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3. Pestilences and Contagious Diseases in the Middle Ages

Albert the Great and the Fourteenth-Century Plague Treatises[*]

▼ **ABSTRACT** This paper explores Albert the Great's views on pestilences and contagious diseases. Albert did not dedicate a specific work or part of a work to these topics, but upon thorough inspection it is evident that pestilences were given careful attention within his corpus. Despite objective historical limitations (he did not experience any plague outbreaks during his lifetime and in his works the terms *pestis* and *pestilentia* are vague, covering a large variety of different sicknesses), Albert's investigation of the causes of pestilential and contagious diseases is worthy of consideration. My first claim is that he explained these phenomena in scientific terms and not as a result of God's will, which in the Middle Ages was often invoked as the cause of natural calamities. My second thesis is that Albert's explanatory models provided the basis for the late-medieval discourse on plague. In his works, the fourteenth-century treatises on plague, the so-called *Pestschriften*, found some of the conceptual tools they used to construct the etiological and nosological identity of this devastating disease.

1. Introduction

In the Middle Ages, people were familiar with a whole range of catastrophic events (earthquakes, floods, fires, famines, and wars). Among such calamities, pestilences had particularly devastating and lasting effects, and left deep traces in medieval societies: the undoing of family ties, the undermining of social structures, the impair-

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ment of political institutions, the collapse of economic life, and a sharp demographic decline.

Two plague pandemics hit the medieval world: the Justinianic plague — after the name of the Emperor Justinian, a sufferer himself — and the mid-fourteenth-century pandemic, the so-called Black Death. A large body of contemporary sources inform us about the dire consequences of medieval plague outbreaks, especially of the Black Death. The disaster was not only chronicled by historians, but also elicited philosophical and medical explanations, invited theological reflections, and provided a subject for literary reworking. Moreover, plague figured as a key element in private correspondences, account books, charters, and political documents of different kinds and origin.[1] The medieval understanding of plague, being mostly based on the description of symptoms, was far from the modern-day laboratory perception.[2] This

1 On the 1347–50 plague pandemic, see, e.g, Philip Ziegler, *The Black Death* (London: Collins, 1969); Jean-Noël Biraben, *Les hommes et la peste en France dans les pays européens et méditerranéens*, 2 vols (Paris-La Haye: Mouton, 1975–76); *La peste nera: dati di una realtà ed elementi di una interpretazione*. Atti del XXX Convegno storico internazionale, Todi, 10–13 ottobre 1993 (Spoleto: Centro italiano di studi sull'Alto Medioevo, 1994); Klaus Bergdolt, *Der Schwarze Tod in Europa. Die Große Peste und das Ende des Mittelalters* (München: Beck, 1994); *The Regulation of Evil. Social and Cultural Attitudes to Epidemics in the Late Middle Ages*, ed. by Agostino Paravicini Bagliani and Francesco Santi (Firenze: Sismel-Edizioni del Galluzzo, 1998); William Naphy and Andrew Spicer, *Plague. Black Death and Pestilence in Europe* (Stroud: Tempus Publishing Limited, 2004); Ole J. Benedictow, *The Black Death 1346–1353. The complete history* (Woodbridge: Boydell Press, 2004); Joseph P. Byrne, *Encyclopedia of the Black Death* (Santa Barbara, California-Denver, Colorado-Oxford: ABC-CLIO, 2012); Kay Peter Jankrift, *Im Angesicht der 'Pestilenz'. Seuchen in westfälischen und rheinischen Städten (1349–1600)* (Stuttgart: Steiner Verlag, 2020); Alberto Luongo, *La peste nera. Contagio, crisi e nuovi equilibri nell'Italia del Trecento* (Roma: Carocci, 2022). For an up to date account of plague in general, see at least Dominique Buchillet, 'Epidemic Diseases in the Past: History, Philosophy, and Religious Thought', in *Encyclopedia of Infectious Diseases: Modern Methodologies*, ed. by Michel Tibayrenc (Hoboken: John Wiley and Sons, 2007), pp. 517–24; Frank M. Snowden, *Epidemics and Society: From the Black Death to the Present* (New Haven: Yale University Press, 2019).

2 See Andrew Cunningham, 'Transforming Plague: The Laboratory and the Identity of Infectious Disease', in *The Laboratory Revolution in Medicine*, ed. by Andrew Cunningham and Perry Williams (Cambridge: Cambridge University Press, 1992), pp. 209–44. Towards the end of the nineteenth century, Alexandre Yersin discovered the bacillus causing the plague disease (*Yersinia pestis*). Usually present in rats and wild rodents, this bacterium is transferred to humans through the bite of fleas (of rodents or humans), giving rise to the infection, which may be bubonic, pneumonic, or septicemic. In the pneumonic form, it is transmitted from person to person by coughing, sneezing, spitting, or even speaking. Recent studies, benefitting from the growing use of the resources of modern sciences (paleogenetics, archeobiology, microbiology, immunology, etc.), have started to question the identification of the 14th-century plague pandemic with the contagious disease caused by *Yersinia pestis*. On the new genetic and biological approach to medieval plague, see, e.g., Graham Twigg, *The Black Death: a biological reappraisal* (London: Batsford, 1984); Susan Scott and Christopher Duncan, *Biology of Plagues. Evidence from Historical Population* (Cambridge: Cambridge University Press, 2001); Susan Scott and Christopher Duncan, *Return of the Black Death: the world's greatest serial killer* (Chichester: Wiley, 2004); Vivian Nutton (ed.), *Pestilential complexities: understanding medieval plague*, *Medical History. Supplement*, 27 (London: Wellcome Trust Centre for the History of Medicine at UCL, 2008), in particular Vivian Nutton's introduction and the papers by Lars Walløe, Samuel K John Jr., Daniel Antoine, and Elisabeth Carniel; Lester K. Little, 'Plague Historians in Lab Coats', *Past and Present*, 213 (November 2011), pp. 267–90; *Pandemic Disease in the Medieval World: Rethinking the Black Death*, ed. by Monica H. Green (Kalamazoo–Bradford: ARC Medieval Press, 2015); George Dameron, 'Identificazione di un killer. Recenti scoperte scientifiche e storiche sulla natura della peste nera', in *Boccaccio 1313–2013*, ed. by Francesco Ciabattoni, Elsa Filosa, and Kristina Marie

medieval approach explains why the words *pestis* and *pestilentia* had a broad meaning, covering a wide range of different epidemic and contagious diseases having more or less similar symptoms.

This paper focuses on Albert the Great's views on pestilences and contagious diseases. As is well known, Albert the Great (1200–80) was a key figure in the intellectual life of the Middle Ages. A Dominican friar, a master regent in theology at the University of Paris and the Dominican *studium generale* at Cologne, he was a systematic commentator of the *Corpus Aristotelicum* and thus an attentive scholar of natural processes, including biological and medical phenomena.[3] His scientific interests spanned from human physiology, psychology and embryology to the theory of the elements, from cosmology to zoology and botany. He was already called *doctor universalis* in his lifetime due to his encyclopedic scientific knowledge.

Even though he has not left us a specific work specifically dedicated to pestilences and contagious diseases, we find his views on these subjects scattered throughout his works. As we will see, Albert explained pestilences in strictly naturalistic terms, relying on some of the most prominent sources on natural philosophy, medicine, and astrology at his disposal (above all, Aristotle, Galen, Avicenna, and Albumasar), on the Bible, on his personal 'experience', and on secondhand observations. Albert took the same approach to pestilences and contagious diseases as he did to other natural and human-related catastrophes (deluges, fires, floodings, earthquakes, wars, and famines).[4]

Olson (Ravenna: Longo, 2015), pp. 57–70; Pierre Toubert, 'La Peste Noire (1348), entre histoire et biologie moléculaire', *Journal des Savants*, 1 (2016), pp. 17–31. On a paleogenetic and phylogenetic basis, Monica H. Green, 'The Four Black Deaths', *American Historical Review*, 125 (2020), pp. 1601–31, has recently laid out a scenario in which the *Yersinia pestis*, present in a latent form throughout Asia as early as the thirteenth century due to the Mongol conquests, became visible in Asia, the Black Sea, and the Mediterranean with its devastating effects only between the 1330s and 1340s.

3 On Albert's medical expertise and theories, see at least Nancy Siraisi, 'The Medical Learning of Albertus Magnus', in *Albertus Magnus and the Sciences. Commemorative Essays 1980*, ed. by James Weisheipl (Toronto: Pontifical Institute of Medieval Studies, 1980), pp. 379–404; Heinrich Shipperges, 'Das medizinische Denken bei Albertus Magnus', in *Albertus Magnus. Doctor Universalis 1280/1980*, ed. by Gerbert Meyer and Albert Zimmermann (Mainz: Matthias-Grünewald-Verlag, 1980), pp. 279–94; Miguel de Asúa, 'War and Peace: Medicine and Natural Philosophy in Albert the Great', in *A Companion to Albert the Great. Theology, Philosophy, and the Sciences*, ed. by Irven M. Resnick (Leiden-Boston: Brill, 2013), pp. 269–97; Katja Krause, 'Grenzen der Philosophie. Albert der Großen Kommentar zu De animalibus und die Medizin', *Documenti e Studi sulla Tradizione Filosofica Medievale*, 30 (2019), pp. 265–93; Amalia Cerrito, *Albert the Great (c. 1193-1280) and the Configuration of the Embryo: Virtus Formativa* (London: Palgrave Macmillan, 2023).

4 The scholarly debate on the definition of natural catastrophes and their difference from human-induced calamities cannot be gone into here. For different positions on these issues, see, e.g., Jacques Berlioz, *Catastrophes naturelles et calamités au Moyen Age* (Firenze: Sismel-Edizioni del Galluzzo, 1998), pp. 20–25, (p. 24); Michael Matheus, 'L'uomo di fronte alle calamità ambientali', in *Le calamità ambientali nel Tardo Medioevo europeo: realtà, percezioni, reazioni*. Atti del XII convegno del Centro di Studi sulla civiltà del tardo Medioevo S. Miniato, 31 maggio — 2 giugno 2008, ed. by Michael Matheus and others (Firenze: Firenze University Press, 2010), pp. 1–20. Gian Maria Varanini, 'Presentazione', in *Le calamità ambientali nel Tardo Medioevo europeo*, proposes the concept of 'environmental calamities' ('calamità ambientali'), which expands the usual notion of catastrophe to also include human agency and society's perception of, and reaction to, catastrophic events.

In what follows, after briefly providing basic historical information on the two medieval plague pandemics, I intend first to thoroughly comment on the several passages wherein Albert analyses pestilences. I will then explore the reception of Albert's views in the plague literature originated with the great pandemic of the mid-fourteenth-century. In the attempt to understand the etiology of the pestilence and the mechanisms of contagion, describe the symptoms, work out prophylactic countermeasures, and devise a therapy, physicians and natural philosophers of the fourteenth century often used Albert's ideas as a framework for a rational approach to the pandemic.

2. The Medieval Plague Pandemics: the Justinianic Plague and the Black Death

We know about the beginnings of the sixth-century Justinianic pandemic from the historian Procopius of Caesarea who, being at the court of Justinian in the early 540s, was an eyewitness to the dramatic beginnings of the plague.[5] From 543 onward, the pestilence hit vast areas in Western Europe, striking several regions of Europe on a recurrent basis during the sixth century (543–47, 571, 582–84, 588, 591–94), and returning in frequent waves at least until the eight century.

Gregory of Tours (538/39–594) was the most renowned and authoritative among the Western chroniclers of the Justinianic plague. He viewed the pestilence as the fundamental event of his lifetime. His works accurately describe several waves of the disease. He interpreted the plague from a theological point of view as a manifestation of God's anger at human wrongdoing and viewed it as a tragic event in the history of salvation. In the pages he devotes to the plague we read that the catastrophe was heralded by prodigies (comets, eclipses, floods, etc.). Gregory also describes the liturgical measures (processions, vigils, fasting, prayers, pilgrimages, and sessions of collective confession and penitence) that were taken to counter the disease and seek the intercession of angels and bishop saints.[6]

A similar interpretive pattern is adopted by Paul the Deacon (Paulus Diaconus) in the *Historia Langobardorum*. An historian from the eighth century, Paul described supernatural events that were taking place in 680 when the epidemic was ravaging

5 On the Justinianic plague, see *Plague and the End of Antiquity. The Pandemic of 541–750*, ed. by Lester K. Little (Cambridge: Cambridge University Press, 2007); Merle Eisenberg and Lee Mordechai, 'The Justinianic Plague and Global Pandemics: The Making of the Plague Concept', *American Historical Review*, 125 (2020), pp. 1632–67. For an analysis of the two medieval plague pandemics, see Gundolf Keil, 'Seuchenzüge des Mittelalters', in *Mensch und Umwelt im Mittelalter*, ed. by Bernd Herrmann (Stuttgart: Deutsche Verlags-Anstalt, 1986), pp. 109–28.

