

CODING



from VICTORIANS DECODED: ART AND TELEGRAPHY

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Designed by Olivia Alice Clemence

BACK AND FRONT COVER:

James Tissot, *The Last Evening*, 1873 (details), The Guildhall Art Gallery, Corporation of London.



CODING

ANNE CHAPMAN

CODED ENCOUNTERS: TISSOT'S *THE LAST EVENING*

Fig. 1, James Tissot, *The Last Evening*, 1873, Guildhall Art Gallery, City of London Corporation.

The Last Evening depicts a tense and ambiguous shipboard encounter, a coded encounter situated within a patterned, repetitive and also coded environment. Five people face away from the glow of an unseen setting sun reflected on clustered and partially obscured clouds; they pay no attention to the beauty of the evening, instead seeming to concentrate elsewhere. The painting's title suggests that their intense scrutiny relates to the significance of this evening being the last. James Tissot groups together his claustrophobic huddles of protagonists on a deck compressed by awkward perspective. They seem shut in together as repetitions of rigging obliterate the horizon, that orienting marker of space. So confined, they make attempts at reading, at deciphering the meaning of each other's expressions and bearing. In the foreground the ship's mate gazes thoughtfully at a young woman.¹ She reclines under a bright red travelling rug; its colour draws attention to itself and thus, as travelling is passing not permanent, to the temporary nature of the situation. Tissot presents the couple's relationship ambiguously: the mate's attempt to wrap an arm around the woman seems thwarted by the chair in which she sits, yet his firm hand steadies this rocker. She does not return his gaze. Two older gentlemen sit a little behind and one, the captain, almost looks at the couple. The other, wearing a top hat, is older. He glowers intently at his companion, his face almost touching the captain and his eyes seeming to rest on the other man's cheek or ear. Finally, close behind yet entirely ignored, a young girl looks on as she watches the face of the elderly man. Tissot brings his intimate groups close

enough to overhear each other. They seem to be on the verge of a whisper, secret messages about to be shared, yet in such a confined space there is no privacy for spoken secrets. Mouths shut, no one utters a sound. If these people have messages to communicate, they do so corporeally rather than verbally. Their scrutinising looks suggest that they attempt to read meaning encoded in each other's bodies. Yet not one look is returned; there is no reciprocity.

Tissot first exhibited *The Last Evening* at the Royal Academy in 1873 alongside *The Captain's Daughter* and *Too Early*. These two address similar themes to *The Last Evening*; the former is another depiction of scrutiny and of the difficulty of meeting someone else's gaze, and the latter, away from the water this time, depicts a ballroom where unknown codes and social illiteracy compound to make an awkward spectacle. At the time of the exhibition, the *Contemporary Review* stated that 'M. Tissot requires nothing from the spectator except a solution of the problems put before him' and proceeds to make clear that those problems are ones of reading people and 'leaving too much to the imagination'.² *The Last Evening* demands as much scrutiny from its audience as its cast of characters give to each other. It invites us to look for clues, to read and re-read applying our own knowledge of the complex corporeal codes through which relationships play out. More recent criticism describes Tissot's works as 'visual invitations to narrative'.³ Such an invitation, one that presents itself as a problem to be solved, affords ambiguity; little wonder then that Russell Ash's response to *The Last Evening* finds 'storylines so tenuous or ambiguous as to leave the viewer questioning what human drama is actually being revealed'.⁴ These are complicated instances of communication both between the painting's characters and between artist and audience.

At the time when Tissot produced *The Last Evening*, telegraphic communication was pervasive, one of many media shaping the nineteenth-century cultural imagination; as a system of communication it depended on code. Telegraphic codes allowed clear transmission reliant on a shared key that all operatives could send and read. They could take someone else's message and transform it with a communication system that its original writer might not comprehend, into electrical patterns of switching on and off. Such an act of encoding makes messages at once transparent and opaque, structured by codes to which only specialists have the key; a telegrapher creates a pattern which communicates only to other telegraphers. But there could be more than one code at play; only the message's originator and recipient may understand the meaning of the words encoded and decoded for them by telegraphers.

Thus a telegraphic culture communicates by composing meaning using the rules of different codes and keys, the success of which depends upon technical mastery. In *The Last Evening* Tissot draws our attention to skilful composition. Both the edges of the

distinctly patterned travelling rug and of the checked dress worn by the young woman reveal the structural components: Tissot picks out the individual threads, black, white, red, and yellow, emerging from the fabric into which they have been woven, fabric constructed through a repetitive, coded process creating patterns. Tissot's use of such uniformly patterned fabrics encourages his audience to think about the expertise involved in their creation, a transformative act in which the skilful weaver (man or machine) joins individual strands together through the encoded action of following a pattern. The open weaving of the chairs on which the couple sit emphasise reliance on skilful fabrication.

Whilst Tissot presents these patterns distinctly, at the same time he presents the equally repetitive structural patterns of the ships' rigging as unreadable. The overlaying of many instances of these ordered ropes obscures their form and viewers find it impossible to distinguish one ship from another. Tissot not only shows us the ropes formed into the structures of rigging, he also places a carelessly wound, potentially tangled rope hanging centrally to the painting and another lying discarded on the deck, escaping out of the right-hand side of the picture. They intimate both a job performed and potential future use; the repetitive process of encoded construction is ongoing here. In these many instances of systems of patterned transformation, both the parts (threads and ropes) and their sum (cloth and rigging), contextualise Tissot's protagonists in a world in which codes are visible structures that repeat profusely. Indeed the repetitions seem to go on endlessly, to the point that decoding seems superfluous.

