

ASTROLOGY, ASTRAL INFLUENCES,
AND OCCULT PROPERTIES IN THE THIRTEENTH
AND FOURTEENTH CENTURIES

BY NICOLAS WEILL-PAROT

The notion of natural “occult” is usually viewed by modern scholars as a tautological way of dealing with phenomena for which there was no current explanation. Consider how Molière mocks scholastic medicine in the “Intermède” of *Le malade imaginaire* when he gives the Bachelierus a silly answer to the question of why opium makes one sleep: “quia est in eo virtus dormitiva / Cujus est natura / Sensus assoupire.” Opium makes one sleep because it has a sleep-inducing power; its nature is to make “the senses drowsy.”¹ The words of Molière’s Bachelierus are strikingly similar to what Augustine writes in the *City of God* (21, 7) concerning natural things that are endowed with extraordinary properties: “So for the other cases, irksome to rehearse, in which an unusual power seems to be present contrary to nature, yet no other explanation is given except to say such is their nature. No doubt their explanation is short, and still it answers enough.”² Obviously, however, the very meaning of Augustine’s statement is just the opposite of Molière’s. In Augustine’s view, the answer is “short,” because the real and only cause is God himself; nature is only an illusory cause. For Molière, the Bachelierus’s answer is inane, because it seems to give a scientific explanation but in fact says nothing and certainly does not look for the true natural causes. But between Augustine and Molière there was scholastic science, in which the

¹ A study of this section can be found in Keith Hutchison, “Dormitive Virtues, Scholastic Qualities, and the New Philosophies,” *History of Science* 29 (1991): 245–78, esp. 245.

I wish to thank Gad Freudenthal, Danielle Jacquart, and Barbara Obrist for their readings and advice, and Azéline Jaboulet-Vercherre and Katelyn Mesler for their English emendations.

The author is Maître de conférences in Medieval History at Université Paris 8 and Junior fellow of the Institut universitaire de France. This article was previously a presentation given at a workshop held by the team CHSPAM (UMR 7219) of the CNRS and organized by Gad Freudenthal: “L’astrologie au Moyen Âge: Traditions arabe, hébraïque, latine” (Paris, 8 November 2008).

² Augustine, *De civitate dei* 21, 7, ed. Bernhard Dombart and Alfons Kalb with Johannes Divjak, 5th ed. (Stuttgart, 1993), 501: “quibus licet vis insolita contra naturam inesse videatur, alia tamen de illis non redditur ratio, nisi ut dicatur hanc eorum esse naturam. Brevis sane ista ratio, fateor, sufficiensque responsio.” English translation: Augustine, *The City of God against the Pagans*, vol. 7, *Books XXI–XXII*, trans. William M. Green (Cambridge, MA, 1972), 43.

virtus occulta was not a mere tautological statement but a real explanation based on a coherent conception of nature.

From the thirteenth century onwards, the prominent framework of scholastic philosophy and science was an Aristotelian, or better an Aristotelizing, one. As is well known, the Aristotelian cosmos was divided into a superlunary world, where, beneath the sphere of the so-called fixed stars, seven spheres were carrying and moving the seven planets respectively, and a sublunary world, that of the four elements, i.e., fire, air, water, and earth, undergoing continuous generation and corruption — each of them being defined through a couple of qualities (earth being cold and dry, water cold and moist, air warm and moist, and fire warm and dry). According to scholastic medicine and natural philosophy (from the twelfth and thirteenth centuries onwards), the natural operations produced by the inferior bodies could generally be reduced to the action of primary qualities or to those qualities deriving directly from their mixing (i.e., complexion). These qualities could be called “manifest,” since they were obviously perceived by a man when he was looking for them: a warm body, for instance, reveals its warm quality to the man who touches it.

But certain natural phenomena could not be explained by primary qualities or the mixing of them, as in the case of the lodestone’s attraction of iron, since a man who touches a magnet cannot perceive its attractive power. The same could be said about the power of purging the bile that was attributed to rhubarb (or to scammony), and the antidotary power of theriac. Such effects were entirely dependent on virtues (or properties) called “occult,” since they were hidden to human sense perception and hence to intellectual understanding. Consequently, the concept of occult property could account for such natural phenomena called wonders (*mirabilia*), because their cause was not manifest and therefore induced astonishment among men.

The concept of occult properties was used to account for the power of amulets, i.e., certain natural objects worn or carried on one’s person for protection against specific troubles: e.g., the eagle stone, when worn by a pregnant woman, was supposed to protect her against miscarriage.³ The authors writing about natural philosophy became eager to seek the cause of occult properties, which transcended the elementary world, passing into the superlunary world. Most of the philosophers thought that the origin of occult

³ This distinction between amulets and talismans derives, with some emendation, from that suggested by Brian P. Copenhaver, “Scholastic Philosophy and Renaissance Magic in the *De vita* of Marsilio Ficino,” *Renaissance Quarterly* 37 (1984): 523–54, at 530.

properties could be a specific celestial *influentia*.⁴ As these philosophers considered celestial causes, their thought necessarily hit upon astrology, a branch of knowledge that had spread widely since the twelfth-century Latin translations of scientific Greek and Arabic texts.

The discussions about the concept of natural magic gave particular relevance to the relationship between astrology and occult properties; “natural magic” was defined as a kind of magic based on natural forces only, excluding any recourse to demonic spirits. The concept of occult property was not only useful in accounting for the efficacy of certain drugs and for the power of amulets, it also provided an explanation for the existence of a natural magic. By definition, magic implies an artificial operation: in one way or another, human work is necessary to make the magical power being produced; therefore amulets, being natural objects, do not belong to magic properly: they are related to natural wonders (*mirabilia*). On the other hand, a talisman can be defined as an artificial object endowed with magical power (generally an image, a figurine); a talisman is magical since it is a man-made object whose power cannot be explained by manifest natural causation. The medieval concept of natural magic, as coined by scholars from the thirteenth century onwards, was essentially referring to astral magic, namely a kind of magic based on recourse to astral forces and influences. For that reason, admitting the existence of a natural astral magic implied that it was possible to focus the natural influences of the stars upon the sublunary world artificially.⁵

Thus some medieval philosophers were eager to demonstrate that a purely astral magic could be called “natural,” and they suggested two explanations: the first one was based on non-demonic astral influences, the second one on the concept of natural occult properties. Actually these explanations were subtly connected, whether in such fields as physical science, natural philosophy, and medicine (magnets or amulets), or in those belonging to natural magic (purely astrological talismans), the concept of occult property dealt with the science of stars.

My aim here is not to study the general issue of occult properties in medieval science — a task I am pursuing elsewhere.⁶ Rather, I want to focus on

⁴ Edward Grant, “Medieval and Renaissance Scholastic Conception of the Influence of the Celestial Region on the Terrestrial,” *Journal of Medieval and Renaissance Studies* 17 (1987): 1–23. See also John D. North, “Celestial Influence — the Major Premiss of Astrology,” in “*Astrologi hallucinati*”: *Stars and the End of the World in Luther’s Time*, ed. Paola Zambelli (Berlin, 1986), 45–100.

⁵ Nicolas Weill-Parot, *Les “images astrologiques” au Moyen Âge et à la Renaissance: Spéculations intellectuelles et pratiques magiques (xiii^e–xv^e siècle)* (Paris, 2002).

⁶ With the support of the Institut Universitaire de France, I am about to complete a work provisionally entitled *Points aveugles de la nature: La rationalité scientifique médiévale face à l’occulte [les propriétés occultes], l’attraction magnétique et l’horreur du vide (xiii^e–xv^e)*

the role that astral influences, on the one hand, and astrology proper, on the other, play in the speculations about occult properties by Latin medieval scholars. Although occult properties were somehow related to celestial influence, their relationship to astrology per se remains to be investigated.

The link between the sublunary world and the superlunary world, as conceived in scholastic philosophy, implied two different ideas, which should be clearly distinguished: on the one hand, the existence of astral influence on the inferior world; on the other hand, a human ability to “read in the heavens” future terrestrial events.⁷ As Alain de Libera rightly wrote: “The astrological doctrine necessarily has two sides: etiology and semiology.”⁸ This distinction is fundamental, because the fact that a medieval scholar acknowledges astral causation does not necessarily imply that he also admits the semiological side (that the location of the planets and constellations are considered to be signs that foretell events on earth) and its technical consequences (the usual rules and techniques of astrology). An astrological world-view, however, implies admitting both. Whereas an author like Thomas Aquinas gives astral influences a significant role in his cosmology, he has reservations about the “semiological side” and allows little room for astrology properly speaking. On the other hand, both components of astrology are quite prominent in the thought of Albertus Magnus.⁹ Note that such a distinction between cause and sign is used here in order to define clearly what is astrology proper; this does not mean that every author (a theologian, a philosopher, an astrologer, or a physician) explicitly and consciously makes use of it: he actually refers usually either to astrology proper or to astral influence, according to the topic that he tackles. Thus medieval authors’ views on astrology can differ according to two parameters. The first is to what extent a man can read in the heavens; the second is to what extent

siècle). Many scholars have tackled the question of occult properties in the Renaissance and early Modern Age; see notably Keith Hutchison, “What Happened to Occult Qualities in the Scientific Revolution?” *Isis* 73 (1982): 233–53; idem, “Dormitive Virtues”; Desmond M. Clarke, *Occult Powers and Hypotheses: Cartesian Natural Philosophy under Louis XIV* (Oxford, 1989); John Henry, “Occult Qualities and the Experimental Philosophy: Active Principles in Pre-Newtonian Matter Theory,” *History of Science* 24 (1986): 335–81; Copenhaver, “Scholastic Philosophy”; Paul Richard Blum, “*Qualitates occultae*: Zur philosophischen Vorgeschichte eines Schlüsselbegriffs zwischen Okkultismus und Wissenschaft,” in *Die okkulten Wissenschaften in der Renaissance*, ed. August Buck (Wiesbaden, 1992), 45–64; Tristan Dagron, “La doctrine des qualités occultes dans le *De incantationibus* de Pomponazzi,” *Revue de métaphysique et de morale* 49 (2006): 3–20.

⁷ The expression “reading in the heavens” is borrowed from Jean-Patrice Boudet, *Lire dans le ciel: La bibliothèque de Simon de Phares, astrologue du xiv^e siècle* (Brussels, 1994).

⁸ Alain de Libera, *Penser au Moyen Âge* (Paris, 1991), 262.

⁹ On Thomas’s and Albertus’s views, see notably Thomas Litt, *Les corps célestes dans l’univers de saint Thomas d’Aquin* (Louvain, 1963); Paola Zambelli, “Albert le Grand et l’astrologie,” *Recherches de théologie ancienne et médiévale* 49 (1982): 145–58.

astral influence can reach the inferior world: does it affect only very general processes or also particular events due to particular astral configurations? (To be sure, the central issue of human freedom is partly based on this last question.)

In the following, I will first clarify the definition of “specific form” and its meaning within the scholastic worldview. After that, I will attempt to grasp the astral origin attributed to these properties. Next, I will ask whether astrology per se (including its semiological side) plays a role in these theories. Finally, I will examine the consequences of this distinction for the medieval conception of natural magic.

