

Deleuze, Guattari and the Art of Multiplicity

Edited by Radek Przedpełski and
S. E. Wilmer

EDINBURGH
University Press

Williams, James (2003), *Gilles Deleuze's Difference and Repetition: A Critical Introduction and Guide*, Edinburgh: Edinburgh University Press.

Williams, James (2011), *Gilles Deleuze's Philosophy of Time: A Critical Introduction and Guide*, Edinburgh: Edinburgh University Press.

Witkin, Robert W. (1998), *Adorno on Music*, London and New York: Routledge.

Talisman-Images: From the Cosmos to Your Body

Laura U. Marks

This chapter identifies a kind of image, the *talisman-image*, that intervenes in the order of the cosmos in order to effect specific changes here on Earth. In the hands of a competent magician, talismans compel the universe to bend according to forces of *contact*, *correspondence*, *sympathy* and *passion*. As the thirteenth-century Latin *Picatrix*, a translation of the tenth-century Arabic magic text the *Ghayāt al-ḥakīm* (Goal of the Sage), puts it, 'The talisman is nothing other than the force of celestial bodies that influence bodies' (*Picatrix* 2003: 120). As I will argue, talismanic practice gives us a deep history of the theory of affect as a cultivated contact and mimetic sympathy among human practitioners, the things they wish to affect, heavenly bodies, and a series of linked intermediaries. The *Picatrix* defines magic as the exertion of action at a distance by means of an intervening image (Bakhouche et al. 2003: 19): the talisman is one such image.

Another definition of magic from medieval times is 'the awareness of the interrelatedness of all things in the world by means of a simple but refined sense perception' (Glucklich 1997: 12). Muslim and medieval European magicians cultivated this awareness of the inter-relatedness of things by refining their perceptions and making themselves microcosms of the universe: creating, as I will explain, a ceremonial body. They fashioned talismans to also represent the cosmos in miniature. Deploying a model of the universe as a manifold, I will ask whether, in our seemingly disenchanted times, it is still possible to re-fold the universe, grasping the points of disparate histories and places and drawing them together: to do modern magic.

Talismans Now

A media archaeology¹ of digital apps will find their origins in small devices, fashioned of particular stones and metals at particular calendrical moments, inscribed with mysterious diagrams, prayed over using powerful invocations, and worn or buried to begin their work. Talismans constitute the deep source of contemporary media technologies that exert action at a distance. Penelope Gouk draws attention to the parallel between these Renaissance technologies for action at a distance and technologies of our time for rapid secret communication and remote surveillance

(1997: 230). Talismans are the precedent for technologies that rely on the interconnectedness of seemingly separate things, and for images that don't represent but carry out operations. They deepen the genealogy of 'devices of wonder', at once visible and legible, that Barbara Maria Stafford and Frances Terpak (2001) trace from small-screen media to cabinets of curiosities. You could value the contemporary technology over the early one and say not that apps are modern talismans, but that talismans were medieval apps. Indeed, our smartphones do some of the things that talismans were supposed to do, like attract a lover or destroy an enemy. However, we will see that talismans pose demanding criteria for efficacy that few media works of our time are able to meet.

Like talismans, digital applications carry out algorithmic operations on the physical world, folding together distant points. Also like talismans, most of them are small, fitting easily into the hand or a pocket. They use their powers to affect things at a distance to send messages instantly, invest your money, protect you from maleficent intruders, and perhaps locate and attack the distant home of your enemy.² They use their powers of divination to predict the weather, magically draw music and movies down from the clouds, predict when you will be fertile, and of course read what your stars are doing today. And like talismans, they aim to present the cosmos in miniature.

Magic requires a cosmology. Digital applications and networked media corporations require a cosmos interconnected partly by physical infrastructure, partly by rhetoric. These technologies, developed to serve shareholder capitalism and the military, rely on physical connections between the human-computer interface, wireless networks, remote servers, energy sources and the internet, as well as on the labourers who produce digital devices and mine the rare earths that go into them.³ They mystify these material connections with an aura of intimacy and serendipity. Given the *Picatrix*'s definition of magic as the exertion of action at a distance by means of an intervening image, our most talisman-like contemporary images are operational images. Operational images 'do not represent an object, but rather are part of an operation', mystifying the human agency involved (Farocki 2004). Examples include images generated by facial-recognition technology and images that smart bombs produce of their targets. While, as we will see, human physicality and intention were crucial to the operation of medieval talismans, the human-computer interface of digital apps is often a rather insulting cover for operational images that only need humans as data.

To compare the cosmoi of contemporary apps and medieval talismans, you can imagine our planet Earth surrounded by spherical or elliptical orbits of influence. High Earth orbit satellites, such as weather and communication satellites, look down upon the globe from about 36,000 kilometres. GPS satellites orbit the planet at an altitude of 20,200 kilometres. Imaging satellites graze Earth's atmosphere, orbiting at no higher than 2,000 kilometres (Riebeek 2009). In short, our contemporary informational and surveillance orbits cling quite close to the planet. In contrast, the most intimate of the medieval heavenly bodies, the moon, orbits the earth at a distance of 384,000 kilometres. The other planets are many magnitudes further away, and the stars unfathomably distant. Yet it was to these heavenly agents that medieval magic

confidently appealed. While talismans address the heavens, apps only address what early cosmic scientists called the sublunary sphere – and a very thin slice of it!

In addition, let me point out that digital apps do not work with true causality, but with statistical or quantitative quasi-causes that the designers select for their utility. They do not correspond to cosmic powers but, usually, to corporate or military interests. In contrast, talismans seek to harness the fundamental causal forces of the cosmos.

At this point a reader may be understandably sceptical about the actual powers of talismans. In what follows I will explain how medieval talismans functioned, and what conception of the cosmos made it possible for them to function. Then we will be able to test whether talismans can work now; whether, in our seemingly disenchanted times, it is still possible to re-fold the universe.

A Pliable Cosmos

The manifold cosmos of Leibniz, whose internal causality so fascinated Deleuze, is a closed, densely folded entity with a continuous inside surface and a continuous outside surface. In *The Fold*, Deleuze works to open up Leibniz's cosmos while maintaining the image of the universe as a vast, folded surface. Deleuze relates this concept of the manifold to the mathematical model for chaos within a contained system called the Baker's Transformation: a surface folded multiple times, like dough in the hands of a baker, until points that were adjacent become separated, while points that were far distant now press together, across a fold (Deleuze and Parnet 1996; Stivale 2000–11).⁴ Félix Guattari, Deleuze's longtime collaborator, proposes that the cosmos is generated by way of two ontological foldings that generate first matter, then thought (Guattari 1995: 153; see also Goodchild 1996). These contemporary models of cosmoi appear to be chaotic, but folding allows them to maintain a fundamental order of connectivity.

The modern Western concept of the universe as manifold has one of its most important and least recognised origins in Islamic Neoplatonist cosmology, which developed in the Muslim world and spread to the Latin West in the medieval and early modern period. Neoplatonism conceives that all things emanate from God in a series of levels or hypostases, each of which has causal effects on the one below. The concept of emanation allows the cosmos to become multiple while retaining its unity: it is the unfolding of the one into the many. Islamic Neoplatonist texts combine Qur'anic teachings, Greek Neoplatonic cosmology, Aristotelian natural science, and in some cases Indian, Harranian and other cosmologies in varied combinations, but generally they describe a cosmology of nested spheres (*aflāk*; singular *falak*), each of which is caused by the prior sphere and retains contact with it. At some point the transcendental spheres of (usually) First Cause (*al-Bārī*), Intelligence (*al-'Aql*) and Soul (*al-Nafs*) give way to the physically observable spheres of the heavens, the earth, and elements that compose earthly things. The French translators of the *Picatrix* note that it deploys by turns the hierarchical models of the eighth-century alchemist Jābir ibn Hayyan (see also Pingree 1980), the Ikhwān al-Safā' or Brotherhood of Purity, a tenth-century secret society based

in Basra (see Netton 1982; Ikhwān al-Safā' 2011), and Pseudo-Empedocles, without seeking to reconcile them: what was important to the author of the *Picatrix* was that the source was God, and therefore the magic was legitimate (Bakhouché et al. 2003: 17). I wonder if this admixture of disparate sources is what allows Islamic Neoplatonist cosmology to map so directly on to astronomy, so that the divine world comes into contact with the physical world.

Diagramming the Islamic Neoplatonist cosmology involves a series of concentric circles. One can begin with God in the centre, emanating the universe; or one can place our earthly world at the centre in the sublunary (literally, below the moon) sphere, encircled by the celestial sphere, beyond which lies the divine sphere, with a variable number of other spheres in between. In Jābir's terms, the first sphere under the third hypostasis 'is the Supreme Luminous Sphere, namely the one which embraces the world in which we are' (qtd in Haq 1994: 54). For now I ask the reader to note that surface or membrane where the transcendental gives way to the physical, the divine makes contact with the sublunary.

The reader may remark a morphological difference between the Leibnizian and Neoplatonist cosmoi. While the manifold universe of Leibniz that Deleuze studies in *The Fold* consists of a single entity, body on the outside, spirit on the inside, the emanationist universe of the Neoplatonists consists of a series of concentric layers. The concern of these thinkers remains the same: to devise elegant solutions for how the universe can be simultaneously one and many. For the Islamic Neoplatonists, creation by emanation meets the Qur'anic criterion that there be nothing prior to or more powerful than God. The descending levels of the cosmos are caused by God and cannot exist independently of God; causality cascades down from one level to the next. Leibniz ingeniously reduced the number of layers to one, though he too argues for multiple kinds of causality whose final cause is God.

With this Neoplatonist model of a well-organised cosmos established, practices emerged to intervene in its order by *folding it differently*: astrology, alchemy and magic, in particular the making of talismans. The *talisman-image* intervenes in the order of the cosmos by folding it and drawing the folded points into contact with the body.

Talismanic magic in the Islamic Neoplatonist tradition allows the practitioner to manage the cosmos in miniature, folding the powers of planets and stars together with earthly people, places and objects to make things happen. Embodying not only entities distant in place and time but an entire cosmology that explains how they connect, in effect each talisman comes with a cosmological user's manual that not only allows it to intervene in the order of the universe but explains why it does. Talismanic magic builds on the older practice of fetishes, objects that establish a physical contact with some distant person or thing. Fetishes rely on sympathetic magic, the affinities among things that come into contact in the earthly realm. The talisman makers, however, in order to fend off accusations of devilry, insisted that they were doing celestial magic: calling on the influence of the stars and planets, which in turn answered to God's command.