Even when we can see all the parts and the system, decoding requires something more. Turning our attention from the structure of the setting to the social moment depicted by Tissot, the ambiguity of the narrative he has carefully composed shows that legibility depends not only on clarity of media. Without a key to rely on we must provide an imaginative reading. In receiving Tissot's message, we see each of his characters clearly, the direction of their gazes and the expressions on their faces, their proximity to each other and the positions of their hands. And yet the nature of the relationships between these five slips away the more attentively we look. Although he confines us to the deck with the characters, Tissot keeps us just far enough away for *The Last Evening* to invite us to read everyone all at once. Thus he urges the viewer to consider the relation of one thing to the next, rather than decode a single expression closely as the personally-focused participants do. In trying to identify connections, the viewer creates his or her own narrative. Tissot shows us that a situation can yield private and public messages simultaneously.

Despite its indecipherability, Tissot does present proximity as attractive. In the centre of the foreground the captain's limp hand holds his disregarded newspaper, a blur of illegible print without a single clear letter, contrasting with the precise rendering of patterned fabric and its fringes. The news (reporting from a distance) appears unreadable and

uninteresting; a close reading of people nearby holds attraction instead. Distant news takes time: newspapers communicate comparatively slowly through witnessing, reporting, editing, printing, selling and buying, but *The Last Evening* turns its characters' gaze on the immediate moment. The painting's title insists on the significance of the moment. The temporality of messages concerns Tissot here: the connection between reading, meaning and a particular moment in time. The title affects the questions that we ask about the relationships before us. The viewer wonders what consumes these character's thoughts and what the finality of this moment might mean to them. Tissot makes evident that in an always encoded environment, even when we can discern the structure of the code, meaning derives from the questions we ask of the message.

Such interrogative proximity makes the sending of messages equally problematic in *The Last Evening*. Each character directs attention towards someone else, yet they display no awareness that they transmit a message to another. Each protagonist fails to display any conscious effort in encoding their own body, as none of them notice that they themselves are being read. These messages demand decoding yet their encoding lacks deliberation. Tissot shows us messages being read where none are intentionally sent. Where one sends a message unconsciously, transmitting that message only because it is looked for, then the message is in fact defined by the recipient. These characters do not choose a code with which to communicate, yet they are communicating.

In a straightforward metaphor telegraphy can be used as an image of romantic connection, a connection based on the sharing of code. *The Last Evening* approaches code in a different way. Tissot emphasises a lack of connection not only with unmet gazes, but equally with the placement of hands. A poem and accompanying illustration from *Belgravia: a London magazine*, only two years after the exhibition of *The Last Evening*, reveal the kind of messaging where comprehension arises directly out of connection. Here reciprocity determines meaning. In 'Love's Telegraphy' by H Savile Clarke a 'happy maiden' plays a game of blind man's bluff and tries to guess the identity of those of whom she catches hold. 'At last one hand is in her own---/ Ah, beating heart, be still! One name at last is surely known/ By love's electric thrill [...] the tender thoughts transmitted then'.⁵ Savile Clarke portrays reciprocated touch communicating a clear romantic message between the couple. Tissot's protagonists, however, keep their hands to themselves. Where a hand is clasped, it is in its owner's other. Proximity invites inspection but Tissot shows readers who fail to connect with their texts.

And yet, not one of these faces even hints at confusion, or suggests trouble in reading. Isolated from each other, they nonetheless seem to find themselves confronted by that which makes sense. In this way Tissot distances his audience from his painting; its ambiguity maintains our confusion while his characters reveal none of the bewilderment

which comes with the indecipherable. In *The Last Evening* Tissot suggests that amidst a skilfully encoded and decoded culture there is a consuming satisfaction in indulging an imaginative and deeply personal reading to which only the individual reader has the key.

1. The two uniformed men here are the same as in *The Captain and His Mate* (1873, Private Collection) and so we can take these titles to be their roles.
2. John Forbes White, 'The Royal Academy Exhibition of 1873', *Contemporary Review*, vol. 22 (1873), p. 288.
3. Carole G. Silver quoted in Katharine Lochnan, 'Introduction', in *Seductive Surfaces: The Art of Tissot*, ed. by Lochnan (New Haven: Yale University Press, 1999), p. xiv.
4. Russell Ash, *James Tissot* (London: Pavilion, 1995), plate 15.
5. H. Savile Clarke, 'Love's Telegraphy', *Belgravia: a London magazine*, vol. 5 (1875) p. 534.