THE OCCULT: RATIONALITY AND SPECIFIC FORM

In Molière’s view as well as in Augustine’s, the explanation of natural wonders by some proper nature of a thing was tautological. But the Avicennian notion of specific form gave the explanation of such marvels by some proper nature a real meaning. The history of occult properties is thus strictly linked to the history of the concept of nature.

In the *Canon*, the medical encyclopedia translated from Arabic into Latin by Gerard of Cremona in the second half of the twelfth century and subsequently diffused throughout the academic world (perhaps from the 1230s on¹⁰), Avicenna borrowed from Galen the concept of the whole substance, a key concept that could be found in several of the latter’s works. Galen had explained that, in addition to drugs that operate through the combination of their primary qualities (hot, cold, dry, and moist), certain drugs were endowed with a particular power that derived from the substance taken as a whole (e.g., poisons).¹¹ This allowed him to explain properties that could

¹⁰ On the diffusion of Avicenna’s *Canon* in the Middle Ages, see Danielle Jacquart, “La réception du *Canon* d’Avicenne: Comparaison entre Montpellier et Paris aux ^{xiii}^e et ^{xiv}^e siècles,” in *Histoire de l’École médicale de Montpellier* (Paris, 1985), 69–77; eadem, “Lectures universitaires du Canon d’Avicenne,” in *Avicenna and His Heritage*, ed. J. Janssens and D. De Smet (Louvain, 2002), 313–24; Nancy G. Siraisi, *Avicenna in Renaissance Italy: The Canon and Medical Teaching in Italian Universities after 1500* (Princeton, 1987), 44–45; Joël Chandelier, “La réception du Canon d’Avicenne: Médecine arabe et milieu universitaire en Italie avant la Peste Noire” (Ph.D. diss., École Pratique des Hautes Etudes, Paris, 2007), 43–46.

¹¹ See, for example, Galen, *De simplicibus medicinis*: “Et ostendi iterum quod de proprietate medicine est ut alteret corpus aut in qualitatem unam quaecumque qualitas sit: quare calefacit aut infrigidat aut desiccet aut humectet aut per duas qualitates, quare efficit de istis operationibus quas diximus duas operationes combinatas, aut per totam substantiam sicut multe medicinarum previtiosarum et medicinarum conservativarum et omnes medicine solutive et multe medicinarum que nominantur attractivae” (MS Paris, BNF lat. 11860, fols. 84r^a–124v^b, at 116v^b). See also Galen, *Opera omnia* 11: 5, 1, ed. and trans. C. G. Kühn (repr. Hildesheim, 1964), 705.

not be reduced to the *crasis* (the complexion or mixture of primary qualities). Avicenna's formulation in the *Canon* was more precise. According to him, the whole substance could also be called specific form. This was neither the primary qualities nor the complexion (or mixture of these qualities), but something that perfected a predisposition inherent in this complexion — in other words, something that transcended the complexion. Examples of operations performed through the specific form included the alleged power of rhubarb to purge the bile and a lodestone's attractive power on iron.¹²

According to most of the medieval scholars, the concept of specific form accounted sufficiently for occult properties. And both of these concepts, specific form and occult properties, were in turn used in order to account for unexplained phenomena. I hold that this focus on occult properties and specific form was the result of an attempt to provide a rational and exhaustive explanation of the entire created world. In the face of phenomena that could not be explained by primary qualities, scholastic science kept the unknown in check by framing it within the notion of specific form. There were operations whose causality was hidden to both the human senses and the human intellect. Because they could not be explained by the combination of the primary qualities, they were subsumed under the concept of specific form, a form suited to a given species, which transcended the complexion (the mixture of primary qualities). The specific form made it possible to give a name to unexplained phenomena without analysis of their content. This empty notion was held to be the ultimate rational explanation. Were the unknown simply the not-yet known, a gap would be opened in the explanatory frame of the sublunary world. Instead, thanks to the specific form, the unknown was transmuted into the occult: the negative was inverted into a positive entity. Therefore the occult was forever and structurally occult (unlike a secret, which is by definition provisional), and could

¹² Avicenna, *Canon* (Venice, 1505), Liber I, Fen II, Doctrina II, Summa I, Cap. 15 ("De his que proveniunt ex his que comeduntur et bibuntur"), fol. 30r^a: "Et sua quidem operans substantia est illud quod forma sue speciei operatur quam acquisivit post complexionem; quod cum eius simplicia se commiscuerunt et ex eis generata fuit res una, preparavit se ad recipiendum speciem et formam additam super illud quod habent simplicia. Hec ergo forma non est qualitates prime quas habet materia, neque est complexio que generatur ex eis sed est perfectio quam acquisivit materia secundum aptitudinem que fuit ei acquisita ex complexione, sicut in magnete virtus attractiva, et sicut natura cuiuscumque specierum vegetabilium et animalium, scilicet illa quam habent post complexionem propter complexionis preparationem; neque est de simplicibus complexionibus, neque ipsamet complexio, quia non est caliditas neque frigiditas neque siccitas neque humiditas, neque simplices neque commixte, sed est verbi gratia color aut odor aut anima aut alia forma de non perceptis sensu. . . . Tota autem operatio hec non provenit ex eius complexione, immo ex eius forma specifica adveniente post complexionem. Unde propter hoc vocamus huiusmodi operationem a tota substantia, scilicet forma specifica, et non qualitate, scilicet non aliqua quatuor qualitatum, neque eo quod est earum commixtio."

be accommodated within the world order without threatening its arrangement.¹³ In other words, were there a possibility of knowing the unknown, there would be uncertainty; but scholastic science — at least its prevailing trend¹⁴ — kept the unknown within limits (as previously said) and could thus assert a rational mastery of the entire sublunar world.

OCCULT PROPERTIES AND ASTRAL INFLUENCES

In his *De viribus cordis*, Avicenna provides a more comprehensive explanation: the specific form, he writes, comes from a superior influence.¹⁵ It is important, I think, to locate this medical definition, which he provides in the *Canon* and the *De viribus cordis*, within the broader context of Avicennian philosophy. The nature of this influence seems to be clarified in the *Physics* of the *Shifa*, Avicenna's philosophical encyclopedia. When he defines "nature," the philosopher explains that nature and form (essence) are not synonymous except in a simple body (i.e., a pure element). In a compound body, on the other hand, the nature refers not to its form but to its complexion. Hence this nature or complexion cannot be a new substantial form nor can it produce one: it can only prepare this compound body in

¹³ Nicolas Weill-Parot, "Science et magie au Moyen Âge," in *Bilan et perspectives des études médiévales (1993–1998): Actes du II^e Congrès Européen d'Études Médiévales*, ed. Jacqueline Hamesse (Turnhout, 2004), 527–59; idem, "Encadrement ou dévoilement: L'occulte et le secret dans la nature chez Albert le Grand et Roger Bacon," *Micrologus* 14 (2006): 151–70. The latter article points out that the occult must be distinguished from the secret (this distinction does not appear in William Eamon, *Science and the Secrets of Nature: Books of Secrets in Medieval and Early Modern Culture* [Princeton, 1994]); Nicolas Weill-Parot, "The Elusive Hermes and the Occult in Medieval and Renaissance Scientific Thought: A Preliminary Survey," in *Hermetism and Rationalism in an Era of Cultural Change: Questions in Fifteenth- and Sixteenth-Century Metaphysics (with Excursions in the Seventeenth Century)*, ed. Jan R. Veenstra (forthcoming); idem, "Pietro d'Abano et l'occulte dans la nature: Galien, Avicenne, Albert le Grand et la *differentia* 71 du *Conciliator*," in *Médecine, astrologie et magie entre Moyen Âge et Renaissance: Autour de Pietro d'Abano*, ed. Jean-Patrice Boudet, Franck Collard, and Nicolas Weill-Parot (forthcoming). Copenhagen ("Scholastic Philosophy") emphasized the importance of the specific/substantial form in medieval speculations on magic. Recently Graziella Federici Vescovini has focused on "l'occulto," borrowing some of my concepts — "objectivization of the occult," occult as a "positive" property, and the occult as a "structurally unexplainable mystery" and as "void notion" — but ascribing to them a somewhat different meaning within her approach, which gives "occult" a very broad meaning (*Medioevo magico: La magia tra religione e scienza nei secoli XIII e XIV* [Turin, 2008], 169–222).

¹⁴ There are few exceptions, e.g., Roger Bacon, who could be viewed as a philosopher of the secret rather than a philosopher of the occult (see Weill-Parot, "Encadrement ou dévoilement") and, in a different way, Nicole Oresme and Henry of Langenstein, who criticized the model of occult properties (see below).

¹⁵ Avicenna, *De viribus cordis*, 1.10, in Avicenna, *Liber Canonis* (Venice, 1490), sign. n n iiii. This medical opusculum seems to have been translated by Arnald of Villanova.

such a way that it will be able to receive a new substantial form from the outside.¹⁶

Where does this form come from? The Avicennian system asserts that a series of Intelligences, each of them associated with a celestial sphere, successively emanate from the First Intellect, which directly emanates from the First Principle. The tenth and last Intelligence is called the Agent Intellect. It is the *dator formarum* or “giver of forms.”¹⁷

If we rely on the consistency between the *Canon* and the *Physics*, we can make two statements. First, despite Michael McVaugh’s salutary warning, it seems that specific form, from its very origin, can be identified with substantial form.¹⁸ The parallel between the *Canon* and the *Physics* clearly leads to this conclusion (and other works by Avicenna could also be mentioned). Second, although Avicenna borrows the “whole substance” from Galen, the concept undergoes a profound metamorphosis when introduced into the Avicennian system. In the last resort, Avicenna’s specific form is based on the theory of induction of the form by a superior agent, the aforementioned *dator formarum*. But this does not lead to astrology; in any case, Avicenna is a critic of that “science.”¹⁹

¹⁶ Avicenna Latinus, *Liber primus naturalium, Tractatus primus, De causis et principiis naturalium*, ed. Simone Van Riet (Louvain-la-Neuve, 1992), cap. 6, 59–60.

¹⁷ Avicenna Latinus, *Liber de philosophia prima sive scientia divina*, ed. Simone Van Riet (Louvain, 1980), 9, 4, 487; 9, 5, 489–90 and 492–93; and Introduction by Gérard Verbeke, 63*–66*. See also James A. Weisheipl, “Aristotle’s Concept of Nature: Avicenna and Aquinas,” in *Approaches to Nature in the Middle Ages*, ed. Lawrence D. Roberts (Binghamton, NY, 1982), 137–60, at 150; Herbert A. Davidson, *Alfarabi, Avicenna, and Averroes on Intellect: Their Cosmologies, Theories of the Active Intellect, and Theories of the Human Intellect* (New York, 1992).