Pictured here (Fig. 12.1) is an image from al-Ṭūsī Salmān's *'Ajā'ib*

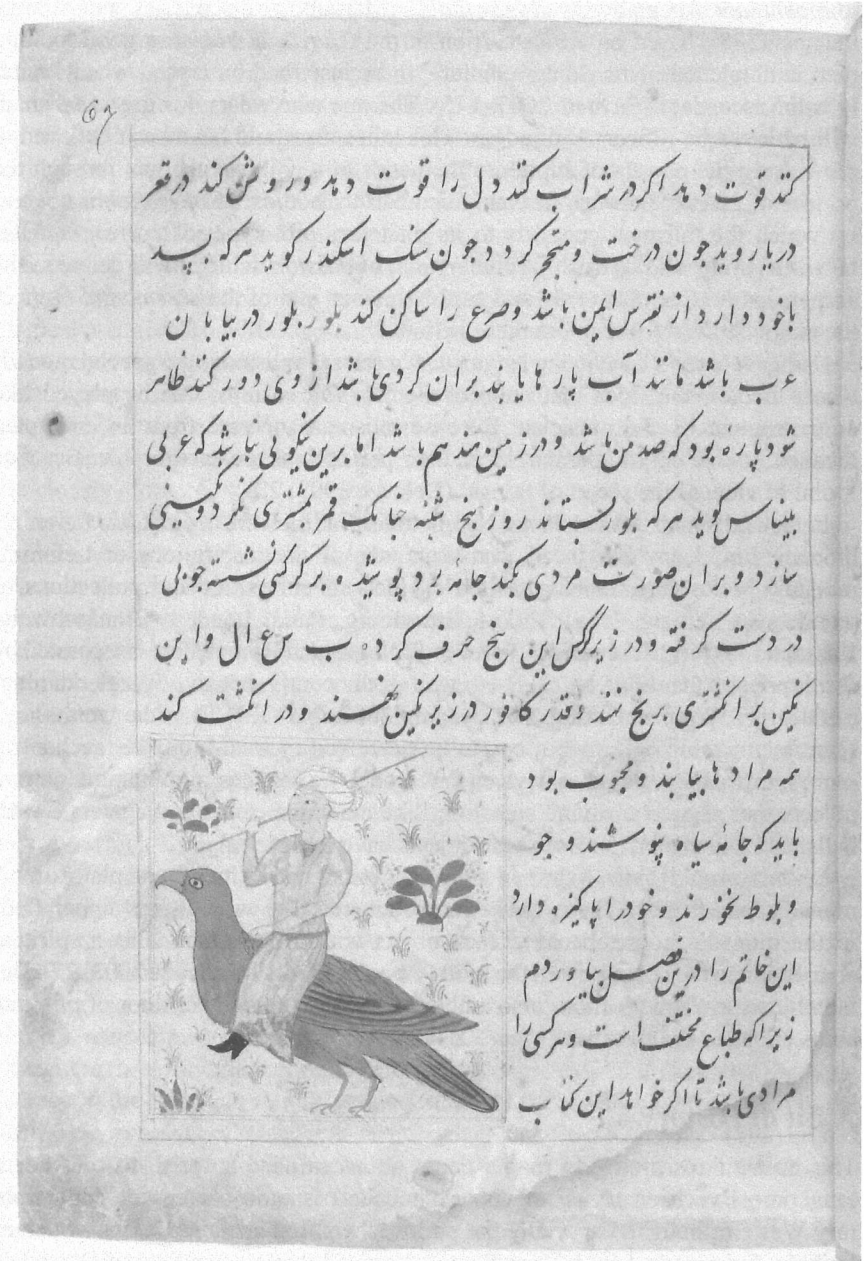


Figure 12.1 Man riding a vulture: image to be inscribed on a crystal, from al-Ṭūsī Salmānī, *'Ajā'ib al-makhlūqāt* [Marvellous discoveries and strange beings], 1388.

Courtesy of Bibliothèque nationale de France.

al-makhlūqāt wa ghāra'ib al-mawjūdāt (Marvellous discoveries and strange beings, 1388), based on an instruction in the *Ghayāt al-ḥakīm*: a good-looking man in ample garments riding a vulture, to be inscribed on crystal when Jupiter is in the ascendant (*Picatrix* 2003: 145). The one who wears this useful talisman will be loved by officers and judges. This talisman would have been believed to draw down the powers of Jupiter to the hands of a political aspirant through the powers of *contact* between heavenly and earthly bodies; of *operational images*, by which the talisman connects to its planetary prototype; of *correspondence* between Jupiter and its earthly counterparts; of *passion*, which I will define as the suspension between heavenly and earthly realms; and of the *ceremonial body* of the magician. We will explore these below.

Using Deleuze's Leibnizian language, we can say talismans are special monads whose bodies, the folds that connect them to the cosmos, can be played like an instrument by the musician. Because talismans operate from an encrypted location known only to the magician, their perceptions are anamorphic: Baroque 'point of view as the secret of things' (Deleuze 1993: 22).

In fact, talismans in the Islamic Neoplatonist tradition are not just *like* Leibniz's monads, but, I am convinced, constitute one of the inspirations of Leibniz's monadic philosophy. Leibniz visited cabinets of curiosities and collections of wonders in Leipzig, Jena, Altdorf, Strasbourg, Paris, London, Braunschweig, Kassel, Frankfurt, Nuremberg, Florence, Bologna and Rome – this last curated by Jesuit priest Athanasius Kircher – as well as the comprehensive Wunderkammer of Olearius Worm in Gottorp (Bredenkamp 2007: 212–13). There he would have seen innumerable objects that beg to be perceived as mini-monads: mechanical globes; astrolabes and other devices that model the heavens in miniature; natural objects that suggest a divine signature, like mandrake roots and agates; crystal balls; and talismans. Many of these objects have Islamic origins.

Leibniz would have found in the cabinets of curiosities exemplars of his monadic philosophy. These collections constitute the windowless upper floor of the monad's house, because each object within them maintains a spiritual connection to the cosmos from the monad's point of view (Deleuze 2003: 27). But the objects in the collections also embodied the monad's lower floor of *physical* connections to the cosmos.

A Bit of History

This vein of research into magic came as a complete surprise to me. For a long time I've been trying to unpack occulted Islamic sources of contemporary Western thought, especially the philosophers that inspired Deleuze, such as Leibniz, Spinoza and John Duns Scotus. I argued that a genealogy of Deleuze's conception of Being as a manifold, in which actual and virtual constitute unfolded and enfolded aspects of an infinite disjunctive unity, finds one of its most important sources in Islamic Neoplatonism. I demonstrated that Deleuze's conception of the univocity of being originated with the major philosopher Avicenna (Ibn Sīnā, c. 980–1037) (Marks 2013). More recently I've demonstrated the generative

meeting between Deleuze's thought and that of Persian process philosopher Šadr al-Dīn Muhammad al-Shīrāzī (1571–1640) (Marks 2018). This chapter, however, pursues an even more 'minor' aspect of Deleuze's Islamic genealogy. Struck by the similarity between Leibniz's concept of the human as microcosm and that of the Ikhwān's al-Safā', but unable thus far to trace a connection between them in major or official philosophy, I fell into the deep, minor history of magic and the occult and began to learn how their texts and practices travelled from the Arab and Islamic world to the Latin West.

A history of magic always begins in the middle, and this chapter cannot do justice to the complex paths of transmission, synthesis and invention along which magical practices from Mesopotamia and India, Greece and Rome, Syria, Iran, the Nabateans and the Chaldeans travelled before they reached the Arab world in the ninth century. Scholars are working to disentangle these histories. As more details come into focus, the history takes ever more forking paths and becomes ever more minor, until it reaches an unwritable scale of fractal granularity. Therefore I will judiciously gloss.

Termed in Arabic *bātinīyya*, the search for inner secrets, the hermetic tradition⁵ associated with Islamic Neoplatonism was developed by minorities within Islam or people working on the fringes of religious orthodoxy, including the non-Muslim Sabaeans of Harrān, Shi'i Muslims and Sufis. (Sunni Islam rejected the Neoplatonist theory of creation through emanation, as it was incompatible with the indigenous Muslim concept of God (Netton 1982: 43), appeared to threaten the unity of God, and presumed knowledge of God's ways.) All these groups, especially the often-persecuted Shi'a, developed practices of secrecy, concealment and dissimulation to protect their communities and their doctrines. These practices shaped their cosmic knowledge into characteristic forms of secrecy, which I term manners of enfolding and unfolding (Marks 2010). Secret is *sirr* in Arabic, from the verb *sarra*. Ruqayya Yasmine Khan points out that two forms of the verb, *sarra* and *asarra*, connote both concealment and revelation: *asarra* means both 'he kept it secret' and 'he revealed it'. Khan argues this means *sirr* involves a dialectic: 'a secret is not a secret until it is revealed to someone, so secrecy invites revelation, and this revelation, in turn, may entail another concealment' (2000: 241). Secrets create relationships between those who share them, and their forms change, unfold and re-fold differently. Studying secrecy in the Shi'i community around imam Ja'far al-Sādiq (c. 699–765) in the hostile environment of late eighth-century Baghdad, Etan Kohlberg (1995) argues that *taqiyya* or strategic dissimulation involves two modes, prudential and non-prudential: the former protects oneself and one's friends from exposure, the latter protects the listener, for whom the secret knowledge may be unbearable.

But there were those who put secrets in writing, including the aforementioned alchemist Jābir ibn Hayyan and the Ikhwān al-Safā', as well as Maslama al-Qur-tubī (d. 964), thought by some to be the author of the *Ghayāt al-ḥakīm* (Melvin-Koushki 2017; Saif 2017). Among other magical sciences, their texts explain how to appeal to the heavenly bodies at astrologically propitious times by fashioning talismans that would have specific effects.

Muslim practitioners of magic cultivated the persuasive theory that astrology works at God's command, and thus doesn't contradict monotheism. It would follow that using talismans to manipulate events is compatible with religious belief in divine causality, because talismans are natural, scientific phenomena and not idolatrous. This argument facilitated the movement of Arabic and Islamic talisman theory to the Latin, Christian West. Festooned with stern injunctions not to divulge their secrets to the unworthy, these texts circulated all across the Muslim world and, from the thirteenth century on, into Europe, where they became the basis of wildly popular 'books of secrets'. To give a few examples: the earliest Arabic book of magic translated into Latin may be the *Kitāb sirr al-khaliqa* (Book of the secrets of creation, 825) by Bālinās (Pseudo-Apollonius), which was translated by Hugo of Santalla in about 1145 as *Emerald Tablet* and attributed to Hermes Trismegistus. Another important text, the ninth-century *Kitāb sirr al-asrār* (Book of the secret of secrets), misattributed to Aristotle, compiled by Yahya ibn Batiq, was translated as *Secretum secretorum* in 1250. Al-Majrīṭī or al-Qurtubī bundled the chapters on magic from the *Rasa'il Ikhwān al-Safā'* (898) with the *Kitāb sirr al-asrār* and two chapters of Jābir into the *Ghayāt al-ḥakīm*. This work was translated into Castilian for Alfonso X in the thirteenth century and soon thereafter translated into Latin as the *Picatrix*, which was translated into all Romance languages and became a medieval best-seller. Everyone wanted to be a magus.