CATALOGUE ENTRY C1 | CODING

SIR JOHN GILBERT (1817 – 1897)

EGO ET REX MEUS: KING HENRY VIII AND CARDINAL WOLSEY, 1888

160 X 104 cm

GUILDHALL ART GALLERY, CITY OF LONDON CORPORATION



Telegraphic communication was made secret by the use of codes, a secrecy essential to its commercial and political use. In *Ego et Rex Meus*, Sir John Gilbert presents the machinations of political secrecy as an exercise of power: King Henry VIII and Cardinal

Wolsey are seen locked together in private conversation but the title translates as 'I and my King', suggesting a dominance of the Cardinal over a monarch of whom he has control. The incident depicts Act I Scene II of Shakespeare's *Henry VIII*. The play commences with a Prologue that emphasises truth juxtaposed with an opening scene that introduces Wolsey as a suspicious character: 'this cunning cardinal'. In *Reproductions of the Pictures by Sir John Gilbert presented to the Corporation of the City of London* the description of the painting accompanying its collotype copy quotes Act I Scene II's opening lines. The King says to Wolsey: 'My life itself and the best heart of it,/ Thanks you for this great care: I stood i' the level/ Of a full charged confederacy, and give thanks/ to you that chok'd it'.¹ Henry is thanking his Cardinal for protecting him; his gratitude for 'great care' suggests he has trust in Wolsey, but both the play's audience and the painting's viewers are encouraged to wonder if this trust is misplaced. Whilst the King and Wolsey huddle together secretively, we find tension and unease here. Gilbert portrays Wolsey as sly and the King as being unable to read his Cardinal's face: he has his eyes shut. The Cardinal also prevents Henry from reading the rolled up papers tightly gripped in his hand, their words hidden from view; Wolsey holds them across his body away from the King. In the play the scene proceeds to reveal that Wolsey has set taxes without the King's knowledge and he demands that his secretary tell a lie about the origin of those taxes' repeal. Gilbert reflects this as he portrays the Cardinal pulling his scarlet robe around him. This gesture suggests the creation of a boundary between himself and the King, a gesture that presents Wolsey as the secretive and self-protecting character of Shakespeare's scene.

Ego et Rex Meus is just one of Gilbert's many paintings and illustrations of Shakespearean scenes. His contributions illustrating *Henry VIII* for Howard Staunton's *The Works of Shakespeare* (also titled *Sir John Gilbert's Shakespeare*) total sixteen and include a version of the scene painted here. This picture was exhibited in the RA in 1889 (no. 293), and was his only picture in this exhibition. Gilbert was elected to be ARA in 1872, the same year in which he received his knighthood, and RA in 1876. He was also president of the Royal Watercolour Society for over twenty-five years.

The painting is one of a large collection of Gilbert's works held by the Guildhall Art Gallery, a collection which includes another depiction of the Cardinal, the watercolour *Cardinal Wolsey, Chancellor of England, on his Progress to Westminster Hall* (1887). Having already resolved to discontinue selling his work in 1885, Gilbert distributed his paintings amongst a number of galleries in 1893 including the Guildhall.² Their collection grew due to a bequest from Gilbert's brother in 1903. In the year of his initial donation, the Corporation of the City of London presented Gilbert with the Freedom of the City, the first time an artist received this honour.

1. A. G. Temple, *Reproductions of the Pictures by Sir John Gilbert presented to the Corporation of the City of London* (London: Blades, East & Blades, 1893), p. 10.

2. For a chronology of Gilbert's life and work, see: Spike Bucklow and Sally Woodcock (eds.), *Sir John Gilbert: Art And Imagination in the Victorian Age* (Farnham: Lund Humphries in association with Guildhall Art Gallery, City of London, 2011), pp. 13-17.

CATALOGUE ENTRY C2 | CODING

JAMES TISSOT (1836 - 1902)

THE LAST EVENING, 1873

72 X 103 cm

GUILDHALL ART GALLERY, CITY OF LONDON CORPORATION



Having been born and having grown up in the French port of Nantes, James Tissot, in later years, gave many of his images of courtship a marine setting. *The Last Evening* suggests a shipboard romance that may be coming to an end, its protagonists under scrutiny. The ring on the young officer's finger signals that he is married. The young lady, who has no ring on hers, is apparently not his wife. Tissot sets up a series of glances that make it impossible fully to decode the 'story' here.

Although he would not move to London until the early 1870s, Tissot first exhibited at the Royal Academy in 1864. This picture was exhibited there in 1873 (no. 121). At the same exhibition, he showed two other pictures: *The Captain's daughter* (no. 108) and *Too early* (no. 914).¹ At the time of the exhibition, the *Contemporary Review* stated that 'M. Tissot requires nothing from the spectator except a solution of the problems put before him' and proceeds to make clear that those problems are ones of reading people and 'leaving too much to the imagination'.² *The Last Evening* demands as much scrutiny from its audience as its cast of characters give to each other.