6 On Gregory's views on plague, see Michael McCormick, 'Gregory of Tours on Sixth-Century Plague and Other Epidemics', *Speculum*, 96/1 (2021), pp. 38–96. The theurgic conception characteristic of the High-Medieval battle against pestilences underlies the liturgical measures described by Gregory: see Mirko D. Grmek, 'Le concept d'infection dans l'Antiquité et au Moyen Age, les anciennes mesures sociales contre les maladies contagieuses et la fondation de la première quarantaine à Dubrovnik (1377)', *Rad Jugoslavenske Akademije Znanosti i Umjetnosti*, 384 (1980), pp. 9–55 (p. 24).

Rome. Almost simultaneous lunar and solar eclipses prefigured the calamity. Paul writes that at that time many people saw an evil angel holding a hunting-spear in his hand and being ordered by a good angel to bang with it on the doors of the houses of the people doomed to die. Someone had the revelation that the plague would stop if an altar dedicated to the martyr Saint Sebastian were installed in the basilica of St Peter's 'ad Vincula'. Once this was done, the epidemic ceased to sweep across the city.[7]

The second medieval plague pandemic, known today as the Black Death, but named differently by the medieval people (*mortalitas*, *epidemia*, *pestilentia*), was a fundamental event in the later Middle Ages, marking a turning point in the European history according to many historians.[8] After first appearing in Central or Eastern Asia, plague struck the region around the Caspian Sea around 1345, moved from the Eastern to the Mediterranean ports along the trade routes in 1347, expanded inland, and swept across Europe until around 1352.[9] There were several pandemic resurgences in the second half of the fourteenth century and epidemic outbreaks continued to strike in localized areas in Europe until the eighteenth century.

The plague also drew a wide range of reactions from all components of medieval society.[10] Like the Justinianic plague, the Black Death was considered from a supernatural perspective as a collective punishment inflicted by God for human crimes.[11] This idea led to public rites of repentance and to invocations of the saints, the angels,

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7 Paulus Diaconus, *Historia Langobardorum*, ed. Georg Waitz (Monumenta Germaniae Historica. Scriptores rerum Langobardicarum et Italicarum sec. VI–IX) (Hannover: Hahn, 1988; repr. of ed. Hannoverae, impensis bibliopolii Hahniani 1878), VI. 5, p. 166, 20–34.

8 The scale of the demographic collapse that followed the Black Death outbreak is often adduced as a proof of its being a watershed in history. On the demographic aspect, see Rinaldo Comba, 'Il rilevamento demografico: prima e dopo la peste nera', in *La peste nera: dati di una realtà ed elementi di una interpretazione*, pp. 155–73.

9 The traditional view that the early spread of the pandemic was due to the Tartars besieging the Crimean city of Caffa in 1346 and throwing plague-infected cadavers over the walls of the city has recently been rejected: see Hannah Barker, 'Laying the Corpses to Rest: Grain, Embargoes, and *Yersinia pestis* in the Black Sea, 1346–48', *Speculum*, 91/1 (2021), pp. 97–126. Interestingly, the episode, narrated in Gabriele de Mussis' *Historia de morbo*, has been interpreted by several scholars as an early example of bacteriological warfare: see, e.g., Vincent J. Derbes, 'De Mussis and the Great Plague of 1348. A Forgotten Episode of Bacteriological Warfare', *Journal of the American Medical Association*, 196. 1 (1996), pp. 59–62; Mark Wheelis, 'Biological Warfare at the 1346 Siege of Caffa', *Emerging Infectious Diseases*, 8 (2002), pp. 971–75.

10 See e.g., *The Black Death*, trans. and ed. by Rosemary Horrox (Manchester-New York: Manchester University Press, 1994); John Aberth, *The Black Death. The Great Mortality of 1348–1350. A Brief History with Documents* (New York: Palgrave Macmillan, 2005).

11 This notion, which we often find linked to what can be called a pastoral of fear, was widespread in the fourteenth century among authors with different backgrounds: see, e.g., Gabriele de Mussis, *Historia de morbo*, ed. by August Wilhelm Henschel, 'Document zur Geschichte des schwarzen Todes', *Archives für die gesammte Medicin*, 2 (1842), pp. 45–59 (pp. 45–46); Boccaccio, *Decameron*, ed. Vittore Branca, vols 2 (Torino: Einaudi, 2014[4]), vol. 1, Intr. p. 15, § 8, p. 21, § 25; Iohannes de Rupescissa, *De consideratione quintae essentiae* (Basel: 1561), p. 163; Giovanni Villani, *Nuova Cronaca*, ed. Giuseppe Porta (Milano-Parma: Fonazione Pietro Bembo-Ugo Guanda, 1991), vol. 3, XIII. 84, pp. 485–86; Matteo Villani, *Cronica con la continuazione di Filippo Villani*, ed. Giuseppe Porta (Milano-Parma: Fondazione Pietro Bembo-Ugo Guanda, 1995), vol. 1, I. 1–2, pp. 5, 1–9, 20; Francesco Petrarca, *Prose*, ed. P. G. Ricci, E. Carrara, and E. Bianchi (Milano-Napoli: Ricciardi, 1955), p. 1122.

and the Virgin Mary. The need for self-mortification reached shocking peaks with the bands of flagellants wandering through German lands and performing violent penitential rites by scourging themselves.[12] The plague outbreaks and the wondrous events foreshadowing or surrounding it (earthquakes, eclipses, fires, hail, rains of toads and snakes, etc.) were interpreted in eschatological terms as harbingers of the nearness of the apocalypse.[13] The sense of a looming catastrophe led many to perceive no moral limitations and forget human dignity. These people exceeded in merrymaking and indulged in debauchery, as though they were living their last hours.[14] The need to find a cause for the pandemic facilitated the dissemination of conspiracy theories that considered the plague to be man-made. Several human groups (lepers, foreigners, the wealthy, and Jews) were scapegoated. In particular, the Jews were accused of poisoning wells and spreading the plague, an accusation that led to massacres of innocent people.[15]

After the first onslaught of the plague outbreak, public authorities responded by issuing ordinances concerning quarantine, isolation of the plague-affected, and sanitation. All these measures suggest that there was awareness that interhuman contagion was the reason for the spread of the disease.[16]

Physicians, however, were unable to understand the speedy propagation of the disease within the traditional nosological Hippocratic-Galenic framework, and could

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12 See, e.g., Henricus de Hervordia, *Liber de rebus memorabilioribus sive Chronicon*, ed. August Potthast (Gottingae: Sumptibus Dieterichianis, 1959), pp. 280–81. On the flagellants, see F. Graus, *Pest — Geissler — Judenmorde. Das 14. Jahrhundert als Krisenzeit* (Göttingen: Vandenhoeck & Ruprecht, 1987; 2. durchges. Aufl.), pp. 38–59.

13 Robert E. Lerner, 'The Black Death and Western European Eschatological Mentalities', *The American Historical Review*, 86 (1981), pp. 533–52; Laura A. Smoller, 'Of Earthquakes, Hail, Frogs, and Geography: Plague and the Investigation of the Apocalypse in the Later Middle Ages', in *Last Things. Death and the Apocalypse in the Middle Ages*, ed. by Caroline Walker Bynum and Paul Freedman (Philadelphia: University of Pennsylvania Press, 2000), pp. 156–87, pp. 316–37, claims that the hallmark of the fourteenth-century discussion on plague was the interweaving of apocalyptic explanations with naturalistic analyses. On the medieval apocalyptic interpretation of catastrophes, see the recent Robert E. Bjork, *Catastrophes and the Apocalyptic in the Middle Ages and the Renaissance* (Turnhout: Brepols, 2019). Useful remarks can also be found in John Aberth, *From the Brink of the Apocalypse: Confronting Famine, War, Plague, and Death in the Later Middle Ages* (New York-London: Routledge, 2001).

14 Boccaccio, *Decameron*, vol. 1, Intr. pp. 19–20, § 21–22, p. 27, § 44; Matteo Villani, *Cronica*, I. 6, pp. 16, 10–17, 29. David Herlihy, *The Black Death and the Transformation of the West*, ed. and introd. by Samuel K. Cohn, Jr. (Cambridge, Mass.-London: Harvard University Press, 1997), pp. 63–65, regards this behaviour as 'revulsion toward death' or a 'victory, however temporary, over death'. For further links between pandemics and conspiracy theories, see section 4 of chapter 10 of this volume.

15 Graus, *Pest — Geissler — Judenmorde*, pp. 155–389; Samuel K. Cohn Jr., 'The Black Death and the Burning of the Jews', *Past and Present*, 196 (2007), pp. 3–36; Jan Philipp Weber, *Die Jugendpogrome zur Zeit des Schwarzen Todes 1348–1350. Was waren die Ursachen?* (München: Grin Verlag, 2019).

16 Paul Slack, 'Responses to Plague in Early Modern Europe: The Implications of Public Health', *Social Research*, 55 (1988), pp. 433–53, makes interesting remarks on the responses of medieval political authorities. For political reactions in later centuries, see Carlo Maria Cipolla, *Miasmi e umori* (Bologna: Il Mulino, 1989), Id., *Il pestifero e contagioso morbo. Combattere la peste nell'Italia del Seicento* (Bologna: Il Mulino, 2012). One should not forget that some of the treatises on the plague were commissioned by town governments, city leaders, or sovereigns. Therefore, a sharp distinction between the public health policies enacted by political authorities and the remedies suggested by medical treatises seems to be untenable.

only devise preventive remedies and curative measures with a limited impact on the plague's spread. The recourse to alchemical therapies and magical amulets is a clear sign of the inadequacy of the usual humoral medical approaches.[17]

3. Albert the Great on Pestilences

3.1. A Philosophical Approach

Since he died in 1280, Albert did not experience the ravages of the Black Death. By the words *pestis* and *pestilentia*, he did not refer to proper plague, caused by the bacterium *Yersinia pestis*, but to unspecified epidemics, contagious diseases, leprosy, miasmatic contamination, or malaria-like sickness due to an unhealthy environment.[18]

He accounted for this large body of pestilences and contagious diseases in different ways, but all of his explanations had a scientific basis. This is one of the reasons why Albert's analyses were so successful among fourteenth-century authors.

A crucial passage from Albert's commentary on the *De causis proprietatum elementorum* (= *DCPE*) helps us clarify his attitude towards pestilences. Even though here Albert deals with deluges, his words describe a scientific approach to be applied to catastrophes of any kind, including pestilences.

> Sunt autem quidam qui omnia haec divinae dispositioni tantum attribuunt et aiunt non debere nos de huiusmodi rebus quaerere aliam causam nisi voluntatem dei. Quibus nos in parte consentimus, quia dicimus haec nutu dei mundum gubernantis fieri ad vindictam maleficii hominum. Sed tamen dicimus haec deum facere propter causam naturalem, cuius primus motor est ipse qui cuncta dat moveri. Causas autem suae voluntatis non quaerimus nos, sed quaerimus causas naturales, quae sunt sicut instrumenta quaedam per quae sua voluntas in talibus producitur ad effectum.[19] (There are some who ascribe everything to the divine disposition, saying that we ought to seek no other cause of such things than God's will. We agree with them partly because we maintain that these events happen by the will of God, Who governs the world, as a punishment for men's misdeeds; yet,

17 Chiara Crisciani and Michela Pereira, 'Black Death and Golden Remedies. Some Remarks on Alchemy and the Plague', in *The Regulation of Evil*, pp. 7–39; Byrne, *Encyclopedia of the Black Death*, pp. 9–10. According to Nicolas Weill-Parot, 'La rationalité médicale à l'épreuve de la peste: médecine, astrologie et magie (1348–1500)', *Médiévales*, 46 printemps (2004), pp. 73–88, available at https://journals.openedition.org/medievales/884 (last accessed 01.02.2022), the recourse to seals against plague must be linked to the rational framework of scholastic medicine.

18 On the fluctuation of the meaning of the terms 'pestilence' and 'epidemics' in the thirteenth and fourteenth centuries, see Joël Chandelier, 'Définition et terminologie des épidémies dans la médicine latine de la fin du Moyen Âge', in *Épidémies, épizooties. Des représentations anciennes aux approches nouvelles*, ed. by François Clément (Rennes: Presses universitaires de Rennes, 2017), pp. 29–42 (pp. 30–35).

19 Albertus, *De causis proprietatum elementorum*, ed. by Paul Hossfeld (Alberti Magni Opera omnia, 5. 2) (Münster i.W.: Aschendorff, 1980), I. 2. 9. pp. 76, 75–77, 2. The work has been translated into English: Albert the Great, *On the Causes of the Properties of the Elements (Liber de causis proprietatum elementorum)*, trans. with introduction and notes by Irven M. Resnick (Milwaukee: Marquette University Press, 2010).

> we state that God does these things by means of a natural cause, of which the first mover is He himself that sets everything in motion. However, we do not search for the causes of His will, but search for the natural causes, which are like instruments by which His will is put into effect in such events).

