

MAGIC AND SCIENCE IN THE MIDDLE AGES

THE BUILDING OF THE BOUNDARIES BETWEEN NATURAL MAGIC AND NECROMANCY, ca. 1230–ca. 1310

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LEARNED MAGIC ARRIVED in Western Europe along with the other bodies of knowledge from the Greco-Arabic tradition thanks to the Latin translations that were completed primarily on the Iberian Peninsula during the twelfth and thirteenth centuries. In contrast to sorcery and other practices hitherto disdained by the intellectual elites as rural superstitions, learned magic enjoyed considerable power of attraction and prestige due not only to its world view and complex techniques but also to the authority conferred by its ancient, often mythical origins. When the new natural sciences and occult arts spread throughout Western Europe, university scholars were faced with the need to filter them to integrate them into high culture if they were considered licit, or if not, strongly refute them by means of faith and reason.

Thus, it was primarily during the thirteenth century that theologians and natural philosophers began to distinguish between two types of learned magic. One, which we can call natural magic, is compatible with religion and included in the sciences, insofar as it seeks to know and exploit those mechanisms of nature that are hidden, because they elude rational knowledge. The other type, usually called necromancy, and currently referred to as ritual, ceremonial, or addressative magic, is seen as incompatible with religion, as it is aimed at the domination of spirits, which the scholastics always consider to be demons, with the objective of using their power. Therefore, the natural or supernatural causality attributed to one or the other is the basis for differentiating between natural magic and necromancy. Causality is the factor that distinguishes both types of magic from rational knowledge, since the causes attributed to them, whether natural or supernatural, are occult.

This chapter seeks to review the opinions of scholastic thinkers during the key period from the thirteenth century to the beginning of the fourteenth century, in order to define exactly what can be considered natural magic, as opposed to necromancy, and to discern which bodies of knowledge and practices concerning the occult were perceived by the intellectual elites as licit and which were considered dangerous or forbidden.

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Occult Properties and Natural Magic

In the intellectual circles of late medieval Latin Europe, it was common to postulate the existence of hidden properties in nature, with diverse nomenclature, which establish a relationship between all the elements of the universe and are the cause of portentous effects in our world. This is what Nicolas Weill-Parot referred to as the “natural occult.”¹ Hereinafter, we will use the name “natural magic” to refer to the use and study of these properties in writings on the natural world and medicine, although during the Middle Ages, this nomenclature was used only by William of Auvergne and only became widespread during the Renaissance. In contrast, late medieval authors tended to restrict the term “magic” to illicit practices. Most of them attributed the origin of occult properties to the stars. Such properties served to justify such diverse phenomena as the attractive force of magnets, certain virtues attributed to stones, animals or herbs, the electric discharges of the ray, premonitions, or the evil eye, with the common denominator being that they existed outside the rational framework of natural scholastic philosophy.

The only medieval scholar to use the term natural magic (*magica naturalis*) to refer to the science (*scientia*), that is the study of the wonders “that nature works with the virtues infused by God,” was William of Auvergne in his works *De legibus* (1228–1230) and *De universo* (1236–1240). William, theologian and bishop of Paris, considered natural magic to be the eleventh part of natural science and equivalent to what philosophers called, very improperly, “necromancy according to physics” (*nigromantia secundum physicam*).² Of course, this should not be confused with “necromancy” in the more usual sense of demonic magic but in the general sense of “magic.”³ According to William, it was not possible to comprehend the numerous and amazing “occult virtues,” although their effects are found in the books of researchers and in those on secrets and admirable virtues of animals.⁴ According to him, such occult virtues function on the basis of sympathetic and antipathetic relations between them by their *aspectus* and *habitus* within the framework of a cosmic connection (*colligantia*).⁵ This doctrine with its neoplatonic roots would be set aside by later theorists on occult properties.⁶

The more general conception of occult properties was developed in the medical field, based on Galen, the treatise *De physicis ligaturis* attributed to Costa ben Luca,⁷ and Avicenna. Avicenna developed the most influential formulation of these properties within the framework of his pharmacological theory set forth in the *Canon*, which was translated by Gerardo da Cremona in the twelfth century, and in *De viribus cordis* which

1 Weill-Parot, *Points aveugles de la nature*, 25–136; Draelants, “Notion of ‘Properties.’”

2 *De legibus*, 24, William of Auvergne, *Opera*, 1:69; *De universo*, 1.1.43, William of Auvergne, *Opera*, 1:648.

3 Sannino, “*Nigromantia secundum physicam*.”

4 *De universo*, 2.3.22 and 2.1.32, William of Auvergne, *Opera*, 1:1060 and 1:883.

5 *De universo*, 1.1.46 and 2.2.75, William of Auvergne, *Opera*, 1:657 and 1:930.

6 Weill-Parot, *Points aveugles de la nature*, 103–5.

7 Wilcox and Riddle, “Qusta ibn Luqa’s Physical Ligatures.”

was translated by Arnau de Vilanova in the last third of the thirteenth century. In the *Canon*, Avicenna explains these properties by the perfection of matter coming from the *forma specifica* or, according to the Galenic expression, *a tota substantia*, beyond the primary qualities and the complexion.⁸ In the Latin version of *De viribus cordis*, it is called *proprietas*, and its cause is attributed to “a superior influence,” which would be “a divine emanation” according to another passage.⁹ Weill-Parot has convincingly argued that the *proprietas* is infused by the “giver of forms,” one of the intelligences emanating from the first intellect, which proceeds from God.¹⁰ However, Latin authors interpret this as being due to the influence of the stars.