In *The Last Evening* Tissot groups together claustrophobic huddles of protagonists on a deck compressed by awkward perspective. He shuts them in together and repetitions of rigging obliterate the horizon, that orienting marker of space. So confined, they

make attempts at reading, at deciphering the meaning of each other's expressions and bearing. In the foreground the ship's mate gazes thoughtfully at the young woman. She reclines under a bright red travelling rug, its colour drawing attention to itself and thus, as travelling is passing not permanent, to the temporary nature of the situation. Tissot presents the couple's relationship ambiguously: the mate's attempt to wrap an arm around the woman seems thwarted by the chair in which she sits, yet his firm hand steadies this rocker. She does not return his gaze. Two older gentlemen sit a little behind and one, the captain, almost looks at the couple. The top-hatted elder of the men glowers intently at his companion, his face almost touching the captain and his eyes seeming to rest on the other man's cheek or ear. Finally, close behind yet entirely ignored, a young girl looks on as she watches the face of the elderly gentleman. Tissot brings his intimate groups close enough to overhear each other. They seem to be on the verge of a whisper, as if there are secret messages about to be shared, yet in such a confined space there is no privacy for spoken secrets. Mouths shut, no one utters a sound. If these people have messages to communicate, they do so corporeally rather than verbally. Their scrutinising looks suggest that they attempt to read meaning encoded in each other's bodies just as we attempt to decode the narrative of the relationships Tissot only hints at in his painting.

AC

1. Although it appears that *The Last Evening* and *The Captain's Daughter* were hung with their labels mixed up, the RA catalogue assigns the numbers as given here.

2. John Forbes White, 'The Royal Academy Exhibition of 1873', *Contemporary Review*, vol. 22 (1873), p. 288.

CATALOGUE ENTRY C3 | CODING

SOLOMON JOSEPH SOLOMON (1860 – 1927)

A CONVERSATION PIECE, 1884

97.5 X 122.5 CM

THE ROYAL BOROUGH OF KENSINGTON AND CHELSEA, LEIGHTON
HOUSE MUSEUM

In this painting of a late-Victorian, upper-middle class drawing room, semi-hidden figures and a fractured web of glances create an enigmatic mood. *A Conversation Piece* explores attention and distraction and the possibility of secret messages failing to be received.

Solomon first exhibited at the Royal Academy in 1881 and his subsequent frequency in showing there led to the space reserved for his paintings being known as ‘Solomon’s corner’.¹ However *A Conversation Piece* was not exhibited in the 1884 RA exhibition, although Solomon showed two other pictures there in that year: *Ruth* (no. 908) and *Portrait of a gentleman* (no. 926). Solomon was elected to be ARA in 1896 and RA in 1906, the second Jewish Royal Academician (the first being Solomon Alexander Hart (1806-1881)).

Although overlapping, the figures in *A Conversation Piece* seem disconnected, each isolated and frozen. In spite of the musical accompaniment provided by the girl in white seated at her instrument, Solomon presents a quiet, still scene. The painting’s title refers to a type of group portraiture, often presenting its participants quite informally, although not necessarily in conversation. But in addition, Solomon’s use of this title draws the viewer’s

attention to the fact that here none of the participants attempt conversational interaction. *A Conversation Piece* seems instead entirely concerned with display. Pattern adorns every surface, and ornamental items, from lamps and figures to peacock feathers and framed pictures, stand on every available space. Solomon not only makes much of this array of items gleam with reflected light, he also draws our attention to illumination, depicting a maid in the background lighting a lamp. She supplies visibility. This visual display is not straightforward however. Solomon complicates the spectacle as he contrasts attention with deception with his inclusion of the peacock feathers and tiger skin rug: the former, understood to be a conspicuous device to attract a mate, is placed away from the glare of the lamps in a dark corner, whilst the latter, a set of markings which offered camouflage in the shadows, is foregrounded and brilliantly lit. With this inversion Solomon emphasises disguise and deception. His interest in disguise and visibility were later shown when he worked on camouflage during the First World War, publishing the book *Strategic Camouflage* in 1920.²

The smart young man in the foreground of the picture fails to reciprocate his companion's admiring gaze, instead concentrating on the *carte de visite* in his hand. She wears a lilac dress with row upon row of flounces and is as showy as the decoration of the room. Amongst such abundant display however, the girl fails to stand out; not only is she ignored by the object of her admiration, but also none of the others take the opportunity to oversee and monitor the potential lovers. Solomon presents such excess of ostentation as a hindrance, failing to generate the usual benefits of display. It has a deadening effect and impedes action. Indeed, only the athletic sculptures that decorate the room present action, but even there Solomon shows action held still, permanently stopped motion. Perhaps the most striking feature of the painting is the strange owl lamp glowing bright red from the background. Its brilliant eyes stare, stretched fully open, yet they direct their gaze at nothing. They suggest a state of bedazzlement appropriate to the excessive display. In this picture Solomon depicts a state of profusion where it is possible to hide secrets in plain sight.

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1. Jenny Perry, *Solomon J Solomon RA* (London: Ben Uri Art Gallery, 1990), p. 5.

2. Solomon J. Solomon, *Strategic Camouflage* (London: John Murray, 1920).

CATALOGUE ENTRY C4 | CODING

GEORGE FREDERIC WATTS (1817 – 1904)

ARIADNE ON NAXOS, 1875

75 X 94 cm

GUILDHALL ART GALLERY, CITY OF LONDON CORPORATION



Ariadne stares out to sea in grief caused by the desertion of Theseus, her lover, who left her sleeping on the island of Naxos' shore. In her hand she holds a ball of red thread symbolising her continued connection to Theseus, in spite of his betrayal (she had provided the ball of thread and sword that assisted his escape from the Minotaur's labyrinth). Her servant points in the other direction, signaling that Dionysus is coming to claim Ariadne as his bride. Watts depicts an opposition here between the languid longing of Ariadne with her limbs loose, her hair fallen and her clothing disheveled, and the resolute insistence in her more ordered servant's firm indication. The picture is therefore about the switch point between two alternatives: Theseus and Dionysus; lassitude and energy; briny waste and lush woodland; romance and sex. Many telegraph codes depended on binary switching, a switching between right and left or between dots and dashes with the breaking or completion of an electric circuit.