¹⁸ Michael McVaugh, “The Development of Medieval Pharmaceutical Theory,” in *Aphorismi de gradibus*, vol. 2 of *Arnaldi de Villanova Opera medica omnia*, ed. M. R. McVaugh (Granada, 1975), 18–19 n. 11: “It is tempting to identify the physicians’ *forma specifica* or *forma a tota substantia* with the philosophers’ *forma substantialis*, and to refer to it as such. There is, however, a good reason not to do so: the medical writers concerned do not themselves make the identification, always referring to it in the terms used by the *Canon*. The only man I have so far found to explicitly equate the two is Peter of Abano.” Brian P. Copenhaver disagrees with McVaugh: “The same form called ‘substantial’ because it gives substantial being (*esse*) to a composite can also be called ‘specific’ because it makes the composite a member of its species (*species*). Avicenna had the latter point in mind when he said that specific form is ‘that by which a thing is what it is,’ and most medieval physicians were more interested in the abstract metaphysics of substantial form debated by philosophers” (Copenhaver, “Scholastic Philosophy,” 541 n. 48).

¹⁹ In another field of research, an interesting view of Avicenna’s philosophical approach on mixture and substantial form is provided by Abraham D. Stone, “Avicenna’s Theory of Primary Qualities,” *Arabic Sciences and Philosophy* 18 (2008): 99–119. On Avicenna’s criticism of astrology in medicine: D. Jacquart, “La scolastique médicale,” in *Antiquité et Moyen Âge*, vol. 1 of *Histoire de la pensée médicale en Occident*, ed. Mirko D. Grmek (Paris, 1995), 175–210, at 205; concerning his treatise against astrology, which was not translated

Another widespread source that emphasized the role of astral influences in occult virtues was the Pseudo-Mesue's *Canones*, which was an important text for Latin medical thought, as Danielle Jacquart has demonstrated.²⁰ This text, as Sieglinde Lieberknecht has argued, may be partly based on one or several Arabic sources; its definitive form should be dated between 1260 and 1290. According to the Pseudo-Mesue, "everything is actually endowed with a double power, as the philosophers say, namely, an elementary one and a celestial one."²¹

The most famous Latin scholars who promoted the theory of the natural occult were Albertus Magnus, Thomas Aquinas, Pietro d'Abano, and Arnald of Villanova. All of them borrowed the basis of their theory from Avicenna, although the *Canon* is not always explicitly mentioned.

Thus Albertus Magnus, in his *De mineralibus* (probably completed about 1254²²), investigates the cause of the properties of minerals and reviews several theories attributed to authors such as Alexander of Aphrodisias, Plato, Hermes, and Avicenna. He ascribes the theory involving the imagination of celestial Intelligences to Avicenna, as he could find it in Avicenna's *Metaphysics*;²³ but he does not mention, in this section devoted to Avicenna, the specific form, even though it is a key concept in the *Canon*.²⁴ The Dominican magister proceeds to reject the explanation based on the imagination of celestial Intelligences: in his view, they are merely instrumental movers of celestial spheres that are actually moved by the Prime Mover.²⁵ In the end,

into Latin: Avicenne, *Réfutation de l'astrologie*, ed. and French trans. Y. Michot (Beirut, 2006).

²⁰ Danielle Jacquart, *La médecine médiévale dans le cadre parisien* (Paris, 1998), 221 and 374.

²¹ Pseudo-Mesue, *Canones, versio antiqua* (Venice, 1561), repr. in facsimile in Sieglinde Lieberknecht, *Die Canones des Pseudo-Mesue: Eine mittelalterliche Purgantien-Lehre; Übersetzung und Kommentar* (Stuttgart, 1995), Ia Intentio, cap. 1: "Dotatur enim omne duplici (ut aiunt philosophi) virtute, scilicet elementari et coelesti."

²² James A. Weisheipl, "Appendix I: Albert's Works on Natural Science (libri naturales) in Probable Chronological Order," in idem, *Albertus Magnus and the Sciences: Commemorative Essays 1980* (Toronto, 1980), 565–77, at 568.

²³ On the influence of Avicenna's *Metaphysics* on Albertus Magnus's commentary on *Metaphysics*, see notably Amos Bertolacci, *The Reception of Aristotle's Metaphysics in Avicenna's Kitāb al-Sifā: A Milestone of Western Metaphysical Thought* (Leiden, 2006).

²⁴ Albertus Magnus, *De mineralibus*, 2.1.2 (MS BNF lat. 6787, fol. 14r^b): "Avicenna autem et quidam alii sequentes eundem dixerunt in omnibus naturis quedam aliquando apparere prodigia ex ymaginatione motorum superiorum." I have provided references to this thirteenth-century manuscript rather than to the editions of Jammy and Borgnet, which are not always reliable.

²⁵ Ibid., 2.1.3 (fol. 15r^a): "Non enim ymaginatio aliquo modo potest intelligenciis celestibus convenire, neque enim sunt concepciones tales in eis que motu celi et elementalibus qualitibus non explicentur, eo quod nihil est inordinatum in eis [. . .]. Intellectus enim practici sunt et per se formales [*ed. Borgnet*; *formale MS*] ad opus nature quod celestis

he provides his own explanation of the origin of the power of minerals, which is precisely the theory of specific form. But instead of ascribing it to Avicenna he attributes it to “Constantine and others.”²⁶ As Dorothy Wyckoff rightly pointed out, when Albertus Magnus refers to Constantine the African he actually means the *De physicis ligaturis*, a work by Qustā ibn Lūqā that Constantine translated into Latin.²⁷ This well-known opusculum lists a series of amulets and argues that most of their power derives from the power of human imagination; but another way is suggested: an *actio ex proprietate*, i.e., the operation of occult properties, but which, to be sure, does not display the concept of specific form.²⁸ Several hypotheses can be suggested to account for the absence of Avicenna’s name from the section of *De mineralibus* devoted to specific form. First, it is possible that Albertus Magnus did not yet have access to the *Canon* when he was writing *De mineralibus*, so that his only avenue to the Avicennian concept of specific form was through indirect sources like Arnold of Saxony’s encyclopedia.²⁹ This hypothesis, however, seems unlikely.³⁰ Second, I would suggest another and bolder hypothesis: Albertus Magnus may have believed that ascribing the notion of “specific form” to Avicenna would necessarily require him to accept the theory of the *dator formarum* as well; but this he rejected outright, like most of his Latin contemporaries. The Latin world conceived of hylomorphism, i.e., the constitution of substance through the union of matter and form, in several ways, all of them denying the Avicennian theory of the *dator formarum*.

motus explicat sicut instrumentum. Neque unquam concepcio aliqua est in motore nisi talis.”

²⁶ Ibid., 2.1.4 (fol. 15r^a): “Refutatis igitur omnibus hiis dicimus cum Constantino et aliis quibusdam quod virtus lapidis causatur ab ipsa lapidis specie et forma substantiali.”

²⁷ Albertus Magnus, *Book of Minerals*, trans. Dorothy Wyckoff (Oxford, 1967), 65, 267, and 277.

²⁸ Two recent editions of this text are available: John Wilcox and James Riddle, “Qustā ibn Lūqā’s *Physical Ligatures* and the Recognition of the Placebo Effect,” in *Medieval Encounters* (Leiden, 1994), 1–25; and Roberto Casazza, “El *De physicis ligaturis* de Costa ben Luca: Un tratado poco conocido sobre el uso de encantamientos y amuletos con fines terapéuticos,” *Patristica et Mediaevalia* 27 (2006): 87–113.

²⁹ Arnoldus Saxo, *De floribus rerum naturalium*, IV, Prologus, ed. E. Stange, *Die Encyclopädie des Arnoldus Saxo, zum ersten Mal nach einem Erfurter Codex*, II, III, IV, ed. E. Stange (Erfurt, 1906), IV, 78 (Arnold’s words are almost the same as those of Avicenna in the *Canon*). On Arnold of Saxony as a source for Albert the Great, see Albertus Magnus, *Book of Minerals*, trans. Wyckoff, 268.

³⁰ According to the notes in Dorothy Wyckoff’s translation of the *De mineralibus*, Albert the Great clearly refers twice to sections of Avicenna’s *Canon*. In *De mineralibus* 2.2, when Albert writes that “Avicenna says it is called Jewstone because it is frequently found in Judaea,” he refers to Avicenna’s *Canon*, 2.2.404 (Albertus Magnus, *Book of Minerals*, trans. Wyckoff, 100 n. 13). In Book 4, concerning sulfur, Albert refers to *Canon*, 2.2.612 (ibid., 204 n. 4).

In his *Epistola de operationibus occultae naturae*, Aquinas explains that an occult operation comes from a power that itself derives from a superior agent (since it cannot be reduced to elementary qualities).³¹ More specifically, there are two kinds of superior agents: superior Intelligences and celestial bodies. There are also two kinds of occult operations: those in which the agent acts without impressing any form on the matter and those in which there is an impression of a form. The operations without the impression of a form can originate either in celestial bodies (e.g., the effect of the moon on tides) or in superior Intelligences (e.g., the action of demons on “nigromantic images”).

Nevertheless, the operations in which there is an impression of a form are most properly called “occult.” Unlike Avicenna, Thomas holds that this impression is produced not by a celestial Intelligence but by a celestial body (a similar position is found in Averroës’s last works³²). Thomas gives the reasons for this position. While he does not directly confront Avicenna, he does attack the *Platonici* who thought that the substantial forms were separate substances, which they called “species” or “ideas.” This doctrine is rejected for two reasons: first, because a natural thing is made of matter and form (Aristotelian hylomorphism); second, because the immutability of forms cannot account for the changes that inferior bodies undergo.

Thus celestial bodies are the principle of impressed forms. Thanks to their motion, celestial bodies produce generation and corruption in inferior bodies. In other words, they fulfill three necessary and sufficient conditions for being the principles of the forms of natural bodies: (1) they are superior agents; (2) since their corporeal nature, though ethereal, allows a kind of contact with inferior bodies, the operation can be called “natural”; (3) the variability introduced by the motions of celestial bodies and the relationships between their respective motions explains the mutations of the inferior world.

In short, Aquinas rejects the Platonic doctrine and prefers a Peripatetic scheme. This approach leads him to ascribe a celestial — and even astral — origin to occult powers, on metaphysical grounds. In other words, Aquinas’s model includes four hierarchical levels: (1) at the top, separate intellectual substances: they are the primary principles and contain all the forms (“formas apud se intellectas”); (2) celestial bodies that transmit, through their

³¹ *De oculis operationibus naturae ad quemdam militem ultramontanum*, in *Thomae Aquinatis Opera omnia*, editio Leonina, vol. 43 (Rome, 1976), 159–86.

³² Gad Freudenthal, “The Astrologization of the Aristotle Cosmos: Celestial Influences on the Sublunar World in Aristotle, Alexander of Aphrodisias, and Averroës,” in *A Companion to Aristotle’s Cosmology: Collected Papers on the De caelo*, ed. Alan C. Bowen and Christian Wildberg, forthcoming. (I am grateful to the author for sending me this article before publication.)

motions and powers, the aforesaid forms to matter; (3) corporeal matter that receives these impressed forms; and (4) the operations (*actiones*) and powers (*virtutes*) of natural bodies, which are produced by the specific forms of these bodies.

