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Cryptographic City

Decoding the Smart Metropolis

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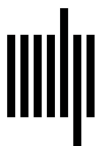
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1 Written in Stone

People with an eye for architectural detail can identify messages on buildings, and in parks, pavements, and cemeteries. Some of these messages are in code as inscriptions, symbols, and geometrical shapes. As persistent relics from the past, stones seem to harbor secrets. Messages inscribed on stone present as if secrets to be deciphered. Such lithic secrecy provides a touchpoint for cryptography and place. It is the persistence of coded inscriptions in stone such as Egyptian hieroglyphics and stonemasons' marks that imprint on the human imagination the idea of coded messages from the past.

I'll focus in this chapter on institutionalized secret societies such as Freemasonry. Such societies establish historical links between cryptography and urbanism. By the end of the chapter we will have extracted what we can about secret writing that's pertinent to smart city narratives, settled the limits of the historical narrative, and prepared ourselves to advance to deeper but less obvious evidence of cryptography in the city.

Secret societies were commonly associated with *hermeticism*, a mixture of traditions that draw on the mythic figure of Hermes Mercurius Trismegistus, a philosopher of indeterminate origin and the focus of various European mystery cults.¹ One of the possible origins of the name Hermes is the Greek word ἑρμα or *herma*, a heap of stones as a way marker or a place for offerings to the gods. Hermes is also the trickster god of Greek legend.² The word *hermetic* has come to mean something that is hidden, exclusive, secretive, locked away and sealed. According to various readings Trismegistus is a divinity and his following may have originated in Ancient Egypt. *Trismegistus* means "thrice great," referring to this mystery figure's putative status as priest, philosopher, and king.

The hermetic tradition also draws on the art of interpreting numbers known as numerology, based on the idea that certain numbers and number combinations have significance and influence beyond their role in mathematics and calculation. According to one scholar, numerology is “the belief that things happen because numbers make them happen.”³ The writings of the ancient traditions of the Hebrew Kabbalah also draw on numerology and the occult.⁴

The French scholar Jacques Gaffarel (1601–1681) is of interest as a proponent of secret writing, and notably the alluring presentation of what he termed “the Celestial Hebrew Alphabet.”⁵ Such writing exploits apparent correspondences between constellations and letters of the alphabet. He seemed to present this system as an alternative or complement to the signs of the zodiac and for reading the night sky for interpretations of earthly events now and in the future. A helpful article by Arnold Lebeuf explains the authority claims behind the system:⁶ “The Renaissance esoteric tradition of sky alphabet was directly influenced by the Jewish Cabbalah, mystic ideas presenting the creation of God as a text, a piece of literature, a mathematical and semantic potential of creative combinations.”⁷ These traditions are current in the twenty-first century—for example, in the architecture of Daniel Libeskind, whose diagrams on paper, on the ground, and on his buildings seem to draw explicitly on Kabbalist symbols.⁸

For another contemporary example deploying mystery writing consider the controversial and short-lived CCRU (Cybernetic Culture Research Unit) at the University of Warwick. The CCRU drew on philosophy, mathematics, science, and engineering to celebrate and amplify imaginative myth making—hence their neologism *hyperstition*, an amalgam of *hyper* (excessively energetic) and *superstition*. They celebrated a particular network diagram they called a “nomogram” described on a CCRU web page as a “Decimal Labyrinth” with “syzygies,” “zygonovism,” a “tractor zone,” and “primary flows.” That lexicon provides something of the flavor of contemporary numerological discourse. It is inventive, ambiguous, esoteric, cryptic, and easily dismissed by skeptics. Significantly, in support of the theme of this book, insofar as cities and built environments are designed, arranged, and modified with these hermetic, Kabbalist, and numerological traditions in mind we are entitled to attribute influence from cryptography. These traditions recur throughout history in the architecture and rituals of various secret societies.

Thinking in Stone

Freemasonry is among the secret societies that draw on mystery traditions and numerology. A book published in 1875, *The Pythagorean Triangle: The Science of Numbers* bears the imprint of Freemasonry and outlines the significance of certain numbers in the society's rites and its architecture.⁹ The latter draws on the dimensions of the Temple of Solomon and other metrics that appear in the Old Testament of the Bible.