Within both the Muslim world and Europe, magic travelled by minor routes, considered suspect and disparaged in multiple ways. In the Muslim world magic was deemed suspect for its pagan origins and, by the Sunni majority, for its cultivation by Shi'i groups. It was deemed suspect by both Islam and the Christian Church as idolatrous or demonic. Furthermore, Arabic texts on magic were not on the Latin Scholastics' curriculum, even if some Scholastics pursued it on the side. Magic was non-scholarly, popular knowledge. William Eamon argues that in bypassing the academy, this knowledge was proletarianised; magic and astrology were useful skills in the competitive world of the courts. The Shi'i and Sufi concept of *bāṭiniyya*, the search for esoteric knowledge, resonated: 'The distinction between public knowledge and esoteric counsel was, in reality, the secret of power and advancement for late-medieval intellectuals' (Eamon 1994: 50). Magic also mingled with the suspect sources of women's and folk wisdom (Kieckhefer 1989).

Scholastic attacks on alchemy often used Avicenna's warning to alchemists in the meteorology in *Al-Shifa'* (The Healing, 1027), translated into Latin by Alfred of Sareshal in 1200. '*Sciant artifices*,' Avicenna writes; 'Let the artificers know' that art is inferior to nature and cannot change it. The characteristics of metals that determine their species (*na'u*) can't be known (Newman 1989). Basically, Avicenna is warning the alchemists that, because they don't understand all the variables involved, their data is worthless.

All manner of books of secrets circulated in late medieval and Renaissance Europe containing instructions on alchemy, astrology, mantic arts including geomancy and '*ilm al-kātif* or scapulimancy (divination from the shoulder blades

of sheep, practised in many world cultures; Burnett 1996), recipes for medicine, perfumes, incendiary devices and many other useful arts. Each book contained a warning that echoes the Shi'i language of *taqīyya*, such as this in *Secretum secretorum* (based, you recall, on the Ikhwān al-Safā's *Rasa'il*):

I am revealing my secrets to you figuratively, speaking with enigmatic examples and signs, because I greatly fear that the present book might fall into the hands of infidels and arrogant powers, whereby they, whom God has deemed undeserving and unworthy, might arrive at that ultimate good and divine mystery. . . . Know therefore that whoever betrays these secrets and reveals these mysteries to the unworthy shall not be safe from the misfortune that shall soon befall him. (Qtd in Eamon 1994: 47)

The enticing and flattering language of secrecy surely contributed to the secret books' cachet.

The thirteenth- and fourteenth-century European reception of Arabic texts eagerly applied the immediately useful aspects of magic, alchemy and astrology (which would develop into the sciences of chemistry and astronomy) less often than they evinced interest in their philosophical underpinnings (Eamon 1994; Gouk 1997: 234). An exception, Roger Bacon (c. 1219–92), based his own hermetic philosophy on the *Secretum secretorum*, though when he found out it was not by Aristotle he disavowed it like a hot potato. Only later in the Renaissance did European esoteric thinkers such as Nicolas of Cusa (1401–64), Cornelius Agrippa (1486–1535) and Giambattista della Porta (1535–1615) elaborate a full-blown Neoplatonist cosmology. By this time, the Arabic Muslim sources had already been partially effaced and replaced with more distant heritages in ancient Egypt, ancient Greece and Jewish mysticism.

This chapter focuses on the Islamic connection over better-documented Egyptian, Greek and Kabbalistic sources of the hermetic tradition in order to perform a historiographical unfolding. For, as often happens, the occulted Islamic elements of early modern European intellectual history remain neglected. Here lies my annoyance with Joshua Ramey's thrillingly original *The Hermetic Deleuze* (2012), which argues that certain of Deleuze's concepts derive from the Western hermetic tradition. In sympathy with Ramey's argument, I nevertheless regret that he repeats the Eurocentric error of ignoring the Islamic foundations of European hermeticism, instead jumping from the Greeks to the Renaissance as though eight centuries of civilisation did not occur in between.⁶ I deepen the roots Ramey posits to identify some of their origins in Islamic esotericism: cosmology, astrology, alchemy, talismanic science and the arts of secrecy.

Another reason these occult historical connections between the Muslim world and Europe are so difficult to make manifest is a double standard in scholarship that indulges Western histories of the occult while censoring those histories in the Muslim world, in an effort to clean up after Orientalism. As Matthew Melvin-Koushki puts it, 'Reacting to the depredations of European colonialism, Orientalism's wellspring, the well-intentioned scholarly compulsion has been to

exercise Islamic history and culture of “superstition” and “magic” in an effort to banish Orientalist stereotypes of cultural and scientific stagnation’ (2017: 288). Historians of the Muslim world now focus on chemistry and astronomy and play down alchemy and astrology, even though in medieval times these constituted two sides of the same practice.

So let us turn to a media archaeology of the talismanic properties of *contact*, *operational image*, *correspondence*, *passion* and *ceremony*, the means by which magicians can fold the universe.

Magic by Contact: Al-Kindī’s Ray Theory

The theory of affect or bodily causality popular in our time has some very deep roots, deeper still than Spinoza (1632–77), to whom Deleuze credits the concept. I’m talking about the theory of ray-based astral causation attributed to Yaḳūb ibn Ishāq al-Kindī (801–73).⁷

Al-Kindī, a prolific scholar of mathematics, optics, medicine and cryptography, as well as philosophy, oversaw the lively translation industry at the Bayt al-Hikmah (House of Wisdom) in Baghdad, the capital of the ‘Abbasid caliphate. His *De radiis* (*On Rays*) proposes a universal theory of causality based on rays, a kind of wave-based physics. Al-Kindī argues that the heavenly bodies, at God’s command, send out rays, which travel in straight lines in all directions and affect everything they touch. This argument is al-Kindī’s interpretation of the Qur’anic verse ‘The sun and moon revolve to a computation; And the grasses and the trees bow (to Him) in adoration’ (Adamson 2007: 182; Ali 1993: 461). Since these rays differ according to their positions, distances and angles, they have infinitely varied effects. ‘Because of this mutual condition of the rays,’ al-Kindī writes, ‘so much diversity comes about that hardly two or more things which actually exist in this world are found to be similar in all respects, even if human sensation cannot grasp the difference’ (al-Kindī 2012: 222–5). (This will be why talismans tend to use redundant information: to get as many rays working together as possible, or to mitigate forces of certain rays.) Even if we cannot detect it, that is, the complexity and uniqueness of things on earth parallel those of the ever-changing heavens. Absorbing all those rays, ‘each place in this world contains the rays of all the things that actually exist in it’ (al-Kindī 2012: 226).

Earthly entities not only absorb rays but emit them in turn, al-Kindī continues. Sounds and colours emit rays. The emotional passions of the soul are the effect of rays and in turn send out their own rays. Imagination, too, or the inner capacity to make images, is the effect of rays, for the imagination absorbs the imprint of things and reproduces them in microcosm (Burnett 2009; Hanegraaff 2003: 363).

This ray-based physics synthesises several sources. The ray theory al-Kindī innovatively adapts from optics. The astral causality comes from the *Great Introduction to Astrology* by al-Kindī’s colleague Abu Ma’shar al-Balkhī (d. 886), which argues that events in the terrestrial world are caused by movements in the celestial world. These movements are no mechanical clockwork but living forces, as Liana Saif points out, for Abu Ma’shar argues the stars and planets act ‘through

their rational souls, by virtue of being alive, and through their natural movement . . . by God’s leave’ (Saif 2017: 305). Al-Kindī attempted by a number of arguments to prove that the stars, with human-like psychology, did God’s bidding by free will, though he did not quite succeed (Adamson 2007: 183–5).

Thinking of the stars and planets as living, willing beings leads us to a third ingredient in al-Kindī’s ray theory, the fascinating figure Ṭābit ibn Qurrā (d. 901). Ṭābit worked in Baghdad as a mathematician and translator, and was knowledgeable in the production of talismans. He was not a Muslim but a Sabean of Harrān in northwestern Mesopotamia, now southeastern Turkey. The Sabean religion synthesised Greek, Syriac, Jewish, Persian and Indian sources. They worshipped stars as representatives of a divine unity. Al-Kindī describes their basic tenet as: ‘The world has a cause who has never ceased to be, who is one, not manifold, who cannot be described by means of attributes which apply to the things caused’ (qtd in Pingree 2002: 19). The Sabaeans carried out elaborate initiations in their temple for equal numbers of female and male youths. Despite all this syncretism, the Sabaeans are mentioned in the Qur’an as people of the book.

From Ṭābit, al-Kindī adopted the Neoplatonist idea that God, as first cause, is so high above us humans that we can only reach him through intermediaries, the heavenly bodies (Burnett 1987: 87). Incorporating Abu Ma’shar’s astrology with Ṭābit’s argument that the stars and planets enact God’s will, al-Kindī is able to argue that *all* events in this world are caused by the rays of the heavenly bodies, at God’s command.

In al-Kindī’s cosmology the activity of every entity, down to the smallest blade of grass, is the effect of the entire heavenly harmony (al-Kindī 2012: 225). If you understand this harmony, he promises, you will know the past, the present and the future. It is here that *On Rays* becomes a manual of talismanic magic: a set of practices to bend celestial rays in order to influence earthly things.

Al-Kindī instructs the magician to make images of celestial bodies by carving a figure into metal or stone or by moulding it. Judging by surviving talismans, such as those illustrated by Emilie Savage-Smith (2003), the resulting image was approximate. Tenth-century Iranian magicians inscribed figures of a scorpion, rampant lion or dog, stars, and Arabic script on silver or base metal about two centimetres across; Savage-Smith writes that these may have been intended to ward off sudden death. The figures are very simple, but according to al-Kindī the tactile impression of the specialist’s ceremonial labour will send out rays. ‘Every actual figure, certainly every form impressed in elemental matter, produces rays that cause some motion in all other things’ (qtd in Page 2013: 91). This suggests that effective images are not representations but physical indexes, that is, in Charles Sanders Peirce’s definition, signs that are caused by the object to which they refer. In al-Kindī’s account, talismans work in two directions, indexing both source and destination. This theory that images are produced by contact resonates not only with other arts of inscription and modelling but also with mechanical media like photography, film and video.