In short, specific forms can be traced back to the highest principle: separate substances (namely celestial Intelligences). According to Aquinas, celestial Intelligences have impressed the forms they contained upon matter, although through an *indirect* process. Moreover, this is the meaning of Aquinas's statement that "the whole work of Nature seems to be the achievement of a wise agent" (which reminds us of Albertus Magnus's sentence: "*opus naturae est opus intelligentiae*").³³ But Aquinas, unlike Avicenna, absolutely denies a *direct* impression of forms by a celestial Intelligence.

In Aquinas's view, "specific form" is synonymous with "substantial form." Nature as a whole is endowed with substantial forms by the celestial bodies; occult properties are only an example within this universal process. Nothing in his model leads to astrology, because astrology rests on the assumption that particular (or individual) forms are produced at particular moments. Aquinas actually places occult properties (such as the attractive virtue of the lodestone) in the category of operations deriving from species and hence occurring *semper velut frequenter*, and not within the category of phenomena that are *praeter naturam*.

We enter the realm of astrology properly speaking only when a medieval scholar tries to conceive an occult power that derives not from a species but from a particular individual of a species, according to the astrological model of nativities (birth horoscopes). This individual form occurs in speculations about monsters, but also, and more often, in theories about "astrological images," i.e., talismans (magical artificial objects) allegedly endowed with a magical power derived exclusively from stars and constellations — and not from demons. This is precisely what Thomas denies in the *Epistola*: in his view, all talismans are nigromantic or demonic.³⁴

³³ Thomas Aquinas, *De occultis operationibus naturae*: "ita quod totum opus naturae videtur esse opus cuiusdam sapientis." The English translation of the few sentences quoted here is taken from Joseph Bernard McAllister, *The Letter of Saint Thomas Aquinas De occultis operibus naturae ad quendam militem ultramontanum* (Washington, 1939), §13. On this idea see notably James A. Weisheipl, "The Axiom 'Opus naturae est opus intelligentiae' and Its Origins," in *Albertus Magnus, Doctor universalis 1280–1980*, ed. Gerbert Meyer and Albert Zimmermann (Mainz, 1980), 441–63.

³⁴ In the *Summa contra Gentiles*, book 3, at the end of chapter 105, Aquinas seems to accept the hypothesis of an "astrological image," provided that artificial bodies can be considered as "quasi forme specificae." I argued that this passage does not actually mean that Thomas accepts the theory of "astrological images"; see Weill-Parot, *Les "images astrologiques"* (n. 5 above), 248–59. I demonstrated (*ibid.*, 25–219) that the expression and concept of "astrological images" was coined in the anonymous *Speculum astronomiae*, a work that

There are, however, a few scholastic sources that treat the specific — and not individual — occult property in a way that seems to take astrology into account.

Some anonymous thirteenth-century *Quaestiones* on Aristotle's *Physica* are extant in a manuscript at Gonville and Caius College.³⁵ Silvia Donati suggests that they are of English origin.³⁶ In the seventh book, one of the *Quaestiones* asks whether the lodestone moves iron according to natural motion. The approach taken here to this question — which recurs in commentaries on the *Physica* — is quite original. A doctrine of light, which involves particular planets, serves as a conceptual tool. The basis of the explanation, like all of those given in the commentaries on the *Physica*, comes from Averroës: iron is moved towards a lodestone through an inner power that seeks to achieve its perfection through contact with the lodestone.³⁷ In the Gonville and Caius College *Quaestiones*, however, the explanation involves light (*lux*).³⁸ When a lodestone is generated, light is incorporated into it; the same occurs in the generation of iron. But the process is noble (i.e., strong) in lodestone and weaker in iron. The attractive power thus comes from a celestial body, through its light. This power is potential (*in potentia*) in iron and becomes actual only when it is excited by the power of lodestone and consequently becomes the mover of its subject (iron). As far as the lodestone is concerned, the inner power introduced during its generation finds something similar to itself in the power of iron and strongly

has been (probably wrongly) ascribed to Albertus Magnus. On the question of the authorship of this work, see Paolo Lucentini, "L'ermetismo magico nel secolo XIII," in *Sic itur ad astra: Studien zur Geschichte der Mathematik und Naturwissenschaften; Festschrift für den Arabisten Paul Kunitzsch zum 70. Geburtstag*, ed. Menso Folkerts and Richard Lorch (Wiesbaden, 2000), 409–50; Bruno Roy, "Richard de Fournival, auteur du *Speculum astronomiae*," *Archives d'histoire doctrinale et littéraire du Moyen Âge* 67 (2000): 159–80; Agostino Paravicini Bagliani, *Le Speculum astronomiae, une énigme? Enquête sur les manuscrits* (Florence, 2001).

³⁵ MS Cambridge, Gonville and Caius College, 509/386, fols. 155v^a–206v^b.

³⁶ Silvia Donati, "Per lo studio dei commenti alla *Fisica* del XIII secolo: Commenti di probabile origine inglese degli anni 1250–70 ca.," *Documenti e studi sulla tradizione filosofica medievale* 2 (1991): 361–441, esp. 425–26.

³⁷ Averroës, *In physico auditu libri octo commentaria magna*, in *Aristoteles, Opera cum Averrois Commentariis* (Venice, 1562–64; repr. Frankfurt, 1962), vol. 4, Liber 7, summa 3, text. 10, fols. 314r^a–315r^a. (See also Averroës, *Commentarium magnum in Aristotelis Physicorum: librum septimum* [Vindobonensis, lat. 2334], ed. Horst Schmiejka, *Averrois Opera*, Series B: Averroes latinus [Paderborn, 2007], [chap. 10], 27). See Nicolas Weill-Parot, "Magnetic Attraction as a Challenge to the Inanimate Realm: The Example of Walter Burley," in *Animate/Inanimate: From Theories of Matter to Medical Practices*, ed. D. Jacquart and N. Weill-Parot, forthcoming (and see my work mentioned above, n. 6).

³⁸ On the part that light (*lux* or *lumen*) plays in medieval physical theories, we can refer, for instance, to Robert Grosseteste; see Allistair C. Crombie, *Robert Grosseteste and the Origins of Experimental Science, 1100–1700* (Oxford, 1953).

illuminates the latter; consequently the latter tends to go back to the nature of the light that was responsible for its introduction into the iron and inheres in the lodestone in a noble way.³⁹

Next comes a question about the nature of this power of which both iron and lodestone partake. It could be a *virtus regitiva universi locius*, a power ruling the whole universe.⁴⁰ But since this latter power can be found in all simple and compound bodies, it would not account for why lodestone attracts iron but not wood. Therefore, besides the *virtus regitiva universi locius*, a particular power is proper to lodestone and iron. The text then moves towards an analysis that, although not astrological strictly speaking, involves a relationship between metals and stars — a well-known relationship among alchemists.

It seems that this power is the light of Mars, of which iron and lodestone partake to a high degree. Now Mars is the master of war and shares its power with lodestone and iron; for, in these inferior bodies, it is the cause of things of which weapons of war are made.⁴¹

The relationship between iron and Mars is not original in itself; but its use to explain magnetic attraction in a scholastic commentary on the *Physica* is quite unusual.⁴² In fact, a similar idea can be found in earlier anonymous *Quaestiones* on the *Physica* that are extant in the manuscript L III 21 at the Biblioteca Comunale degli Intronati in Siena.⁴³ According to Silvia Donati it should be dated between 1250 and the early 1270s, and its author is prob-

³⁹ MS Cambridge, Gonville and Caius College, 509/386, fol. 200v^a: “Videtur quod in generatione adamantis incorporatur ei lux et in generatione ferri similiter, sed differenter, quia in adamante nobili modo et in ferro sub debili modo et in potentia; et ligata est materie, quia non potest in operationi, nisi per excitationem virtutis inmisce adamantis; et hoc per virtutem corporis celestis, et quando sic illuminatur et excitatur fit motor sui subiecti in quo est. Illa autem virtus inmissa ad adamantem invenit simile sibi in ferro, vehementi modo illuminat virtutem similiter repertam, et sua virtute regreditur per naturam lucis ad illud in quo incorporatur sub esse nobiliori; et, sic regrediendo, trahit secum ad adamantem. Unde est dupliciter loqui de ferro, scilicet, secundum quod ferrum est de se solum et sic habet motum deorsum, loquendo tamen de ferro et de virtute ei inmissa et ei unita secundum quod illa duo cedunt in unum mobile, sic est motus naturalis. Sic patet quis est motor proximus et simul est cum moto in toto motu.”

⁴⁰ This universal power is one of the key concepts I am currently studying (see above, n. 6).

⁴¹ MS Cambridge, Gonville and Caius, 509/386, fol. 200v^b: “Videtur quod illa virtus est lux marcialis, que maxime participatur a ferro et adamante. Mars autem dominus belli est et participat suam virtutem cum adamante et ferro, quia in hec inferiora est causa aliquorum ex quibus fiunt arma belli.”

⁴² At least this seems to be the case according to the many commentaries on the *Physics* I have read.

⁴³ MS Siena, Biblioteca degli Intronati, L III 21, fols. 1r^a–92r^a.

ably an English magister.⁴⁴ In order to explain the lodestone's attractive power on iron, the anonymous author says that "some maintain" that, in addition to the "celestial power" spreading over the whole inferior world (*per totum*), there is "the power of this star that is called Mars."⁴⁵

The analysis of these positions leads us to a first conclusion. Generally speaking, occult properties imply an indeterminate astral influence and do not necessarily lead to astrology proper. In this respect, "astrological images," cause they imply astrology, become a turning point towards an astrological conception of the occult.⁴⁶ Albertus Magnus, Arnald of Villanova, and Pietro d'Abano are the main witnesses of this issue.

ASTROLOGY AND PARTICULAR OCCULT PROPERTIES

In his book devoted to stones, the *De mineralibus*, Albertus Magnus (like all other Latin scholars) draws a distinction between the powers of certain bodies deriving from the mixture of their elements and those whose cause is the species itself (*ipsam speciem*). To support this theory, he compares the power of gems and the operations that are proper to men, animals, and plants, which are more specific beings. For example, man's specific operation is thinking (*intelligere*), which is not caused by his complexion.⁴⁷ Albert's demonstration makes use of hylomorphism.⁴⁸

Then Albert explains how a form can produce many effects; the lapidary in the *De mineralibus* ascribes many effects to each stone. As an example, *beryllus* (beryl) has many powers; for instance, "it is effective against peril from enemies and against disputes, and to give victory. It is also said to cause mildness of manner and to confer cleverness." Moreover, "some medical men also say that it is good against sloth, and pains of the liver, and against shortness of breath and belching, and that it is good for watery

⁴⁴ Donati, "Per lo studio," 396–409.

⁴⁵ MS Siena, Biblioteca degli Intronati, L III 21, fol. 180r^b: "est tunc principaliter a virtute celesti que diffunditur per totum, et forte cum virtute eius stelle que Mars dicitur sicut dicunt [dicuntur MS] quidam; et sub esse compleciori recipitur in adamante quam in ferro."