The theologian Albertus Magnus appeared open to natural magic in his works on nature, in which he claimed to have collected information on animal, vegetable, and mineral substances with amazing virtues coming, not from their components or composition, but brought about in the species as a whole by the faculties of heaven or the soul, understood through experience (*experimentum*) and used by the magicians. If one is well-acquainted with the *virtus celestis*, as he called it, one can employ natural means to achieve everything that can be achieved by means of the magical sciences.¹¹ Albertus made a sharp distinction between licit and illicit magic in his theological writings, but in his natural works he is even interested in necromancy. In my view, he followed the tendency, as he himself acknowledged, to respect the authorities in each of the fields of knowledge he dealt with—religious authorities for theological works, philosophical authorities for the natural sciences and medical authorities for medicine.¹²

Roger Bacon restricted the term “magic” to illicit practices, but at the same time, he referred to amazing natural effects as “secret workings of nature and technology” (*secreta opera nature et artis*). In the set of treatises in which this English Franciscan developed his theory of *scientia experimentalis* between 1266 and 1278, these “secret workings” fall within the scope of what he defines as *scientia experimentalis*; this is one of the specific natural sciences which has its basis in experience, and which the philosopher should employ to discern true science and technology from the fallacies of the magicians.¹³ Bacon’s criteria for distinguishing between false knowledge and true knowledge were based not only on their moral legitimacy or theological arguments, but also on their utility for philosophy, as the practices and knowledge acquired by illegitimate means are either unreliable or ineffective. More specifically, the criteria he took into account in order to delimit the illicit are as follows: first, astrological determinism; second, invocation by means of conjuring and sacrifices to demons, who act primarily out of spite and may give true or false information; third, the contamination of astral

⁸ Avicenna, *Canon*, fol. 28v.

⁹ Avicenna, *De viribus cordis*, 125–34.

¹⁰ Weill-Parot, *Points aveugles de la nature*, 51–53.

¹¹ Albertus Magnus, *De vegetabilibus*, 474–75; Albertus Magnus, *De mineralibus*, 2.2.10 and 2.3.6; and Albertus Magnus, *Opera omnia*, 5:40 and 55.

¹² *Super II Sententiarum*, 13.C.2, Albertus Magnus, *Opera omnia*, 27:247.

¹³ Bacon, *Opus maius*, 1:392 and 394–96; *Communium naturalium*, 2, Bacon, *Opera*, 2:5 and 9.

observations with circles, figures, meaningless characters, foolish formulas and irrational supplications; fourth, the recourse to fraudulent means, with accomplices, mechanical tricks, and sleight of hand.¹⁴

Likewise, Thomas Aquinas recognized the existence of natural occult properties and considered their use legitimate. However, his concern was primarily directed towards discerning between occult operations of natural causation and those of supernatural origin, whether diabolical or miraculous. In particular, he devoted an epistle entitled *De operationibus occultis nature ad quendam militem ultramontanum* (ca. 1270), to the causality of what he called the “hidden workings of nature.”¹⁵ Aquinas distinguished between workings generated by the form imprinted by the stars (*forma specifica*) and those caused directly by a superior agent (supernatural), because the latter are not found in all individuals of a species, while the former are, insofar as they have their origins in an intrinsic principle of that species. The corollary of his reasoning is that natural occult workings cannot be introduced into an object by means of technology (*ars*).

In the *questio* 5.41 to Aristotle’s *Metaphysica*, written during the 1270s, the Averroist philosopher Siger of Brabant advocated for what he understands as “magic,” or that which we herein term “natural magic,” to be classified as science.¹⁶ Siger framed his own discourse on magic in tacit opposition to those of Aquinas and Avicenna.¹⁷ Faith prevented him from denying the existence of demons and their intervention in the world. However, these questions were not the object of science, which is concerned with universal truths. Therefore, the works of intelligent entities, whether good or evil, were not the subject of science. Thus, Siger considered magic, that which we herein refer to as “natural magic,” to be “technology and science” (*ars et scientia*), as opposed to necromancy.

Some of the most illuminating passages defining occult properties are found in two works by physician Arnau de Vilanova: *Speculum medicine* (ca. 1308), and *De parte operativa*, unfinished at his death in 1311.¹⁸ In pharmacological compounds, the primary and secondary qualities, which develop from the primary qualities, can be predicted by means of reason. That said, in addition to these complexional qualities, everything that is created *per naturam* or *per artem*, whether mineral, vegetable, animal or artificial, acquires properties originating from the influence of the stars. Their knowledge and use are truly difficult, because they are accessible only through experience and not by means of reason as are the common qualities. For this reason, Arnau sometimes called them *vires occulte* or *virtus occulta*, although he usually referred to them simply as *proprietates*.¹⁹

¹⁴ *Tractatus brevis*, Bacon, *Opera*, 5:1–24; Bacon, *Opus maius*, 1:240–42.