Al-Kindī’s ray theory was at the heart of Islamic and medieval Latin theories that the heavenly bodies not only influence sublunary events but can be supplicated

to intervene in them. Six hundred years later, the Italian Neoplatonist Marsilio Ficino wrote in his manual on healing talismans adapted from the *Picatrix*, *Three Books on Life*:

The Arabs say that when we fashion images [*imagines*] rightly [*rite*], our spirit, if it has been intent upon the work and upon the stars through imagination [*imaginatio*] and emotion [*affectus*], is joined [*coniunctum*] together with the very spirit of the world [*spiritus mundi*] and with the rays of the stars through which the world-spirit acts. And when our spirit has been so joined, it too becomes a cause why (from the world-spirit by way of the rays) a particular spirit of any given star, that is, a certain vital power [*virtus vivida*], is poured into the image – especially a power which is consistent with the spirit of the operator. (Ficino 1989: 3.20)

While significant differences exist, al-Kindī and Ficino both conceive of talismans as establishing a flow of power between the divine source, the practitioner and the image, which allows the image to carry out the practitioner's intentions.

We can see how al-Kindī's ray theory is a theory of causality by *contact*. Heavenly and earthly bodies affect one another, in infinitely diverse ways, by sending out and absorbing rays. I note a strong resemblance between al-Kindī's theory of stellar rays and Spinoza's theory of encounters among bodies that generate a great number of possible modifications, augmenting or restraining the body's power of acting (Spinoza 1901: Part III, prop. I). This theory is the basis of Deleuze's (1988) concept of affect. While I don't have evidence that Spinoza knew of the work of al-Kindī, al-Kindī's theory of astral causation by rays was well known in early modern European thought and was the basis of subsequent arguments about divine and earthly causality; thus it is possible to draw a conceptual genealogy of affect from al-Kindī to Spinoza to Deleuze and our contemporary theory of affect.⁸

What holds together those concentric spheres of the Neoplatonist cosmos, especially the celestial and sublunary spheres, the heavens and our world? A physical force? Natural correspondences? Spirits?

Operational Image: Diagrams of Force

Al-Kindī suggested that characters or engraved forms could augment the activity of planets, fixed stars and constellations. The *De radiis* is not illustrated. However, the magic text *Sirr al-asrār* of Pseudo-Aristotle, which as you recall is one of the sources of the *Ghayāt al-hakīm* and the Latin *Picatrix*, states that engraved forms channel astral influences into the talisman, thereby establishing the 'connection with the celestial bodies and the reception of their rays which enable you to achieve or destroy what you wish' (qtd in Saif 2017: 312). Thus at some point talisman makers began incorporating little symbols that appear to be based on al-Kindī's description of stellar rays. These little images of circles connected by lines condense the action of stellar rays into *diagrams*, or signs that

represent relations among parts of a thing by analogous relations among their own parts (Peirce 1955: 105). They consist of two or more points or circles connected sometimes by straight lines, as one would expect of a diagram of rays, and sometimes by curving and path-like lines (Fig. 12.2). For example, five symbols in which straight or interlacing lines connect small, regular circles illustrate a spell in the *Picatrix*: 'So that a man of your choice runs to you (or wherever you want): Write these figures on a piece of linen on the day and hour of Venus. When the second decan of Taurus is in ascendant and Venus is there too, write his name on it; then set fire to the end of it' (*Picatrix* 2003: 139; my translation from French).

For the magicians and their clients, the stellar-ray diagrams act on their celestial target by diagramming its function. Diagrams draw forces into matter, Deleuze (2003) writes, describing how Francis Bacon begins a painting with a set of free marks. As Ramey writes, the diagram is 'a mark that potentially relates the known to the unknown' (2012: 162).

A later source of these diagrams is the esoteric works of the thirteenth-century Egyptian Sufi Ahmad al-Būnī (d. c. 1230), which are chock full of textual amulets employing magic squares, powerful letters (similar to the '*ilm al-hurūf*' or science of letters of the Andalusian Sufi Ibn 'Arabi, 1165–1240) and stellar-ray diagrams. Al-Būnī's magic continued to be practised in North Africa: the early twentieth-century Moroccan magician Ibn al-Hajj combines stellar-ray diagrams with Arabic letters in his spells (Doutté 1909). Al-Būnī's magical books were taken up all across North Africa, the Levant and Persia. They were not translated into Latin or other European languages. However, as Noah Gardiner (2017) demonstrates, Jewish esotericist readers in Egypt studied al-Būnī's works. I speculate that they were additional conduits by which these diagrams of stellar efficacy found their way into Kabbalistic magic, and thence into European Renaissance esotericism.

Writing on medieval Latin books of magic, Sophie Page notes that they commonly hold that these astral signs faithfully represent 'the likeness of the countenance of the heavens', and that they were first made by wise men who named figures in the heavens that only they could understand (2013: 87). It is striking, then, that stellar-ray diagrams multiply and become more complex as later magicians devised their own private maps of cosmic forces, as though they are privy to new astral knowledge. Renaissance magicians such as Ficino, Agrippa, Nostradamus and John Dee seem to vie with each other to produce ever more singular astral signs.

The *Picatrix* describes how the talisman extends the power of the celestial rays that strike it across its surface, in a remarkably Deleuzian manner: 'The surface is the extension of the effect of the talisman in the place. When there is extension, there is necessarily surface; all that stretches out, up to the most subtle, is surface' (*Picatrix* 2003: 131; my translation from French). Deleuze emphasises in *The Fold*, *Difference and Repetition*, *The Logic of Sense* and other works that all meaning occurs on the surface of phenomena, rejecting the Platonic legacy of depth as a guarantee of significance. The *Picatrix*'s emphasis on surface allows us to consider that causation is physical; even very subtle causation is not metaphysical but simply requires a very refined perception, such as magicians cultivated.⁹

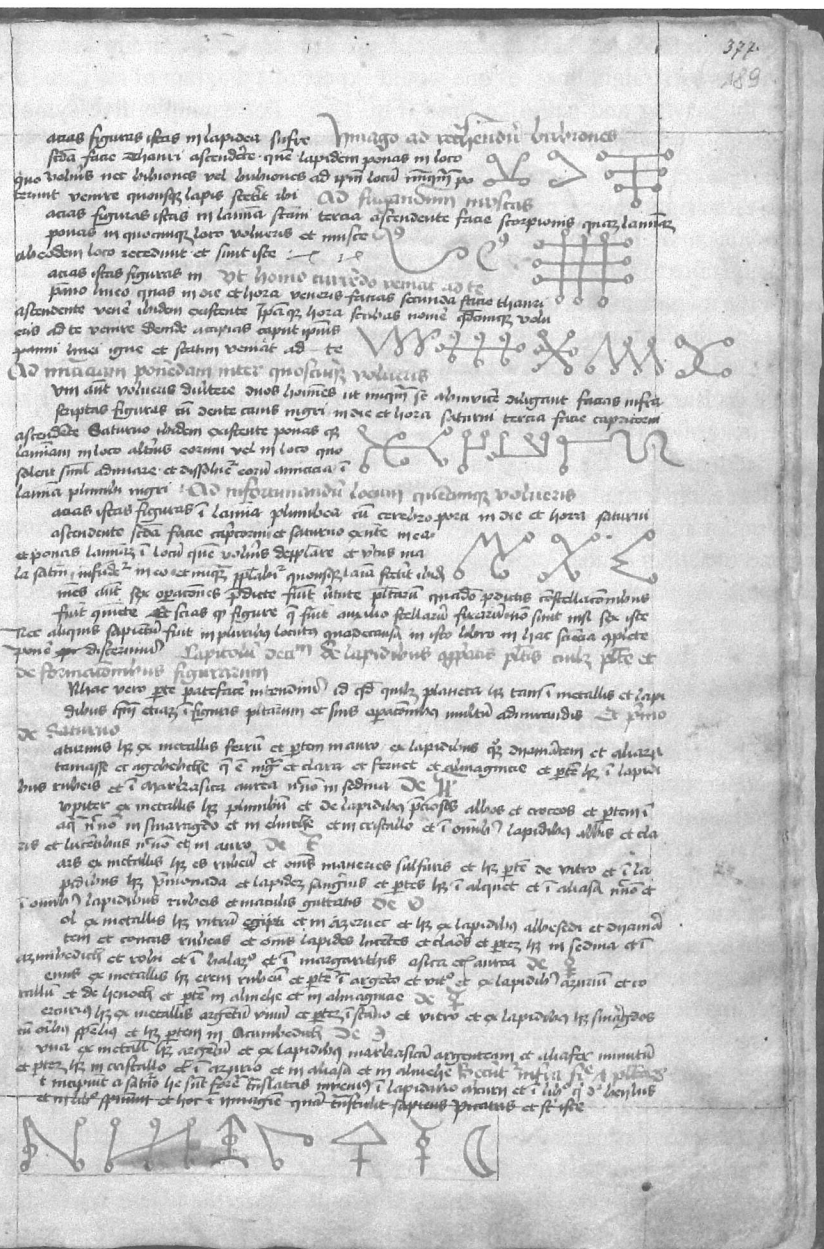


Figure 12.2 A page from *Picatrix Latinus* (1458–1459, f. 189^r). Courtesy of Biblioteka Jagiellońska, Kraków.

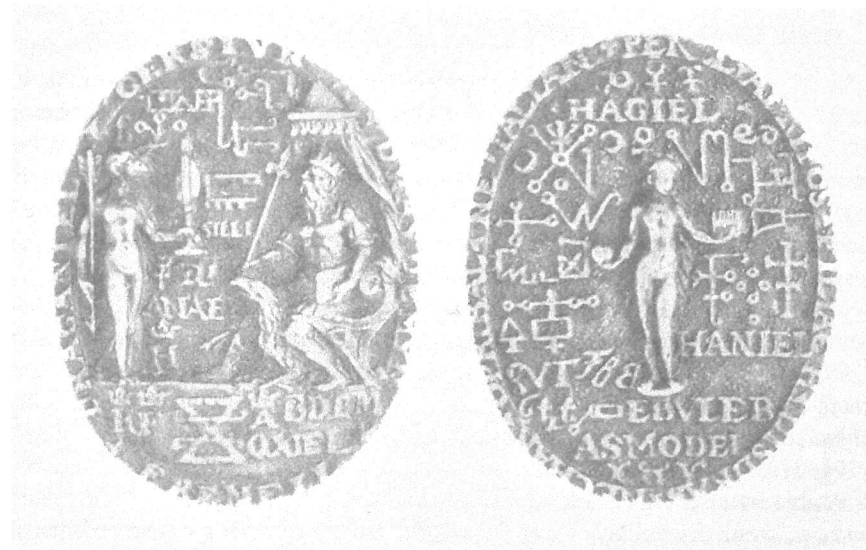


Figure 12.3 Talisman of Catherine de' Medici (in or before 1551). Drawing by Tancrède Abraham (1885). Courtesy of The Warburg Institute.

