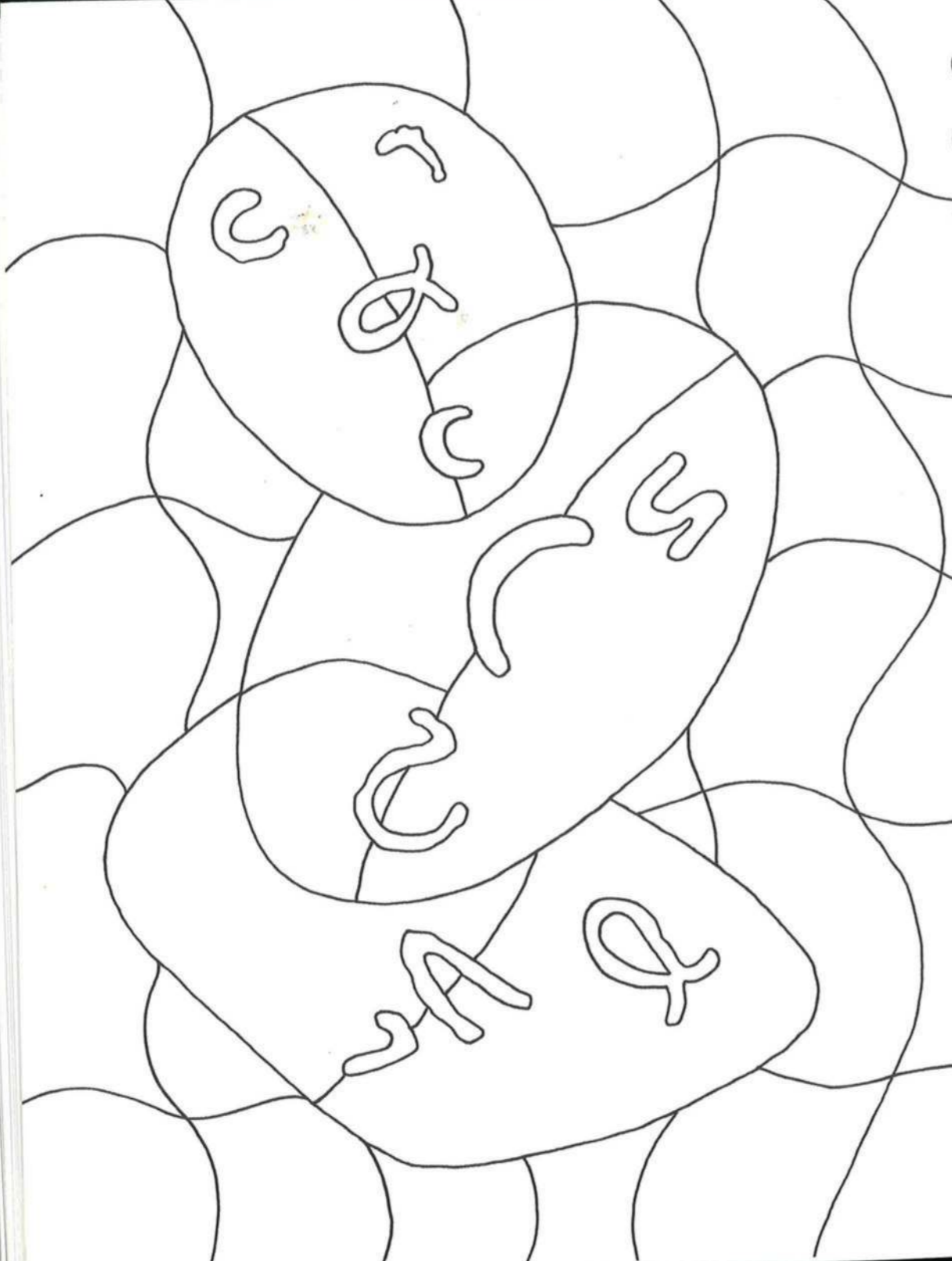
- *A Media Archeology of Steganography*: Photos by Aad Hoogendoorn and Maja Medić
- *TLTRNW*: Photos by Sander van Wettum and Lotte Stekelenburg
- *Greetings from the Invisible Borderlands*: Photo by Mihail Bakalov
- *The Kandinsky Collective*: Photos by Janez Jansa and Jure Goršič
- *Thunderclap*: Photos in Beijing by Jeff Yiu. Photos in Sydney Artspace Idea Platform by Richard Phillips
- *Hutong Whispers*: Tanja Kanazir