¹⁵ Aquinas, *Letter of Saint Thomas Aquinas*.

¹⁶ Siger of Brabant, *Quaestiones in metaphysicam*, 279–85.

¹⁷ Maurer, “Between Reason and Faith.”

¹⁸ Arnau de Vilanova, *Speculum medicine*, 142–43 and 254–56.

¹⁹ Giralt, “*Proprietates*”; McVaugh, “Development of Medieval Pharmaceutical Theory,” 17–20, 115–22, and 249–52.

When speaking of these properties, the distinction made by Arnau and other authors between specific and individual faculties is fundamental. Indeed, the occult properties are called *forma specifica* when they cover the entire species and, therefore, occur in each and every individual of the species, although to varying degrees. But in other cases, the *propietas* is exclusively individual, produced by a fortuitous concurrence of factors, such as the position of the stars at the given moment in which the individual is conceived, born, or in an object of human creation such as astrological figures or images, when its manufacture is completed.

Similar to that of Arnau is the conception of occult properties developed by his contemporary Pietro d'Abano, also a physician, in *Conciliator differentiarum philosophorum et medicorum* (1310). According to him, the differences in the magnitude of the *forma specifica* between individuals of the same species are due to the divergences between their complexions and materials, in addition to the complexions and materials of the external agents that have introduced it into them, i.e., the stars.²⁰

Power of the Soul, *Fascinatio*, and Prodigious Faculties

Magical and astrological literature conveys the idea that magicians and astrologers possess extraordinary faculties, either through the power of their souls or due to the astrological conditions that influenced their birth. This question was the subject of great controversy among the scholastics.

The fundamental starting point for the late medieval debate on the power of the soul is Avicenna's *De anima*, 4.2. The latter, after exposing the power of the soul over one's own body, which was accepted by the Latin scholars without reservation, moves on to the subject of its external influence, which is more controversial, because it advocates action at a distance, which was not acceptable in Aristotelian physics, i.e., a soul can naturally influence foreign bodies through *fascinatio*, but in addition, if it is noble, constant and powerful, it can subdue matter to heal or destroy, cause rainfall and fertility or drought and death.²¹ Unlike Avicenna, some of the scholastics related it to an astrological influence.²²

Avicenna's influence can already be found in William of Auvergne, who hesitatingly took up the possibility that the souls of certain animals, such as the basilisk, and of certain persons can work wonders outside their bodies, which are the object of natural magic.²³ It is also from Avicenna, as well as from al-Ghazālī, that Albertus declared having derived the definition of *fascinatio* that he gives in his early commentary on the *Sentences*, 2.7.7.²⁴ Albertus, however, had reservations, for the reason that neither *fascinatio* nor magical art can harm those whose faith in God is steadfast. Several years later,

²⁰ Federici Vescovini, *Medioevo magico*, 192–204.

²¹ Avicenna, *Liber de anima*, 65–66.

²² On *fascinatio*, see Delaurenti, “La fascination et l'action à distance.”

²³ *De universo*, 1.1.43, William of Auvergne, *Opera*, 1:648.

²⁴ Albertus Magnus, *Opera omnia*, 27:153.

however, he no longer expressed such reticence when he related *fascinatio* to the exaltation of man as the only link between God and the world which, coming from the Hermetic *Asclepius*, he took up in *De animalibus* and other writings; men of auspicious birth accomplish wonders, devise incantations, and make prophecies thanks to the power to transmute the bodies that the stars imbue in their souls.²⁵

The theory of *fascinatio* appears in some of Bacon's works which were also based on Avicenna. According to the Franciscan, this phenomenon is explained by a contagious faculty received by the bodily complexion of a person born under an inauspicious constellation. With the corrupt vapours and spirits produced by his unfortunate complexion and transmitted primarily through the porosity of his eyes, he contaminates those around him. And if the wickedness of the soul, the burning desire, the conviction of his power, a firm intention and the selection of astral conditions are added in, there can be no doubt that nature obeys his thoughts. The wise men, in contrast, rely on the benevolence of the soul and an auspicious complexion.²⁶

Equally inspired by Avicenna, Pietro d'Abano stated that the noblest souls are endowed with exceptional natural faculties that have their origins in the position of the stars at their birth. This gives them the ability to overcome earthly bonds, exercise *fascinatio*, and dominate and transform earthly matter, including healing the sick. This is one of two causes, along with the strength of the patient's imagination which is induced by trust in the physician; here, we see the influence of *De physicis ligaturis* by which the *precantatio*, a formula with therapeutic value, can produce results. For Pietro, *fascinatio* takes place when the soul of the magician, agitated by a violent feeling, alters his body and his eyes, through which he then alters the air, and this in turn alters the body of the one to whom the incantation is directed.²⁷

The proliferation of Avicenna's theories of origin around *fascinatio* and the power of the soul met with strong opposition, which was expressed, for example, in their condemnation in 1277 by Étienne Tempier, bishop of Paris, who attacked, among other things, the ideas that one soul can have power over another or that astrological conditioning affects the inclinations of the soul.²⁸ Likewise, based on Aristotle, according to whom all natural movement works by means of contact, Aquinas explicitly replied to Avicenna in *Summa theologiae*, 1a q.117, art. 3 (1270–1272), denying that the human soul has the capacity to affect an external body without an intermediary bodily agent. He recognized only that, through the effect of a particularly powerful imagination, the soul can alter the humours of its own body, particularly in the eyes, through which it affects the surrounding air within a certain radius; common examples include the gaze of a menstruating woman or the venomous gaze of sorceresses. In the latter case, the intervention of the devil cannot be ruled out.