He did not exclude the possibility of a divine punishment of human misdeeds. Such an explanation, however, had no scientific value in the context of the commentary on the *DCPE* because it did not identify the secondary causes used by God as a means by which He accomplished His will. Albert's scientific stance vis-à-vis cataclysms is condensed in the words 'However, we do not search for the causes of His will, but search for the natural causes', which constitute a programmatic principle opposed to the fideistic attitude of those who believe that all depends on divine disposition.

Our extension of Albert's explanatory model of deluges to his study of pestilences is not only conceptually pertinent, but also justified on a historical basis, because the aforementioned passage was to be quoted by some fourteenth-century scholars dealing with the plague (in particular, Conrad of Megenberg and Henry of Herford).

3.2. Physical Causes

All the theories put forward by Albert relate pestilences to the corruption of the air. Already documented in the *Corpus Hippocraticum* (*Nat. hom.* 9), the idea that epidemics were airborne diseases, caused by corrupt air or noxious exhalations, was the backbone of medieval etiological analyses. Moreover, according to the Galenic conception of the six non-natural things, air was the thing that acted more effectively on human beings than any other, including food and drink (*De regimine sanitatis* I. 1).[20] Further, the aerist theory was endorsed by Avicenna[21] and remained dominant in the fourteenth-century *Pesttraktate*.[22]

In a passage from his commentary on the *DCPE*, Albert mentions both a physical and an astrological origin of air corruption. The air is either corrupted by an inferior poisoning and corrupting cause ('ex inferiori invenenante et corrumpente'), namely

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20 See also Galenus, *De febrium differentiis*, I. 6, where several causes for the corrupt air are put forward.

21 See Avicenna, *Liber canonis*, IV. fen i. tract. 4. cap. 1. (Venetiis: 1507; repr. Hildesheim: Georg Olms Verlag, 2003) f. 416ra-b.

22 The literature on medieval conceptions of contagion is extensive and cannot be summarized here. See at least Grmek, 'Le concept d'infection dans l'Antiquité et au Moyen Age', pp. 9–55; Vivian Nutton, 'The Seeds of Disease: An Explanation of Contagion and Infection from the Greeks to the Renaissance', *Medical History*, 27 (1983), pp. 1–34; *Contagion. Perspectives from Pre-Modern Societies*, ed. by Lawrence I. Conrad and Dominik Wujastyk (London-New York: Routledge, 2000); Saul Jarcho, *The Concept of Contagion in Medicine, Literature and Religion* (Malabar: Krieger Publishing Company, 2000); *Air, miasmes et contagion. Les épidémies dans l'Antiquité et au Moyen Âge*, ed. by Sylvie Bazin-Tacchella and others (Langres: Dominique Guéniot, 2001); Aurélien Robert, 'Contagion morale et transmission des maladies: histoire d'un chiasme [XIII^{e}-XIX^{e} siècle]', *Tracés. Revue de Sciences humaines*, 21 (*Contagions*) (2011), pp. 41–60. On the ancient roots of the concept of contagion, see Fabio Stok, 'Il lessico del contagio', in *Atti del Seminario Internazionale di Studi 'Letteratura scientifica e tecnica greca e latina'* (Messina 29–31 ottobre 1997), ed. by Paola Radici Colace and Antonino Zumbo (Messina: Edizioni Dr Antonino Sfameni, 2000), pp. 55–89.

the breath of poisonous animals ('ex spiritu animalium venenosorum'), a corruption similar to that arising from a poisonous vapour, a corpse, a swamp, or whatever else has decomposed ('ex vapore venenoso, ex cadavere vel palude vel aliquo alio resoluto'), or by the influence of a superior celestial body ('ex superiori corpore aliquo caelesti').[23]

Albert goes into detail about each of the specific cases of physical corruption. With regard to animals' corruptive breath, he refers to the two great *dracones* mentioned in the *DCPE*. In his commentary on the text, Albert clarifies that *draco* was the name of a species of a cubit-long snake whose bite was venomous and deadly.[24] According to the *DCPE*, in Philip of Macedon's time there was a valley between two mountains in *Armenia Minor* infested by a poisonous air killing whoever crossed it. Socrates was asked to find the reason for the contamination. He ordered to construct a structure as high as the mountains and to set a flat, clean, and polished mirror on top of it. In this way, he was able to see reflected in the mirror two snakes, one on each of the two mountains. The vapour released from their stomachs and expelled through their mouths was infecting the air.[25] Once he had learned the cause of the poisoning, the king commanded the snakes to be slain by someone who had covered his mouth, nostrils, and all the body's pores through which the contaminated air could have penetrated into his body ('tecto ore et naribus et omnibus poris, per quae poterat attrahi aër infectus […]').

In itself, the episode narrated by the *DCPE* is significant because it gives Albert authoritative support for his view that the air is tainted by the vapour let out by some animals ('Corruptio autem illa aeris fuit ex vapore resoluto ex draconibus […]') and indicates that his knowledge about contamination and pestilences is often derived from previous sources.

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23 *DCPE*, II. 2. 1. p. 95, 14–20: 'Corrumpitur autem aer dupliciter, aliquando videlicet ex inferiori invenenante et corrumpente, aliquando autem ex superiori corpore aliquo caelesti corrumpente ipsum; ex inferiori quidem sicut ex spiritu animalium venenosorum, cui corruptioni similis est, quae est ex vapore venenoso, ex cadavere vel palude vel aliquo alio resoluto […]'. On Albert's views, see also the analysis contained in Alessandro Palazzo, 'Forms and Models of Contagion According to Albert the Great. Pestilence, Leprosy, the Basilisk, the Menstruating Woman, and Fascination', *Quaestio*, 23 (2023), pp. 221–51.

24 *DCPE*, II. 2. 1. p. 95, 43–44: '[…] est enim serpens cubitalis, qui draco vocatur et habet morsum et venenum mortiferum'. On the *dracones*, see Albertus, *De animalibus libri XXVI nach der Cölner Urschrift*, ed. by Hermann Stadler, 2 vols (Münster i.W.: Aschendorff, 1916–1920), vol. 2, XXV. 2. nn. 25–29. pp. 1565, 18–1567, 26. These *magni dracones* have nothing to do with the Biblical 'draco magnus' (see *Revelation* 12. 3 and *Psalms* 73. 13–14). For the recourse to the Biblical terminology of *dracones* in relation to natural calamities, see Isabelle Draelants, 'Phénomènes célestes et tremblements de terre au Moyen Âge: enquête sur l'historiographie médiévale dans les limites de la Belgique actuelle (600–1200)', in *Les catastrophes naturelles dans l'Europe médiévale et moderne*, ed. by Bartolomé Bennassar (Toulouse: Presses universitaires du Midi, 1996), pp. 187–222 (pp. 208–10); for the pestilential dragon in early-medieval hagiographic contexts, see Peregrine Horden, 'Disease, dragons and saints: the management of epidemics in the Dark Ages', in *Epidemic and ideas. Essays on the historical perception of pestilence*, ed. by Terence Ranger and Paul Slack (Cambridge: Cambridge University Press, 1992), pp. 45–76.

25 *DCPE*, II. 2. 1. p. 95, 21–59 (p. 95, 47–50.53–54): 'Hi autem dracones *aperuerunt ora* contra se invicem et infecerunt *aërem* in medio ex *vapore* ventris sui, qui *egrediebatur ex orificiis eorum* […] infectio causabatur ex *vapore* resoluto *de ventribus draconum*'.

It is interesting to note that in this particular case Albert does not explicitly mention the concept of pestilence; rather he describes the infection of air due to the breath of the *dracones* as a form of poisoning ('ex veneno diffuso in aërem'). However, the distinction between pestilences and poisoning is not always clear-cut. As we shall see, some of the fourteenth-century treatises on plague were to refer to poison both to explain the cause of the pestilence and to explain how the disease works within the human body.[26] According to Albert, the *dracones* are not the only animals able to emit poison. Elsewhere, he claims that the basilisk snake spreads poison by breathing or by looking.[27] It should be stressed that Albert does not explicitly associate the basilisk with pestilences, even though it cannot be denied that the basilisk's property of infecting the air through the spirit issuing from its eyes makes this animal a fitting explanatory model for air corruption — the same holds true for the menstruating woman, whose eyes release a spirit able to infect the air and cloud the surface of a polished and a clean mirror.[28] Unsurprisingly, therefore, the basilisk will feature as one of the possible causes of air infection in a few fourteenth-century plague tractates.

Water is also subject to be infected, as Albert shows by describing the poisoning effects of the *iusquiamus* (its scientific name is *Hyoscyamus niger*), a toxic herb[29] that can cause the death of fish. Yet, being warm, the air is contaminated more intensively than water, which, due to its coldness, does not putrefy (*putrescere*) as fast and strongly as the air. The poisoning of water also has destructive effects on reason and memory and causes suffocation.[30]

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26 On this point, see Frederick W. Gibbs, *Poison, Medicine, and Disease in Late Medieval and Early Modern Europe* (London-New York: Routledge, 2019), chapter 4, who claims that these treatises understood plague epidemic as a form of poisoning, identifying poison as the cause and the agent of the disease and not merely using it as a metaphor of the epidemic. The 'poison thesis' has been thoroughly illustrated by John Aberth, *Doctoring the Black Death: Medieval Europe's Medical Response to Plague.* (Lanham-Boulder-New York-London: Roman and Littlefield, 2021), Intr. and Chap. 1, pp. 48–148. For a more nuanced position on the role of poison, see Danielle Jacquart: 'Les multiples facettes des relations entre empoisonnement et peste dans les explications médicales de la fin du Moyen Âge', in *Poison. Knowledge, Uses, Practices*, ed. by Caterina Mordeglia and Agostino Paravicini Bagliani (Firenze: Sismel-Edizioni del Galluzzo, 2022), pp. 223–48. On the medieval writings on poisons and venoms, see Franck Collard, *Les écrits sur les poisons* (Turnhout: Brepols, 2016).

27 Albertus, *De animalibus*, vol. 1, VII. 2. 5. p. 553, 18–23; Id., *De anima*, ed. by Clemens Stroick (Alberti Magni Opera omnia, 7. 1) (Münster i.W.: Aschendorff, 1968), II. 3, 1. p. 97, 84–85. On the medieval tradition on basilisk and its ancient roots, see Robert McNeill Alexander, 'The Evolution of the Basilisk', *Greece and Rome*, 10 (1963), pp. 170–81. Albert claims that the hiss of the basilisk can also infect the surrounding air: see Albertus, *De animalibus*, vol. 2, XXV. 2. p. 1555, 32–35, p. 1561, 27–31.

28 See Albertus, *De anima*, II. 3. 1. p. 97, 82–83. Similarly, the eyes of a wolf can poison the surrounding air and, through the air, the eyes of human beings: see Albertus, *Quaestiones super De animalibus*, ed. Ephrem Filthaut (Alberti Magni Opera omnia, 12) (Münster i.W.: Aschendorff, 1955), VIII. 34, p. 199, 71–78. On 'visual contagion', see Justin K. Stearns, *Infectious Ideas. Contagion in Premodern Islamic and Christian Thought in the Western Mediterranean* (Baltimore: The Johns Hopkins University, 2011), pp. 91–105.

29 Albertus, *De vegetabilibus libri VII*, ed. by Ernst Heinrich Friedrich Meyer and Karl Friedrich Wilhelm Jessen (Berlin: Typis et impensis Georgii Reimeri, 1867), VI. 2. 10, pp. 526–27. This herb is also used by necromancers to invoke demons (p. 527).

30 *DCPE*, II. 2. 1. pp. 95, 61–96, 20.

Albert makes it clear that air corruption spreads much farther than the released vapour. This is due to the fact that a vapour can only rarefy to a limited extent, while the bad smell and the ensuing contamination can spread far through the air.

> Et oportet scire, quod haec corruptio aëris multo longius dispergitur, quam possit extendi vapor resolutus; vapor enim resolutus non extenditur multum, eo quod fumus non potest tantum rarificari. Sed odor et corruptio cum odore ad longinquas partes inficit aerem[31] (It must be known that this corruption of the air spreads much further than the exhaled vapour can; indeed, the exhaled vapour does not expand very far because the smoke cannot rarefy very much. Yet, the stench and corruption caused by it corrupts the air to far-off regions).

In other words, stinking things can act both through their smoke-like and vaporous substance ('ex substantia vaporativa et fumosa') or through the quality of being reeky ('ex foetore qualitativo'): in the former case, they contaminate from nearby and by a strong infection, whereas in the latter they contaminate faraway locations only through a qualitative alteration, locations where nothing of the vapour released by their substances ever arrived.[32]

The idea of corruption 'ex foetore' is behind the popular practice of disseminating pleasant scents through the air to counter the spread of pestilences, which will be one of the most common remedies prescribed in the fourteenth-century plague tractates.[33]

To clarify the difference between noxious vapours and corruptive smells, Albert uses a zoological example. Vultures are believed to sense the smell of the air polluted by a mass of cadavers of men and horses lying on a battleground at a distance of five hundred leagues. No smoke-like evaporation ('nulla fumalis evaporatio') can spread to such a distance, not even if it becomes as thin as fire.[34] In this case too, Albert

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31 *DCPE*, II. 2. 1. p. 96, 21–26.