Workshops

- Willem De Kooning Academy: Photos by the students
- Qspace: Photos by Varsha Mahajan
- The Influencers: Photos by Carlos Monroy

Photos that are not credited are mine





Conclusion

My journey into steganography first grew from my desire to address and subvert surveillance. In hindsight, I have come to realise that my initial perspective was rooted in a generalised, Western perspective. In 2017, I had the opportunity to participate as an artist-in-residence at I:projectspace in Beijing and ZK/U in Berlin. With gratitude to the experiences and the generous people I met along the way, and a pivotal period of reflection about my own identity in the aftermath of the two residencies, my research project shifted perspective – namely, taking a feminist, post-colonial lens. This lens opened up new doors and brought forth many new questions. For instance, how are steganographic practices tied to the performance of innocuousness and femininity? What can steganography teach us about gender roles and the values assigned to them by society? How are gender roles and racial stereotypes tampered with to subvert and camouflage? How can steganography be a critical tool to investigate stereotypes, social norms, archetypes and things that we take at face value?

Over the course of this project on steganography, I have encountered many examples of innocuousness and femininity being performed as an embodied part of steganographic practices. These practices often take advantage of perceptions of innocence, as exemplified by the women who carried invisible ink messages; the cryptographic feature concealed and neglected in the Barbie typewriter for young girls; and the childish homonyms of Chinese memes that carried political dissent. Especially during war time in the twentieth century, secret messages were often masked in 'women's work' such as the cross-stitch samplers by Alexis Casdagli, knitting done by female secret agents and the quilted blankets of the Underground Railroad. The fact that decoration and ornamentation are so frequently co-opted as carriers of secrets speaks volumes about their perceived societal value. It highlights their deemed frivolity, counting on the fact that one is sure to dismiss it.

In a Mulan-esque move, women have been known to don themselves in male attire to fit into a patriarchal society. In their text 'Seafaring Women', Anastasiia Palamarchuk and Rebecca Sittler show detailed accounts of nineteenth- and twentieth-century female stowaways that posed as male sailors, hiding in plain sight with their clothing and their 'stereotypical behaviour'.¹

Which brings me to the recurring motif of stereotypes used as deceptive devices, extending from the trustworthy old lady who smuggles code into her knitting to the eccentric artist who is able to cross enemy lines. The so-called harmless guise of performance art for Chinese feminist activist protests allows them to reach a public audience without being immediately stopped by a government that forbids public demonstration.

A Cookbook of Invisible Writing is the distilled culmination of my exploration into the intriguing and shapeshifting world of

steganography, involving research and practice. For four years I've worked under the auspices of the research project Tactics and Poetics of Invisibility to resuscitate low-tech, analog and obsolete steganography – first, as a tactical response to the pressing issue of high-tech digital surveillance; later, additionally, in response to the rising tide of racism, misogyny and fascism.

I explored analog forms of steganography as a way to make up for the deficiencies of digital communication – the practical act of evading the digital gaze. And I came to the conclusion that in facing the open waters of the online world, a revival of the analog world of paper and invisible ink should seriously be considered. The aim of my project, however, was never to replace one form of communication with another. Steganography is a tool, to be used together with existing communication tactics, mediums and platforms. My approach has resulted in the hybrid use of cryptography alongside steganography, and analog alongside digital forms of communication.