Most of us first encounter secret societies through fiction, such as in *Indiana Jones and the Last Crusade* (dir. Steven Spielberg, 1989), *His Dark Materials* (dir. Tom Hooper, 2019),¹⁰ and Dan Brown's novels. Brown's *The Lost Symbol* takes place in the unlikely setting of Washington, DC, under the Capitol Building, drawing on the mythos surrounding its founding in a Masonic ceremony by the most famous Freemason, George Washington (1732–1799).¹¹

Secrecy and mystery of course run counter to the overt messages of mainstream intellectual development in philosophy, religion, politics, science, and the arts, at least since the Enlightenment. There's no room for secret communications and hidden wisdom in an open and democratic society that seeks liberty, equality, community, and openness to the power of clarity and explanation. That explains in part the resistance within architecture, planning, and other disciplines concerned with the built environment to a wholehearted embrace of institutions that are founded on secrets. That said, secret societies grew as major elements of civil society in the Age of the Enlightenment and persist to this day, institutionalized and touching on professions responsible for the built environment, notably architects and their buildings. Societies of Freemasonry and their "lodges" were at the forefront of such secretive institutions.

The Freemasons call their meeting places and their associated communities *lodges*. That's a reference to the simple shelters in which Medieval stonemasons would work under cover from the elements on construction sites. The architectural historian James Curl provides an extensive account of the historical development of the lodge as a meeting place and its eventual transformation into a theatricalized version of the Temple of Solomon described in the Old Testament book of 1 Kings, chapter 6.¹²

Rather than recount that history here, I'll briefly consider the fortunate architectural coincidences that reside with the word *lodge*. A lodge was

originally a shelter, with only simple functional articulation of parts (i.e., rooms), as in the case of a shed, pavilion, cabin, booth, or bothy. Related to *lodge*, we have *loggia*, an annex to a building that is open on some of its sides, like a porch or veranda. The lodge may be permanent like a hunting lodge, but you don't stay there permanently. Lodgings are temporary places of residence, less permanent than a house or a home, though the short-term arrangement persists in the naming of long-term accommodation. In French housing is *logement*, in Italian *alloggi*, and in Spanish *alojamiento*.

Sometimes words are associated by happenstance that contributes to their adoption. Log cabins might be lodges but there's no etymological connection between *log* and *lodge*. Beavers cut logs and build and shelter in lodges. A ship's log is derived from the old practice of recording the progress of logs strung together with rope and cast out from a ship to gauge its speed. The ship's log is a *logbook*, though at school I recall that a logbook was a book full of logarithm tables (from *logos*, ratio). That used to confuse us but reinforced the relationship between logbooks and data. To *log* information is to enter it into a logbook, ledger, or database. To *log on* or *log in* is to gain access to the database or system by entering your credentials. Then you may lodge your interest, complaints, or money, which is to deposit or place some content. So, if it seems logical to do so you can log in to lodge your payment for your lodgings. Dare I say, by this lexicographical logic the *lodge* provides a kind of early entry point to data in the city.¹³

The extensive and scholarly *Handbook of Freemasonry* edited by Henrik Bogdan and Jan Snoek¹⁴ indulges no such word play, but is instructive on Masonic institutions. Much of architecture's theory and myth relates to the crafts of working stone, not least to measurement and to establishing ratios, and stone's affordances such as longevity and dimensional stability. According to Andrew Prescott in the *Handbook of Freemasonry*, "Freemasons were originally a specialist grade of stonemason, who specialised in the carving of freestone."¹⁵ Freestone was fine stone that could be carved in any direction to create free forms. Freemasons were the elite of the masons and carved capitals, bosses, friezes, and gargoyles. Coteries of aristocrats, politicians, and merchants adopted the masonry guild ethos and its status and symbols. Some well-known architects were among them, including Christopher Wren (1632–1723) and John Soane (1753–1837). By most accounts, Freemasonry as an organization began in Scotland (figure 1.1). As a quick summary, David Stevenson wrote the following about the early days of



Figure 1.1

Symbols over the entrance to the Edinburgh Lodge, Mary Chapel. The building was adapted in 1893 by the Freemasons and houses minutes of meetings dating back to 1599. *Source:* Author.

freemasonry: “By the seventeenth century Scotland possessed a network of permanent institutions calling themselves lodges. Membership, at first, consisted almost entirely of stonemasons, but over time men of other occupations and social statuses were admitted, from craftsmen to noblemen. Within lodges there was brotherhood, but also a division into two ranks or degrees: entered apprentices and fellow crafts (also known as masters).”¹⁶

Stevenson goes on to highlight the secretive nature of such organizations: “Members had secrets, collectively known as the Mason Word, into

which they were initiated by elaborate rituals. These contained references to historical traditions relating to the mason craft and lodges, and included secret recognition codes by which initiates could identify each other. Compasses and the square played a part in their symbolism."¹⁷ The "secret recognition codes" were not electronic or digital of course but presaged the idea of encryption keys and passcodes. Credentials, codes, rituals, and symbols: these access the secrets of the lodge.