The talisman made (supposedly) by Nostradamus for Catherine de' Medici (1519–89) (Fig. 12.3) bears modelled figures of Venus and Jupiter, based on descriptions from the *Picatrix*, surrounded by Kabbalist names of angels that correspond to the decans that support these planets. With semiotic redundancy, Catherine's talisman is also densely covered with complex antenna-like diagrams, each line still bound at both ends by circles, that correspond to these heavenly bodies: these are Nostradamus' versions of the stellar-ray diagrams. Pierre Béhar's (1996) exhaustive analysis shows that this talisman, which Catherine wore at her bosom every day for the last thirty years of her life, was designed to ensure marital harmony and fruitfulness.

The stellar-ray diagrams are *operational images*, signs that 'do not represent an object, but rather are part of an operation' (Farocki 2004). The proprietary complexity of later stellar diagrams emphasises that this is an operation that only the magician understands. Like Félix Guattari's asignifying images, the stellar-ray diagrams act on things, bypassing the domain of representation (Celis Bueno 2017). More cautiously, we can define them as *agents*, in Alfred Gell's (1998) term: signs believed to act on the heavenly source by invoking its causal function.¹⁰ Properly employed, the stellar-ray diagrams call down the forces of the stars, the planets and the spirits attending them. Magicians intend their diagrams of stellar rays to carry out specific effects, but they are facing unknown and potentially dangerous forces – hence the highly programmatic rituals and prayers that accompany talismanic magic.

Cosmic Correspondences

Like the Big Bang of physics, the emanated cosmology of Neoplatonism is created by a One/God that expands in all directions, producing the concentric spheres of the cosmos. As these spheres pull away, they maintain their connections to the source, all the way to the material realm of Earth. (This is where you mentally invert that diagram so that the earth, rather than the One or God, is at the centre.) Each heavenly body will maintain a connection with the earthly things that correspond to it, from stones to plants to personalities. Thus in Neoplatonic thought, sympathetic magic is the natural result of sympathy between entities that are separated but were once united. As Giovanni della Porta put it in his *Magia naturalis* (1551): 'The celestial intelligences, the stars, and the planets were thus links in a chain of multiple causation in which form, emanating from God, permeates the universe like the rays of the sun emanating from a central source' (qtd in Eamon 1994: 213).

Arabic uses several words for talisman. There's *tilsam*, from the Greek, and *īranj*, from the Pahlavi word for magic. Other terms emphasise talismans' physical indexicality. *Al-qālib*, form or mould, is Ṭābit ibn Qurrah's term for the talisman, a sculpture of a human form. The Latin *Picatrix* translates this as *sigil*, talisman. Though the terms are sometimes used interchangeably, they indicate two different kinds of talismanic magic, one, which we have seen, relying on contact, and the other relying on resemblance (Weill-Parot 2011: 118–19). In fact, according to the Neoplatonist principle of similitude, resemblance is the result of contact, because things on earth resemble things in the cosmos with which they are connected. This is why in the Neoplatonist cosmos the world below, and in turn each human being, is considered to be a microcosm of the cosmos. Three times the *Picatrix* quotes Pseudo-Ptolemy, Abū Jaf'ar Ahmad ibn Yusuf ibn Ibrāhīm: 'The faces of this age are subject to the faces of the stars', as well as Pythagoras' statement that heavenly figures are models of earthly ones (Weill-Parot 2011: 124).

Talismanic magic relies on this theory of causal connection by emanation, which builds on the ancient tradition of correspondences between earthly things and the seven planets and twelve zodiacal signs. For example, the *Ghayāt al-ḥakīm*'s list of correspondences for Mercury include sciences, geometry, writing and translation; the tongue, brain and heart; heterodox religions; linen; professions such as carpentry and sculpture; acrid flavours; streams and wells; mercury; reeds; medicinal plants like ginger; monkeys, wolves and other fast animals; and blue and mixtures of colours (*Picatrix* 2003: 181–2). The late sixteenth-century Ottoman *ḥakīmī al-sa'ada* (Book of felicity), a book of astrology that belonged to Fatima, daughter of Sultan Murad III, is based on a text by Ja'far al-Sādiq, the sixth imam of Shi'ī Islam. It includes several tables of correspondences beautifully illustrated by Nakkaş Osman, including a jolly chart of correspondences between planets and human personalities. Examples abound of methods to harmonise one's body with the cosmos by attending to correspondences. Correspondence charts are still commonly available on astrology and occult websites.¹¹

Correspondence allows the talisman to transfer powers from superior to infe-

rior forms. The thirteenth-century *Lapidario* or Book of Stones of Alfonso X, the first European book of magic based on an Arabic source, explains, with pictures, how to mine the stone or metal that corresponds to the heavenly body governing your target when the stars are propitiously aligned. The magician fashions the talisman when the planet or constellation pertaining to its nature is at its zenith, using a corresponding material, burning the corresponding fragrances, and eating the corresponding foods. All this allows the magician to incorporate the celestial body's powers. The contemporary sorcerer Clifford Hartleigh Low (2017) echoes the *Picatrix* when he writes on his blog, 'By consuming things that resonate with a particular planetary hierarchy, one harmonises with it and, in a sense, one's body gradually becomes similarly composed.' In correspondence theory we hear a strong resonance with Spinoza's concept of combining bodily powers.

In masterly research on talismanic functions in Islamic architecture, Persis Berlekamp (2016) points out that two forms of magic considered distinct by anthropologists like James Frazer and, following him, Michael Taussig and Alfred Gell, magic by similarity and magic by contact, are not separate in Islamic Neoplatonism. This is because, as we have just seen, the doctrine of creation by emanation posits that things are similar because they were once in contact (Berlekamp 2016: 85). I would say these two forms of magic are not redundant but overdetermined, a view that is useful for a time like ours when it is harder to argue that earthly things *resemble* the heavens, but still possible to argue that earthly things have had *contact* with the heavens.

A point about similitude I would like to mention here, without delving into detail, is that *abstract* images can also resemble the cosmic entities that caused them. Ornamentation produced by manual algorithmic processes, such as the geometric ornamentation on Islamic religious monuments, invites the viewer to cognitively and physically learn from it, as both Carol Bier (2008, 2012) and I (Marks 2010) have argued. In a magnificent analysis of the eleventh-century Seljuk tomb towers at Kharraqān, Iran, Bier argues that its inscriptions from the Qur'an's Light sura, 'these are the similitudes (or parables) which we offer for men to reflect' (Qur'an 59:21), refer to *amthāl*, the plural of *mithāl*, likeness or allegory, and relate to the concept of the imaginal realm, or realm of immaterial likenesses, *alam al-mithāl*. With such non-figurative images the connection from the divine source to the human recipient can be even greater, for as our eyes move over abstract images we physically embody their rhythms (Marks 2010, 2018). Such non-figurative motifs repeated over a surface give rise to haptic space, engendering an embodied and multisensory connection (Marks 1998, 2010). To the degree that they are a bit too complex to master cognitively, patterns give rise to a feeling of entanglement between beholder and object that Gell (1998) calls 'stickiness'. Bier suggests that the geometric patterns on the tower are *amthāl*, manifestations of the divine, so that the beholder reflects on the divine as their eyes move over the patterns; thus we can consider that such patterns in a religious context draw, or even 'stick', the beholder to their divine source.

Correspondence theory was eminently harmonious with religion, for it consisted of simply pointing to cosmic links that God had placed in matter. Albert

Great wrote in 1260 that 'the stars can impress an image on stones and certain bles' (Grafton 2007: 192). The theory of correspondences would develop the Renaissance doctrine of signatures, whereby outer marks correspond to inner natures (Grafton 2007: 185). Looking not to Arabic sources but to Ovid, Paracelsus von Hohenheim (1493/4–1541) devised a medicine based on the doctrine of signatures, in which ailments could be treated by ingesting natural analogues: walnuts for headache, but also fragrant, 'solar' plants like citrus for eye problems, since the eyes are ruled by the sun. Of course the demise of this medieval verse of enchanted correspondences parallels the rise of modern science – but Paola Findlen suggests more subtly, it marks 'another chapter in the exclusion of poetry from science' (1990: 518).

Session: Mediating Spirits

In the Neoplatonist hierarchy of spirits, divine beings reside in the highest part of heaven; in the next sphere are the planetary rulers; and lingering in that ether between the celestial sphere and our world live spirits instructed to engage with humans (Page 2013: 199–200). For magicians, the most important surface in this series of embracing spheres is the membrane between the celestial and the sublunary, for this is where human intervention is possible. As I noted earlier, this is where the metaphysical and the physical worlds come into contact.

No Arabic texts by Ṭābit are known to survive, but a precious text by Fakhr al-Dīn al-Rāzī (1149–1209) relates a story by Ṭābit in which he uses talismans all on the assistance of several different planets. Wrongly accused of some deed by the caliph al-Muwaffaq, he flees, his son still sleeping. The pursuers' horses go out and they do not recognise Ṭābit's son even as he moves among them.

When I received the news that [the spirit] concealed him from the search . . . when I questioned my spirit, saying 'Why did you not do the same for me as you did for my son?' They [the spirits] replied: 'Your *haylāğ* was in opposition to Mars and to a fixed star of Mars' complexion. So we did not feel secure in our case as we did in that of your son Sinān; for his *haylāğ* was safe from the malefics.'

Then I made a talisman and it overcame the enemy in 40 days. I got help against him [my enemy] from one of my brothers, over whom Mars was dominant, and he met with a dreadful end. Then my spirit was angry with me and punished me so that I feared for my life. So I apologised to her and told her: 'I thought you were too important to be concerned with affairs like those for which I was asking help from others.' I did not stop trying to placate her with sacrifice and prayer until she stopped harming my condition.

Then I asked him [the spirit of Saturn] to mend the heart of al-Muwaffaq toward me. But Saturn is a cold planet by nature and slow in movement, and so was taking a long time to deal with my case. So I asked Venus for help and made a sacrifice to her. At the same time I made a sacrifice to my spirit so that

she should not harm me for asking for Venus' help. The aim was achieved and I was saved. (Burnett 2007: 13–14)

Notice how Ṭābit uses talismans and magic to fold the cosmos to his advantage, pulling in the powers first of Mars, then of Venus to influence his personal situation, adapting his energies to theirs with devoted supplication. Recalling al-Kindī's claims about the qualities of the heavenly bodies, 'rational' is not the first word I would use to characterise the planets with whom Ṭābit carries out his talismanic negotiations – more like capricious, sulky and vain – but there is no doubt that they possessed will.

Note that Ṭābit appeals both to various planets and to intervening spirits, both his personal spirit and the spirits of the planets. Many magicians rounded out their appeal to heavenly bodies with address to the spirits that attend them. Mediating between the celestial and the sublunary worlds, these spirits, angels or devils, are willing, desirous or forced to engage with humans. Arabic authors use the term *ruhāniyyāt* for the spirits associated with heavenly bodies. Saif argues that the *ruhāniyyāt* 'must be perceived as tools that impel volitional forces to facilitate natural processes for the benefit of the operator' (2017: 308). But at the same time, these Arabic authors, like medieval Latin authors, go to lengths to distinguish the heavenly powers associated with the planets from the lower powers of jinn and devils (Saif 2017: 308; Page 2013: chapter 5). Many of these are the decanic demons associated with each ten degrees of the zodiac. The *Picatrix* describes each one of these personified figures, which it attributes to Indian sources, and explains how to fashion talismans that appeal to them.