Other examples of Watts' interest in switching include *Choosing* (1864) his portrait of the then seventeen year old Ellen Terry, the Victorian actress who would briefly be his wife. In this portrait, now at the National Portrait Gallery, we see Terry symbolically choosing

between gorgeous, flamboyant, but barely scented camellias and delicate, simple, but highly perfumed violets.

Watts was elected to be ARA in January 1867 and RA in December that same year. *Ariadne on Naxos* was not exhibited at the Royal Academy, although in 1875 he showed five pictures there, including *Blanche* (no. 266) and *The late Marquis of Lothian* (no. 420). Watts studied the Elgin Marbles (removed from the Parthenon in Athens and on display in the British Museum) from an early age and their influence can be seen here as the painting imaginatively completes fragmentary figures from the pedimental sculptures.¹ His representation of classical subject matter was extensive; for example he also painted a number of versions of *Orpheus and Eurydice* and *Endymion*. He often tackled classical subjects in the sculptural works that he started to make in the latter part of his professional life. Watts considered Ariadne throughout his career. In 1863 he first exhibited a painting of the abandoned goddess at the Royal Academy and he produced later versions and re-workings up to the 1890s. This 1875 representation of the scene is considered Watt's most complete version and seems to have been influenced by *Titian's Bacchus and Ariadne* (1520-23) which Watts had copied in London's National Gallery;² there are echoes of Titian's landscape and composition here, although, unlike Titian, Watts does not include Theseus and Dionysus. Their absence suggests that the nature of the alternatives matter little here; the moment of the switch itself holds significance.

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1. Stephanie Brown, 'Watts and Sculpture' in G. F. Watts *Victorian Visionary: Highlights from the Watts Gallery Collection*, ed. by Mark Bills and Barbara Bryant (New Haven: Yale University Press in association with Watts Gallery, Compton, 2008), p. 59.

2. Barbara Bryant, quoted in Veronica Franklin Gould, Hilary Underwood and Richard Jefferies, 'The Catalogue' in *The Vision of G. F. Watts OM RA (1817-1904)*, ed. by Gould (Surrey: Watts Gallery, 2004), p. 52.

CATALOGUE ENTRY C5 | CODING

ABC TELEGRAPH TRANSMITTER

KING'S COLLEGE LONDON ARCHIVES. K/PP107/11/1/5



In 1840 sending a telegram was a time consuming business. First you had to visit your local telegraph office, fill out the message form, pay the clerk, wait for the nosy clerk to send the message about your private business and then wait again while a second (probably equally nosy) clerk copied it out at the other end. At this point a telegraph boy walked it the last mile or so to its final destination. You would then wait, all over again, for the process to be repeated in reverse and the reply to arrive. Telegraph pioneer, Charles Wheatstone, had a rather different vision for telegraphy.

Wheatstone dreamed of a universal system where everybody, every home, office, bank, factory and workshop would have access to instant 'electric mail'.¹ The bureaucracy of telegraph clerks, engineers and offices could be wiped out in a stroke and messages sent promptly, privately and directly from one personal machine to another. He designed and built the ABC transmitter to make this dream a reality. It was to be the simplest of machines and was intended to be operated safely by anyone, regardless of age, sex or training. If you could spell the word then you could telegraph it with a simple turn of the handle.

The system had three working parts: the generator, the communicator and the indicator. The generator was built to eliminate the need for batteries. The Daniell cell battery - despite being a great advance - was still heavy, required knowledge to put together, and - most important from a public safety standpoint - filled with sulphuric acid. To power the ABC telegraph Wheatstone designed an electro-magneto generator. It exploited Faraday's recent (1831) discovery that if you set an iron rod wrapped in copper wire (an armature) spinning inside some magnets, electricity is produced. Wheatstone attached the copper armature to a handle on the outside of the case. When the handle was turned it created a small pulse of electricity that could be used to send the signal.

The communicator was a toothed disc with all the letters of the alphabet, numbers and common punctuation marks marked upon the face. The sender pressed the button for the letter he or she wanted to send and then turned the handle. Each pulse from the handle moved the disc on one letter. When the disc got round to the required letter it automatically broke the circuit and set the machine back to its zero state. The sender then pressed the button for the next letter and again began turning the handle. At the indicator, or receiving end, was a second dial marked with letters and numbers. Each time an electrical pulse was received down the line the dial moved on one letter. The person at the receiving end wrote down the letter and the dial was set back to zero. With practice up to 15 words per minute could be sent (compare with our average mobile-phone texting speed of 35 words per minute!).²

Wheatstone improved on his *ABC Telegraph* and in 1858 patented the *Universal Telegraph Receiver*. In 1860 he founded *The Universal Private Telegraph Company* and began building his visionary system. By 1868 20% of all telegraph lines belonged to private companies and individuals, all of which were swept away after the nationalisation of the telegraph companies in 1870. The GPO changed the system's name back to the *ABC Telegraph* and distributed the easy-to-use devices to the new – and largely untrained – telegraph staff in local post offices. The world had to wait more than a hundred years for Wheatstone's dream of 'electric-mail' to finally become a reality.