32 *DCPE*, II. 2. 1. p. 96, 38–45: 'Sed oportet scire, quod odorifera et foetida dupliciter inficiunt, scilicet ex substantia vaporativa et fumosa et ex foetore qualitativo. Et primo quidem modo inficiunt de prope et forte infectione, secundo autem modo inficiunt alterando solum et longe multum in locis, ubi numquam aliquid fuit de fumali evaporatione ipsorum'. The distinction between a qualitative alteration of the air linked to seasonal changes and a substantial change such as putrefaction of the air we find in some fourteenth-century plague treatises does not seem to be patterned after Albert's distinction: see John Arrizabalaga, 'Facing the Black Death: perceptions and reactions of university medical practitioners', in *Practical Medicine from Salerno to the Black Death*, ed. by Luis García-Ballester and others (Cambridge: Cambridge University Press, 1994), pp. 237–88 (pp. 246–47). This view is entertained, among others, by Jacme d'Agramont: *Regiment de preservació de pestilència* (Lleida, 1348), intr. by Jon Arrizabalaga, Luis García Ballester, and Joan Veny, ed. by Joan Veny (Barcelona: Enciclopèdia Catalana, 1998), Intr. Chap. 1 and Art. V, Chap. 1, pp. 53b, 22–55a, 19. For an English translation of the text, see 'Regimen of Protection Against Epidemics or Pestilences and Mortality', trans. by María Luisa Duran-Reynals and Charles-Edward A. Winslow, *Bulletin of the History of Medicine*, 23 (1949), pp. 57–89.

33 John M. Riddle, 'Pomum ambrae: Amber and Ambergris in Plague Remedies', in *Sudhoffs Archiv für Geschichte der Medizin und der Naturwissenschaften*, 48 (1964), pp. 111–22.

34 *DCPE*, II. 2. 1. p. 96, 30–38: '[…] vultures enim corruptionis, quae de cadaveribus resolvitur, foetorem coniciuntur aliquando per quingentas leucas sensisse et illuc advenisse, ubi infra quingentarum leucarum spatium ante numquam visi sunt, propter multitudinem cadaverum, quae in terra illa post caedem quandam ceciderunt ex hominibus et equis, ad quod spatium nulla fumalis evaporatio posset extendi,

is not relying on experience-based information, but is quoting a well-known passage, widespread across the works of Arab and Latin authors.[35]

The physical corruption of the air (*ex inferiori*) can be also explained on a geographic basis. In this regard, Albert maintains that the tainted air disperses through vaster spaces and is especially abundant in Africa.[36] In his *De natura loci* (= *DNL*), he adds that Africa was not a pleasant place to live in both because of its deserts and because of its poisonous and monstrous animals infecting the air and making the region uninhabitable.[37] Here too, Albert is relying on a written source, the *Cosmographia* by Aethicus Ister.[38]

In *DNL*, Albert explores the climatic and environmental factors producing miasmatic contamination in temperate locations on the seacoast. These areas are made warm and humid by the corruptive action of an overabundant liquid (*superfluo umore*). Heat cannot consume the liquid (*umor*) in excess; on the contrary, it multiplies and corrupts the liquid. As a consequence, these areas are full of pestilential vapours and there are thunder and lightning. All of this results in high mortality of human beings and other animals, because the humid and poisonous air penetrates the inner parts of vital organs, leading to immediate death. Here Albert gives a slight hint at the biological side of the process of infection ('aër umidus corrumpitur et efficitur venenosus et penetrat indigestus ad interiora vitalium et perimit subito'). Moreover, he adds that these pestilential locations are often swampy and the water on the ground contaminates habitations. Therefore, the products of farming are often contaminated in accordance with the ontological principle that a place (*locus*) is connatural with what is located in it (*locatum*). Hence, Albert urges to flee regions

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etiam si ad ignis raritatem, ut diximus, perveniret'. The fact that a smell is different from the smoke-like evaporation of an odorous thing is demonstrated by Albert in the *De anima* within the discussion of the physiology of smell: see Albertus, *De anima*, II. 3. 25. p. 135, 12–51, where he also quotes the passage on the vultures.

35 See Eckhart, *Expositio s. evangelii secundum Iohannem*, ed. by Karl Christ and others (*Die lateinischen Werke*, Bd. 3), (Stuttgart-Berlin-Köln: Kohlhammer, 1994), n. 700, pp. 614–15 and n. ad loc.

36 *DCPE*, II. 2. 1. p. 96, 49–52: 'Haec autem corruptio in aëre longius spargitur et abundat praecipue in Africa, sicut diximus in libro de natura locorum. Ex his igitur et similibus sunt corruptiones aeris causatae ex inferiori'.

37 Albertus, *De natura loci*, ed. by Paul Hossfeld (Alberti Magni Opera omnia, 5. 2) (Münster i.W.: Aschendorff, 1980), 3. 5, p. 38, 40–44: '([…] habeat [*scil.* Africa] nec delectabilem habitationem propter eremos multas et venenata et monstruosa animalia, quibus est plena, quae aërem inficientia non permittunt homines habitare in ea'.

38 Aethicus Ister, *Cosmographia*, ed. by Michael W. Herren (Publications of the Journal of Medieval Latin, 8) (Turnhout: Brepols, 2011), § 110, p. 212, 4–6: 'Plures itaque gentes uultu horribile et nonnulla monstruosa; serpentium et ferarum multitudinem, rinocerotas, camilopardus, basiliscus et dracones inmensus […]'. It should however be noticed that the passage referred to is an implicit quotation from Isidore's *Etymologiarum sive originum libri XX*, ed. Wallace Martin Lindsay, (Oxford: Clarendon, 1911) XIV, 5, 14–15: 'Aethiopia dicta a colore populorum […] plurimas habens gentes, diverso vultu et monstruosa specie horribiles. Ferarum quoque et serpentium referta est multitudine. Illic quippe rhinoceros bestia et camelopardus, basiliscus, dracones ingentes, ex quorum cerebro gemmae extrahuntur'.

of this kind, a warning that will be often repeated by the fourteenth-century plague tractates as an effective way to avoid the pestilential disease.[39]

In another passage, Albert insists that an excess in humidity is a factor in corruption. A place is infected by nearby ponds (*stagnis*), swamps (*paludibus*), and mud (*lutis*), and is affected by thick humidity (*grossa umiditate*). Sometimes, a pestilence is said to break out as a consequence of the corruption caused by mud and marshes. Even though it is unclear what the vague term *pestilentia* refers to, one can safely guess that in both abovementioned passages Albert has in mind endemic malaria-like diseases.[40]

Forests are also unwholesome, because since their soil (*fundus*) is filled with vapour that is trapped (*conclusus*) under the branches of trees, they contain clouds and whirlwinds ('nebulas et turbines') of a thick suffocating air. Among trees, some are especially harmful (e.g., the walnut and the oak), for they either corrupt the air with their pungency (*amaritudine*) or, since they are tall, they contain the air, without allowing it to be ventilated and purified.[41]

In the *Meteora* (= *Met.*), Albert identifies earthquakes as another physical cause of aerial contamination. As is well-known, this work is concerned with those phenomena that occur near stars (the Milky Way, comets, etc.) or in the air (rainbows, vapours, etc.), or that arise from vapours trapped in water or the earth (wind and earthquakes). Based on Aristotle's *Meteora*, Albert argues that when the sun acts on the earth made humid by rain, two vapours, moist and dry, rise up. Sometimes the vapour arises from the depths of the earth ('extrahitur de profundo terrae'), where it is coerced into subterranean cavities. When it is compressed underground, the vapour is shaken in the bowels of the earth and its agitation impacts on what ecloses it, causing an earthquake.[42]

Frequently an earthquake is followed by a pestilence because after being trapped in the earth and deprived of light and air, the vapour somehow has the nature of poison. For several days before its complete eruption during the earthquake, the

39 *DNL*, 1. 13. pp. 21, 85–22, 10: 'Loca autem, quae sunt remotiora a meridie et accedunt ad climata frigidiora et temperatiora, sita super mare aliquod, efficiuntur calida et umida superfluo umore et corrumpente; locus enim talis plus habet umidi, quam calor consumere possit, et ideo calor multiplicat ipsum et corrumpit, et ideo talia loca frequenter sunt vaporosa et pestifera habitantibus ea, et in locis illis fuerunt multa tonitrua et coruscationes. Corrumpentur et inficientur multum, ita quod inducunt gravem mortalitatem in homines et animalia alia, quia aër umidus corrumpitur et efficitur venenosus et penetrat indigestus ad interiora vitalium et perimit subito. Talia autem loca etiam paludosa sunt frequenter ex umore diffuso in terram et corrumpente habitationem; quandocumque enim calidum non est nisi corrumpens umidum et non vincens ipsum, inducit pestiferas corruptiones, et ideo talia loca fugienda sunt, quia etiam ea quae cultura nascuntur in talibus locis, frequenter corrumpunt, quia, sicut diximus superius, locus et locatum connaturalitatem multam habent'.

40 *DNL*, 1. 13. p. 22, 88–96.

41 *DNL*, 1. 13. pp. 22, 97–23, 7.

42 Albertus, *Meteora*, ed. by Paul Hossfeld (Alberti Magni Opera omnia, 6. 1) (Münster i.W.: Aschendorff, 2004), III. 2. 6, pp. 133, 42–134, 2, p. 134, 46–48.

corrupt vapour leaks gradually out through the pores of the earth, killing animals (e.g., sheep) that take their nourishment from the soil and thus absorb the poison.[43]

Albert also affirms that he was once an eyewitness to the poisoning effect of the vapour arising from below the surface of the earth.

> Ego autem vidi in Paduana civitate Lombardiae quod puteus ab antiquo tempore clausus inventus fuit, qui cum aperiretur et quidam intraret ad purgandum puteum, mortuus fuit ex vapore cavernae illius. Et similiter mortuus est secundus, et tertius voluit scire, quare duo moras agerent, inclinatus in puteum adeo debilitatus est quod spatio duorum dierum vix rediit ad seipsum. Cum autem exspirasset vapor putrefactus in puteo, factus est bonus et potabilis.[44] (In Padua, a city of Lombardy, I saw that a well that had long been closed was found. After the well was opened, someone got in to purge it, but died from the vapour coming out of that cave. The same happened to a second person. Since he wanted to know why the two were delaying, a third man leant into the well, but was so weakened that only after two days he could barely come back to himself. Only after the putrefied vapour had exhaled, did [the water in] the well become good and drinkable).

The episode shows that here Albert understands *pestilentia* as a form of poisoning due to inhalation of toxic vapours.

3.3. Astrological Causes

Let us now return to the initial passage from Albert's commentary on the *DCPE* and examine the second type of causes of air contamination evoked there, namely, celestial bodies. In particular, Albert refers to the doctrine of planetary conjunctions, i.e., the theory relating natural catastrophes and momentous historical events to the alignments of the planets moving along the ecliptic. One of the forms of the so-called universal astrology, this theory had been advanced by the Arab astrologer Albumasar in his renowned work *On the great conjunctions* (*Book of Religions and Dynasties*), written in Arabic towards the end of the ninth century and translated into Latin in the twelfth century by John of Seville, then revised in Toledo later in the twelfth century. Conjunctionist astrology enjoyed great success in the Latin Middle Ages and Early Modern Times, Albert being one of the Western scholars most fascinated with it.[45]

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43 *Met.*, III. 2. 12. p. 141, 30–58, esp. p. 141, 48–58: 'Scias etiam quod frequenter pestilentia et praecipue omnem sequitur terraemotum. *Vapor* enim inclusus et privatus sic luce et aëre libero grossus est habens quasi veneni naturam. Et ideo animalia interficit, praecipue quae terrae quasi semper proximum os tenent sicut oves. Quia antequam totus erumpat vapor, per plures dies semper aliquid eius paulatim per poros terrae evadit et laedit animalia pastum in loco terraemotus accipientia et continue os iuxta terram habentia, quia ex hoc quasi continue hauriunt vaporem venenosum'.

44 *Met.*, III. 2. 12. p. 141, 30–72.

45 Alessandro Palazzo, 'Astrology and Politics: the Theory of Great Conjunctions in Albert the Great', in *Stars, Kingdoms, Beliefs, and Masses. Political Astrology in the Mediterranean Area from the Middle Ages to the Renaissance*, ed. by Marienza Benedetto and others, *Quaestio*, 19 (2019), pp. 173–203, with extensive bibliography on the medieval discussion on great conjunctions.

The theory of great conjunctions was a very effective scientific tool, which enabled Albert to explain natural phenomena and human affairs taking place on the whole Earth, in a specific region, or in a city in terms of celestial causality. Since planetary conjunctions were seen as causes — and thus signs — of events to come, this astrological doctrine was believed to also provide information about the future. Although the periodic alignments of Saturn and Jupiter ('great conjunctions') constituted the core of conjunctionism,[46] Mars too played a crucial role and, by coming into conjunction with other planets, had a major impact on the sublunar world.