During this time, I've also explored the poetic and creative potential of alternative modes of communication and how they might work to strengthen community bonds by giving workshops and sharing knowledge in community settings across Europe and China. Beyond its tactical modes of resistance, steganography can also assist in building deeper and more meaningful relationships. My hope is for these techniques to transcend short-term hit-and-run tactics and foster social ties over time. Finally, it is my sincere hope that this Cookbook might be able to contribute to the conversation by helping you make small changes and perform acts of resistance at whatever scale, wherever you find yourself to be. <3 <3 <3

1. 'The Institute for Inverted Histories (IIH)', Rebecca Sittler (blog), accessed 12 April 2018, <http://www.rebeccasittler.com/iih>; Institute for Inverted Histories (blog), 2015, accessed 12 April 2018, <http://www.invertedhistories.com/>.

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Colophon

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Biography

Amy Suo Wu was born in China, grew up in Australia, and lives in the Netherlands as an artist and teacher. Her practice is an exploration into how to (re)activate, amplify and preserve erased or obscured histories in critical and playful ways. She is currently a graduation project supervisor at Experimental Publishing at Piet Zwart Institute, and teaches at Cultural Diversity at Willem de Kooning Academy, both in Rotterdam.

Recent solo and group exhibitions have been held at Artspace Ideas Platform, Australia; Drugo More, Croatia; Aksioma - Institute for Contemporary Art, Slovenia; Kunsthau Langenthal, Switzerland; I:projectspace, China; Seoul Mediacity Biennale, Korea; TENT Rotterdam and Showroom MAMA, the Netherlands.

She has lectured and facilitated workshops at Artez Graphic Design, Arnhem; Design Academy, Eindhoven; The Royal Academy of Art, The Hague; Gengdan Institute of Beijing University of Technology, Beijing; Merz Academy, Stuttgart; Academy of Fine Arts, Ljubljana; The Influencers Festival, Barcelona; and Mine, Yours, Ours Festival, Rijeka.

Answers



ILLUSTRATIONS:

Page vii

Key: Look for the letters with pink spots

Technique: Null cipher

Page xvii

Key: Read image and letters as a sentence

Technique: Rubus

Page 9

Key: Squint your eyes and look for the letters

Technique: Camouflage

Page 29

Key: Look for the capital letters

Technique: Cross word camouflage

Page 45

Key: Read the lighter bricks and use cipher alphabet decoder #3 - Morse code

Technique: Camouflaged Morse code

Page 83

Key: A Chinese dictionary

Technique: Aestheticisation of a foreign language (Chinese) as a steganographic medium

Page 135

Key: Read figurines and refer to cipher alphabet decoder #5 - Kandy

Technique: Camouflaged substitution cipher

Page 195

Key: Read eyes, nose and mouth and refer to cipher alphabet decoder #4 - Ford shorthand

Technique: Camouflaged substitution cipher

BORDERS:

Pages i-v: refer to cipher alphabet decoder #1

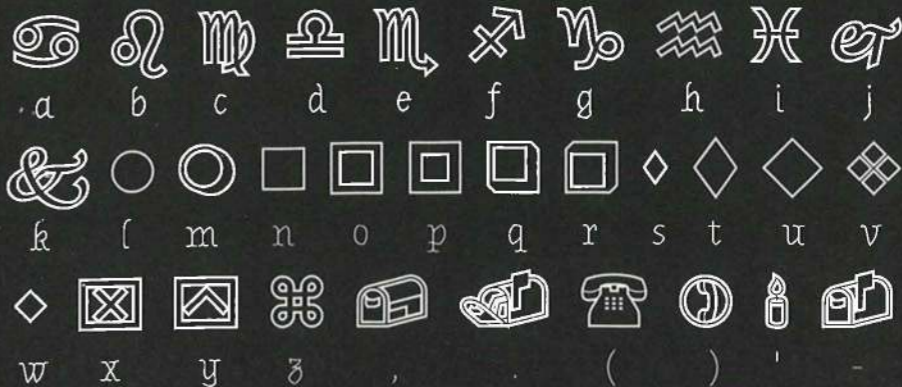
Pages 13-28: refer to cipher alphabet decoder #6