⁴⁶ Weill-Parot, *Les "images astrologiques"* (n. 5 above).

⁴⁷ Albertus Magnus, *De mineralibus*, 2.1.4 (MS BNF lat. 6787, fol. 15r^a): "Et hoc clarius videtur in hiis que melius aliis specificata et formata sunt, sicut est homo, qui operatione qua homo est, habet intelligere que ex nullo causatur complexionante."

⁴⁸ Concerning hylomorphism in Albertus Magnus and his concept of "inchoatio formarum," see Bruno Nardi, "La dottrina d'Alberto Magno sull' 'inchoatio formae,'" in idem, *Studi di filosofia medievale* (Rome, 1960), 69–101; Anna Rodolfi, *Il concetto di materia nell'opera di Alberto Magno* (Florence, 2004). Form, as he points out, is intermediate between the celestial powers from which it comes and the material complexion to which it is given. In a way, he is summarizing the Aristotelian definition of form, which, unlike the Platonic idea, is not completely separate from matter.

eyes.”⁴⁹ He distinguishes two perspectives on form, the ontological and the cosmological. As viewed in itself, form is a simple essence and hence can produce only a single effect, since every single thing can derive from only a single thing.⁵⁰ If form is viewed, first, as produced by celestial powers, which are multiplied “by all the constellations and their circles, which the twelve Signs [of the Zodiac]” describe “successively above the horizon of anything that the form is entering,” and second, as implying the work of elementary powers in its operation, form can be thought of as manifold “according to the natural potencies surrounding its simple essence.” Thus, although a given form can perform only a single distinctive operation (its own proper operation), it is able to produce many effects.⁵¹ Elementary matter, on the one hand, and astrological configuration, on the other hand, account for this multiplicity of effects.

Albert also explains that a power can be more or less potent, not because of its form, since this is one unit, but because the effect of a specific form is greater or lesser according to the characteristics of matter — since the material in a thing can be more or less ordered. Just like living things, stones that “are kept for a long time away from the place where they were produced” lose their specific power. Interestingly enough, here Albertus Magnus refers to his teratology.⁵²

⁴⁹ Albertus Magnus, *De mineralibus*, 2.2 (lapidary). The translation comes from idem, *Book of Minerals*, trans. Wyckoff (n. 27 above), 76.

⁵⁰ Albertus Magnus, *De mineralibus*, 2.1.4 (MS BNF lat. 6787, fol. 15r^b): “Si ergo in se consideretur, ipsa est essentia simplex, unius tantum operativa, quodcumque est illud, quod unius est tantum efficere unum, et ab unico est unicum, sicut tradit tota universitas philosophorum.”

⁵¹ Ibid.: “Si autem hec forma consideretur ut effluens a virtutibus celestibus [ut est virtutibus coelestibus *ed. Borgnet*] primo multiplicatis per superiores et inferiores, et omnes ymagines et circulos quos duodecim signa cum stellis suis describunt [distribuunt *ed. Borgnet*] super orizontem rei illius cui influitur forma; et secundo, secundum quod ad eam operate [operantem *ed. Borgnet*] sunt virtutes elementales, erit ipsa forma multiplex valde secundum potencias naturales suas que [*ed. Borgnet*; quas *MS*] circumstant essenciam suam [*ed. Borgnet*; sua *MS*] simplicem, et sic multorum effectuum erit effectiva, licet forte unicam habeat primam [propriam *ed. Borgnet*] operationem.” The translated sentences in quotation marks come from Albertus Magnus, *Book of Minerals*, trans. Wyckoff, 65–66.

⁵² Albertus Magnus, *De mineralibus* 2.1.4 (MS BNF lat. 6787, fol. 15v^a): “Et ad memoriam hic [hoc *ed. Borgnet*] revocandum quod in libro methaeorum diximus, lapidum species et [ad *ed. Borgnet*] individua quodammodo esse mortalia, sicut et homines, et extra loca generationis sue diu contenti corrumpuntur, et non nisi equivoce retinent nomen speciei, licet in figura et colore eorum hoc non nisi per longissimum tempus possit deprehendi. Et sicut in animalium factura et in complexione aliquando tanta <est> discrasia [tanta est disgracia *ed. Borgnet*] quod animam hominis non attingit, sed solum qualemcumque hominis figuram. Ita etiam est in lapidum generatione, aut propter inordinationem materie, aut propter vehementissimas virtutes celestium in contrarium moventes, sicut diximus in secundo nostrorum phisicorum.”

This fundamental chapter of the *De mineralibus* highlights the idea that, for Albert, the *species* or *forma substantialis* explains the powers of stones. The concept of the property of a *species* (what is distinctive about it) is explained using Aristotelian terminology: the marvelous power of a stone is similar to the intellectual faculty of man. It is the specific activity that derives from the specific form of a being. Whereas Albert cautiously avoids attributing to a form the distinctive features that would not accord with its essential uniqueness, he is able to account for the multiplicity of effects produced by a single form and their greater or lesser intensity.

It is when he tackles the issue of astrological seals that he gives astrology an important role in his theory of the occult. He actually writes that this subject belongs to both *nigromancia* and *astronomia* (the science of stars).⁵³ He compares the production of natural seals — i.e., “corporeiform” figures, figures bearing shapes of natural bodies, and which are found naturally imprinted or drawn in certain stones — with that of monsters. When a conjunction of luminaries occurs in “certain places” in the heavens, the human shape is impeded and “the material grows together into a horrible monster.”⁵⁴ The corporeiform figures that are found in some stones (especially gems) can be explained in the same way.⁵⁵ Comparing astrological seals produced by nature with the generation of monsters — a phenomenon that is obviously an exception — Albertus Magnus explains the seals by referring to the exceptional and precisely located action of an astrological configuration. The recourse to astrology is therefore justified in this case. He implicitly admits that these astrological seals produced by nature can be endowed with powers. An explanation for the production in nature of astrological seals endowed with powers is a preamble and prerequisite for his demonstration that artificial astrological seals can be endowed with magical powers: in

⁵³ Ibid., 2.3.1 (MS BNF lat. 6787, fol. 25v^a): “De ymaginibus autem lapidum et sigillis post hec est dicendum, licet enim pars illa sciencie <sit> pars nigromancie secundum illam speciem nigromancie que astronomie subalternatur, que et de ymaginibus et sigillis vocatur, tamen propter bonitatem doctrine *etc.* [. . .] [licet enim pars ista sit pars necromantie secundum illam speciem necromantie quae astronomiae subalternatur et quae de imaginibus et sigillis vocatur . . . *ed. Borgnet*]”; *ibid.*: “Antiquorum enim sapientum scripturam de sigillis lapidum pauci sciunt nec sciri potest nisi simul et astronomia et magica et nigromantice sciencie sciuntur [*sciuntur ed. Borgnet*].”

⁵⁴ Ibid., 2.3.2 (fol. 26v^a): “Non enim ignoramus quod sunt quedam loca in celo in quibus cum luminaria convenerunt [*convenerint ed. Borgnet*] impediunt etiam in propria et efficaci materia figuram humanam generari, et materia tunc concrecit in horribile monstrum.” The translation comes from: Albertus Magnus, *Book of Minerals*, trans. Wyckoff, 131.

⁵⁵ I call them “corporeiform figures” in order to distinguish them from those that are symbols. See Weill-Parot, *Les “images astrologiques,”* 103–9. A comprehensive typology of non-corporeiform magical figures is suggested by Benoît Grévin and Julien Véronèse, “Les ‘caractères’ magiques au Moyen Âge,” *Bibliothèque de l’École des Chartes*, 162 (2004): 305–79.

other words, he is speaking of purely astrological talismans produced by human beings — a much more difficult demonstration, because it implies overcoming the difference between nature and art.⁵⁶

If, at certain astrological moments, nature can produce natural seals endowed with powers, it can also be admitted that if a craftsman chooses the right astrological moment (this kind of technique is usually referred to as an astrological election) he can make figures that will be endowed with astral powers. By determining the appropriate astrological moment and making the astrological seal precisely, the craftsman intentionally inserts his action within the *cursus naturae*, as if he were a mediator of natural causality. Nature is the real agent.⁵⁷

In the chapters where he addresses this issue, however, Albert does not give the exact status of the particular power with regard to properties deriving from a specific form, which is common to all individuals of a species. The initial comparison with monsters might lead one to view the powers given to astrological seals as exceptional forms, or, in other words, monstrous forms, i.e., forms that are at the extremity of a species. Human action, thanks to free will, escapes the course of nature; consequently, its insertion within this natural course must be an accident, like the accidental and monstrous seals that are sometimes produced in gems by nature.⁵⁸

The possibility of purely astrological talismans — “astrological images” — is based on the idea that there are two kinds of astral influence on the inferior world: permanent or general and definite or momentary.⁵⁹ The first one can be called astral; the second one, astrological. Physicians of the late thirteenth and the early fourteenth centuries, including Arnald of Villanova and Pietro d’Abano, went further in their analysis of accidental occult properties, in addition to occult properties that come from specific form.⁶⁰

⁵⁶ Albertus Magnus, *De mineralibus*, 2.3.3 (MS BNF lat. 6787, fol. 15r^a).

⁵⁷ Weill-Parot, *Les “images astrologiques”*; idem, “Causalité astrale et science des images au Moyen Âge: Éléments de réflexion,” *Revue d’histoire des sciences* 52 (1999): 207–40.

⁵⁸ Albertus Magnus holds that astral figures influence species themselves: *De mineralibus*, 2.3.3 (MS BNF lat. 6787, fol. 27v^b): “Non intendimus hic de figuris mathematice sumptis, sed de figuris prout indicant [inducunt *ed. Borgnet*] diversitatem generancium et generatorum in ordine et speciebus et natura forme et materie sue.” But these are in fact particular occurrences, namely accidents.

⁵⁹ I am grateful to Danielle Jacquart, who drew my attention to the distinction between general and more particular astral influences several years ago.

⁶⁰ Weill-Parot, *Les “images astrologiques,”* 461–70 and 514–16; idem, “La magie et l’astrologie à l’intérieur et à l’extérieur de l’université: Recherches de ponts conceptuels,” in *Actes du congrès d’histoire des sciences et des techniques organisé à Poitiers [2004] par la SFHST*, ed. Anne Bonnefoy and Bernard Joly, Cahiers d’histoire et de philosophie des sciences (Paris, 2006), 282–83 (brief summary of a presentation).