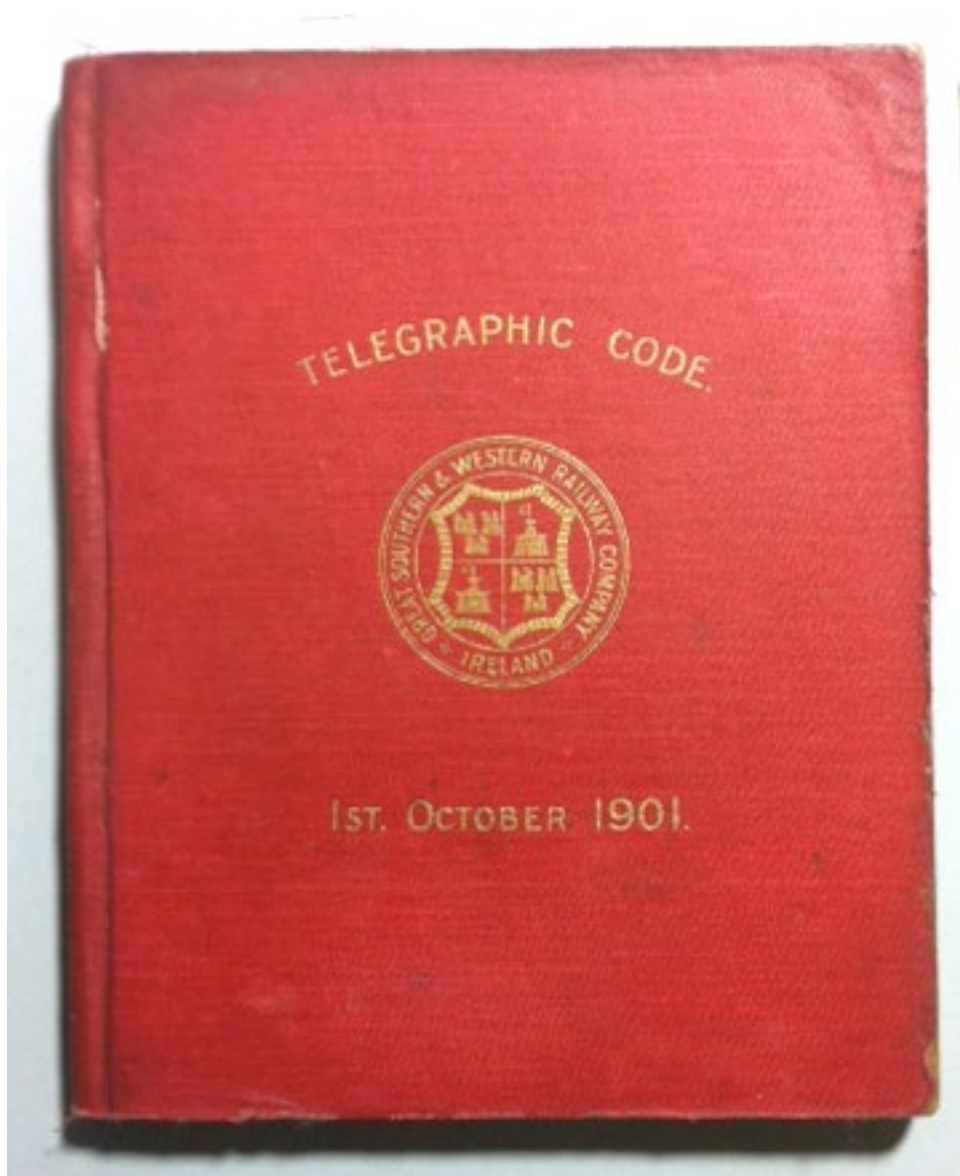
CN

1. S. Roberts, *Distant Writing* (2012), <http://distantwriting.co.uk/privatetelegraphy.html> (consulted 4 September 2016).

2. Roberts, *Distant Writing* (2012).

CATALOGUE ENTRY C6 | CODING

CODE BOOKS



Telegrams may have been astonishingly fast but they were anything but private. In the UK, large businesses and other organisations could invest in one of Wheatstone's Universal Telegraph Company's private systems to connect their personal workshops, factories and offices. Longer distance messages - and certainly all international traffic - had to pass under the eyes of multiple telegraph clerks and telegram delivery boys. For many organisations this message transparency was totally unacceptable.

The police, for example, deal in information which needed to be widely shared but was too sensitive to be relayed on public lines. Williamson's Police Telegraph Code (1885) was produced to keep police messages private and also allow them to be usefully shortened.¹ It is divided into thematic headings, such as 'suspect appearance' or 'crime wanted for'. A single code word can stand for a whole phrase, for example 'FELONY FENCEFUL FETLOCK' decodes as 'the suspect has two teeth out in front, a slightly turned up nose and is a smooth talker'. For speed, police code books are often laid out in the order that a police report is written.