Pages 54-70: refer to cipher alphabet decoder #2

Pages 78-80: refer to cipher alphabet decoder #2

Pages 88-132: refer to cipher alphabet decoder #3

Cipher alphabet decoder #2 - Wrigglings



Cipher alphabet decoder #3 - Morse code



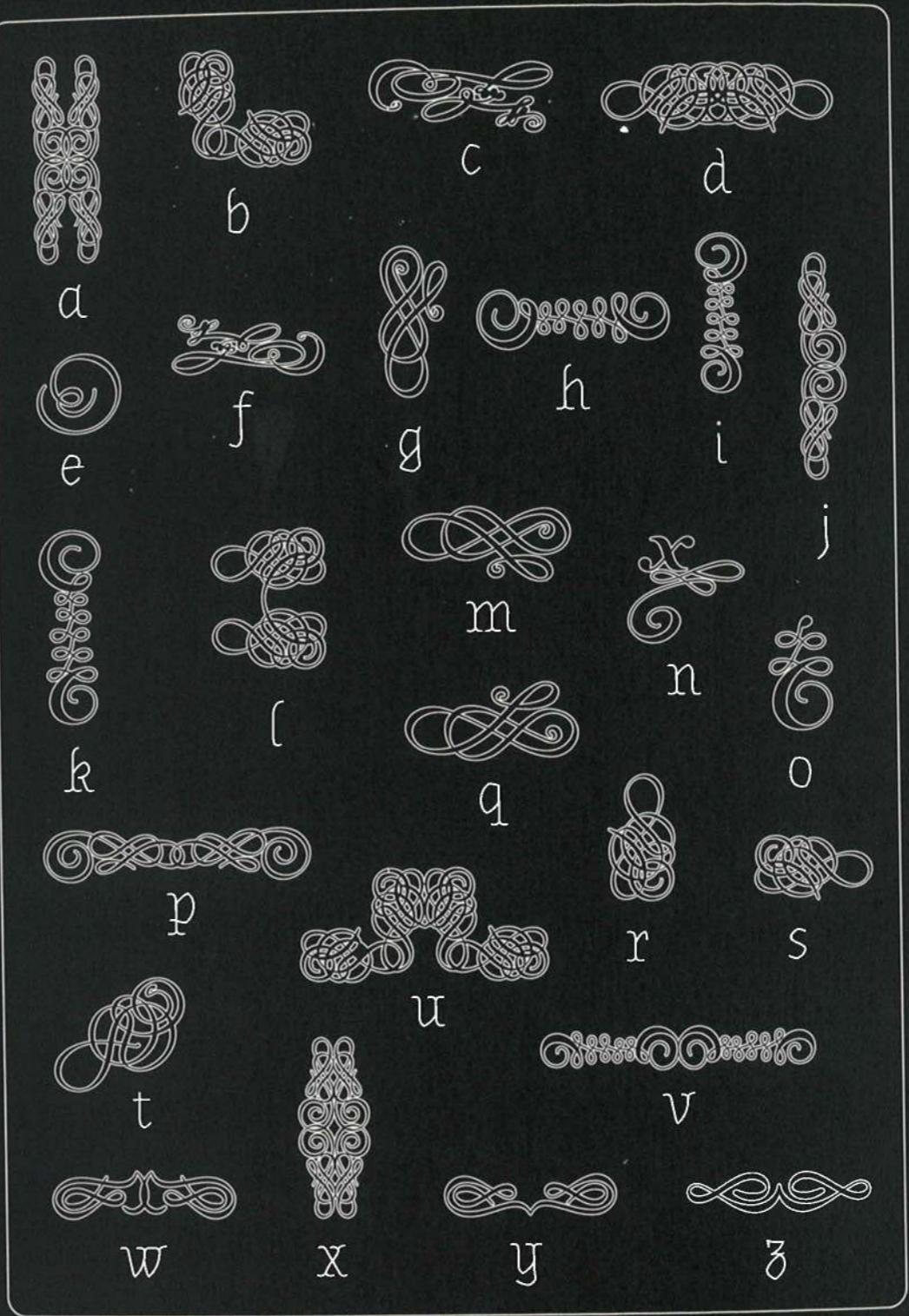
Cipher alphabet decoder #4 - Ford shorthand





_cipher alphabet decoder # 5 - Kandy

_cipher alphabet decoder # 6 - Cornucopia of Ornaments



A COOKBOOK OF IMAGINABLE WRITING