An Unsecret Society

If secrets are Freemasonry's *raison d'être*, then a researcher might expect the society to have some purchase in a kind of *topo-* or *arche-*cryptology, especially if it is founded on myths and rituals about a building, Solomon's Temple, and in which its *Early Masonic Catechisms* refers to God as "thou great Architect of Heaven and Earth."¹⁸

Being secretive puts any organization at a disadvantage. A secret society founded on the idea of "secrets which must never be written" works against developing a vibrant scholarly tradition or collective memory. Freemasonry offers texts about numbers and codes,¹⁹ and harbors archives of writings about its history and practices, but it is left to others to advance general theories or applications of the covert, secretive, hidden, or cryptographic.

In its early days in the seventeenth century, Freemasonry incorporated the pre-Enlightenment idea of the *memory theatre*, the skills exhibited by certain orators to memorize the key points in a speech by associating them with an imaginary room layout. That's interestingly spatial and architectural, but it implies a legacy in oral tradition rather than writing—secrets passed on by word of mouth, though written texts inevitably intervene.

In spite of its fascinating history, periods of persecution, political intrigue, infighting, and influence, and a rich pantheon of adherents (Mozart, Voltaire, Goethe, Washington, Conan Doyle, Kipling) Freemasonry's main strength was that it offered the benefits of club membership in a formal setting, providing companionship at its mostly male gatherings. That's a major insight from historian John Dickie's *The Craft: How the Freemasons Made the Modern World*.²⁰ Participants in its anachronistic, funereal cosplay were united by the idea of secrets. After his careful historical account, Dickie offers a more casual summary of the movement in an article in *Time*: "Masonic rituals consist of secrets, wrapped in secrets, wrapped in secrets.

Once the wrapping is removed, what is revealed are moral principles of utterly disarming banality. Be a nice fellow. Learn more about the world. Remember that death puts things in perspective. The great secrets of Freemasonry are all motherhood and apple pie."²¹

Dickie shows how secrets serve as a recruiting tool. People are lured in to participate in the organization's secrets. Some are attracted to clubs that have exclusive entry criteria. Secrets also keep people together. Like families, organizations can bond by agreeing to keep their secrets, even if the secrets are just about their rituals. Dickie wrote: "Masonic secrecy is not a way of hiding anything at all. It is the wrapping, and not what it contains, that is key. Secrecy is a way of enveloping bonds of fellowship in solemnity and sacredness."²² According to *The Early Masonic Catechisms*, a freemason may not disclose any of the masonic secrets "unless to a True and Lawful Brother."²³ That presupposes you know who a "brother" is when outside the bounds of the lodge. It is tempting to say that the secret is that there is no secret. But the main covert asset of the lodge is to know who is in it—within its fraternal embrace.

Mostly, the architecture of Freemasonry involves providing a stage setting for rituals. Scholarly books and articles on buildings that incorporate motifs from Freemasonry will frequently point out specific building elements and their referents—for example, the ubiquitous drawing compass and square found on Masonic tombs, pediments, and regalia that ostensibly reference devices for marking and measuring building elements. In his essay "Freemasonry and Architecture," James Stephens Curl elaborates: "In masonic terms, the vertical has associations with licence and the horizontal with restraint, so the square defines how the vertical and horizontal are joined in a manner that would be sound construction in a building made of stone. Thus these implements are representative of morality."²⁴

The presence of two pillars on either side of a building's entrance, especially if flanked by walls in the manner of *in antis*, is a further reference to the lost Temple of Solomon. But in keeping with the tenets of a secret society the allusion could be subtle, according to Curl: "the Solomonic Temple as an idea could be alluded to by this subtle means, not overtly, but perhaps slyly, missing those who were uninformed."²⁵ Any building may be organized around and adorned with covert references and in-jokes. It seems that buildings under the sway of Freemasonry participate overtly in this tradition. The incorporation of symbols in art and architecture does not

of necessity indicate a cryptographic ethos or mindset. We have to dig a little deeper. I will probe architecture's cryptographic substrate further as I proceed.