Individual businesses and industries developed their own code books. Not only did they preserve company secrecy but also allowed messages to be shorter and cheaper by having one code word stand for whole sentences. It helped with the accurate sending of jargon and industry related words and also reduced the monotony of sending frequently repeated information.

The same issue of privacy also applied to all personal telegraph traffic, and code books were produced for the use of private individuals. *Unicode: the Universal Telegraphic Phrase Book* (1894) was a long-running and often reprinted code book of cipher words for 'Commercial, Domestic and Familiar Phrases in Ordinary Use'. Used all over the world, Unicode covered everyday occurrences such as births, deaths, lunch engagements, marriages, racing, hotels and theatre engagements.²

Even on private systems code books were still useful. They saved time and freed up the system so more messages could be sent. From the very beginning the railways were heavy users of the telegraph (indeed it was initially designed as a railway safety system). Individual railway companies had their own code books tailored to meet their needs.³ They also shared important standard words across the railway network such as EARWIG (meaning: 'following urgently required') to avoid confusion and accidents!

Coding didn't always save time, however! Being non-words, or indeed numbers (such as the popular Slater's Telegraphic Code) it was incredibly hard for the clerk to check for accuracy.⁴ A reversed letter or missing digit would often slip through, meaning that when the message arrived at its destination it was either decoded as a different word or in some other way indecipherable. This problem was so frequent that the more popular code book producers (such as McNeill's who produced a Mining and General Telegraph Code, 1899) also published a 'terminal index', a list of code words by the order of their backwards spelling, last letter first.⁵ The receiver of the scrambled code could work backwards through the encoded word, find the mistake and unscramble the message.

1. Williamson (Chief Superintendent), *Telegraphic Code for the Use of the Police* (London: Eyre and Spottiswoode, 1885).
2. Anon, *Unicode: The Universal Telegraphic Phrase Book* (London, Paris and Melbourne: Cassell and Company, 1894, 9th ed.).
3. Great Southern and Western Railway Company, *Code Book* (Ireland, 1901).
4. R. Slater, *Slater's Telegraphic Code to Ensure Secresy in the Transmission of Telegrams* (London: W R Gray, 1870).
5. B. McNeill, *Mining and General Telegraph Code. Terminal Index - for use with McNeill's Code* (London: Whitehead, Morris & Co., 1899).

CATALOGUE ENTRY C7 | CODING

CRYPTOGRAPHS AND CIPHER POST

KING'S COLLEGE LONDON ARCHIVES. K/PP107/11/1/22



Baron Lyon Playfair, great friend of Charles Wheatstone (and for whom Wheatstone's 'Playfair' cipher is named), recalls that he and Wheatstone would amuse themselves by deciphering the ciphered personal adverts in *The Times*. These were sometimes secretive business dealings but more often they were clandestine romantic correspondences. At one point Wheatstone even took out an advert in *The Times* himself to advise a young woman against the elopement she and her beau had been planning. He made sure to encrypt it in her own cipher code of course.¹

The reason why Wheatstone was able to decipher these codes so easily was the frequency of certain letters or combinations of letters. In a cipher, a letter is substituted for another

letter to encode it.

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | | | |
| | | | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |

In this example the key is A=D, the cipher is to move three letters further down the alphabet. This is called the ‘Caesar’ cipher (and was purportedly used by Caesar). A message reading:

THE CAESAR CIPHER IS NOT THE BEST

once enciphered would read:

QEB ZXBPXO ZFMEBO FP KLQ QEB YBPQ.

The word ‘the’ is a very common word in English so if the code cracker starts with the assumption that QEB may = THE we get the phrase:

THE ZXEPXO ZFMHEO FP KLT THE YEPT

More importantly, the cracker also notes that Q is three letters back from T, E is three letters back from H and B is three letters back from E. The key to the cipher must be therefore ‘move three letters down the alphabet’. Code cracked.

The cryptograph is designed to thwart deciphering by disguising letter – and therefore word – frequency. The device looks like the face of a clock, with a long hand and a short hand. The letters A to Z appear printed in a circle around the outside of the face. Within this is a second circle of letters, this time printed on a moveable card to enable the user to choose the key. Once the key is set, say A=D again, the big hand is pointed at the desired letter on the outer alphabet, the small hand then points to the inner, ciphered alphabet, which is copied down. Vivaly, the hands are linked to each other via a gear so that every time the big hand moves through the 26 letters of the outer alphabet, the small hand moves through 27. As the hands only turn in a clockwise direction, every time the big hand passes the 12 o’clock point, it moves the whole cipher key along one letter.² High frequency words, such as ‘the’ are therefore never enciphered the same way twice and are much harder to crack!

Wheatstone had good reason to manufacture and market the Cryptograph. Not only could it keep personal messages from prying eyes but it could also increase telegraphic traffic, as Wheatstone notes in the instruction booklet which accompanied the device:

The number of telegraphic messages relating to domestic occurrences are very much limited by the disinclination of parties to let their family affairs to be known to officials in their neighbourhood; and there can be no doubt that were this difficulty removed, this class of message would be significantly augmented, to the benefit of the telegraphic department as well as the public (Wheatstone, c.1854).