In his commentary on the *DCPE*, Albert ascribes several types of calamities — including pestilences — to the conjunctions of the planets.

> Coniunctio enim duarum praecipue stellarum, quae sunt Iuppiter et Mars, cum aliis coadiuvantibus in signo Geminorum, quod est triplicitatis aëreae, faciunt ventos pestilentes et aëres corruptos, qui subito necant multitudinem hominum et animalium, sicut ventus fuit, qui in Adremoth interfecit exercitum unum subito; Iuppiter enim, cum calidus et umidus in natura, habet elevare ventos et vapores et praecipue in signo Geminorum, quod signum est calidum et umidum in ultimo statu naturae aëris. Mars autem, cum sit intemperate calidus et siccus, ignit vapores elevatos, et ideo incipiunt per aërem multiplicari fulgura et scintillationes et pestiferi vapores et ignes et veneno peracuto et ideo inducunt frequenter pestilentias[47] (The conjunction of Jupiter and Mars, aided by other celestial bodies in the sign of Gemini, a sign belonging to the airy triplicity, brings about pestilential winds and contaminates the air, which kills multitudes of men and animals, as did the wind that in Adremoth instantaneously destroyed an entire army. Being naturally warm and humid, Jupiter must raise winds and vapours, mainly in the sign of Gemini, which is a warm and humid sign in the extreme condition of the airy nature. By contrast, Mars, being excessively warm and dry, inflames the risen vapours. Hence, the air gets filled with bolts of lightning and sparkles, and pestilential vapours and flames poison the air and thus cause frequent pestilences).

While the reference to the wind of Adramoth is already in the *DCPE*, Albert himself provides the scientific explanation of how the conjunction of Jupiter and Mars causes the air to be poisoned and pestilences to take place. In the *DCPE*, Albert also finds a mention of a wind that was produced by the conjunction of some planets in the sign of Virgo and that brought about a pestilence in Iamen, a region of India.[48]

Albert also relates the pestilential air to the joint effects of Mars and Jupiter in the section of the *Met.* dealing with thunders.[49]

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46 *DCPE*, I. 2. 2. pp. 64, 82–65, 17.

47 *DCPE*, II. 2. 1. p. 96, 53–68.

48 Ps.-Aristoteles, *De causis proprietatum elementorum*, ed. by. Paul Hossfeld, in Albertus, *De causis proprietatum elementorum*, p. 62, 72–74. See *DCPE*, I. 2. 2. p. 64, 10–17.

49 *Met.*, III. 3. 22. p. 173, 36–47: '[…] tonare attribuunt, cuius nulla alia causa est, nisi quia Iuppiter habet in proprietate elevare ventorum fortium et siccorum materiam, ut supra diximus, praecipue quando fuerit coniunctus in virtute aliqua cum Marte tempore aestivo in signis aquilonaribus; quia tunc certissime potest

3.4. Medical Explanations

In the texts we are analysing, Albert does not deal with curative measures to be taken against pestilences. In a few passages, however, in addition to the causes and the process of air corruption, he also examines the impact of contaminated air on the human body and the development of the disease. In the commentary on the *DCPE*, he argues that excessive dryness of the air excites (*acuit*) the humors produced by the human body, giving rise to serious illnesses (*aegritudines pravae*) and lethal pestilences. Wise physicians, Albert continues, state that corrupted air contaminates even more than food and drink, because it reaches, unaltered, the lung, the heart, and, through hidden pores, the whole body, while food and drink reach the inner vital organs only after being cooked and digested.[50]

Albert also takes a medical approach in the *quaestio de animalibus* no. 32 ('Utrum morbus pestilentialis proveniat ex infectione aëris') of Book 7.

> Ad istud dicendum, quod morbus pestilentialis maxime provenit ex infectione aëris, quia cum aër infectus inspiratur, inficit pulmonem, quia rarae compositionis est, et pulmone infecto inficitur cor, et ideo respirantibus et inspirantibus accidit talis morbus.[51] (It must be replied to this that a pestilential disease to a largest extent arises from the corruption of the air, because once the corrupted air has been inspired, it infects the lung, which is composed of a thin substance, and after the lung the heart gets infected; therefore, this disease affects those who breathe in and breathe out).

In the same *quaestio*, once again Albert mentions carcasses and other rotten beings as causes of aerial contamination, adding that since cadavers and putrid things are more numerous (*magis abundant*) on the surface of earth than in the upper part of the air, birds are less affected than ground-bound animals by the abovementioned disease.[52]

Moreover, domestic animals tend to die more than wild animals for several reasons:[53] first, since they are more numerous and live in a smaller spaces, the mingling

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praedici quod multae scintillationes et tonitrua fient in aëre, ita ut etiam periculum sit futurum hominibus propter aëris pestilentiam ex nimia corruptione futura propter vapores incensos pestiferos immixtos aëri; quia Iuppiter cum sole elevat eos et Mars incendendo corrumpit eosdem; et ita fit aër venenosus'.

50 *DCPE*, II. 2. 1. p. 96, 69–78: 'Aliis etiam de causis similibus accidit *aëri superflua siccitas*, quae acuit umores generatos in hominibus, et ideo *habitatoribus* illius aëris *accidunt aegritudines pravae et pestilentiae mortiferae*; plus enim inficit aër corruptus quam corruptus cibus vet potus, sicut dicunt Sapientes Medicorum, eo quod aër corruptus non alteratus transit ad pulmonem et ad cor et per poros occultos in corpus totum. Cibus autem et potus ad interiora vitalia non pertingunt nisi alterata per decoctiones et digestiones'. From a parallel passage in the *De animalibus* we learn that Albert was certainly referring to Galen (*De regimine sanitatis*, I. 1): see Albertus, *De animalibus*, vol. 1, VII. 3. 5. p. 569, 10–13. The passage is also quoted by Henry of Herford (*Catena aurea entium*, V. 2. 7; VIII. 6. 17), who mentions Galen explicitly.

51 Albertus, *Quaestiones super De animalibus*, VII. 32. p. 186, 27–32.

52 Id., *Quaestiones*, ed. Ephrem Filthaut, VII. 32. p. 186, 42–45: 'Praeterea, aër inficitur ex cadaveribus mortuorum animalium et aliis putrefactis, quae magis abundant in superficie terrae quam in superiore parte aëris, et ideo iste morbus minus accidit avibus quam gressibilibus'.

53 Id., *Quaestiones*, ed. Ephrem Filthaut, VII. 32. p. 186, 47–59.

of their breaths makes air more infectious ('ex multiplicatione sui anhelitus magis inficitur aër');[54] second, domestic animals are more humid than wild animals, because they are fatter, and humidity is the principal agent of corruption and putrefaction;[55] especially sheep and oxen die of this disease ('ex tali morbo'), the former feeding on the products of farming (*ex terraenascentibus*) and being unable to distinguish what is toxic from what is innocuous, the latter having a lung of thin substance (*rarae compositionis*), which means their heart and breath (*spiritus*) get more easily infected when they inspire polluted air.

In the *Met.*, Albert once again has recourse to conjunctionism. He describes the different types of fires that are formed in the cold region of the air by drawing on Seneca's *Naturales Quaestiones*. When all these different kinds of flames are under the influence of Mars, especially in the years of its conjunction with Jupiter, they foreshadow storms, outbreaks of anger in human beings, and pestilences. In particular, flames (*scintillationes*) spread through the air, corrupting and poisoning it. The poisoned air causes abscesses and pustules ('ad apostemata generanda et variolas').[56]

In the texts examined so far, the term 'pestilence' is used to designate a wide range of epidemic, endemic, and contagious diseases, whose exact identity, however, is often difficult to pinpoint.

3.5. Leprosy

Leprosy is a contagious disease whose specific nature Albert seems to be aware of. One of the main sources for the medieval discussion on leprosy is the Bible, which Albert also cites in this regard several times. The biblical background explains a distinctive trait of the medieval discourse on leprosy, namely, the interplay between the spiritual (leprosy as a disease of the soul, which is a consequence and a manifestation of sin) and the physical level (leprosy as a disease affecting the body).[57] In the

54 The trasmission of the disease through contaminated breath foreshadows the concept of contagion through contiguity, an idea which Albert does not further elaborate upon.

55 See Galenus, *In Hippocr. Epidem.*, III. 1, Kühn XVII, 651. Humidity [*humidum*] is the subject of putrefaction: see *Met.*, IV, 1, 8, p. 220, 1–30. On the process of putrefaction in general, see *Met.* IV. 1. 5–11, pp. 216, 21–224, 65.

56 *Met.*, I. 4. 9. p. 39, 58–66: 'Significationes omnium istorum sunt secundum effectum Martis, et praecipue quando fiunt in anno, quando Mars et Iuppiter sunt coniuncti. Tunc enim in aëre signant huiusmodi ignes tempestates et in hominibus iras et pestilentias ex aëreo veneno, quia scintillationes huiusmodi saepius discurrentes per aërea, cum sit vapor frigidus et siccus combustus, corrumpunt aërem et faciunt venenosum, praecipue ad apostemata generanda et variolas et huiusmodi'. See also *Met.*, I. 4. 9. p. 40, 6–9: 'Vult autem Albumasar quod etiam ista aliquando mortes regum et principum significent propter dominium Martis, praecipue quando fiunt in forma inconsueta et saepius solito'.

57 Saul Nathaniel Brody, *The Disease of the Soul. Leprosy in Medieval Literature* (Ithaca-London: Cornell University Press, 1974); Grmek, 'Le concept d'infection dans l'Antiquité et au Moyen Age', pp. 18–23; Stearns, *Infectious Ideas*, pp. 37–66. Scholarship on medieval conceptions of leprosy is extensive and ever growing: see, e.g., Richard Palmer, 'The Church, Leprosy and Plague in Medieval and Early Modern Europe', in *The Church and Healing*. Papers Read at the Twentieth Summer Meeting and the Twenty-First Winter Meeting of the Ecclesiastical History Society, ed. William J. Sheils (Oxford: Basil Blackwell, 1982), pp. 79–99; François-Olivier Touati, 'Contagion and Leprosy: Myth, Ideas and Evolution in Medieval

Commentary on the *Gospel of Luke*, Albert addresses a difficulty arising from the apparent contrast between the Biblical passages (*Leviticus* 14 and 2 *Kings* 5) forbidding contacts with lepers and the episode of Christ touching the lepers. The inconsistency is avoided by arguing that since leprosy is a contagious disease, the prohibition was imposed to avoid disseminating it. Since, in the case of Christ, touching does not propagate the infection, but is aimed at curing the disease, the law is not abolished, but rather it is respected according to the intention of the lawgiver ('non solvitur lex, sed impletur secundum legislatoris intentionem').[58]

The religious characterization of leprosy is also behind Albert's reflection on its contagiousness. In Book 4 of the *Sentences* commentary, Albert reflects on the phrase 'mentis contagione ac cecitate', used in Peter Lombard's *Liber Sententiarum* to qualify sin, and contrasts contagion with sin.[59] What is important for us in this passage is not the denial of the ability of sin 'to produce a contagion' ('contagionem faciens'), a point Albert will refute in his reply to this argument, but the notion of contagion as a disease originating from contact, a definition which is reminiscent of Isidore of Seville's *Etymologiae*.[60]

> Contagio enim est morbus proveniens ex simili contactu: sicut dicitur morbus contagiosus, qui ex convictu et contactu quodam conversationis et communicationis quae in conversatione est, contrahitur: non autem omne peccatum est tale: ergo non omne peccatum est contagionem faciens[61] (Indeed, contagion is a disease arising from a similar contact, just as a contagious disease is called that which is contracted from both living together and some contact caused by being associated and mutually interacting. But not every sin is such; therefore, not every sin produces a contagion).

The text affirms that contagion is not the process of transmission of the sickness, but the sickness itself. This point is reiterated in Albert's reply to the argument, where he clarifies that every sin causes contagion. He also adds that contagion is the corruption produced by the influence of a noxious cause.

Minds and Societies', in *Contagion. Perspectives from Pre-Modern Societies*, pp. 179–201; Luke Demaitre, *Leprosy in Pre-Modern Societies. A Malady of the Whole Body* (Baltimore: Johns Hopkins University Press, 2007), and bibliography quoted in both contributions.

58 Albertus, *Enarrationes in primam partem Evangelii Lucae (I–IX)*, ed. by Auguste Borgnet (Alberti Magni Opera omnia, 22) (Paris: Vivès, 1894), 5. 13, p. 374b: 'Videtur autem contra legem facere, Levit. XIV, 1 et seq., ubi dicitur, quod qui tangit leprosum immundus erit. Adhuc, IV Reg. V, 10, Eliseus non tetigit leprosum, sed verbo curavit. Sed ad hoc dicendum, sicut diximus in Matthaeo, quod lex non tangendi leprosum ideo data est, quia lepra morbus contagiosus est: et ideo praecipiuntur non tangi, ne leprosi per factum multiplicentur. Ubi ergo per tactum non fit infectio, sed leprae curatio, ibi non solvitur lex, sed impletur secundum legislatoris intentionem. Et hoc modo secundum Chrysostomum, ostendit se Christus non contrarium legi, sed super legem ut legis Dominum'.