A Secret House

A reader of architectural history might think Freemasonry's secretiveness contributes little to an understanding of architecture and cities beyond what neoclassicism offers, and as a channel for patronage. That's apparent from the scholarly literature on Freemasonry. One prominent architect provides an exception with work that adopted principles and attitudes shared with Freemasonry. The prominent Regency architect John Soane (1753–1837) was a Freemason. In an account provided by architectural historian David Watkin, Soane “took Freemasonry very seriously.”²⁶ Though he wasn't initiated as a member until age sixty his work adopted the attitude of Freemasonry: “He reflected its deistic philosophy in his own references to God as ‘the Architect of the Universe,’ and in his numerous designs for funerary monuments, tombs, sepulchral chapels, and mausoleums.”²⁷

Soane designed the Masonic Hall in London, which was completed in 1830, though it is no longer standing. Professionals might join clubs and societies for business contacts without incorporating the organization's rites and symbols into their professional practice. A society's moral codes, communality, and work of improvement or redemption are sufficient to exert influence on professional life. But it seems as though Soane's commitment to the ideals of Freemasonry as a secret society is evident in his architecture, even domestic architecture.

Soane purchased a terrace house at 13 Lincoln's Inn Fields in central London in 1795. He lived there with his family and extended and renovated it over a number of years so that it combined the functions of home, studio, library, and museum. The house was Soane's lifework and passion documented notably in a book by Helene Furjan, *Glorious Visions: John Soane's Spectacular Theatre*.²⁸ Having visited the house on two occasions, I observed it to be austere, melancholic, funereal, formal, ceremonial, and symmetrical, as might befit a homage to stonemasonry. It crams enough artifacts, adornments, and architectural features to fill a building ten times its volume. This oddly scaled building fascinates and invites curiosity.²⁹ Furjan's scholarly assessment of the building outlines Soane's debt to the aesthetic

tastes of eighteenth- to nineteenth-century London for sentimental fiction, collections of antiquities, and theatres and spectacles, as well as to theories of the sublime, shadows, and mysterious light—motifs adopted by many architects at the time, though amplified in Soane's work.³⁰

Mystery features prominently in Furjan's account of Soane's house-museum, and here there is a direct link with architectural secrets as suggested by a focus on the *crypt*, a hidden place. As we know, the word *crypt* provides the root for the word *cryptography*. Soane's crypt is open to the rest of the house, and you can look down into it from various points in the plan as an evocation of mystery. It is configured as a romanticized funerary crypt. But Furjan says the same spatial devices apply to the rooms above: dome, colonnade, picture gallery, and even the breakfast room and other domestic quarters. She notes that Soane extended quasi-Gothic, neoclassical conventions, transforming Gothic literature "into a three-dimensional, inhabitable spectacle."³¹

I like to see the building in terms of secrets, as befitted the product of a devotee of a secret society. After all, theatricality is a controlled art of revealing and concealing. Furjan relates the house-museum to "representations and constructions of landscapes,"³² particularly in the house's association with tropes of the garden picturesque. The building employs "a series of carefully framed scenes and prospects."³³ Entrances to rooms frequently align to produce a viewing sequence (an *enfilade*). Sometimes there are glimpses encountered through "apertures" that "suddenly come into line" as you move across a room.³⁴

Hidden within this account of prospect is its landscape converse of *refuge*, though that's certainly evident in the house-museum. It has nooks and hiding places. The visitor to the building frequently looks down, up, or though from a position of safety: a place from which you can see without being seen, or where you can retreat from view if you want seclusion. The requirements of a private house combined with a semi-public museum demand that the architect give attention to a play between prospect and refuge. Other aspects of the building make even more overt reference to secrecy: cupboards, cabinets, and the famous gallery of paneled walls that hinge open to reveal a series of paintings by J. M. W. Turner among others (figure 1.2).

I like to think that the house-museum by Soane is not only a place of secrets, but also a lesson in the architecture of secrets. It is fair to say Soane



Figure 1.2

Moving panels in the Picture Room, John Soane's house. Photo: Gareth Gardner.

demonstrated affinity between his secret society membership and his house as an instruction manual in the spatial art of secrets. If nothing else, the building demonstrates that architecture has more to contribute to the theory and practice of secret keeping than do secret societies. I would add the offer of crypts, basements, darkened rooms, and cupboards to the reasons secret societies gravitate toward architecture: its histories and theories, functions, types, and symbols.