²⁵ Sturlese, "Intelletto acquisito e divino."

²⁶ Bacon, *Opus maius*, 1:142–43 and 398–99; *Opus tertium*, Bacon, *Opera*, 1:98.

²⁷ *Differentiae* 64 and 135, Pietro, *Conciliator*, fols. 94v and 191v–192v; Paschetto, *Pietro d'Abano*, 135–37 and 235–42; Delaurenti, *La puissance des mot*, 347–64.

²⁸ *Chartularium*, 549, no. 112 and 555, no. 207.

As for the assertion that, of all men, magicians are graced by the stars, at the moment of their birth, with the power to perform magical operations, in *Summa contra gentiles*, 3.105 (ca. 1260) Aquinas responded that neither celestial bodies nor human words can ever have the power of influencing the intellect.

Siger of Brabant also rejected the explanation developed by Avicenna for *fascinatio*. His argument was not far removed from Aquinas's naturalistic justification, as Siger sought an explanation that would agree with Aristotle and Averroes, i.e., that a soul can only affect a foreign body indirectly, by means of its own body.²⁹

The position of Arnau de Vilanova lies somewhere between the two; he accepted the effects of *fascinatio* and the extraordinary faculties of certain individuals without attributing them to the power of the soul or to action at a distance. According to Arnau, people can possess occult properties which are also imbued by the position of the stars at the moment of their birth, and which interact with the faculties coming from the favourable or unfavourable situation in the heavens at the moment the procedure is performed. Therefore, it is thanks to such properties rather than to their operations or instruments that, on certain occasions, some magicians, sorcerers and *fascinatores* perform their operations with great effectiveness, while at other times, or if performed by other people, the failure is absolute. The medium of transmission is the air, which they corrupt or affect with the vapours they emit.

Magical Figures, Words, and Characters

Late medieval theologians and natural philosophers agreed both in rejecting the practices included in magical books that are explicitly addressed to spiritual beings, such as sacrifices, propitiations, fumigations or adorations. Another series of technical resources, among which characters, figures, words and images stand out, require a deeper reflection to discover whether they are of a diabolical character or whether their effects can have a natural origin. In this section, we focus on characters (symbols, letters and other markings), figures (both geometrically based and figurative representations) and the word, meaning an oral formula or incantation (*carmen*, *incantatio*).³⁰

Following Augustine, who considered all magical practices, including characters, formulas, and rituals, as signs of a pact with demons (*De doctrina christiana*, 2.20.30; *De civitate Dei*, 21.6), most detractors of necromancy consider the use of words, formulas, characters, and figures to be a clear line of demarcation between natural magic and necromancy. William of Auvergne argued that, like images, characters, and figures have no effect unless they function as signs by which demons can recognize their worshippers. Therefore, they constitute an obvious indication of the necromancers' pact with the devil. Likewise, William denied that words and formulas have magical power in and

²⁹ Siger, *Quaestiones in metaphysicam*, 287.

³⁰ On the power of the word, see Delaurenti, *La puissance des mots*.

of themselves. They only take effect through the work of the demons whom magicians venerate.³¹

Thomas Aquinas came to the same conclusion as William of Auvergne in affirming that the natural matter of human words are the sounds emitted, and their form is the meaning expressed by the ideas of the mind; therefore, they do not have the capacity to alter a natural body by means of a natural faculty but only by means of a spiritual substance. Likewise, for Aquinas (*Summa contra gentiles*, 3.105–7), characters and figures are signs, because they have no active or passive value in terms of preparing matter to receive a natural effect. Therefore, if they are signs, they must be addressed to intelligent beings, the only beings who can be honoured with the sacrifices and prostrations that are usually addressed to them. Who are these beings? The evil nature of the practitioners of these arts and the means they use, as well as the material and immoral character of their objectives, prove that the targets must be demons. However, even when the purposes are not evil, such as the acquisition of knowledge in the *Ars notoria*, the use of figures and unknown words, and not instituted by God, shows that it is based in an agreement with the devils, which cannot enlighten the intellect (*Summa theologiae*, 2a2ae q.95, art. 8).³² Although he does not state it so clearly, the thoughts of Albertus Magnus on characters and words must not have been very different from those of Aquinas, if several of the allusions scattered throughout his work are taken into account.³³

For his part, Arnau de Vilanova responded in *De reprobacione nigromantice fictionis* (1276–1288) to the belief that spirits are naturally subdued by figures, arguing that it is impossible for these, or any other accident, to dominate a substance. The power to coerce demons can be provided to figures neither by their matter nor by their artificer nor by the stars. The words contained in incantations, as the accidents that they also are, are subject to the same limitations and also cannot obtain such coercive capacity from the air, the vocal organs or the soul.³⁴

Pietro d'Abano dedicated the *differentia* 156 of the *Conciliator* to the efficacy of enchantment (*precantatio*) which, according to him, derives from an internal cause, the soul, and an external cause, the stars. He who utters it must be a wise man—a doctor or an astrologer—with a good reputation to arouse confidence and must have a strong and well-disposed soul.³⁵

The scholastic who went the furthest in accepting the power of signs and words was Bacon. He distinguished between characters and formulas based on astrological conditions and those that are fraudulent. As for the former, he elaborated his theory on the properties of characters, letters, images, formulas and incantations on the basis of the

31 *De legibus*, 27, William of Auvergne, *Opera*, 1:89–90; Sannino, “*Nigromantia secundum physicam*.”