In the *De parte operativa*, Arnald of Villanova, distinguishing between things that operate through primary qualities and those that act through a property, asserts that the latter come from a celestial impression. But there are two different kinds of properties: first, a specific power, i.e., the power that follows species and that is consequently found in all individuals of that species; second, a property that occurs by accident and can only be found in one particular individual of that species but not in the others. It follows that it is when these particular properties are produced that astrology plays a part. In order to explain how a particular property is acquired, Arnald refers to the theory of the degrees of qualities, an issue he addressed in the *Aphorismi de gradibus*, a work on the degrees of quality of drugs. There he showed that it is possible to determine the degree of the primary qualities of a certain compound medicine or complexion. Thus a body can be hot in the first, second, third, or fourth degree.⁶¹

Such a theory is part of the very important reflection on the latitude of forms during the late thirteenth and early fourteenth centuries at universities such as Paris and Oxford: breaking with a strictly Aristotelian system, many theologians and philosophers asserted that a secondary form (i.e., quality) could change in intensity when a real part of this quality was added to another one.⁶² But occult properties cannot be reduced to those qualities that Arnald evaluated in terms of degrees in his *De gradibus*, because they derive from a specific form that transcends complexion.⁶³ In the *De parte operativa*, Arnald nevertheless refers to this doctrine; he uses the theory of the degrees of qualities but adds the external contribution of celestial bodies.⁶⁴

Although a property occurs by nature in the thing generated through celestial impression, what prepares the thing generated for the reception of the property is sometimes the whole latitude (*tota latitudo*) of the mixture (*mix-*

⁶¹ McVaugh, "The Development of Medieval Pharmaceutical Theory" (n. 18 above).

⁶² The question of the latitude of forms can be found in Arabic and Jewish sources. With regard to the debate in the Latin world in the late thirteenth and early fourteenth centuries, see notably Pierre Duhem, *Le système du monde* (Paris, 1906–13), 7:480–533; Anneliese Maier, "Das Problem der intensiven Grösse," in eadem, *Studien zur Naturphilosophie der Spätscholastik*, 2: *Zwei Grundprobleme der scholastischen Naturphilosophie*, Storia e Letteratura: Raccolta di studi e testi 37 (Rome, 1968), 3–109; Edith Dudley Sylla, "Medieval Concepts of the Latitude of Forms: The Oxford Calculators," *Archives d'histoire doctrinale et littéraire du Moyen Âge* 40 (1973): 223–83; Jean-Luc Solère, "Plus ou moins: le vocabulaire de la latitude des formes," in *L'élaboration du vocabulaire philosophique au Moyen Âge*, ed. Jacqueline Hamesse and Carlos G. Steel (Turnhout, 2000), 437–88; Joël Biard, "L'être et la mesure dans l'intension et la rémission des formes (Jean Buridan, Blaise de Parme)," *Medioevo* 27 (2002): 415–48.

⁶³ McVaugh, "The Development of Medieval Pharmaceutical Theory," 18–19 and n. 11.

⁶⁴ Nicolas Weill-Parot, "L'impossible mesure de l'occulte et les tentatives de quantification (fin du XIII^e–XIV^e siècle)," *Micrologus* (= *La mesure*), forthcoming.

tionis) or of the complexion, which is suited to the species. Thus the property is a specific power, that is to say a power resulting from the species; this is why it is suited to all the individuals of the species.

But sometimes what prepares the thing generated for the reception of a property is a particular degree of the mixture, which is included within the latitude (*latitudo*) of the species. But <this property> occurs to it by accident at the hour when it is generated through a random convergence of causes: for instance, a powerful aspect of celestial bodies at the hour when it is generated or when the seminal principle falls into the natural field or when it is born or when the perfection of the being of a thing is achieved, as in artificial figures.⁶⁵

In this section Arnald differentiates the *tota latitudo* of the complexion of a species ("latitude of a species," as he writes) from a particular degree included within the latitude of a species. *Tota latitudo* means the whole range of degrees of a quality between a minimum intensity and a maximum intensity. Every complexion of a given species has a distinctive *tota latitudo*. Each individual of that species has a complexion that is necessarily included within this range: although these complexions differ from each other, all of them are included between the maximum and the minimum that set the limits of the latitude of the species.

Next Arnald distinguishes between two kinds of astral influences. The first acts on all the degrees of complexion included within the *tota latitudo* of a given species. The second operates in a more limited way and on a more precise target: on a particular degree that is included within this *latitudo*. In other words, every individual of a given species receives the property given through the first astral influence: this is a specific property. But within that species only individuals whose quality has a precise and suitable degree will receive the particular property deriving from the second astral influence, which occurs by accident.

The astrological-nativity model is necessary in order to account for the accidental occurrence of this particular property in a certain individual of a given species. This is how Arnald addresses the issue of astral magic, in particular "astrological images." "At every hour," he writes, "the parts of the

⁶⁵ Arnaldus de Villanova, *De parte operativa*, in idem, *Opera omnia* (Lyons, 1532), fol. 127r^a: "Proprietas enim licet naturaliter adveniat generato ab impressione celesti, tamen illud quod disponit generatum ad susceptionem ipsius quandoque est tota latitudo mixtionis vel complexionis que convenit speciei. Et sic proprietas est virtus specifica id est consequens speciem. Ideo convenit omnibus individuis speciei. Quandoque vero illud quod disponit generatum ad susceptionem proprietatis est aliquis particularis gradus mixtionis qui sub speciei latitudine continetur, sed accidentaliter ei subvenit in hora generationis ex fortitudine causarum concurrentium, utpote forti aspectu celestium corporum, sive hora generationis, sive hora casus principii seminalis in agro nature, seu hora nativitatis, seu hora qua res sui esse perfectionem accipit ut in figuris artificialibus."

orb introduce such or such a power into the things generated according to what is required by the figure of the orb determined by the horoscope or the ascendant at the hour related to the thing which is able to be generated or which is generated, whatever it is.”⁶⁶ But the power is received only by bodies that have been prepared to do so by nature or by art; the case of “astrological images” belongs to this second category (things produced and prepared by human effort).⁶⁷

Thus either by nature or by art, the astrological-nativity model can explain why some individuals of a given species are endowed with a property that cannot be found in every individual of that species.⁶⁸ When imprinting in metal the zodiacal sign that is ruling at that moment in order to make an artificial astrological seal, the craftsman makes the matter receptive to the special influx of the zodiacal sign. Arnald of Villanova rejects all “addressative”⁶⁹ magic in medicine, but he makes room for purely

⁶⁶ Ibid.: “In omni enim hora influunt partes orbis aliam et aliam virtutem generabilibus secundum quod requirit figura orbis determinata per oroscopum vel ascendens in hora relata ad generabile vel generatum quecumque sit.”

⁶⁷ On Arnald of Villanova’s view concerning “astrological images,” see Weill-Parot, *Les “images astrologiques,”* 456–500; idem, “Astrologie, médecine et art talismanique à Montpellier: Les sceaux astrologiques pseudo-arnaldiens,” in *L’Université de Médecine de Montpellier et son rayonnement (xiii^e–xv^e siècles)*, ed. Daniel Le Blévec and Thomas Granier (Turnhout, 2004), 157–74; Graziella Federici Vescovini, “I cosiddetti sigilli arnaldiani,” *Traditio* 60 (2005): 201–42. (Despite my great respect for Prof. Federici Vescovini’s scholarship, I should note that in this article she unfortunately confuses what I wrote in *Les “images astrologiques”* about *De sigillis* and what I said about another opusculum, the hermetic *De duodecim imaginibus Hermetis* or *Liber formarum*. As a result she criticizes an argument she believes I advanced in this book but which in fact I never defended.) On Arnald’s attitude to magic and occult properties, see also Sebastià Giralt, “Estudi introductori,” in Arnaldi de Villanova, *Opera medica omnia*, 7: *Epistola de reprobatione necromantice fictionis (De improbatione maleficiorum)*, ed. Sebastià Giralt (Barcelona, 2005), 11–198 (esp. 143–98); idem, “Proprietats: Las propiedades ocultas según Arnau de Vilanova,” *Traditio* 63 (2008): 327–60.

⁶⁸ Arnaldus de Villanova, *De parte operativa*, fol. 127^r: “Sed tamen virtutem quam superiora influunt non suscipiunt nisi corpora disposita vel solum per agentia naturalia vel adminiculo artis, ut ex parte quedam individua cuiuslibet speciei acquirunt aliquam proprietatem que ceteris eiusdem speciei non convenit.”

⁶⁹ I call “addressative” magic (in French “magic destinative”) the magic that implies acts (prayers, invocations, rituals, or other signs) by means of which the magician addresses a sign to a separate intelligence (a demon, an angel, or some other spirit); see Weill-Parot, *Les “images astrologiques,”* esp. 36–37, 905; idem, “Astral Magic and Intellectual Changes (Twelfth–Fifteenth Centuries): ‘Astrological Images’ and the Concept of ‘Addressative’ Magic,” in *The Metamorphosis of Magic from Late Antiquity to Early Modern Period*, ed. J. Bremmer et J. R. Veenstra (Leuven, 2002), 167–87; idem, “L’irréductible ‘destinativité’ des images: Les voies de l’explication naturaliste des talismans dans la seconde moitié du xv^e siècle,” in *L’art de la Renaissance entre science et magie*, ed. Ph. Morel (Paris, 2006), 469–81.

astrological seals (which are kinds of “astrological images”). In his genuine works, he notably mentions a seal of Pisces for foot ache and a seal of Leo for pain caused by kidney stones — a witness tells that he made use of this seal in order to cure Pope Boniface VIII in 1301.⁷⁰

Pietro d’Abano’s view on this issue, as presented in his *Conciliator*, is quite similar to Arnald’s, though his approach is different.⁷¹ Moreover, *differentia* 71 of the *Conciliator* is greatly influenced by Albert’s *De mineralibus*.⁷² In *differentia* 10 of the *Conciliator*, Pietro distinguishes three kinds of astral influences; in *differentia* 71, he mentions only two of them. There is, he says, a universal influence that is ascribed to light and above all to motion. For example, depending on whether a planet is direct or retrograde, its effect on the sublunary world is respectively hot or cold. In *differentia* 10 Pietro inserts a middle influence: although stars are made of quintessence and not the four elements, they can be considered to have primary qualities — but only with respect to the effects they produce in the inferior world.⁷³ But this middle influence is actually the same as the universal influence: and it is probably why in *differentia* 71 Pietro no longer evokes the middle influence and acknowledges only the universal and particular influences.⁷⁴

The particular influence is “a certain astral influx.” But the adjective “particular” seems ambiguous here. Pietro d’Abano does not say exactly the same thing about this influence in *differentia* 10 and in *differentia* 71. In *differentia* 10, he writes: “This particular way is a certain astral influx introduced on each individual in an almost different way according to its own nativity [i.e., birth horoscope] or revolution.”⁷⁵ Thus this particular influx brings individual features or properties. But in *differentia* 71, concerning the same particular influx he writes:

⁷⁰ Weill-Parot, *Les “images astrologiques,”* 456–500. Arnald also mentions the seal of the constellation of Serpentarius against poison (ibid.).

⁷¹ Concerning Pietro d’Abano’s approach to occult properties, see Graziella Federici Vescovini, “La concezione della *virtus occulta* nella dottrina medica di Arnaldo di Villanova e di Pietro d’Abano,” in *Écriture et réécriture des textes philosophiques médiévaux: Volume d’hommage offert à Colette Sirat*, ed. Jacqueline Hamesse and Olga Weijers (Turnhout, 2006), 107–35; Weill-Parot, “Pietro d’Abano et l’occulte” (n. 13 above).