Spatial Affordances

How do the tenets of cryptography interact with both architecture and the rules and practices of secret societies? Assemblages of elements, social movements, cities, societies, and systems carry *affordances*. I introduced the concept of *affordances* in the introduction as those properties, attributes, or qualities of things that are relative to the person or creature that encounters them. The steps leading up to an urban public square afford movement between levels, or they afford sitting outside if the weather is suitable. They also afford jumping and ollieing for a skateboarder, or they afford



Figure 1.3

“Architecture” in pigpen cipher. *Source:* Author.

hindrance to people who are less mobile. Though they may appear as adjectives or nouns (e.g., “accessibility,” “concealment”), affordances start with actions (e.g., “to access,” “to conceal”). It helps my case to identify seven affordances through which cryptography communicates possibilities for action in the city, and even within secret societies.

So, the first affordance is to *conceal*. Traditionally, cryptography deploys ciphers for concealing messages, communicated via text, symbols, or other devices, such as knots in string, abstract markings, or binary signals as in Morse code in sound, light, or other media. *The Early Masonic Catechisms* refers to cryptography; for example, a master says to his novice: “I could not avoid immediately thinking of the old Egyptians, who concealed the chief Mysteries of their Religion under Signs and Symbols, called Hieroglyphicks.”³⁵ Egyptian hieroglyphics were a perennial stimulus for secret societies, especially prior to their decipherment with the discovery of the Rosetta Stone in 1799. The most commonly used concealing method that appears on Masonic inscriptions (in particular on tombstones) is the Masonic cipher, less elegantly named the *pigpen* substitution cipher (figure 1.3). There are many explanations on the Internet, including a website by Johan Åhlén that translates clear text to pigpen automatically.³⁶ The coded characters are based on configurations of lines at right angles to one another and dots. Ciphers based on straight lines and dots are easier to chisel into stone than curves. They are also easier to draw with a drawing app.

Cryptography deploys ciphers for concealing messages, communicated via text, symbols, or other devices. Concealment is also an obvious affordance of objects in space. If you put something into a cardboard box and close the lid, then it is concealed from view. Buildings conceal their contents. I’ve already discussed how Soane’s house-museum provides a vivid illustration of the subtle architectural art of concealment. In cities concealment involves basic geometry and what George Lakoff and Mark Johnson in their seminal studies of metaphor call “the containment metaphor.”³⁷ Cryptography hides messages inside code; buildings “hide” their contents

within walls. You can “hide” in a building from the elements and enemies. In his conclusion to an interesting essay outlining the history of domestic privacy, Robin Evans remarked how architecture (at least in the twentieth century) had the capacity to contain human experience by “reducing noise-transmission, differentiating movement patterns suppressing smells, stemming vandalism, cutting down the accumulation of dirt, impeding the spread of disease, veiling embarrassment, closeting indecency, and abolishing the unnecessary.”³⁸ These are some of the basic affordances of architecture as concealment.

The second affordance of cryptography is that it *controls access*. As well as messages, cryptography provides admission to something, or the message that it reveals offers access, as if a key to a door, cupboard, box, file, or information. Access and its denial are crucial aspects of any secret society. Whether or not such organizations deploy cryptography in earnest, the idea of access concealed via codes provides a leitmotif. Cryptography serves as a meta-symbol for the secretive organization.

Buildings specialize in controlled access, revealing and concealing. This access applies to different sensory modalities: judicious revealing of sights, sounds, smells, and what you can touch. Visitors and occupants move through doors. They also peer through arches, windows, screens, and from balconies and mezzanines. Openings, shafts, atriums, stairwells, and porous membranes provide access to sight, circulation, sounds, and airflows as exemplified in Soane’s subtle use of openings and enfilades.

The third affordance is that cryptography *combines*, makes patterns, introduces combinatorial complexity. In a book chapter “Two Thousand Years of Combinatorics” the mathematician Donald Knuth defines *combinatorics* as “the generation of combinatorial patterns”³⁹ that crosses cultures and disciplines such as poetry, music, and religion. It is also a branch of study in modern mathematics. In his book on the history of cryptography, Simon Singh relates the term *cipher* to “scrambling”: “the term *encipher* means to scramble a message using a cipher.”⁴⁰ From a spatial and architectural point of view I prefer the more generally applicable concepts of *combination*, *combinatorial complexity*, and *assembly*.