The Moroccan early twentieth-century magician Ibn al-Hajj practised a magic of correspondence that combined astrological, Islamic and indigenous North African beliefs. Ibn al-Hajj's spell to make yourself invisible relies on al-Būnī's recipe for a powerful burnt compound made by an impossibly long and complex process called *khankat'irya*. You must wrap your head in a cap of a gazelle skin inscribed with three characters, which his interlocutor Edmond Doutté illustrates, composed of lines tipped with circles – stellar-ray diagrams. You should invoke God with certain powerful names, and say, 'I beg you to submit to me one of the servers of your name who will do my will.' You deliver yourself to a long mortification exercise. You then throw some cinders of the *khankat'irya*, recite its spell seven times, and recite a certain invocation twice over a table inscribed with certain Arabic and rectilinear characters. Your shadow will disappear and you will become invisible and inaudible (Doutté 1909: 100–1).

Ibn al-Hajj asks for a helping spirit to descend. Those spirits who are suspended between the heavenly and earthly realms, right at the contact point, are considered more amenable to the magician's command. Interestingly, a Latin text argues the spirits are moved by *passion*. Medievalist Sophie Page translates from the thirteenth-century magic book in the Benedictine abbey of St Augustine's, the *Liber de essentia spirituum*: 'The lower the position, the more *passionate* the spirit and the more likely it is to interact willingly or unwillingly with human beings' (2013: 101; my emphasis). We saw that al-Kindī argued that the emotional

missions of the soul send out rays, which may influence the things of the world, suggesting that passion is a powerful state that can affect others. Spinoza, in contrast, argues that passion is 'a state wherein the mind is passive', vulnerable to being affected by others (1901: Part III, definition 1). Deleuze, in his concept of the affection-image, would value passion more as a volatile suspension between passivity and activity (1986: chapter 6) – one of the differences between Spinozan and Deleuzian theories of affect.

The Church tried to repress these idolatrous practices. The 1277 Condemnations of Paris condemned the idea that higher intelligences can impress things on lower, and that intelligences imprint forms on matter via the heavenly bodies (Page 2013: 1). Albert the Great (d. 1280) wrote in *De minerabilis* that celestial magic, aimed at the immutable divine world, was acceptable, but condemned sympathetic magic that appeals to the sublunary demons with incantations or the burning of incense. In other words, the Church accepted natural magic that identifies correspondences between the earthly and the heavenly that can be accounted for by science. It outlawed destinative magic, that is, magic that seeks to make contact with a (possibly demonic) intelligence (Weill-Parot 2011: 130–2). The 1277 Condemnations also condemned suffumigation, or the burning of incense, presumably because a being that can smell incense must be sublunary, thus possibly demonic.

It follows that Albert would have criticised digital apps as demonic, for in their reliance on low to high Earth orbit satellites they appeal to the sublunary realm. At best, following Avicenna, digital apps are ignorant of real causality, as they cause low-level effects, such as the weather, with causes. Let the artificers know!

The Ceremonial Body

For a talisman to function, the indexical, operational and passionate links between talisman and object are not enough: the talisman must be activated through ceremony. Talisman practitioners theorise some combination of desire, intention and bodily effect among *all* parties to the talismanic contract. Al-Kindī emphasises that both the operator and the recipient of image magic must have focus and right intention, and the magician must have imagination, desire and confidence/faith (*ides*). Pronouncing names 'with intention and proper ceremony' produces active rays – as though intention were a lens that focuses the rays' power (D'Alverny and Hudry 1974). Confidence and hope help the desire to produce an effect, he writes, just as scammony (bindweed) is a laxative (al-Kindī 2012: 233).

Arduous processes of study, asceticism, fasting and prayer match magicians' temporality to the temporality of the cosmos. In addition they must mine the stones, harvest the plants, make the talismans in stages according to the astrologically propitious moments, and write and pronounce very complicated spells. Commenting on the thirteenth-century Latin magic text the *Ars notoria*, Frank Laassen points out that its program of fasting, contemplation, prayers and rituals could take several years to complete. He suggests that these practices could have brought about altered cognitive states. In particular, reading aloud long lists of *verba ignota*, unknown words, messes with your brain (2012: 46). These words,

such as 'Semalfay, Craton, Anagil, Panthomagos, Tingen . . .' (2012: 47), look to me like the names of angels in different languages, suggesting that the initiate of the *Ars notoria* might truly have begun to hallucinate/perceive alternate worlds opening up in the cracks of this world.

Berlekamp argues persuasively that another way medieval Islamic magic was understood to be effective is 'efficacy by sensation': the senses were considered vulnerable conduits and needed special protection. Her analysis of zoomorphic bronze door knockers from thirteenth-century Anatolian mosques discovers several layers of apotropaic (that is, turning away harmful influences) significance. Figures of lions, coiled dragons and birds have protective qualities, according to astrological and hadith sources; the loud knocking would itself be apotropaic; the knocking effectively speaks the profession of faith inscribed on the door (2016: 90–8). Grasping the knocker, visually taking in its symbolic and tactile qualities, effecting and hearing the loud report of bronze upon bronze, believers at the mosque threshold would be channelling divinely sanctioned physical powers through their bodies and their senses.

Talismans also cultivate the intimate senses of touch and smell. In a beautiful essay Tanja Klemm emphasises that Marsilio Ficino's talismans operated not by representing but by performing the healing presences of the heavenly bodies, and were experienced in an embodied and multisensory way. Ficino's healing images worked best when they were of softer materials that could warm to the touch: 'If one rubs the *imago* on the skin, and thus warms it, the *virtus* of the image easily connects with the warm corporeal *spiritus vitalis*' (2016: 128).

Al-Kindī, the *Ghayāt al-ḥakīm* and other Arabic authors linked fragrances to each planet and constellation. Studying North African magic at the turn of the twentieth century, Doutté noted that every serious ceremony in which jinns are invoked begins with burning perfumes, each of which is especially effective at specific days and times (1909: 72). Doutté illustrates Ibn al-Hajj's mysterious olfactory magic square, whose letters correspond to a list of fifteen perfumes. Ibn al-Hajj states that if you burn all of these together and throw a little in the fire on the first night of the second half of the month, you will gain the force (via the appearance of a jinn) to carry out whatever conjuration you wish (Doutté 1909: 73). This magic square is a map of the spice routes; it includes no substance indigenous to Morocco but calls for spikenard (Nepal), sandalwood (India), mastic (Greece), frankincense (the Arabian peninsula or Somalia) and the rhizome of *Acorus calamus* or sweet flag (India), among other fragrant cargo.

'These perfumes will put the higher spirits in the service of those who nourish them with their smoke' (Doutté 1909: 73–4). The rising smoke of incense provides a visual and olfactory bridge between human and divine, as Susan Harvey observes (cited in Pentcheva 2006). Affective yet intangible, smell acts like a subtle body somewhere between material and immaterial. A combination of performance, mimesis, incense and disorientation can synaesthetically stage the presence of the divine, as Bissera Pentcheva (2006) writes of Byzantine ritual practices. Through all these rigorous and multisensory devotions, magic draws the heavens down to the earth and interweaves their powers with the senses and

practices of the magician. Magicians not only produce the talisman as a microcosm but activate the Neoplatonic hierarchy of correspondences within it. The magician, through devotional practice, becomes a microcosm (Deleuze 2012: 27).

In certain experimental films, magic makes what Deleuze calls an 'irrational fold' in the perceptible world that may be able to discover primordial bodies, or at least to bring them yet to come. Magic, like the cinema, 'affects the visible with a fundamental disturbance, and the world with a suspension, which contradicts all natural laws of perception. What it produces in this way is the genesis of an "unknown body" that we have in the back of our heads, like the unthought in thought, the birth of a visible which is still hidden from view' (Deleuze 1989: 201). The magician is a ceremonial body that disconnects from everyday perception in order to make a fold that stretches from the body to the cosmos.

Talismans for the Disenchanted World

At the beginning of this chapter I heaped exaggerated scorn on digital apps and virtual images that seek to control worldly events but lack real understanding of the cosmos. But there may exist some app-type media capable of bending the laws of the universe. They would need to be able to invest the user's body with ceremonial powers and link the user to cosmic events, which we have seen requires considerable devotion on the user's part.

There exist talismanic movies, movies that could fold the cosmos in order to carry out operations on it? There are plenty of movies that fold together times and spaces and make new discoveries; that *show* how the universe is interconnected. Other films fold together times and places that are incommensurable, that is, that could not coexist in the same universe, and here a certain world-bending occurs. The incommensurable 'peaks of present' Deleuze describes in films like *Citizen Kane* are points where an image enfolds two or more worlds of the past, each of which contracts the past differently (1989: 98–125; also see Saji 2004). The genre of impossible-fold movies includes time-travel movies, multiple-worlds films and documentaries about the interconnected world by filmmakers like Chris Marker, Mohamad Soueid and the Otolith Group. As I have said, 'To unfold or explicate the image requires retracing each of these pasts and stories that are incommensurable with each other. Thus to invite an interconnection into a film is to re-fold the sign according to their point of view, bringing elements that were implicit and absorbing elements that were explicit' (Marks 2002–3). That intercessor, given the knowledge and bodily discipline of a magician, might be capable of changing the present by drawing up a fold buried in the past.

Some films carry out *operations* on the universe: performative films, and fabulist documentaries, movies that make things happen (Hongisto 2015). Many films, including some environmentalist films, activate sympathy among entities at different levels of the cosmos. A very few works make an *affective* fold that stretches all the way from the cosmos to your body, through delicate and risky

processes of contact, correspondence, sympathy and passion. I save investigation of these media for another writing.

We have seen that talismanic magic relies on a tactile causality of encounters between bodies. Talismans operate in a cosmos in which all things are interconnected by *touch*. I consider al-Kindī's theory of rays to be a theory of indexicality. It, and later medieval philosophies, insist that signs don't just represent their object but are causally connected to it. I believe that everything is an index, in Peirce's sense: every sign is the expression of a causal relationship. We find such a tactile causality in Whitehead too: all prehensions are causal connections. We are constantly being pummelled by signs that do not *represent* their source but actually *transmit* it to us. This is my simple theory of how talismanic powers survive in our day.