32 The angelic magic of the *Art notoria* is generally condemned or silenced in the sources here studied. See Véronèse, “*L’Ars notoria au Moyen Âge*,” 112–15, 249–50, 637–47.

33 *Super II Sententiarum*, 7.50.12, Albertus Magnus, *Opera omnia*, 27:163–64; Albertus Magnus, *De vegetabilibus*, 6.1.34 and 7:458.

34 Arnau de Vilanova, *Epistola de reprobacione*, 226–27.

35 Delaurenti, “Pietro d’Abano et les incantations.”

ineffable power that the astrologer can imprint on words by selecting the most suitable time thanks to the combined *species* of the rational soul and heaven, which can dominate not only natural beings but even minds, taking into account that the free will cannot be oppugned. Indeed, images, formulas, and characters receive powers from the constellation under which they have been crafted. But workings and words contain still other special faculties, because they also receive power from the soul, if it is rational and righteous. The body also plays a role in the process as an instrument of the soul, because its complexion influences them, as well as the very physical reality of the word, i.e., the form it gives to the air when it is uttered. Therefore, four types of *species*—coming respectively from the stars, the soul, the body and the word—must be considered in order to distinguish between the workings of *scientia experimentalis* and those of *magic*.³⁶ Baconian theory was developed primarily under the dual influence of al-Kindi's *De radiis*, not referenced, and Avicenna's *De anima*.³⁷

The Magic of Images

Images and talismans provide a particularly privileged point of observation for perceiving the diversity of sensibilities and opinions expressed by medieval scholars dealing with the occult arts.³⁸ These can take the form of statuettes, rings, gems, medals, or engravings (seals) and were among the principal instruments used in magic. The most well-known treatises in this field were *De imaginibus* attributed to Tābit ibn Qurra, which describes talismans for warding off harmful animals or obtaining fortune, wealth, power, and love. But the two twelfth-century versions of this work that circulated were received very differently—the one entitled *De imaginibus*, by Juan de Sevilla, was praised as an example of the art of images by the *Speculum astronomie* and by Bacon. In contrast, the version written by Adelard of Bath, entitled *Liber prestigiorum*, was rejected by the *Speculum*. What was the reason for such a different reception? To understand this, we must first examine the classification of magical images set forth in the *Speculum*, a treatise in defence of astrology, written around 1260, later falsely attributed to Albertus Magnus.³⁹

In dealing with that which it terms the “science of images” the *Speculum astronomie* distinguished between three types—the images of the first two usurp the name of astronomy, but are in fact necromantic and should be avoided because of the danger to faith, while those of the third are astronomical.⁴⁰ The first category is abominable and

36 *Opus tertium*, Bacon, *Opera*, 1:96–99; Bacon, *Opus maius*, 1:395–97.

37 Fanger, “Things Done Wisely by a Wise Enchanter.”

38 The reference study on astrological images between the thirteenth and fifteenth centuries is Weill-Parot, *Les “images astrologiques” au Moyen Âge* (see esp. 40–62, 27–153, 215–302, 316–39, 456–531).

39 Paravicini Bagliani, *Le Speculum astronomiae une énigme?; Speculum astronomiae*, ed. Zambelli, 1–41 and 121–25.

40 *The Speculum astronomiae and Its Enigma*, trans. Zambelli, 240–50 and 270.

consists of the worst kind of idolatry, as it involves fumigations and invocations. The second type is somewhat less unacceptable but nonetheless detestable—it consists of images with inscribed characters that must be exorcised by certain names.

The third type is more clearly distinct—it consists of a single image, without fumigations, invocations, exorcisms, or inscribed characters, but only engraved at the astrologically propitious moment, after the example of *De imaginibus*. The effects of this type of image come from the *virtus celestis* of the constellations according to whose template they have been crafted. However, the treatise ends up considering it admissible to record some single words or utter a phrase, as long as they have a clear and direct meaning.