59 Petrus Lombardus, *Sententiae in IV libris distinctae*. T. II, *Liber III et IV*, Editiones Collegii S. Bonaventurae Ad Claras Aquas (Grottaferrata: 1981), IV. 18. 4. p. 357, 8–9.

60 Isidorus, *Etymologiarum libri*, IV. 6: 'Idem et contagium a contingendo, quia quemquem tetigerit, polluit'.

61 Albertus, *Commentarii in IV Sententiarum (dist. I–XXII)*, ed. by Auguste Borgnet (Alberti Magni Opera omnia, 29) (Paris: Vivès, 1894), IV. 18. 8, p. 778a.

> [...] dicendum quod omne peccatum contagionem imprimit: dicitur enim hic contagio, non quae serpit tantum ab uno in alium, sed etiam corruptio contracta ex impressione foedantis et putrefacientis[62] ([...] it must be said that every sin causes a contagion. Indeed, we call contagion not only that which creeps from one to another, but also the corruption caused by what pollutes and putrefies).

In other works,[63] Albert draws on the explanatory model of leprosy set forth by Avicenna in the *Canon*,[64] according to which leprosy is an illness whose origin lies in the mental representations of lepers.[65]

This conception is closely related to Avicenna's understanding of the connection between soul and body, as set out in the psychological section of his major encyclopedic work, *Kitāb al-Šifā'*. Here, Avicenna depicts the body-mind relationship in terms of the soul being superior to and independent of the body. This fact is evident in the soul's ability to modify the body without physical intermediation, only through mental representations (emotions, images, and so on). For instance, when a sick man is truly convinced that he will recover and the form of this conviction becomes firmly rooted in his mind, this form affects his body and he becomes well; the opposite happens when a healthy man believes he is ill. The action of the form conceived of by the man is more effective than any medical treatment involving the use of material instruments and media.[66]

Whether leprosy originates from physical contact between bodies or is due to the influence of the soul on the body, the etiologies proposed by Albert make leprosy a natural event which does not involve supernatural causes, notwithstanding the aforementioned intermingling of two levels (spiritual and physical) in the analysis of the disease.

Albert's strictly scientific approach to pestilences and infectious diseases becomes even more evident when it comes to commenting on the famous apocalyptic verses of the *Gospel of Luke* mentioning earthquakes, famine, pestilences, and great signs from the sky.

> Tunc dicebat illis: Surget gens contra gentem, et regnum adversus regnum; et terrae motus magni et per loca fames et pestilentiae erunt, terroresque et de

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62 Albertus, *Sent.*, IV 18. 8. p. 780a.

63 See Albertus, *De fato*, ed. by Paul Simon (Alberti Magni Opera omnia, 17. 1) (Münster i.W.: Aschendorff, 1975), 2. p. 70, 15–18 with references to other passages in Albert's corpus.

64 Robert, 'Contagion morale et transmission des maladies'.

65 Albertus, *De causis et processu universitatis a prima causa*, ed. by Winfried Fauser (Alberti Magni Opera omnia, 17. 2) (Münster i.W.: Aschendorff, 1993), II. 2. 21, p. 115, 70–79: 'Propter quod dicit Avicenna, quod omnis materia subiecta motori alicui, statim ut concipit formam motoris, appetit eam et movetur ad ipsam induendam. Sicut videmus, quod concipiente anima aliquod delectabile, quod dum corpori immittitur per spiritum, statim appetit illud corpus et movetur ad iuduendum ipsum. Propter quod medicus cognoscit accidentia animae inter alias causas aegritudinum. Iam enim quidam, ut dicit Avicenna, ex cogitatione et timore lepre leprosi facti sunt'. See Avicenna, *Liber canonis*, IV. fen 3. tr. 3. cap. 1, f. 442vb-443ra; see also I. fen 1. doctr. 4. c. 2., f. 6vb.

66 Avicenna, *Liber de anima seu Sextus de naturalibus IV–V*, ed. by Simone Van Riet (Louvain-Leiden: Éditions Orientalistes-Brill, 1968), IV. 4. p. 64, 20–24.

> caelo signa magna erunt (Then he said to them: Nation will rise against nation, and kingdom against kingdom. There will be powerful earthquakes, famines, and plagues from place to place; and awesome sights and mighty signs will come from the sky; *Luke* 21. 10–11).

In this case, Albert applies aerial etiology to supernaturally induced pestilences, figuring out the chain of natural processes eventually leading to them. God's anger ('igne furoris Domini') is seen as the first origin of the calamity, which is however the product of a series of natural processes. As in *DNL*, Albert claims that the air is corrupted by thunder and lightning produced by a burning and poisonous vapour. As a consequence, dew and rain infect the earth and poison what is born from it, the products of farming become contaminated, and the underground vapours are shaken, causing earthquakes.[67] By explaining the pestilences and catastrophes in natural terms (*naturaliter*), Albert deprives Luke's verses and other apocalyptic Biblical passages (e.g., *Revelation* 8,5) of their eschatological value. This philosophical exegesis is in line with Albert's general uneasiness with prophetic eschatologism.[68]

4. The Aftermath of Albert's Discussion of Pestilences

According to John Arrizabalaga, the reactions of the mid-fourteenth-century plague treatises to the Black Death 'are the first attempts in late medieval Europe to construct it [scil., plague] as a disease-entity'.[69] In his fundamental article, Arrizabalaga

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67 Albertus, *Enarrationes in secundam partem Evangelii Lucae (X–XXIV)*, ed. Auguste Borgnet (Alberti Magni Opera omnia, 23) (Paris: Vivès, 1894), p. 635a: '"Et pestilentiae". Secundum signum quod est ab aere. Aere enim corrupto cadit ros corruptus, et guttae pluviarum corruptae super terrae nascentia, et faciunt ea venenosa, et pestem sive mortalitatem inducentia. Unde pestilentia, ut dicit Isidorus, dicitur quasi pastulentia: quia pestis illa a pastu venenatorum causatur. Ezechiel. V, 17: *Pestilentia et sanguis transibunt per te.* Jerem. XXI, 6: *Percutiam habitatores civitatis hujus*, scilicet Jerusalem: *homines et bestiae pestilentia magna morientur.* De utroque istorum simul dicitur, Apocal. VIII, 5: *Accepit Angelus thuribulum, et implevit illud de igne altaris, et misit in terram: et facta sunt tonitrua, et voces, et fulgura, et terrae motus magnus.* Angelus autem est Christus Dominus, qui thuribulum cordis sui implevit igne furoris Domini in Judaeos, et effudit in terram Judaeam. Et facta sunt tonitrua et coruscationes, quae naturaliter ex vapore ignito venenoso et corrumpunt aerem, et pastum qui de terra nascitur: et commovendo vapores subterraneos faciunt terrae motum. Haec autem plaga spiritualiter ab eis procuratur, qui mala dant exempla: pastu enim illorum alii corrumpuntur'.

68 Albertus, *Commentarii in IV Sententiarum dist. XXIII–L*, ed. Auguste Borgnet (Alberti Magni Opera omnia, 30) (Paris: Vivès, 1894), IV. 43. 7, pp. 516–18, "An scibile sit tempus adventus Domini ad judicium".

69 John Arrizabalaga, 'Facing the Black Death', pp. 238, 286–87. On the numerous plague treatises related to the Black Death, see Dorothea Waley Singer, 'Some Plague Tractates (Fourtheenth and Fifteenth Centuries)', *Proceedings of the Royal Society of Medicine*. Section of the History of Medicine, 9 (1916), pp. 159–212; Anna Montgomery Campbell, *The Black Death and Men of Learning* (New York: Coloumbia University Press, 1931); Dominick Palazzotto, *The Black Death and medicine: a report and analysis of the tractates written between 1348 and 1350* (PhD dissertation, University of Kansas, 1973); Robert S. Gottfried, *The Black Death. Natural and Human Disaster in Medieval Europe* (New York-London-Toronto-Sydney: The Free Press, 1983), pp. 92–111; Irma Naso, 'Individuazione diagnostica della "Peste nera". Cultura medica e aspetti clinici', in *La peste nera: dati di una realtà*, pp. 351–81; Weill-Parot, 'La rationalité médicale', 73–88; Danielle Jacquart, 'La perception par les contemporains de la peste de 1348', in *L'homme*

has thoroughly explored some of the most authoritative plague treatises with specific regard to the arguments they put forward, the issues they address, and the sources they use. Yet, despite the accuracy and depth of his reconstruction, Arrizabalaga has failed to grasp the crucial role played by Albert's works in this plague literature. It is important to note that behind several of the theses and explanations advanced there were Albert's views on pestilences, and in particular on their etiology. The use of Albert's works is sometimes explicit, mostly silent, and in any case massive, so that it can legitimately be argued that Albert had already initiated the conceptual construction of plague as a 'disease-entity' about a century before the great plague pandemic broke out in Europe in 1347–48.

The recourse to Albert's interpretive categories is also a consequence of the initial widespread perception that the Black Death was not a new type of disease, but only one of the many pestilences occurred in the past, the only difference being its extreme severity and contagiousness.[70] The difficulty to conceptualize the specific character of this disease is also mirrored in the use of a rather traditional and unspecific nosographic vocabulary.[71] The situation changed some time after 1350, when physicians gained awareness of the peculiar features of the plague outbreak compared to past epidemics.[72] John of Burgundy, the author of an important work on plague, affirmed that modern physicians had become much more knowledgeable about the nature of the plague thanks to a long-lasting practice of cures — the statement is found in a tractate written in 1365, i.e., some eighteen years after the plague outbreak had first hit Europe. He also added that their competence in pestilential diseases was incomparably superior to that of medical practitioners and authors of the past because they, with the exception of Hippocrates, had not experienced such a general and enduring epidemic in their life.[73]

Before examining some of the fourteenth-century plague treatises individually, it is worth briefly summarizing some of the main ideas these treatises share with Albert.

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face aux calamités naturelles dans l'Antiquité et au Moyen Âge. Actes du 16ème colloque de la Villa Kérylos à Beaulieu-sur-Mer les 14 & 15 octobre 2005 (Paris: Académie des Inscriptions et Belles-Lettres, 2006), pp. 237–47; John Aberth, *Doctoring the Black Death*.

70 Arrizabalaga, 'Facing the Black Death', pp. 247–48, claims that only Gentile da Foligno changed his view expressed in his earliest and major *consilium*, by acknowledging the unprecedented nature of the 1348 pestilence in two subsequent *consilia.* On the persuasion of a continuity with previous pestilences, see Sabine Krüger, 'Krise der Zeit als Ursache der Pest? Der Traktat De mortalitate in Alamannia des Konrad von Megenberg', in *Festschrift für Hermann Heimpel zum 70. Geburtstag am 19. September 1971*, 2 Bd., ed. by Mitarbeitern des Max-Planck-Instituts für Geschichte (Göttingen: Vandenhoeck & Ruprecht, 1972), pp. 839–83 (p. 839, n. 2).

71 Naso, 'Individuazione diagnostica', pp. 357–61, pp. 372–73.

72 Melissa P. Chase, 'Fevers, Poisons and Apostemes: Authority and Experience in Montpellier Plague Treatises', *Annals of the New York Academy of Sciences*, 441 (1985), pp. 153–69, argues that from 1360 onward Montepellier physicians felt the need for an accurate taxonomy of epidemic diseases and were concerned with fitting plague within an appropriate category. In other words, their clinical experience and the requests of public authorities led this generation of doctors to re-categorize plague and outline its nosographic contours more clearly.

73 Karl Sudhoff, 'Pestschriften aus den ersten 150 Jahren nach der Epidemie des "schwarzen Todes" 1348. III', *Archiv für Geschichte der Medizin*, 5 (1912), pp. 62–69.

As a preliminary remark, it is important to stress that the Aristotelian *Meteora* and the Pseudo-Aristotelian *DCPE*, along with Albert's commentaries on the two works, were given primary importance among the many philosophical and medical works the fourteenth-century literature on plague drew upon and quoted from.[74]

The plague tracts generally agreed with Albert on the theorization of two levels of causes for epidemics — remote and astrological causes, on the one hand, close and physical causes, on the other. Arrizabalaga traces this distinction back to Avicenna, who had differentiated the forms of the heavens from the near causes of pestilential fevers.[75] However, several plague tractates had a more markedly astrological understanding of the remote causes than Avicenna. By celestial and universal causes these treatises usually meant planetary conjunctions, in particular that of Saturn, Jupiter, and Mars in Aquarius which occurred in 1345.[76] Arrizabalaga mentions a few works referring to this famous conjunction (Augustine of Trento's tractate, the *Compendium* of the masters of the Paris medical Faculty, the tractate of the anonymous practitioner of Montpellier),[77] but there were many more.[78] Almost all of them were indebted,

74 Albert's commentary on the *DCPE* is quoted not only by the works we examine below, but also by other plague treatises, for instance by Petrus de Amousis' *Tractatus de epydimia*: see Jacquart, 'La perception par les contemporains', 240. On this work, see Alfred Coville, 'Écrits contemporains sur la peste de 1348 à 1350', in *Histoire littéraire de la France*, t. 37 (Paris: Imprimerie Nationale, 1938), pp. 325–90 (pp. 327–359).