But as we have seen, indexical links are not enough to make magic that folds the cosmos. Talismans pull in the most distant powers – the will of the stars – by appealing to interconnected cosmic levels of ceremony, passion, correspondence, operation and contact. I think it is possible to cultivate awareness of these interconnections and indeed to cultivate ourselves as microcosms. If I say I do not believe in magic, it is for the reason Avicenna gives in *Sciartifices*. The universe is infinite; its inter-relationships are too complex for us to comprehend, let alone manipulate; we mistake causes by orders of magnitude or do not recognise them at all.

Modernity is thought to have broken the links between individuals and cosmos. The Copernican revolution cast the earth out from the centre of the cosmos, breaking the Islamic Neoplatonist cosmology that guarantees continuous contact from the divine to the heavens to the sublunary realm. However, after Latour (1991), I argue that we have never been modern. The apparent fragmentation of our world conceals profound continuities that we can grasp without recourse to mysticism. Here I am inspired by the work of architectural historian Samer Akkach, who demonstrates that certain classical Muslim architecture spatially articulates the link between the human body and the Neoplatonist emanated cosmos. Although the modern understanding of the universe has decentred humankind, Akkach proposes that the concept of 'cosmic habitat' would reassert humankind's responsibility in relation to the planet and the cosmos (2005: 209).

Like Akkach, I seek to recreate the premodern understanding that entities are linked in a web of cosmic connections. I argue that correspondences continue to exist, even in a cosmos that is no longer hierarchical, that is, a cosmos that dispenses with the Neoplatonic hypostases and even with the closed manifold of Leibniz's cosmology. That is because every mediation is a contact with the source, weaving every entity into long strands, chains, of quasi-tactile connection. Each of these chains of contact is unique, not exactly in the way al-Kindī's cosmic causality is unique (because rays strike surfaces in unique ways), but because no two entities are born of the same trajectory of causation. I do believe that distant sources can have powerful effects, even more powerful than what's close. Affect, in al-Kindī's and Spinoza's definitions, is a register of these relationships. When images make contact with us, we recognise that we are strung in webs of

ality. By cultivating affective response and indexical awareness, we can draw the universe close, even rearrange it.

Leibniz's image of the universe as manifold descends from the Neoplatonic description of a divine order, lined at every juncture with devilish desire. We know that Deleuze emphasises that in the course of folding, once-proximal points become separated. Elsewhere Deleuze and Guattari break down the connective tissue of the cosmos even further, admiring the way Riemannian space maintains points of contact between neighbouring entities, without any wholes to hold it together: it is an entirely tactile space (Deleuze and Guattari 1987: 485). It's not such a good thing to end this chapter with those points of contact that embody an entire order even when the divine order is no longer in place – at the fingertips of the magician.¹²

Notes

¹ This media archaeology follows the example of Siegfried Zielinski's (2006) anarcho-archaeology, in that it perceives media of the past as more fascinating than those of the present, but it departs from Zielinski's approach in seeking precedents for contemporary algorithmic media in old sources (e.g. Cramer 2005; Link 2010; Parikka 2012) and in demonstrating the cross-cultural travels that give rise to digital media (e.g. Cammann 1969; Küchler 2001; Eglash 1999; Bier 2004, 2008, 2012; Marks 2010). This last could be achieved using a simple combination of Google Earth, Google Street View and Amazon.

² That's why I prefer my Fairphone, an ethical, transparent, non-obsolescent, fully recyclable mobile phone. Fairphone works with its 103 suppliers, from assemblers in Suzhou to tantalum smelters in Turkey, to enfranchise workers, use recycled materials, avoid using conflict minerals, prevent pollution, and in other ways overcome the exploitation and nastiness coded into most smartphones.

³ I think Deleuze's use of this model is not completely apt, for the Baker's Transformation allows for *cutting* of the surface as well as folding (Shivamoggi 2014: 181–6).

⁴ I use this term broadly despite the warning of Kevin van Bladel in *The Arabic Hermes* (2009) that it should be confined to those movements that strictly follow the Greek Hermetic tradition, in order to acknowledge the contributions of Isma'ili and other Shi'i Muslim thinkers.

⁵ This mistake can be somewhat pardoned because many Arabic hermetic writers attributed their works to Aristotle, or to Aristotle's supposed teacher Hermes, to boost their credibility. See Burnett 1987: 87.

⁶ Some scholars dispute whether al-Kindī is the author of this text, given that the Arabic original is lost and that some works of astrology and magic are falsely attributed to him. See for example Burnett 2009.

⁷ Such a lineage from al-Kindī, or indeed the Sabeans of Harrān, to Spinoza might pass through Maimonides or Yehuda Halevi.

⁸ I refer in this chapter to the French translation of the *Picatrix*, but it is now available in an English translation by Dan Attrell and David Porreca.

⁹ Gell is circumspect about this causal relationship between agent and prototype: stellar-ray diagrams index their source *if* people believe them to be causally connected to it. 'What matters to me is only that people believe that the causal arrow is oriented

in the other way; they believe that the god, as agent, "caused" the image (index), as patient, to assume a particular appearance' (Gell 1998: 25). I relegate this circumspection to a note because I want to allow that talismanic magic, in the manifold practice I describe here, can actually work.

11. See for example 'Astrological Signs and Correspondences', *World Spirituality*, <<https://www.worldspirituality.org/astrological-correspondences.html>>; 'Zodiac Correspondences', *Sacred Wicca*, <<https://www.sacredwicca.com/zodiac-correspondences>> (both last accessed 24 March 2020).
12. Warm thanks to Radek Przepiński and Steven Elliot Wilmer for inviting me to participate in this book and the stimulating conference that preceded it. I am deeply grateful to members of my secret society, the Substantial Motion Research Network (SMRN), who gave me invaluable suggestions on the work in progress, in particular Farshid Kazemi, and also Juan Castrillón, Tarek Elhaik, Azadeh Emadi and Kalpana Subramanian. Thanks to the wonderful students in my class 'A Deep History of Arts of the Secret', Department of Visual and Environmental Studies, Harvard, in autumn 2018. I also thank friends who invited me to present this research in progress and convened enthusiastic, quizzical and captive audiences: Jill Koyama of the Institute for LGBT Studies at the University of Arizona, Tucson; Sama Waham of PLASMA (Performances, Lectures and Screenings in Media Arts), SUNY Buffalo; Steven Chung for the 'Thinking Cinema' series at Princeton University; and Jack Halberstam and Patricia A. Dailey for the Columbia University Seminar on Affect Studies. And my supreme gratitude goes to Carol Bier, also a member of SMRN, for her extremely thoughtful and generous peer review.

References

- Adamson, Peter (2007), *Al-Kindī*, Oxford: Oxford University Press.
- Akkach, Samer (2005), *Cosmology and Architecture in Premodern Islam: An Architectural Reading of Mystical Ideas*, Buffalo: State University of New York Press.
- Ali, Ahmed (1993), *Al-Qur'ān: A Contemporary Translation by Ahmed Ali*, Princeton: Princeton University Press.
- Bakhouché, Béatrice, Frédéric Fauquier and Brigitte Pérez-Jean (2003), 'Introduction', in *Picatrix: Un traité de magie médiévale*, Turnhout: Brepols Publishers, pp. 5–38.
- Béhar, Pierre (1996), *Les Langues occultes de la Renaissance: Essai sur la crise intellectuelle de l'Europe au XVI^e siècle*, Paris: Éditions Desjonquères.
- Berlekamp, Persis (2016), 'Symmetry, Sympathy, and Sensation: Talismanic Efficacy and Slippery Iconographies in Early Thirteenth-Century Iraq, Syria, and Anatolia', *Representations*, 133: 59–109.
- Bier, Carol (2004), 'Pattern Power: Textiles and the Transmission of Mathematical Knowledge', in Inez Brooks-Myers, Susan Tselos and Carol Bier (eds), *Appropriation, Acculturation, Transformation: Textile Society of America 9th Annual Symposium 2004*, Middletown, DE: Textile Society of America, pp. 144–53.
- Bier, Carol (2008), 'Art and Mithāl: Reading Geometry as Visual Commentary', *Journal of Iranian Studies*, 41(4): 491–509.
- Bier, Carol (2012), 'The Decagonal Tomb Tower at Maragha and its Architectural Context: Lines of Mathematical Thought', *Nexus Network Journal*, 14(2), 251–73.
- Bredenkamp, Horst (2007), 'Leibniz's Theater of Nature and Art and the Idea of a Universal Picture Atlas', in Bernadette Bensaude-Vincent and William R. Newman (eds),