CN

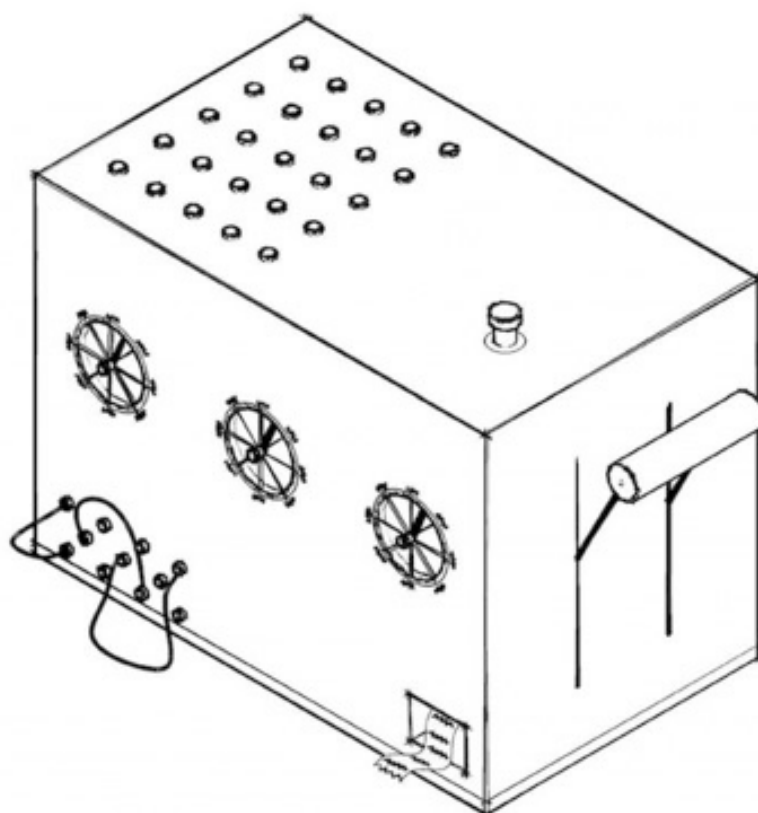


1. B. Bowers, *Sir Charles Wheatstone FRS, 1802-1875*, IEE History of Technology Series, vol. 29 (London: The Science Museum, 2001).

2. Museum of Applied Arts and Science, *The Cryptograph* (2011), <http://tinyurl.com/htg39s5> (consulted 4 September 2016).

CATALOGUE ENTRY C8 | CODING

The Great Grammatizor: Marvellous Messaging Machine



The Great Grammatizor, designed by Alexandra Bridarolli, was the winner of the Scrambled Messages competition to design and make an interactive message-scrambling machine which interprets ‘telegraphy’ freely. The machine, which is located in the Coding section of the exhibition, allows the public to take part in the exhibition by using the machine to produce and print a message that can be taken home.

The machine is in part an homage to the ‘Great Automatic Grammatizor’, a machine in the 1953 Roald Dahl short story of the same name. In the story, the Grammatizor is a ‘computer that will write stories’ that will eventually take over the artistic world, by being able to mass-produce great works of fiction such as novels in under fifteen minutes.¹ Dahl’s story, like Bridarolli’s machine, plays with the idea that grammar is a set of rules and principles that can allow a programmed machine to produce messages that can communicate meaning.

Bridarolli’s Grammatizor creates sentences using the *Exquisite Corpse* structure (from the French *Cadavre Exquis*), a creative method devised by the Surrealists in 1918 which

follows the pattern *adjective noun adverb verb adjective noun* to make sentences using chance procedures that (grammatically at least) make sense. Each member of the group would add a component to the sentence without seeing what had been written previously. Bridarolli says of her own design: '[i]f the original game is meant to be a collaborative bit of poetry, the device imagined for this project will by itself produce the message, in an interactive and didactic relationship with the public'. The machine creates poetic messages made up of words drawn randomly from user-selected categories. The user is given the choice of categories identified with to various historical periods and diverse cultural niches. The resultant mechanically-generated scrambled message may, for instance mix the tabloids with Shakespeare, chivalric romance with the absurd or science fiction with the Victorian age.

This particular device makes a great contribution to *Victorians Decoded* because of its interdisciplinary combination of technological communication and artistic creation. The idea of using existing pieces of literary construction and scrambling them to the point of abstraction echoes the difficulties of early telegraphy in which complete messages might be sent from one end and be indecipherable upon reception. However, the *Grammatizor's* messages retain the rules of grammar so that the new message created out of the bits and pieces of the old still communicates something to the user, rather than a message scrambled to complete nonsense. Victorian telegraphists hoped that with the aid of code books they could retrieve the original message from something garbled even when the message had been corrupted in the process of sending (as is seen in cat. no. C6).

Alexandra Bridarolli is a chemist by background, is completing a PhD at University College London in Conservation Science for Cultural Heritage - a field at the interface of hard science and heritage. Bridarolli worked with UCL's Institute of Making, King's College London and The Courtauld Institute of Art on the development and creation of the *Great Grammatizor*.

RS

1. Kristine Howard, <http://tinyurl.com/zz5m2y9> (consulted 17 September 2016).