Cryptography works with combinations of symbols as in a combination lock or other abstruse sequence. The sheer number of combinations impedes access to the message or the content—unless you have the cryptographic key. For someone without the key the message appears “scrambled.” As I

will examine in chapter 4, whenever theories, myths, and folklores speak of the arrangement of elements, then they participate in the workings of combinatorial complexity: the plethora of possibilities for variation offered by a multiplicity of alternative arrangements.

In the case of secret societies such combination pertains to the ordering of components in ritual. In the *Handbook of Freemasonry*, Arturo de Hoyos amplifies this ritualistic focus as the basis of regional differences between rites as if they are positioned on a staircase or schedule: "The degrees of a Rite will usually, although not always, have a numerical designation or fixed position on a calendar or schedule."⁴¹ De Hoyos explains this ritual profligacy in combinatorial terms, as "Rites" that "may be arranged in a particular sequence."⁴² Such variation enables rival identities and increases the possibility for secrets.

I've already alluded to the importance of number concepts in secret societies. Freemasonry includes mathematicians such as Leibniz, Newton, and Poincaré among its adherents and by appropriation the workings of mathematics via combinatorics and number theory, which invariably deal in sets, series, and combinations.

Buildings are made up of arrangements of elements, evident not least in the configuration of artifacts and classical architectural elements in Soane's house-museum. By my reading this is an aspect of architectural design that flourished in twentieth-century modernity, though nascent in earlier traditions. According to Aristotle, with beautiful things "nothing can be added to them or taken away."⁴³ Andrea Palladio (1508–1580) amplified this assertion to define beauty as a satisfactory relationship of parts to one another and to the whole. Architecture involved the arrangement of parts, though it afforded only limited scope for experimentation and innovation: "Beauty will result from the form and correspondence of the whole, with respect to the several parts, of the parts with regard to each other."⁴⁴

Factory production, modularization, assemblies and more complicated reflections on function and human interaction expanded architecture and urbanism as arts of perfect arrangement to the deliberative assembly of discrete parts. Though any scholar will be quick to point out that architecture is much more than combinations, the task of designing a building now presents architects with configurational challenges analogous to solving a puzzle. Sometimes these configurations shift and change in real time, via furniture, movable partitions, lifts, moving walkways, and responsive

sensor-controlled architectures. Via the affordance of combinatorics, spatial arrangement offers challenges analogous to working through combinations in codebreaking, though rarely with a single correct or optimal “solution.”

The fourth affordance of cryptography is *follow a path, to navigate*. A codebreaker (cryptanalyst) searches through a sequence with many branching paths to explore options, one of which leads to the message. One common characterization of this search is a branching maze, a network of paths, loops, and dead-ends. Branching paths sit within the methods of mathematical procedures, derivations, proofs, and algorithms.

Secret societies invoke the labyrinth as a metaphor of process, hiddenness, and obfuscation. Snoek describes ritual perambulations in Freemason initiations following the pattern of a labyrinth: “The candidate now perambulates the lodge-room three times. Traditionally, the first and third perambulations were clock-wise while the second one went anti-clock-wise, as in the traditional form of the labyrinth (the ‘Troja-castle’). The perambulations go round the ‘tableau,’ in English referred to as the ‘tracing board’, a drawing of symbols on the floor in the centre of the lodge.”⁴⁵ The Troja-castle and its garden labyrinth are in Prague. W. H. Matthews’s 1922 book *Mazes and Labyrinths* highlights the significance of the maze for Masons, as symbol as well as in processional rituals.⁴⁶ As I will examine in chapter 5, labyrinths afford and require expertise in navigation, further aligning cryptography with the city.

In cryptography, a codebreaker searches through a sequence with many branching paths to explore options, one of which leads to the plain text message. Programmers responsible for creating secure encryption invent algorithms that draw on similar processes of path navigation.

Any building or city can present alternative paths, or a single path as a processional journey that weaves through space.⁴⁷ Soane’s house-museum offers several processional routes both horizontally and vertically, an affordance made obvious to the contemporary visitor during a busy period. The Design Methods Movement championed the arts of solving spatial problems as search processes, analogous to traversing a complicated and dynamic maze of possible actions.⁴⁸