75 Arrizabalaga, 'Facing the Black Death', pp. 251–52. For the general Avicennian scheme, see Avicenna, *Liber canonis*, IV. fen i. tract. 4. cap. 1. f. 416ra.

76 According to Bernard R. Goldstein and David Pingree, 'Levi ben Gerson's Prognostication for the Conjunction of 1345', *Transactions of the American Philosophical Society*, 80. 6, (1990) pp. 1–60 (p. 52), the triple conjunction was in fact not a single conjunction of the three planets but a series of three conjunctions, of Mars with Jupiter (1st of March), Mars with Saturn (4th of March), and Jupiter with Saturn (21st of March).

77 Arrizabalaga, 'Facing the Black Death', pp. 252–54. Apart from the reference to the 1345 conjunction of the three major planets, Augustine's treatise stands out for the prominent place it gives to astrological factors for the understanding of pestilences. On Augustine's work, see Lynn Thorndike, 'A pest tractate before the black death', *Sudhoffs Archiv für Geschichte der Medizin*, 23 (1930), pp. 346–56 (repr. with additions as 'Augustine of Trent; a pest tractate before the black death', in Lynn Thorndike, *A History of Magic and Experimental Science*, vol. 3 [New York: Columbia University Press, 1934], pp. 224–32); Domenico Gobbi, *Agostino da Trento. Astrologia e medicina* (Trento: Civis, 2009); Francesca Bonini, 'Forms of Pronosticatio in the Plague Tractate by Augustine of Trento', in *Prophecy and Prophets in the Middle Ages*, ed. by Alessandro Palazzo and Anna Rodolfi (Firenze: Sismel-Edizioni il Galluzzo, 2020), pp. 215–34; Ead., 'The Plague Tractate by Augustine of Trento', *Studi Filosofici*, 43 (2020), pp. 53–74; Ead., 'Plague and Astrology in the Fourteenth Century: The Plague Tractate by Augustine of Trento', *Bulletin de Philosophie Médiévale*, 63 (2022), pp. 383–472.

78 See Campbell, *The Black Death and Men of Learning*, pp. 37–44; Coville, 'Écrits contemporains sur la peste de 1348 à 1350', pp. 363–65, pp. 372–82, with specific regard to the *Causa epidemiae et preservatio eiusdem* and Simon de Couvin's allegorical poem *De judicio Solis in conviviis Saturni*; Palazzotto, *The Black Death and medicine*, pp. 64–72. See, e.g., Symon de Covino, *De judicio Solis in conviviis Saturni*, ed. by Emile Littré, 'Opuscule relatif à la peste de 1348, composé par un contemporain', *Bibliothèque de l'école des chartes*, 2 (1841), pp. 206–43; Raimundus Chalmelli de Vivario, *De peste*, ed. by Robert Hoeniger, in Id., *Der schwarze Tod in Deutschland: ein Beitrag zur Geschichte des vierzehnten Jahrhunderts* (Berlin: Grosse, 1882), pp. 159–77 (p. 161); *Causa epidemiae et preservatio eiusdem*, ed. by Karl Sudhoff, *Archiv für Geschichte der Medizin*, 5, 1/2 (1911), no. 23, pp. 41–46 (p. 42); *Quaestiones*, ed. Karl Sudhoff, *Archiv für Geschichte der Medizin*, 11, 1/2 (1918), no. 107, pp. 52–55 (p. 53). The importance of the conjunction of

either explicitly or implicitly, to Albert on this point. In fewer cases, eclipses were also included among celestial causes of the plague.

The view that pestilence was caused by air corruption was predominant in the fourteenth-century plague treatises, whether or not they attributed this corruption to celestial causes.[79] Some tractates went as far as identifying plague with pestilential air *tout court*.[80] As said above, 'aerist' theory was a widespread etiological model of epidemics in Antiquity and the Middle Ages; therefore, it is difficult to regard Albert as the only source on this point.

However, more specific ideas put forward by some treatises might be traced back to Albert as a main source. Plague tractates shared Albert's conviction about the link between stench and pestilential air,[81] and thus his advice to avoid places contaminated by the presence of stagnant waters or corpses. A few animals — especially the basilisk — were viewed as a cause of poisonous vapours, just as Albert had held the *dracones* responsible for poisoning the air. Albert's view that often a pestilence followed an earthquake was a common conception among fourteenth-century authors.[82] Some of them saw this theory confirmed by the devastating earthquake that struck Carinthia and other areas of Austria, Southern Germany, and Friuli in 1348.

A few treatises explained the pestilence on the basis of the Avicennian soul-body doctrine, urging people not to entertain negative thoughts about or have fear of the plague, because mental images were thought to cause the sickness.[83] As said above,

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the three superior planets also emerges in the vernacular adaptations of some of the Latin treatises: see, e.g., one of the vernacular versions of the Parisian *Compendium* and Guy de Chauliac's *La grande Chirurgie* in *Sylvie Bazin-Tacchella*, 'Rupture et continuité du discours médical à travers les écrits sur la peste de 1348: Le *Compendium de epidemia* (1348) et ses adaptations françaises. La relation de peste contenue dans la *Chirurgia Magna* de Guy de Chauliac (1363)', in *Air, miasmes et contagion,* pp. 105–56 (pp. 133–34 [Albert is quoted], p. 155).

Petrus de Amousis also refers to the 1345 conjuntion and uses astral configurations to explain the selectivity of contagion, human bodies being more or less subject to contamination depending on astral influences. For this reason, the fate of people living in the same climate may be different, with some dying and some surviving: see Jacquart, 'La perception par les contemporains', pp. 244–45. The selectivity of contagion is also explained on an astrological basis by Michele Savonarola and Antonio Guaineri, two fifteenth-century physicians: see Danielle Jacquart, 'Theory, Everyday Practice and Three Fifteenth-Century Physicians', *Osiris*, 6 (1990), pp. 140–60 (p. 146).

79 See Campbell, *The Black Death and Men of Learning*, pp. 48–56; Palazzotto, *The Black Death and medicine*, pp. 72–84.

80 See Arrizabalaga, 'Facing the Black Death', pp. 245–46.

81 Arrizabalaga, 'Facing the Black Death', 275–77, 285, mentions the Parisian *Compendium*, Gentile da Foligno, and Jacme d'Agramont. See also Palazzotto, *The Black Death and medicine*, pp. 165–91.

82 Besides the treatises examined below, see, e.g., *Epistola et regimen Alphontii Cordubensis, de pestilentia*, ed. by Karl Sudhoff, *Archiv für Geschichte der Medizin*, 3, 3 (1909), pp. 223–26 (p. 224); Karl Sudhoff, 'Pestschriften aus den ersten 150 Jahren nach der Epidemie des "schwarzen Todes" 1348. XI Ausarbeitungen über die Pest vor der Mitte des 15. Jahrhunderts entstanden im niederen Deutschland', *Archiv für Geschichte der Medizin*, 11, 1/2 (1918), no. 108, p. 56 (this is however a late treatise dating to the fifteenth century).

83 The idea is advanced not only by Jacme d'Agramont (Art. V, Part 2, Chap. 6), but also by several other treatises: see, e.g., *Ad preseruandum a pestilencia regimen bonum*, ed. by Karl Sudhoff, *Archiv für Geschichte der Medizin*, 11, 1/2 (1918), no. 113, p. 72.

the process whereby bodily transformations are induced by mental representations had been used by Albert to explain the genesis of leprosy.[84]

4.1. Jacme d'Agramont, Regiment de preservació de pestilència

A physician working at the medical *Studium* of Lérida, Jacme d'Agramont wrote a tractate on the plague titled *Regiment de preservació de pestilència* (= *Regiment*). The work is noteworthy for several reasons. First of all, since it dates to 24 April 1348, it is likely to be the first treatise to have been written after the outbreak of the Black Death in Europe. Furthermore, since Jacme intended to lay down a regimen of prevention for the benefit of ordinary people, he addressed his work not to professional physicians, but to the noble men and councillors of the town of Lérida in Catalonia. Moreover, due to its very purpose and addressees, the tractate was written in the Catalan vernacular.[85]

Albert's influence is more significant in the etiological section of this work. Jacme makes his debt clear through two explicit Albert quotes. Their importance cannot be underestimated, because apart from the often-quoted Sacred Scriptures there are only few *auctoritates* (Aristotle, Avicenna, Galen, Rhazes) cited by name in the *Regiment*. Jacme therefore contributed to the dissemination of some of Albert's natural-philosophical ideas about pestilences among a wider non-Latin readership.

But what notions does Jacme owe to Albert? Among the causes of a universal pestilence, Jacme includes planetary conjunctions, quoting the passage in Albert's commentary on the *DCPE* (I, 2, 2) dealing with the great conjunctions between Saturn and Jupiter as causes of mortality and depopulation. Jacme finds the deadly influence of the conjunction difficult to understand, because the qualities of Jupiter are opposed to those of Saturn and should prevent its negative action.[86] Albert is quoted once again as saying that the influence is due to an occult property without a proper name, just like the properties causing the purgative action of rhubarb or the attraction exerted by the magnet.[87]

Besides these explicit citations of Albert's work, in the *Regiment* we find some of his most important ideas. For instance, Jacme shares the view that a pestilence may be brought about by an infection of the air caused by unburied remains of men and horses lying on a battleground.[88] Moreover, he also agrees with the claim

84 On this, see also *Pesttraktat*, ed. by Karl Sudhoff, *Archiv für Geschichte der Medizin*, 11, 1/2 (1918), nos 114–15, p. 92 (dating to the fifteenth century).

85 On Jacme's *Regiment*, see Charles-Edward A. Winslow and María Luisa Duran-Reynals, 'Jacme d'Agramont and the first of the plague tractates', *Bulletin of the History of Medicine*, 22 (1948), pp. 747–65; Francisco José Cremades Rodríguez, *Traducció al castellà del* Regiment de preservació a epidèmia o pestilència e mortaldats *de Jacme d'Agramont* (Tesi doctoral, Universitat d'Alacant, 2009); Id., *El Regiment de preservació de pestilència (1348) de Jacme d'Agramont. Història del manuscrit guardat a Verdú, context i versió en català actual* (Tàrrega-Lleida: Museu Comarcal de l'Urgell-Tàrrega, 2016).

86 Jacme d'Agramont, *Regiment*, ed. Veny, Article II, Part 1, Ch. 2. p. 56b, 33–41.

87 *Regiment*, Article II. Part 1, Ch. 2. p. 56b, 42–46. I was not able to trace this passage in Albert's works.

88 *Regiment*, Article II. Part 1, Ch. 2. pp. 56b, 53–57a, 4.

that vapours formed inside the earth could sometimes cause earthquakes and, once emitted, mixed with the air, corrupting and thickening it.[89] Among the causes of a particular pestilence taking place in a specific city, Jacme also mentions high trees which impede ventilation and thus corrupt the air, but while Albert had referred specifically to walnut and oak trees, he mentions poplars, walnut trees, and fig trees — these differences probably depended on the different natural environments the two authors lived in.[90] Among the signs announcing the coming of a plague, the *Regiment* mentions the appearance in the sky of a fiery body called *drach*, which seems to be the same as the flying dragon mentioned by Albert and, in his wake, by the Parisian physicians in their *Compendium*.[91]

There is, however, a major difference between the *Regiment* and Albert's analyses. The *Regiment* contains frequent biblical references and often advances the view that the plague was a divine punishment for human iniquities. As said, Albert did not accept this theological explanation in a philosophical context. In the last article of the *Regiment*, Jacme goes even so far as to endorse the view that there was a moral plague parallel to the natural pestilence he had examined in the previous parts of the tractate.[92]

4.2. Compendium de epidimia per collegium facultatis medicorum Parisius ordinatum

Albeit not the first plague tractate from a chronological point of view — it dates to October of 1348 — the *Compendium de epidimia per collegium facultatis medicorum Parisius ordinatum* (= *Compendium*)[93] was highly influential due to its origin and official nature. It was a document written by the doctors of the medical faculty at the University of Paris upon request of the king Philipp VI of France and soon became a reference point for many other tractates on plague.[94]

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89 *Regiment*, Article II. Part 1, Ch. 2. p. 57a, 26–33.

90 *Regiment*, Article II. Part 2, Ch. 1. p. 57b, 51–55.

91 *Regiment*, Article III. Ch. 1. p. 59a, 7–9.

92 *Regiment*, Article VI. pp. 65b, 25–66b, 47.