Weill-Parot concludes that the argumentative strategy of the *Speculum astronomie* uses the classification of images in order to include the notion of the astrological image (*imago astronomica*) as a third way. His intention was to remove the suspicion of necromancy from a certain type of image by attributing its effects to a natural astrological causality while condemning the other two types. In its origin, the *imago astronomica* was a “phantom notion,” because in practice, there were no texts on images devoid of any ritual apparatus or without any inscription or formula not intended for supernatural beings.⁴¹

The *Speculum astronomie*, therefore, included Adelard’s translation among those necromantic books that were to be rejected, while that of Juan de Sevilla appeared as an example of a very useful astronomical book. The reason is clear: Adelard translated an Arabic version of Tabit’s book to which fumigations, prayers and explicit invocations of spirits had been added. The dissemination of the two translations was very different; while sixty-one manuscript copies of the Juan de Sevilla are known, only four of the Adelard translation have survived.⁴² In fact, in general, many more copies of the treatises on images not condemned by the *Speculum astronomie* are preserved than of those considered illicit. Thus, this treatise had a decisive influence on the dissemination of books on images. On the other hand, the total or partial scholastic condemnation of texts on images did not prevent copyists from considering them as belonging to the natural realm, and so they were usually included in compilations of natural knowledge, astrology and medicine, but almost never in manuscripts of necromantic texts.⁴³

The separation between at least two types of images responded to a trend that could already be observed in some previous works. A clear precedent is a text that begins *Ut testatur Ergaphalau*, found in a manuscript from the twelfth century, and that, according to its editor, Charles Burnett, could even have been written before the end of the tenth century. In the division of the sciences that it offers, it distinguishes between a *scientia imaginaria pura*, in which the images are based not on incantations or exorcisms, but only on astrological observation, and a *scientia imaginaria exorcismalis* intended for the spirits, that does include the support of incantations and exorcisms.⁴⁴

41 Weill-Parot, *Les “images astrologiques” au Moyen Âge*, 27–153 and 215–19.

42 Bohak and Burnett, *Thabit ibn Qurra*, 48–50, 68–73, 201.

43 Klaassen, *Transformations of Magic*, 23–24 and 39–40.

44 Burnett, “Adelard, Ergaphalau and the Science of the Stars.”

The categories of images established by William of Auvergne and the first Albertus Magnus also point in the same direction, even if they were not yet as well defined as in the *Speculum* and rejected them all. Indeed, in the *De legibus*, 23,⁴⁵ he went to great lengths to demonstrate that magical images, both those made solely with attention to astrological conditions and those which also demand sacrifices, prayers, characters, or figures, are a form of idolatry. In *De universo* 1.1.46, William presented a *questio* on whether terrestrial images obey not only the images of the firmament or constellations but also their representations, arguing with numerous reasons of various orders against the different types of magical images.⁴⁶

In the commentary on the *Sentences* (1246–1249), Albertus Magnus also disapproved of any use of images, because this represented a risk of falling into idolatry and was oriented to evil ends.⁴⁷ Nevertheless, in later works, Albertus expressed different and, at least on first sight, contradictory opinions; in the *De celo et mundo* 2.3.5 (written in 1250), he stressed the difficulty of knowing whether the stars have an effect not only on natural beings but also on artificial ones such as images.⁴⁸ In *De fato*, 4, he justified the power of images on the basis of astrology.⁴⁹ In the *Summa theologiae* (after 1270), he only alluded to astrological images to condemn them as an illusion caused by demons.⁵⁰ But the work to which he devoted most space was *De mineralibus* (1251–1254), in which he first speaks of the powers conferred on certain stones by the *forma specifica* of astral origin (2.1.4); later, in 2.3.1, he refers to traces of figures produced in certain stones by celestial influence, which as a starting point for his defence of the use of artificial images.⁵¹ The solution of Albertus to the dichotomy between *natura* and *ars* was to position the image in a causal chain in which the craftsman manufactures the talisman by subjecting his technology (*ars*) to the natural causality coming from the stars by selecting the astrologically convenient moment according to the theory of the *electiones*. In my opinion, the diverse treatment of the issue in the writings of Albertus can be explained by the orientation and use of different authorities depending on the work, as we have seen before.

With a stance similar to that of al-Kindī, Bacon accepted certain images, at the same level as some characters and formulas, without specifying what type in particular, but emphasized that they meet the appropriate astrological conditions, and also cited Tābit ibn Qurra as the highest authority. He described these images, characters, and formulas as “philosophical,” perhaps with the intention of differentiating between them and the *imago astrologica* as coined by the *Speculum astronomie* from which Bacon differed,

⁴⁵ William of Auvergne, *Opera*, 1:65–67.

⁴⁶ William of Auvergne, *Opera*, 1:658–66.

⁴⁷ *Super II Sententiarum*, 7.50.9 and 11–12, Albertus Magnus, *Opera omnia*, 27:157–58 and 162–64.

⁴⁸ Albertus Magnus, *De caelo et mundo*, 150a.

⁴⁹ Aquinas, *Opuscula omnia*, 5:412–13. *De fato*, previously attributed to Thomas Aquinas, is now thought to be Albertus Magnus’s work.

⁵⁰ Albertus Magnus, *Opera omnia*, 2:327.

⁵¹ Albertus Magnus, *Opera omnia*, 5:28 and 48.

because he accepted images with inscriptions, which in principle are rejected in that book, and left it up to the wise man to discern, by means of “experimental science,” those which are valid and those which are not.⁵² The basis for the differing attitudes of the two is that the Franciscan recognized the power of words, as we have seen above. His position, which was eccentric in his time, goes so far as to argue that the *ars* is capable of going beyond the simple imitation of nature to the point of perfecting it.