⁷² Weill-Parot, “Pietro d’Abano et l’occulte.”

⁷³ Petrus de Abano, *Conciliator controversiarum quae inter philosophos et medicos versantur* (Venice, 1565; repr. in facsimile, Padua, 1985), *differentia* 10, propter 3, fol. 16v^{a-b}; Danielle Jacquart, “L’influence des astres sur le corps humain chez Pietro d’Abano,” in *Le corps et ses énigmes au Moyen Âge*, ed. Bernard Ribémont (Caen, 1993), 73–86.

⁷⁴ Petrus de Abano, *Conciliator*, *differentia* 71, propter 3, fol. 108v^b (see also *differentia* 101, propter primum, fol. 150v^a).

⁷⁵ Ibid., *differentia* 10, propter tertium, fol. 16v^b: “Modus vero particularis est quidam influxus stellaris unicuique individuo fere differenter ab alio propria nativitate aut revolutione eiusdem inditus.”

and [there is] another particular impression properly without motion and light, without any alteration of the medium, impressed on the recipients (*susceptis*) by some particular power of the stars and caused by the place; and such is the magnet's power to attract iron, which derives from the arctic pole,⁷⁶ as we know by experiment. And indeed the specific forms and their consequences follow from that power.⁷⁷

A little further down, Pietro d'Abano writes: "Then we must know that this form with its added features is given to a species, not to an individual; therefore it is also called the form of the species."⁷⁸ Hence, according to *differentia* 10, the particular astral influx seems to be linked with individual properties,⁷⁹ whereas according to *differentia* 71 it seems to be linked with the specific form in the exact meaning of "the form of a whole species." In fact, the two definitions are not contradictory, since Pietro d'Abano immediately writes in *differentia* 71:

And a species is not able to be more or less what it is according to its definition, nevertheless it partakes more or less in the being of individuals and in their principle of action, depending on whether it is near or far from the form or matter [of the individuals]. We indeed see nobler operations coming from some individuals of a species — e.g., from a man with a balanced complexion and from aloe succotrina — but also baser operations coming from other individuals, e.g., from a monster — although indeed it seems to have a human face, however it partakes in the least degree in the operations of a <human being> — just as arabic aloe within its own species. Such a nobility and such an imperfection can occur because of the homogeneity of matter and a good proportion of its complexion, and because of a confusion

⁷⁶ Pietro is probably thinking of Petrus Peregrinus's *De magnele*. Here, the arctic pole means the northern pole of the celestial sphere (it is not the arctic pole of the earth).

⁷⁷ Petrus de Abano, *Conciliator*, *differentia* 71, propter 3, fol. 108v^b: "et altera impressio particularis sine motu et luce proprie absque medii alteratione susceptis impressa ab aliqua virtute stellarum particulari et situ causata; cuiusmodi virtus ferri attractiva magnetis existit ex polo arctico, ut experimur, derivata. Quam quidem virtutem formae specificae cum earum consequentibus sunt secutae."

⁷⁸ Ibid.: "Propter quod sciendum deinceps quod haec forma cum suis appenditiis speciei datur, et non individuo, unde et forma dicitur speciei."

⁷⁹ Note that in *differentia* 10, just after the section quoted, Pietro d'Abano offers the paradigmatic example of the torpedo, a fish that paralyzes the fisherman's hand but not his net. (On the use of this example, see Brian P. Copenhaver, "A Tale of Two Fishes: Magical Objects in Natural History from Antiquity through the Scientific Revolution," *Journal of the History of Ideas* 52 [1991]: 373–98.) Through this example, Pietro d'Abano asserts that the particular astral influx acts in the same way on an individual being without acting on the medium between the stars and this individual; that is the reason why the source quoted here is Alexander of Aphrodisias. In his Comment on *Meteorology* Alexander addresses the problem of the *medium* and mentions this example (on the influence of this source on debates concerning action at a distance, see my work mentioned above, n. 6). Therefore Pietro d'Abano in *differentia* 10 does not really link the particular astral influx and the form of a species.

of matter and a bad proportion of its complexion <respectively>, or because of powers or other things by which the specific form is introduced, because matter organized in the best way or <on the contrary> more or less disorganized can possess these <powers>. And this is why we sometimes see that certain monstrous animals tend towards human shape (*formam*), according to a deficiency or an opposite <tendency toward its own species>.⁸⁰

Thus we understand that the astral influx, which is called “particular” since it acts on definite things, bestows the specific form on the inferior thing, i.e., a form which defines the species of the thing. To be sure, a given species is unique; i.e., it cannot be more or less what it is. But the power deriving from the specific form can be greater or lesser in different individuals. This range of intensities can be explained by the individual’s greater or lesser proximity to the form and matter proper to its species. This proximity is determined by its complexion, which is more or less prepared for the reception of a particular astral power, since every recipient has its own complexion or proportion of qualities. Thus some monstrous animals grow into a human shape (or form) — a theory that Pietro d’Abano borrowed from Albertus Magnus. Hence the astral, particular influx can account for specific forms — as Pietro first asserted in *differentia* 71 — as well as for individual features — as Pietro wrote in *differentia* 10 referring to birth horoscope.

There are some differences between Arnald of Villanova’s and Pietro d’Abano’s views on this issue. Pietro d’Abano ascribes the specific form to a particular astral influx, which exists in addition to the universal influence of the heavens. Arnald of Villanova does not refer — at least explicitly — to such a distinction. This fits in with the general fact that, in his medicine, Pietro d’Abano gives much more importance to astrology than Arnald of Villanova does. But in addition to this first difference, we note that the specific form is ascribed to a general or permanent astral influence by Arnald of Villanova, whereas it is ascribed to a particular astral influx by Pietro d’Abano. Nevertheless, as said before, Pietro d’Abano makes the particular

⁸⁰ Pietro d’Abano, *Conciliator*, *differentia* 71, propter 3, fol. 108v^b: “Et quia species magis non suscipit et minus secundum rationem eiusdem, secundum tamen esse individuorum et actionis principium in magis participatur et minus: secundum amplius et minus appropinquare aut distare formae vel materiae. Videmus enim a quibus individuus speciei operationes provenire nobiliores, ut ab homine temperato, et aloe succotrino, ab aliis vero viliores sicut a morione: hic enim et si figurationem videatur habere humanam, operationibus tamen illius minime participat, sicut aloes arabicum in eius specie. Huiusmodi quoque nobilitas et imperfectio potest contingere propter homogeneitatem materiae et bonam proportionem complexionis ad eam, et propter materiei confusionem et ipsius ad complexionem improportionem aut propter virtutes seu alia a quibus forma introducitur specifica, eo quod sint materiae optime configuratae vel inconfiguratae secundum tamen magis et minus. Et ideo videmus interdum monstrosa quaedam animalia ad formam tendere humanam secundum vero minus et contra.”

astral influx responsible not only for the specific form (*differentia* 71), but also for individual features (*differentia* 10). As a consequence, Pietro's model comes very near to Arnald's explanation. Finally, the doctrines of both physicians are quite similar as far as the link between astral influence/astrology and occult properties is concerned. Individual differences in the complexion account for the different intensities of their properties, but also for some properties proper to an individual — in this case, the individual property can be compared to a monster within its own species, as Albertus Magnus suggested.

Unlike Albertus Magnus, Arnald of Villanova, and Pietro d'Abano, Thomas Aquinas denies that individual properties can derive from astral influence in any way whatsoever. In his *De occullis operationibus naturae*, only specific properties of natural bodies are taken into account. Moreover he explicitly writes:

Because such powers and workings are derived from a specific form which is common to all the individuals of the same species, it is impossible for an individual of a species to have some kind of power or activity beyond the other individuals of the same species, just because it came into being under a definite configuration of heavenly bodies.⁸¹

Astral influence can only account for differences of strength within a power proper to a species, not for individual special powers.

Yet it is possible that in an individual of the same species the power and activity arising from the species should be found more or less intense according to a diverse distribution of matter and the different configuration of the heavenly bodies at the coming into being of this or that individual.⁸²

Unlike Pietro d'Abano, Thomas Aquinas does not find in this remark a route towards occult individual properties. First, we must remember that Thomas Aquinas was particularly eager to defend the unicity of substantial form. Second — and more significant for our purpose — Thomas Aquinas is reluctant to concede too much power to astrology, and linking occult individual properties to astral influence would grant too much importance to

⁸¹ Thomas Aquinas, *De operationibus occullis naturae* (n. 33 above), 185–86: “Quia igitur huiusmodi virtutes et actiones a forma specifica derivantur, que est communis omnibus individuis eiusdem speciei, non est possibile quod aliquod individuum alicuius speciei aliquam talem virtutem vel actionem obtineat preter alia individua similis speciei, ex eo scilicet quod est sub determinato situ celestium corporum generatum.” Trans. McAllister, *The Letter of Saint Thomas Aquinas* (n. 33 above), §16.

⁸² Thomas Aquinas, *De operationibus occullis naturae*, 186: “Possibile est tamen quod in uno individuo eiusdem speciei virtus et operatio consequens speciem vel intensius vel remissius inveniatur, secundum diversam dispositionem materie et diversum situm celestium corporum in generatione huius vel illius individui.” Trans. McAllister, *The Letter of Saint Thomas Aquinas*, §16.

astrology. Third, such a link would open the way towards justifying “astrological images,” a magical notion he clearly rejects (in the *De occultis operationibus naturae* and other works).

Thus the conflict between the supporters of astral magic and its detractors can be located first in the link between astrological influences and individual occult properties (to be sure, other issues are also important, such as the relationship between *Ars* and *Natura*). The individual occult properties lead to astrology, as shown by the issue of “astrological images” on which the arguments of Albertus Magnus, Arnald of Villanova, and Pietro d’Abano converge.

ASTROLOGY, OCCULT POWERS, AND NATURAL MAGIC

This distinction was well known in the early fourteenth century, as shown by the alchemist Petrus Bonus (or Pietro Bono da Ferrara). In his *Pretiosa margarita novella* (1330) he accepts that celestial bodies introduce forms into inferior bodies through their motion, light, and location in the heavens. He accepts this etiological assumption but also asserts that it is not necessary to take account of astrological configurations in alchemy. When someone wants to have rotten meat produce worms, he does not consider the location of planets and constellations; nevertheless, the astral power will arrive at the suitable moment. This operation, Petrus Bonus writes, like those of alchemy, does not require that the suitable astrological moment be exploited, because astral influence does not need human attention to be efficient in cases in which it is very common (*valde communis*) to all the things generated in nature.⁸³ On the contrary, Petrus asserts, the exact location of celestial bodies must be established in the making of “astrological images” (or purely astrological talismans), “because only by the <celestial bodies> is form impressed into those things, at that precise moment and not another one.”⁸⁴

⁸³ Petrus Bonus Ferrarensis, *Pretiosa margarita novella*, in J.-J. Manget, *Bibliotheca chemica curiosa*, vol. 2 (Geneva, 1702), 8–80, cap. 16, 58b: “Virtus enim cœlestis est valde communis ad omnia, et recipit terminationem per virtutes et dispositiones eorum, quae sunt subjectum ejus in rebus elementatis et elementis, quia sicut operantur virtutes cœlestes in tota natura generabilium et corruptibilium continuo secundum materiam sibi dispositam, aut proprie aut communiter.” On this book, see notably Chiara Crisciani, “The Conceptions of Alchemy as Expressed in the *Pretiosa Margarita Novella* of Petrus Bonus of Ferrare,” *Ambix* 20 (1973): 165–81; Pietro Bono da Ferrara, *Preziosa margherita novella*, introd. and ed. Chiara Crisciani (Florence, 1976). Note that the question of the relationship between *ars* and *natura* in the speculations about “astrological images” (see above, nn. 5 and 57) is also an issue in alchemy; see Barbara Obrist, “Art et nature dans l’alchimie médiévale,” *Revue d’histoire des sciences* 49 (1996): 215–86.