The fifth affordance of cryptography is the pursuit of an origin. In terms of actions, that is *to source, to return* and *to restore*. Cryptography helps preserve the concept of an original—a plain text message, an original meaning. The sense of an original applies to the immediate instrumentality of

coding and decoding messages, but it also invokes appeal to a long-term legacy of messages remaining to be discovered and decoded. Remnants of past communications take on the aura of secrecy. Architectural historian Anthony Vidler refers to the stage setting of Freemason initiation rites as primitivist reenactments of a return to or reinstatement of the lost condition of Adam, the first human: "This quasi-ritualistic and allegorical stage-set demonstrates the double character of the Masonic 'return to origins,' celebrating at once a rebirth founded on primary truths and the civilized 'route of progress'."⁴⁹

Cryptography also provides analogies for architectural history (or historicism) as a journey into the hidden past. Much of architecture's historicist theorizing is dedication to origins, a return to a first authentic primitive source—the garden of Eden, the primitive hut, Noah's ark, the Tabernacle, the Temple of Solomon, the Celestial City, Utopia.⁵⁰ Vidler confirms Freemasonry's and architecture's quests to "return to origins."⁵¹ Soane's house-museum provides many such references to origins: the romance of the collector, the crypt, the staging of historical epochs, legacies in stone. I would add that the quest for authentic origins extends into the Primitivist strands of modern art and architecture.⁵²

The sixth cryptographic affordance deals with practical outcomes, *to transact*. As with devices in written language in general, the purpose of cryptography is to preserve, but also to enable social interactions, albeit with a degree of secrecy and security. There's the communication of a message and the actions that follow, such as access, the delivery of information, and the exchange of money. A novice joining a secret society enters into a contract to uphold its rules and secrets. To adopt cryptographic messages and codes symbolizes a commitment to the society. Cryptography is a further meta-symbol of the organization's secrecy but also its sense of community.

As with writing in plain text, the purpose of cryptography is to preserve, but also to facilitate social interactions. Similarly, buildings undoubtedly protect and preserve. They are also places in which transactions and interactions take place: familial, social, economic, performative, and ritualized. Soane's house-museum was a functional home after all. Reflecting architecture's pragmatism, Evans celebrates "an architecture arising out of the deep fascination that draws people toward others; an architecture that recognizes passion, carnality, and sociality."⁵³ The idea that architecture and urbanism

provide settings for meaningful human interactions pervades conceptions of contemporary urban design.

The seventh affordance is *to trust*. Cryptography plays on uncertainties. It may even obscure the fact that it is concealing a hidden message. You can never be sure if there is a message, or if you are confronting a hoax, a sequence of random symbols designed to give the impression that there's something there or to waste the time of a would-be codebreaker. Freemasons are required not to reveal the secrets of the society, or even the fact of its secrecy. *The Early Masonic Catechisms* asserts: "never Reveal the Secrets or Secrecy of a Mason or Masonry."⁵⁴ Don't divulge the secret, but don't let on that there is a secret. Cities are also founded on concepts of trust, not least as people engage in commerce as I will examine in chapter 8. Part of the pleasure and functioning of architecture comes from uncertainty about whether you can trust that you are in a particular space or out of it, whether you should be there or not, or you are occupying the ambiguous condition of the threshold.⁵⁵ Soane's house-museum plays on such spatial thresholds, transitions, and ambiguities.

As does architecture, secret societies offer more than I have indicated so far. People pay membership dues in formalized secret societies. Such organizations are now registered charities with buildings, financial assets, lobbying power, and influence that are likely to impact on the built environment. Secret societies presumably afford their members more than rituals and secrets. There's conviviality, education, social events, community projects, fundraising, and charitable works. Historically, political causes, resistance, and activism have also driven these societies' activity profile, though that's now proscribed in most Freemasonry lodges, which see themselves as apolitical.⁵⁶

But there are groups, networks, individuals, and "minorities" with various degrees of organization and who at different times have found themselves operating in secret due to risks of persecution or prosecution. Unofficial enclaves of trust form across cities for mutual support, protection, common identity, and activism. Religious, pressure groups and self-help communities fall within this category. Armistead Maupin's novel *Tales of the City* has come to represent San Francisco's LGBTQ+ culture of the 1970s and 1980s and explores the diverse cultural life blood of that particular city. What was once secretive turns into conspicuous presentations of freedom and diversity in urban settings.

In summary, I've identified seven affordances of a secret society, which apply to keepings secrets and to cryptography, allowing participants in certain ways to: conceal, access, combine, navigate, restore, transact, and trust. As affordances or motifs we could translate these to concealment, access, combinatorics, path finding, the search for origins, transactions, and trust. Any architecture or urban configuration might demonstrate these affordances, Soane's house-museum providing a vivid historical reference point.