Aquinas’s attack on this practice was apparently based on the justification given in the *De radiis* of magical and astrological images.⁵³ Indeed, he was of the opinion that, while it is acceptable to make use of natural occult workings which emanate from their substantial form, the effects of objects created by technical means are caused by something else.⁵⁴ The basis of this reasoning was his conception of the *forma specifica*, since, as we have already seen, according to Aquinas, it was the only type of natural occult properties admissible, as he rejected the individual properties. Therefore, as artificial forms such as images or sculptures are accidents not inherent to the entire species, they cannot give an individual the capacity to receive from a celestial body the natural faculty which would allow them to produce effects transcending the virtues of the elements forming the material composition of that celestial body. In any case, these effects must come from an extrinsic agent, from malign spirits.

The proof of demonic intervention is that it is necessary to inscribe characters and figures on the talisman, which would be completely unnecessary for a natural operation. While some convey express invocations to demons that imply an explicit pact with them, others represent tacit pacts with malign spirits, as shown by the engraved drawings and inscriptions. Thus, Aquinas rejected not only the necromantic images but also the astrological images defended by the *Speculum astronomie*.

Up to now, we have considered only a purely theoretical debate; however, around 1300, the practices of physicians such as Arnau de Vilanova and Pietro d’Abano included the use of astrological seals. In the case of Arnau, his interest is attested to both in his works, in which he justifies the therapeutic effects of this method as the result of occult properties, and by evidence based on its use in his professional practice.⁵⁵

Pietro, for his part, used the notion of “astrological image,” under the influence of the *Speculum astronomie*, but also combined the two classes of rejected images established by this treatise into a single category of illicit images. In the *Conciliator* and other works, Pietro spoke of the virtues and methods for making forty-eight astrological images that, according to *electiones* and *interrogationes*, can mitigate, modify or increase astral influences. He attributed a therapeutic function to them, as they have the power to attract

52 Bacon, *Opus maius*, 1:394–98; Bacon, *Part of the Opus tertium*, 53.

53 *The Speculum astronomiae and Its Enigma*, trans. Zambelli, 38–39.

54 The attitude of Aquinas towards images is set forth primarily in the *De operationibus occultis nature*, following the line of reasoning outlined above, but here it is supplemented by passages from the *Summa contra gentiles*, 3, 104–5, and *Summa theologica*, 2a2ae q.96, art. 2, 2.

55 Giralt, “Astrological Works Attributed to Arnau de Vilanova.”

beneficial celestial rays to patients and to protect them from harmful rays.⁵⁶ However, the references of Pietro to the images generally appeared to be inserted within theoretical expositions, and only two witnesses are found regarding a possible therapeutic application of the seals of Leo and the Serpentarium to counteract kidney disease and poisons, respectively.⁵⁷

The Frontiers of the Forbidden

While sacrifices and rituals were unanimously rejected by all scholastic authors, the question of whether other magical resources such as formulas, characters or images generally serve to invoke demons or whether some of them may have properties of natural origin, was a subject of debate. Everyone also agreed that, in reality, human beings do not have any natural or supernatural mechanism, except for the power provided by God to certain saintly people, to subdue demons. It is the demons themselves who teach such practices to necromancers in order to make them think they can bring them under their control and force them to do their bidding. Demons pretend to obey and are even capable of working certain wonders, but in reality, their false submission is nothing more than a deception, permitted by God, to drag sinners who practise necromancy to the perdition of their souls.⁵⁸

Throughout this study, we have seen how the establishment of the boundaries between the newly permitted and forbidden knowledge became the subject of a profound debate in natural philosophy and theology during the thirteenth and early fourteenth centuries. Philosophy provided the theories on the mechanisms by which the natural universe is governed and, therefore, served to determine which were natural and which were supernatural, which were divine and which were diabolical, while theology established the permissibility or otherwise of the use of these mechanisms according to the doctrine of the Church. Faced with the ever vigilant and distrustful attitude of the more orthodox ecclesiastical sectors, the scholars of natural philosophy were interested in clearly delimiting this frontier in order to free the newly imported knowledge of pagans and infidels from suspicion.

Therefore, one must ask what specific interests or uses were served by the legitimization of natural magic. From the outset, it seems evident that physicians such as Arnau de Vilanova and Pietro d'Abano were driven by an immediate, professional stimulus—to take advantage of the powers of a series of substances and instruments and incorporate them into their therapeutic arsenal. The motivations of the developers of natural philosophy, the mendicant orders, are less clear. For the Dominican tradition, in which William of Auvergne, Albertus Magnus, and Thomas Aquinas were the most distinguished, the

⁵⁶ Federici Vescovini, “Pietro d’Abano e l’astrologia-astronomia,” 9–28.

⁵⁷ Pietro, *Conciliator*, fol. 17v (*differentia* 10); Pietro, “El De venenis,” 79; Weill-Parot, *Les “images astrologiques” au Moyen Âge*, 500–31.