- Artificial and the Natural: An Evolving Polarity*, Cambridge, MA: MIT Press, 211–23.
- St, Charles (1987), 'Arabic, Greek, and Latin Works on Astrological Magic Attributed to Aristotle', in Jill Kraye, W. F. Ryan and C. B. Schmitt (eds), *Warburg Institute Studies and Texts 11: Pseudo-Aristotle in the Middle Ages*, London: Warburg Institute, 84–93.
- St, Charles (1996), *Magic and Divination in the Middle Ages: Texts and Techniques in the Islamic and Christian Worlds*, Aldershot: Variorum.
- St, Charles (2007), 'Tābit ibn Qurra the Harrānian on Talismans and the Spirits of Planets', *La corónica: A Journal of Medieval Hispanic Languages, Literatures, and Cultures*, 36(1): 13–40.
- St, Charles (2009), 'The Theory and Practice of Powerful Words in Medieval Magical Texts', in Tetsuro Shimizu and Charles Burnett (eds), *The Word in Medieval Logic, Philosophy and Psychology: Acts of the XIIIth International Colloquium of the Société Internationale pour l'Étude de la Philosophie Médiévale, Kyoto, 27 September–1 October 2005*, Turnhout: Brepols Publishers, pp. 215–31.
- Stann, Schuyler (1969), 'Islamic and Indian Magic Squares, Part I', *History of Religions*, 8(3): 181–209.
- Stuenkel, Claudio (2017), 'Harun Farocki's Assignifying Images', *triple C*, 15(2): 740–54.
- Sturges, Florian (2005), *Words Made Flesh: Code, Culture, Imagination*, Rotterdam: Piet Mondriaan Institute.
- Thérèse, Marie-Thérèse and Françoise Hudry (1974), 'Al-Kindi. De radiis', *Archives de l'histoire doctrinale et littéraire du moyen âge*, 49: 247–8.
- Thompson, Gilles (1986), *Cinema 1: The Movement-Image*, trans. Hugh Tomlinson and Barbara Habberjam, Minneapolis: University of Minnesota Press.
- Thompson, Gilles (1988), *Spinoza: Practical Philosophy*, trans. Robert Hurley, San Francisco: City Lights.
- Thompson, Gilles (1989), *Cinema 2: The Time-Image*, trans. Hugh Tomlinson and Robert Thompson, Minneapolis: University of Minnesota Press.
- Thompson, Gilles (1993), *The Fold: Leibniz and the Baroque*, trans. Tom Conley, Minneapolis: University of Minnesota Press.
- Thompson, Gilles (2003), *Francis Bacon: The Logic of Sensation*, trans. Daniel W. Smith, Minneapolis: University of Minnesota Press.
- Thompson, Gilles and Félix Guattari (1987), *A Thousand Plateaus: Capitalism and Schizophrenia*, trans. Brian Massumi, Minneapolis: University of Minnesota Press.
- Thompson, Gilles and Claire Parnet (1996), 'N comme neurologie', *L'abécédaire de Gilles Deleuze*, television programme, produced by Pierre-André Boutang in 1988–9.
- Thompson, Edmond (1909), *Magie et religion dans l'Afrique du Nord*, Algiers: Typographie L. Jourdan.
- Thompson, William (1994), *Science and the Secrets of Nature: Books of Secrets in Medieval and Early Modern Culture*, Princeton: Princeton University Press.
- Thompson, Ron (1999), *African Fractals: Modern Computing and Indigenous Design*, New Brunswick, NJ: Rutgers University Press.
- Thompson, Harun (2004), 'Phantom Images', trans. Brian Poole, *Public*, 29: 13–22.
- Thompson, Marsilio (1989), *Three Books on Life* (bilingual Latin-English edition with introduction and notes), trans. Carol V. Kaske and John R. Clark, Binghamton: Proemium/Variorum.
- Thompson, Paula (1990), 'Empty Signs? Reading the Book of Nature in Renaissance Science', *Studies in the History of the Philosophy of Science*, 21(3): 511–18.
- Gardiner, Noah (2017), 'Esotericist Reading Communities and the Early Circulation of the Sufi Occultist Ahmad al-Būnī's Works', *Arabica*, 64: 405–41.
- Gell, Alfred (1998), *Art and Agency: An Anthropological Theory*, Oxford: Clarendon.
- Glucklich, Ariel (1997), *The End of Magic*, Oxford: Oxford University Press.
- Goodchild, Philip (1996), 'Geophilosophy', in *Deleuze and Guattari: An Introduction to the Politics of Desire*, London: Sage, pp. 65–72.
- Gouk, Penelope (1997), 'Natural Philosophy and Natural Magic', in Eliška Fučíková (ed.), *Rudolf II and Prague: The Court and the City*, London: Thames & Hudson, pp. 230–6.
- Grafton, Anthony (2007), 'Renaissance Histories of Art and Nature', in Bernadette Bensaude-Vincent and William R. Newman (eds), *The Artificial and the Natural: An Evolving Polarity*, Cambridge, MA: MIT Press, pp. 185–210.
- Guattari, Félix (1995), *Chaosmosis: An Ethico-Aesthetic Paradigm*, trans. Paul Bains and Julian Pefanis, Bloomington: Indiana University Press.
- Hanegraaff, Wouter J. (2003), 'How Magic Survived the Disenchantment of the World', *Religion*, 33: 357–80.
- Haq, Syed Nomanul (1994), *Names, Natures and Things: The Alchemist Jābir ibn Ḥayyān and his Kitāb al-Aḥjār (Book of Stones)*, Dordrecht: Kluwer Academic Publishers.
- Hartleigh Low, Clifford (2017), 'Some Notes on Planetary Fragrances', *The Sorcerer's Blog*, 2 July 2017, <<https://sorcerer.blog/2017/07/02/some-notes-on-planetary-fragrances/>> (last accessed 23 March 2020).
- Hongisto, Ilona (2015), *Soul of the Documentary: Framing, Expression, Ethics*, Amsterdam: Amsterdam University Press.
- Ikhwān al-Safā' (Brethren of Purity) (2011), *On Magic: An Arabic Critical Edition and English Translation of Epistle 52a*, ed. and trans. Godefroid de Callataÿ and Bruno Halflants, Oxford: Oxford University Press.
- Khan, Ruqayya Yasmine (2000), 'On the Significance of Secrecy in the Medieval Arabic Romances', *Journal of Arabic Literature*, 31(3): 238–53.
- Kieckhefer, Richard (1989), *Magic in the Middle Ages*, Cambridge: Cambridge University Press.
- al-Kindī, Yaqūb ibn Ishāq (2012), 'On Rays', in Peter Adamson and Peter E. Pormann (eds), *The Philosophical Works of al-Kindī*, Oxford: Oxford University Press, pp. 217–41.
- Klaassen, Frank (2012), 'Subjective Experience and the Practice of Medieval Ritual Magic', *Magic, Ritual, and Witchcraft*, Summer: 19–51.
- Klemm, Tanja (2016), 'Life from Within: Physiology and Talismanic Efficacy in Marsilio Ficino's *De vita* (1498)', *Representations*, 133: 110–29.
- Kohlberg, Etan (1995), 'Taqiyya in Shi'i Theology and Religion', in Hans Gerhard Kippenberg and Guy G. Stroumsa (eds), *Secrecy and Concealment: Studies in the History of Mediterranean and Near Eastern Religions*, Leiden: Brill, pp. 345–80.
- Küchler, Suzanne (2001), 'Why Knot? A Theory of Mathematics', in Christopher Pinney (ed.), *Beyond Aesthetics: Art and Enchantment*, Oxford: Berg, pp. 55–77.
- Latour, Bruno (1991), *We Have Never Been Modern*, trans. Catherine Porter, Cambridge, MA: Harvard University Press.
- Link, David (2010), 'Scrambling T-R-U-T-H: Rotating Letters as a Material Form of Thought', in Siegfried Zielinski and Eckhard Füllus (eds), *Variantology 4*, Cologne: Verlag der Buchhandlung König, pp. 215–66.
- Marks, Laura U. (1998), 'Video Haptics and Erotics', *Screen*, 39(4): 331–48.
- Marks, Laura U. (2000), 'Signs of the Time: Deleuze, Peirce, and the Documentary Image', in Gregory Flaxman (ed.), *The Brain is the Screen: Deleuze and the Philosophy of Cinema*, Minneapolis: University of Minnesota Press, pp. 193–214.

- arks, Laura U. (2010), *Enfoldment and Infinity: An Islamic Genealogy of New Media Art*, Cambridge, MA: MIT Press.
- arks, Laura U. (2013), 'A Deleuzian *Ijtihad*: Unfolding Deleuze's Islamic Sources Occulted in the Ethnic Cleansing of Spain', in Arun Saldhana and Jason Michael Adams (eds), *Deleuze and Race*, Edinburgh: Edinburgh University Press, pp. 51–72.
- arks, Laura U. (2018), 'Lively Up Your Ontology: Bringing Deleuze into Šadrā's Modulated Universe', *Qui Parle*, 27(2): 321–54.
- ivin-Koushki, Matthew (2017), 'Introduction: De-Orienting the Study of Islamicate Occultism', *Arabica*, 64: 287–95.
- ton, I. R. (1982), *Muslim Neoplatonists: An Introduction to the Thought of the Brethren of Purity (Ikhwān al-Safā')*, London: Allen & Unwin.
- wman, William R. (1989), 'Technology and Alchemical Debate in the Late Middle Ages', *Isis*, 80(3): 423–45.
- e, Sophie (2013), *Magic in the Cloister: Pious Motives, Illicit Interests, and Occult Approaches to the Medieval Universe*, University Park: Pennsylvania State University Press.
- ikka, Jussi (2012), *What Is Media Archaeology?*, Cambridge: Polity.
- ce, Charles Sanders (1955), 'Logic as Semiotic: The Theory of Signs', in Justus Buchler (ed.), *Philosophical Writings of Peirce*, New York: Dover, pp. 98–119.
- tcheva, Bissera (2006), 'The Performative Icon', *Art Bulletin*, 88(4): 631–55.
- ers, Francis F. (2004), 'Hermes and Harran: The Roots of Arabic-Islamic Occultism', in Emilie Savage-Smith (ed.), *Magic and Divination in Early Islam*, Aldershot: Ashgate, p. 55–85.
- atrix: *Un traité de magie médiévale* (2003), trans., intro. and notes by Béatrice Bakhouché, Frédéric Fauquier and Brigitte Pérez-Jean, Turnhout: Brepols Publishers.
- atrix: *A Treatise on Astral Magic* (2019), trans. and intro. by Dan Attrell and David Torrecia, University Park: Penn State University Press.
- gree, David (1980), 'Some of the Sources of the *Ghāyat al-hakīm*', *Journal of the Warburg and Courtauld Institutes*, 43: 1–15.
- gree, David (2002), 'The Sabians of Harran and the Classical Tradition', *International Journal of the Classical Tradition*, 9(1): 8–35.
- ney, Joshua (2012), *The Hermetic Deleuze: Philosophy and Spiritual Ordeal*, Durham, NC, and London: Duke University Press.
- ceek, Holli (2009), 'Catalog of Earth Satellite Orbits', NASA Earth Observatory, <https://earthobservatory.nasa.gov/features/OrbitsCatalog> (last accessed 23 March 2020).
- l, Liana (2017), 'From *Gāyat al-hakīm* to *Šams al-ma'ārif*: Ways of Knowing and Paths of Power in Medieval Islam', *Arabica*, 64: 297–345.
- aji, Alia (2005), 'The Memory of Another Past: Bergson, Deleuze and a New Theory of Time', *Continental Philosophy Review*, 37: 203–39.
- age-Smith, Emilie (2003), 'Islamic Magical Texts vs. Magical Artefacts', *Societas Magica Newsletter*, 11: 1–6.
- amoggi, Bhimsen K. (2014), *Nonlinear Dynamics and Chaotic Phenomena: An Introduction*, Dordrecht: Springer Netherlands.
- noza, Baruch (1901), *Improvement of the Understanding, Ethics and Correspondence of Benedict de Spinoza*, trans. R. H. M. Elwes, New York: Wiley.
- ford, Barbara Maria and Frances Terpak (2001), *Devices of Wonder: From the World to a Box to Images on a Screen*, Los Angeles: Getty Publications.
- ale, Charles (2000–11), Overview, 'L'Abécédaire de Gilles Deleuze, avec Claire Parnet (Gilles Deleuze's ABC Primer, with Claire Parnet)', directed by Pierre-André Boutang (1996), <<http://www.langlab.wayne.edu/CStivale/D-G/ABC3.html>> (last accessed 23 March 2020).
- van Bladel, Kevin (2009), *The Arabic Hermes: From Pagan Sage to Prophet of Science*, Oxford: Oxford University Press.
- Weill-Parot, Nicolas (2011), 'Images corporelles et similitude dans le Picatrix et dans le monde Latin médiéval', in Jean-Patrice Boudet, Anna Caiozzo and Nicolas Weill-Parot (eds), *Images et magie: Picatrix entre Orient et Occident*, pp. 117–35.
- Zielinski, Siegfried (2006), *Deep Time of the Media: Toward an Archaeology of Hearing and Seeing by Technical Means*, Cambridge, MA and London: MIT Press.