A Philosopher's House

Before concluding this chapter, I would like to test the confluence among cryptography, architecture, and language philosophy as demonstrated in the work of Ludwig Wittgenstein (1889–1951). He wrote diary entries in secret code as outlined in Dinda Gorlée's book *Wittgenstein's Secret Diaries: Semiotic Writing in Cryptography*.⁵⁷ There are several touch points with architecture and place in this account. Wittgenstein had trained as a mechanical engineer and undertook a serious foray into architecture when he designed a house for his sister.⁵⁸ Wittgenstein's earlier and only other journey into architecture came with his commissioning of a hut in Norway. It was a simple structure in the local style, but it was built according to his personal preferences and he retreated there while working in Cambridge. The site was remote, isolated and at the head of a fjord with views of the mountains.⁵⁹

Wittgenstein's use of cryptography in personal correspondence may have been a continuation of the kind of parlor games exercised by a large wealthy family of very close home-schooled siblings. I'm inferring that judgment from Gorlée's description of Wittgenstein's early life. The cryptographic code he adopted was not especially inventive. It was a relatively simple case of a substitution cipher. Further in keeping with an interest in cryptography, Wittgenstein seemed to harbor secrets. His family was of Jewish origin though they were baptized as Catholics. He was unhappy in the army and subsequently, it seems, suffered from severe depression. Three of his brothers committed suicide. His unprepossessing Norwegian hut gives expression to the nexus of place and secrecy.⁶⁰

Scholars have also aligned some of Wittgenstein's philosophical ideas with "mysticism," at least as defined by English intellectuals at the time.⁶¹ As explored by many scholars, prominent architects have drawn on unconventional traditions other than the purely rational. Other exemplars include

Frank Lloyd Wright who was a Unitarian, members of the Bauhaus such as Wassily Kandinsky who were Theosophists, and even Le Corbusier the avowed atheist drew on religious symbols of sacrifice in his architecture.⁶² As far as we know, Wittgenstein the temporary architect drew on none of these traditions directly, but his engagement with architecture entitles us to consider his philosophy in these unconventional lights.

Considering the cryptographic affordances discussed in the previous section, Wittgenstein's personal story speaks of concealing and revealing, and in his philosophy is activated by the enigmatic final sentence in his seminal philosophical work the *Tractatus Logico Philosophicus*: "Whereof one cannot speak, thereof one must be silent."⁶³ On the topic of combinations, he refers to "truth combinations" as arrangements of logical signs. His concept of language games in his later book *Philosophical Investigations*⁶⁴ also foregrounds the cryptographic affordance of combinations. The *Tractatus* follows the methods of geometrical proof, which traces a path from a foundational proposition, an origin: "The world is everything that is the case,"⁶⁵ through to more advanced propositions about language, truth, and meaning. Prior to his final statement about silence in the *Tractatus*, he describes his argument as climbing a ladder. Having reached the top the reader should throw the ladder away. The transactional affordance is revealed as "logical necessity."⁶⁶ In Wittgenstein's later writings he veers toward the active, practical, and performative aspects of language. In the *Tractatus* he deals with trust in terms of certainties and probabilities: "Certain, possible, impossible: here we have an indication of that gradation which we need in the theory of probability."⁶⁷ I'm here proposing that the life, thinking, and architecture of this particular language philosopher illustrate and parallel the affordances of a cryptographic cultural mindset grounded in revealing, accessing, combining, path following, origins seeking, transacting practically, and negotiating trust.

So far, I have emphasized the built environment in material terms, as befits an argument that begins with blocks of stone. Contrary to the limitations imposed by walls, floors, and ceilings, various devices work to supplement or confound architecture's engagement in secret keeping—not least photography, image sharing, surveillance methods, and display screens, which I consider in the chapters that follow.

In this chapter I addressed secret societies and their touch points with architecture and the built environment. I called on John Soane's famous

house in London as an illustration of how architecture can demonstrate the precepts of spatial hiddenness. My purpose in the early part of this chapter was to identify the most obvious cases of architecture as a canvas onto which are written coded messages in stone, concrete, and steel. Dynamic digital surfaces and screens are more fluid and adaptable as media for overt or hidden messages that have currency in the moment, a theme addressed in chapter 3.

Chapter 2 will advance further the case that cryptography permeates and affects cities. I think of the city as an arrangement and rearrangement of components and elements: buildings, streets, neighborhoods, blocks, pipes, and services. As a process of arranging, it bears similarities to writing.

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