⁵⁸ Three works focus on such a conception of necromancy as a deception: Aquinas, *Quaestiones disputatae*, 6, 10; Arnau de Vilanova, *Epistola de reprobacione*; Bacon, *Opera*, 1:523–51. Arnau’s epistle seems to be inspired by Aquinas’s question.

natural wonders, so admirable for their lack of rational explanation and so beneficial for humanity, would represent a magnificent proof in favour of the goodness of Creation and against the Cathar dualism that it fought against. On the other hand, for a Franciscan like Roger Bacon, the occult properties would link perfectly with his study of the *virtutes* of the elements of the natural world and with his marked neoplatonic bias.⁵⁹

From this study we can conclude that, when it came to discriminating between that which is permitted and that which is not, within the scholastic viewpoints in favour of accepting Greco-Arabic natural knowledge and harmonizing them with faith, there was a consensus on some fundamental points. First, compared with necromancy or magic judged illicit according to Christian doctrine because it is based on the invocation of spirits, in reality demons, there is another perfectly legitimate magic—although most avoid calling it so, based on amazing natural properties, imbued by the stars and called occult, because they are not comprehensible to human reason but only through experience. As these have a natural cause, it is both licit and beneficial for mankind to employ them. Second, necromancy represents a deception, whether performed by its practitioners in front of others, or inflicted on those who believe in it by the demons they invoke. Third, characters, figures, and words used in a given working are what serve as a guideline for distinguishing between demonic magic and natural magic.

It is in this last aspect, as well as in two more that are closely linked to it—the use of images and the power of the soul—that the principal divergences within scholasticism arose. Scholars such as Albertus Magnus (in his natural works), the unknown author of the *Speculum astronomie*, Roger Bacon, Siger of Brabant, Arnau de Vilanova, and Pietro d'Abano had more open viewpoints in comparison to William of Auvergne and Thomas Aquinas. The latter condemned all practices based not only on characters and words but also on images, and asserted that their effects cannot be due to astral influence alone but imply the direct intervention of demons. In doing so, they denied the possibility that human beings can channel occult properties by technical means (*ars*), a limitation that considerably restricts the margins of natural magic as much as it widens those of diabolical magic. Two sensitivities were thus formed—one more concerned with the dangers that could arise from knowledge of the occult arts on the part of the more “theological” tendency embodied by William, Aquinas, and the religious works of Albertus, and the other more “naturalistic” and interested in the benefits that the new knowledge and its applications could bring to humanity. These, then, represent two attitudes towards knowledge—one more inhibited by the fear of falling into *curiositas* or an excessive desire for knowledge, and the other more daring and driven by a fascination and an optimistic yearning towards the theoretical (*scientia*) and technological (*ars*) knowledge provided by the new translations.

More specifically, we can see that, starting from the two poles mentioned above, the positions held by the scholastics were varied when it came to defining the criteria for distinguishing between that which is licit from that which is dangerous or prohibited, and that which is possible by natural means and that which is not (see Table below).

⁵⁹ French and Cunningham, *Before Science*, 7–268.

Table of Opinions of Scholars on Magic and Science

	<i>Forma specifica</i> or occult properties common to the entire species	Technical mastery of occult properties (images)	Power of the soul	Extraordinary powers from the stars	Power of the word	Characters
Albert (theological works)	×					
Thomas Aquinas	×					
William of Auvergne	×		perhaps			
Siger of Brabant		×				
<i>Speculum astronomie</i>		×				
Arnau de Vilanova	×	×		×		
Albert (natural works)	×	×	×			
Pietro d'Abano	×	×	×	×	×	
Roger Bacon	×	×	×	×	×	some

We can attempt to classify the range of different opinions by taking five variants as a touchstone: first, the technical mastery of occult properties; second, the power of the soul, understood as action at a distance; third, the extraordinary faculties imbued in certain persons by the stars; fourth, the power of the word; and fifth the use of characters. The resulting positions can be graduated as follows: (1) Albertus in his theological works and Aquinas, who rejected the five possibilities as susceptible to the intervention of demons; (2) William, who did not consider the power of the soul impossible; (3) Siger and the *Speculum astronomie*, who defended the channelling of natural magic through technique—Siger in general, and the *Speculum* with a focus on the *astronomical imago*⁶⁰; (4) Albertus, in his natural works, who accepted the power of the soul; (5) Arnau, who admitted the existence of extraordinary personal powers; (6) Pietro, who recognized the power of the word; (7) Bacon, for whom certain characters could have natural effects.

⁶⁰ One technical application of natural magic that William of Auvergne considered possible was the acceleration of the spontaneous generation of certain animals such as worms, frogs or lice (*De legibus*, 24.1.70, William of Auvergne, *Opera*, 1:69), but it is a resource to which he referred only briefly, and has scarcely been contemplated by anyone other than this author.

Lastly, we may wonder whether the debate over the limits of necromancy and the licit occult had consequences for the practice of magic or whether it was ever settled in any way. As shown by the bishop of Paris's condemnation in 1277, the persecution of necromancy certainly gained strength beginning in the second half of the thirteenth century, in accordance with the concerns generated by the diffusion of the new magical texts, and would intensify during the subsequent centuries. In the long run, the criteria of Aquinas, which were more restrictive, rationally founded, and clearer than the indefinite and oscillating criteria of Bacon and Albertus, respectively, as well as his formulation of the pact with the devil, contributed to the theoretical cementing of the witch-hunt. However, throughout the following centuries, the repression of necromancy was fundamentally directed against books and magical workings explicitly aimed at supernatural beings, which were considered illicit by all scholastic thinkers. At the same time, it generally left a wide margin of tolerance for works and practices that could fall into the categories of natural magic and astrology. However, this did not mean that they did not continue to be questioned frequently by the more orthodox. The debate therefore continued.

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