⁸⁴ Pietro Bono da Ferrara, *Pretiosa margarita novella*, 58b–59a: “Sed de rebus, in quibus infunditur forma accidentalis nova et occulta a cœlestibus, ut patet in arte imaginum,

The fourteenth-century scholar who most radically questions the astrological model of occult properties is probably Nicole Oresme. Oresme's view on occult properties has been discussed by modern scholars (Marshall Clagett, Michael McVaugh, Bert Hansen, Edward Grant⁸⁵), some of whom suggest that it can be used to date his works. In some of his treatises, Oresme challenges either the concept itself of occult properties or at least the existence of a particular astral influence called *influentia* responsible for the existence of terrestrial occult properties. Among medieval scholars he is almost the only one who holds such a view (with the exception of Henry of Langenstein, who was influenced by Oresme⁸⁶). It is certain that Oresme explains magnetic attraction by substantial form in his *Quodlibetal questions*, whereas in the *De configurationibus qualitatium* he refers to a link (*colligantia*) and proportions between natural things, borrowing concepts from William of Auvergne but using them within the new framework of discussions of *latitudo formarum*. As for the origin of the phenomena usually considered to be occult, Oresme sometimes acknowledges three kinds of influences from the heavens on the earth: motion, light, and *influentia* — with occult properties depending on the last-named — but sometimes only motion and light. As Edward Grant points out, within the same work, the *Quaestio contra divinatores horoscopios* (which is part of the *Quodlibet*), Oresme successively holds the two different positions.⁸⁷ When he acknowledges only motion and light, he seems to reduce all terrestrial phenomena to interactions among terrestrial compounds; hence we do not know exactly what is happening with the

oportet necessario, ut sciamus et custodiamus determinatos situs et aspectus corporum coelestium tempore proposito: quia a solis illis imprimitur forma talis, et tempore tali, et non alio, sicut patet in libris Astrologiae de electionibus horarum, imaginum et bellorum, aedificiorum et itinere etc. Quia ergo Alchemiae ars non est talis, ideo non expedit ut haec sciat."

⁸⁵ Marshall Clagett, *Nicole Oresme and the Medieval Geometry of Qualities and Motions: A Treatise on the Uniformity and Difformity of Intensities Known as Tractatus de configurationibus qualitatium et motuum* (Madison, WI, 1968), 113 n. 2 and 127–31; Michael McVaugh, "Theriac at Montpellier 1285–1325 (with an Edition of the *Questiones de tyriaca* of William of Brescia)," *Sudhoffs Archiv* 56 (1972): 113–44 (esp. 126 n. 48); Bert Hansen, *Nicole Oresme and the Marvels of Nature: A Study of His 'De causis mirabilium' with Critical Edition, Translation, and Commentary* (Toronto, 1985), 45; Edward Grant, *Planets, Stars, and Orbs: The Medieval Cosmos, 1200–1687* (Cambridge, 1994), 613–14. On Oresme and astrology, see Stefano Caroti, "La critica contro l'astrologia di Nicole Oresme e la sua influenza nel Medioevo e nel Rinascimento," *Atti della Accademia nazionale dei Lincei: Classe di scienze morali, storiche e filologiche, Memorie* ser. 8, 23 (1979): 564–685.

⁸⁶ Lynn Thorndike, *A History of Magic and Experimental Science*, 8 vols. (New York, 1923–58), 3:472–510. See also Hubert Pruckner, *Studien zu den astrologischen Schriften des Heinrich von Langenstein* (Leipzig, 1933); Caroti, "La critica contro l'astrologia di Nicole Oresme," 564–685, at 613–29; Maaike van der Lugt, *Le ver, le démon et la vierge: Les théories de la génération extraordinaire* (Paris, 2004), 146–48.

⁸⁷ Grant, *Planets, Stars, and Orbs*, 613–14 n. 177.

substantial/specific form in such a framework. Whatever the case, Oresme is always opposed to astrology and absolutely denies the possibility of “astrological images.”⁸⁸

The distinction between a specific power deriving from astral influences, without reference to astrology, and a particular power deriving from an accidental astral influx and leading to astrology is long-lasting. At the end of the fifteenth century, for example, the Valencian physician Jerome Torrella, in his *Opus praeclarum de imaginibus astrologicis* (completed in 1496 and published shortly after), distinguishes between the natural forces (*vires*) that are produced at the same time as substantial forms and are thus common to every individual of the species, and forces that occur after the substantial form has been generated. The latter category includes the occult properties by which some men, long after they were born, can no longer eat fish. Torrella tells that when he turned thirty years old he himself became what we would call allergic to fish. Such forces affect only particular individuals in a species.⁸⁹ The individual occult property is the starting point from which Torrella builds up the explanation for “astrological images” (i.e., purely astrological man-made talismans).

In the Middle Ages, from the thirteenth century onwards, natural magic was grounded in the notion of specific form. The idea of natural magic — scientific magic — is intrinsically contradictory, because science aims at giving a rational explanation and hence at disclosing the unknown, whereas magic can be defined as an artificial operation whose causality and processes

⁸⁸ Oresme fights against the idea of “astrological images,” especially in the different works that are part of his *Quodlibet*; see Weill-Parot, *Les “images astrologiques”* (n. 5 above), 422–33. In the *De configurationibus qualitatū et motuum* he presents the view of those who argue that such images are possible, only to reject it: “Et patet alia ratione, putant enim aliqui quod figure et ymagines quedam facte in certis materiis sub quibusdam constellationibus celi mirabiles habeant efficacias et virtutes, quod, sive verum sive non, tamen multo probabilius est corpora habere efficaciam seu virtutem ex naturalifiguratione qualitatis active quam exfiguratione artificiali qualitatis que secundum philosophos non est de genere activarum virtutum” (Part 1, chap. 22, ed. in Clagett, *Nicole Oresme and the Medieval Geometry of Qualities and Motions*, 230.)

⁸⁹ Jérôme Torrella (Hieronymus Torrella), *Opus praeclarum de imaginibus astrologicis*, ed. Nicolas Weill-Parot (Florence, 2008), part 4, 202: “Quaedam [vires] enim sunt quae non simul cum formis substantialibus compositorum naturalium producuntur sed post aliquod tempus productionis eorum, sicut patet de proprietate occulta adueniente homini alicui per quam abhorret pisces et hoc post longum tempus suae generationis, sicut in me expertus sum; postquam enim XXX natus sum annos, si comedo nonnulla piscium genera, mihi accidentia eueniunt grauissima, quum tamen prius non me molestant. Et iste vires non consequuntur, id est non simul sequuntur generationem formarum substantialium aut earum productionem, quia videlicet quam primum tales vires seu proprietates abhorrendi pisces et huiusmodi in nato appareant, sed post tempus generationis atque natiuitatis eius, tales vires introducuntur, neque in omnibus individuīs eiusdem speciei competuntur.”

are not grasped by human sense perception and intellect. Where science casts its light, hidden magical process must disappear.⁹⁰ Two lines of thought answered this paradox in the Middle Ages. The first was the power of imagination: Avicenna had determined that a man's imagination could act not only on his own body, but also on an external body.⁹¹ But this position, which was not accepted by all medieval scholars, was not the most prevalent. A second line of thought was pursued by the medieval scholars who wished to promote natural magic: the metamorphosis of the unknown (a negative concept) into the occult (positive concept) thanks to the concept of specific form (what I have called the objectivization of the occult). In such a process the unknown could remain unknown (instead of being a provisional state on the road to knowledge); thus the magical aspect could survive, on the one hand, while a scientific explanation was provided, on the other. The specific form is the key concept that made the concept of natural magic possible in scholastic thought.⁹²

Brian P. Copenhaver was certainly right when he emphasized the importance of the specific/substantial form for Renaissance (and medieval) speculations about natural magic.⁹³ The specific form makes it possible to account for the occult properties of a species. As noted, however, the specific form is not sufficient to account for the particular occult properties that underlie the most common kind of natural magic, the astral magic of "astrological images." These particular occult properties had to be related to particular astrological influxes.

Astrology indeed played an important part in scholastic speculations about occult properties. But astrology must be distinguished from astral influences, since astrology implies reading stars and constellations as signs. There was an essential distinction between the specific occult properties deriving from a specific form and the particular (or individual) occult properties coming from an accident within the union of matter and specific form.

⁹⁰ See my works, n. 13 above.

⁹¹ Concerning the power of imagination, see notably Lynn Thorndike, "Imagination and Magic: The Force of Imagination on the Human Body and of Magic on the Human Mind," in *Mélanges Eugène Tisserant* (Vatican City, 1964), 7/2, 353–58; Danielle Jacquart, "De la science à la magie: Le cas d'Antonio Guaineri, médecin italien du xv^e siècle," *Médecines, Littératures, Sociétés* 9 (1988): 137–56; Paola Zambelli, "L'immaginazione e il suo potere: Desiderio e fantasia psicosomatica o transitiva," in eadem, *L'ambigua natura della magia* (Milan, 1991), 53–75; Wilcox and Riddle, "Qustâ ibn Lûqâ's *Physical Ligatures*" (n. 28 above); Fernando Salmón and Monserrat Cabré, "Fascinating Women: The Evil Eye in Medieval Scholasticism," in *Practical Medicine from Salerno to the Black Death*, ed. Luis García Ballester et al. (Cambridge, 1994), 237–88; Béatrice Delaurenti, "La fascination et l'faction à distance: Questions médiévales (1230–1370)," *Médiévales* 50 (2006): 137–54.

⁹² Weill-Parot, "Science et magie" (n. 13 above).

⁹³ Copenhaver, "Scholastic Philosophy" (n. 3 above).

Both properties were supposed to derive their power from astral influences. But whereas the specific properties were related to a regular natural order in which astral influences regularly operated, the particular/individual/accidental properties were related to the impact on nature of a definite astral influx at a precise moment, which a trained astrologer could determine. Consequently specific occult properties did not call for astrology, but accidental occult properties did. Occult properties were the key concept through which medieval philosophers built up the notion of natural magic. This is why astrological magic — and, above all, “astrological images” — became the paradigm of the medieval conception of natural magic.

Université Paris 8 (Saint-Denis)