93 On the 'opinion' of the medical faculty of the University of Paris and its vernacular versions (contained respectively in the manuscripts Paris, Bibliothèque nationale de France, fr. 2001 and fr. 12323), see Hippolyte Émile Rébouis, *Étude historique et critique sur la peste* (Paris: Alphonse Picard–Croville-Morant & Foucart, 1888), pp. 34–46; Karl Sudhoff, 'Pestschriften aus den ersten 150 Jahren nach der Epidemie des "schwarzen Todes" 1348. XVIII. Pestschriften aus Frankreich, Spanien und England', *Archiv für Geschichte der Medizin*, 17, 1/3 (1925), pp. 12–139 (pp. 65–76); Coville, 'Écrits contemporains sur la peste de 1348 à 1350', pp. 336–59. Rudolf Sies, *Das 'Pariser Pestgutachten' von 1348 in altfranzösischer Fassung* (Würzburger medizinhistorische Forschungen, 7) (Hannover: Pattensen, 1977), has prepared the critical edition of the vernacular version in Paris, Bibliothèque nationale de France, fr. 12323. Bazin-Tacchella, 'Rupture et continuité du discours médical', pp. 105–31, carries out a comparative analysis of the two vernacular versions of the *Compendium* and Guy of Chauliac's *La Grande Chirurgie*.

94 Campbell, *The Black Death and Men of Learning*, p. 16; Naso, 'Individuazione diagnostica', p. 361; Smoller, 'Earthquakes, Hail, Frogs, and Geography', pp. 172–74, defines the document as the 'best-known scientific discussion of plague from the mid-fourteenth century' (p. 172), while Bazin-Tacchella, 'Rupture et continuité du discours médical', 128, qualifies it as 'un text de référence'.

At the outset of the *Compendium*, the Parisian doctors affirm that they will rely on the statements of ancient renowned philosophers as well as modern wise men, both astrologers and physicians. Albert too must be counted among these sources.[95]

First of all, his influence can be discerned in the idea that the epidemic (*epidimia*) — this is one of the names used by the Parisian masters to refer to the plague — is brought about by both a superior and celestial cause and an inferior and earthly one.[96]

The *Compendium* regards a celestial constellation as the remote and first cause of the 1347–48 pestilence.[97] In particular, the plague pandemic is ascribed to the 'greatest' conjunction of the three major planets (Saturn, Jupiter, and Mars) in Aquarius on 20 March 1345, at one o'clock in the afternoon. This conjunction, aided by other conjunctions and eclipses, corrupted the air surrounding the physicians (*nos*) and heralded both death and famine.[98]

This explanation is bolstered with a quote from the Pseudo-Aristotelian *DCPE* alluding to the great conjunctions of Saturn and Jupiter, occurring every 240 years at every shift of triplicity and producing devastating effects.[99] Albert's influence is explicit because a quote from his commentary on the *DCPE* follows immediately (II, 2, 1). In this passage, which I have already analysed above, Albert depicts the conjunction of Mars and Jupiter as the origin of a pestilential air.[100] It is important

95 *Compendium de epidimia per collegium Facultatis medicorum Parisius ordinatum*, ed. by H. Émile Rébouis, in Id., *Étude historique et critique sur la peste*, pp. 70–145 (p. 72): 'clarissimorum philosophorum antiquorum dictis, ac etiam modernorum sapientium, tam astronomorum quam medicorum'. Other, full or partial, editions of the text are in Justus Friedrich Karl Hecker, 'The Black Death in the fourteenth century', *Wissenschaftliche Annalen der gesammten Heilkunde*, 29 (1834), pp. 219–39; L.-A. Joseph Michon, *Documents inédits sur la grande peste de 1348 (Consultation de la Faculte de Paris, consultation d'un praticien de Montpellier, description de Guillaume de Machaut)* (Paris: J.-B. Baillière et fils, 1860), pp. 49–70; Hoeniger, *Der schwarze Tod in Deutschland*, pp. 152–56.

96 *Compendium*, p. 74.

97 *Compendium*, p. 76: 'Dicamus igitur quod remota causa et primeria istius pestilentie fuit et est aliqua constellatio celestis'.

98 *Compendium*, p. 76: 'Anno namque domini MCCCXLV fuit maxima conjunctio trium planetarum superiorum, scilicet XX[a] die mensis martii, in aquario, prima hora post meridiem: que quidem conjunctio, cum aliquibus conjunctionibus et eclipsibus prioris corruptionis pernecabilis ipsius aeris nos cicumdantis causa existens, mortalitatem et famem nec non et alia multa signat […]'.

99 *Compendium*, p. 76: '[…] testatur Aristoteles, libro suo de causis proprietatum elementorum, circa medium, dicens quod: mortalitas gentium et regna vacua fiunt apud conjunctionem stellarum duarum, Saturni scilicet et Jovis; propter permutationem duarum ipsarum de triplicitate ad triplicitatem, accidunt accidentia magna; et hoc est inventum apud antiquos philosophos". See Ps.-Aristoteles, *De causis proprietatum elementorum*, pp. 63, 80–82.

100 *Compendium*, p. 78: 'Et Albertus de Colonia, libro suo de causis proprietatis elementorum, tractatu 2°, cap. 1, dicit quod conjunctio duarum stellarum, scilicet Martis et Jovis, inducunt magnam pestilentiam in aere […]'. See *DCPE*, II. 2. 1. p. 96, 53–68. The same combination of the two passages, that on the great conjunctions of Saturn and Jupiter from Ps.-Aristotle's *De causis proprietatum elementorum* and that on the conjunction of Jupiter and Mars from Albert's commentary on the *DCPE*, are also quoted in Raimundus Chalmelli de Vinario, *De peste*, ed. Robert Hoeniger, in, Id., *Der schwarze Tod in Deutschland*, p. 164. The quote from Albert's commentary on the *DCPE* is present not only in *Pesttraktate*, but also in astrological literature, for instance the *Summa iudicialis de accidentibus mundi* by John of Eschenden, a specialist in conjunctionist astrology: see Thorndike, *A History of magic and experimental science*, vol. 3, pp. 332–33, pp. 718–19.

to understand that Albert's description of the conjunction of Mars and Jupiter was designed to explain the genesis of the deadly wind that killed an army in Adremoth — a past event recounted by the *DCPE*. On the contrary, the *Compendium* analyses the recent astrological configuration of the two planets and remarks that, from the sixth day of October of 1347 to the end of May of the present year (1348), Mars was in Leo together with the Head of the Dragon, was retrograde, and was in an unfavourable aspect — the fourth — to Jupiter. This astrological configuration is said to be the cause of toxic vapours arising from the earth and infecting the air.[101]

The *Compendium* adds another quotation from Albert's *Met*. explaining the power of Jupiter to raise strong winds.[102] Once again, the *Compendium* adapts the Albert quotation to different geographical and astrological conditions: while Albert asserts that the power of Jupiter depended on the conjunction with Mars taking place in summer in the Northern signs, the *Consilium* speaks of southern winds and the region around Paris ('in nostra regione').

> Jupiter habet a proprietate sua elevare materiam ventorum fortium qui, ut plurimum meridionales existentes, caliditatem et humiditatem superfluas in istis inferioribus induxerunt. Humiditas tamen in nostra regione caliditatem superavit[103] (Jupiter has the property of rising the matter of strong winds, which, being mostly southern winds, produced excessive heat and humidity in these inferior regions. Yet in our region dampness outweighed heat).

In light of the aforesaid, it is clear that the doctors of the Parisian medical Faculty entirely depend on Albert as regards the universal and remote cause of the plague. To describe the 1345 conjunction of three superior planets, they adopt the theory of the great conjunctions, which they significantly do not read in the standard source on this topic — Albumasar's Book on *Great conjunctions* — but in a more concise version provided by the *DCPE*. In so doing, they are strongly influenced by Albert's commentary on the *DCPE*, which contains an exhaustive and technical account of the theory of conjunctions. Moreover, they understand the noxious interaction of Mars and Jupiter on the basis of the two above-mentioned passages in Albert's commentaries on the *DCPE* and the *Met*.

The *Compendium* points to air corruption as the particular and immediate cause of the epidemic,[104] adhering to Albert's views. Apart from this general agreement,

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101 *Compendium*, p. 78.

102 *Compendium*, pp. 78–80: 'Exinde generati sunt venti validi, quia, secundum Albertum, libro quarto metereorum, Jupiter habet a proprietate sua elevare materiam ventorum fortium […]'; see *Met*. III. 2. 22. p. 173, 36–47.

103 *Compendium*, pp. 78, 80.

104 *Compendium*, pp. 80–84. Joëlle Ducos, 'L'air corrompu dans les traités de peste', in *Air, miasmes et contagion*, pp. 87–104 (pp. 94–98), problematizes the concept of air corruption by arguing that the *Compendium* interweaves a meteorological perspective with medical discourse. As a consequence, she singles out four different meanings of air (the location of atmospheric phenomena, matter endowed with qualities and subject to be corrupted, air surrounding physical places and affecting physical states, and matter penetrating into the human body) in the text, remarking that many ambiguities arise concerning the concepts of air corruption, vapours, exhalations, etc.

we also find several tacit textual parallels: the Paris doctors implicitly refer to the passage of Albert's commentary on the *DCPE* (II, 2, 1) stating that contaminated air is more noxious than food and drink because it quickly penetrates into the heart and lung with its evil;[105] moreover, the *Consilium* shares Albert's view that putrid vapours can arise from swamps, ponds, deep valleys (*DNL*, 1, 13), and unburied corpses;[106] furthermore, the Parisian doctors accept the notion that the pestilence may be caused by the putrid vapours that give rise to earthquakes;[107] finally, we find that both Albert's *Met.* (I, 4, 8) and the Parisian physicians refer to that fiery body in the sky known as 'draco'.[108] In sum, the Parisian doctors give voice to some of Albert's most characteristic views on pestilences. Given the authoritativeness of the *Compendium*, these views became part of the fundamental concepts expounded by the plague treatises written during or after the Black Death. Whether or not Albert's name is mentioned, his ideas started enjoying wide currency.

Yet there were differences, too, between the *Compendium* and Albert's theories. Given the urgency of the health crisis and the need to counter the spread of the disease, the Parisian doctors do not limit themselves to the study of the etiology of the plague, but also devote a long section of their *Compendium* to prevention and therapy, aspects mostly neglected by Albert. Furthermore, in contrast with Albert's prominently scientific attitude, the *Compendium* urges the readers to turn to God with humility when the epidemic is caused by divine will. Nevertheless, not even in this case must physicians' advice be overlooked.[109]

4.3. Quidam tractatus de epidemia compositus a quodam practico de Montepessulano

A treatise written by an anonymous practitioner from Montepellier (= Practicus de Montepessulano) in 1349 offers us an example of what can be defined as Albert's conceptual influence.[110] From its beginning, the text shows an evident dependence on the *Compendium* of the Parisian physicians on a few specific points. In particular, in their wake it emphasizes the crucial role of the celestial causes by asserting that

105 *Compendium*, p. 80: 'aer enim malus nocibilior est cibis et potibus, eo quod velociter penetret ad cor et pulmonem cum sui malitia'.

106 *Compendium*, p. 82: 'ut puta a palludibus, lacubus, profundis vallibus, nec non et mortuis corporibus non sepultis nec combustis'.

107 *Compendium*, p. 82, p. 84: 'propter putrefactiones in interioribus coartatas que quando motum terre inducunt, et de facto nuper induxerunt; et sic nocere faciunt et fecerunt, aerem et aquam putrefaciendo'.

108 *Compendium*, p. 88.

109 *Compendium*, p. 92: 'Amplius pretermittere nolumus, quod quando epidimia a voluntate divina procedit, in quo casu non est aliud consilium nisi quod ad ipsum humiliter recurratur, consilium tamen medici non deserendo. Altissimus enim de terra creavit medicinam; unde sanat solus langores Deus qui de fragilitatis solo producit in largitate sua medicinam. Benedictus Deus, gloriosus et excelsus qui, auxiliari non desinens, certam curandi doctrinam timentibus explicavit'.

110 Text published in Michon, *Documents inédits sur la grande peste de 1348*, pp. 71–81. On the text, see Coville, 'Écrits contemporains sur la peste de 1348 à 1350', pp. 359–62. Another edition is Hecker, 'The Black Death in the fourteenth century', pp. 240–48.

the epidemic is identical with air corruption, and all air corruptions can be traced back to celestial causes.[111] The practitioner of Montepellier considers the planetary constellation of the three superior planets taking place in 1345 to be the cause of the plague outbreak. In this regard, he quotes the *Compendium*'s aforementioned passages concerning planetary conjunctions.[112] Since, as we know, the Parisian doctors had drawn their ideas on planetary conjunctions from Albert's views, the practitioner of Montepellier can be seen as being indirectly influenced by Albert via the *Compendium* of the Parisian doctors.

The most original trait of the Montepellier practitioner's treatise resides in its explanation of plague as a contagion due to an aerial spirit going out of the eyes of the sick person and striking the eyes of a healthy person standing nearby and looking at the sick person.[113] 'Visual contagion' gives the epidemic a greater strength and causes instantaneous death. Far from being regarded as miraculous, this form of contagion is considered to be a natural process similar to the phenomenon of burning mirrors described in the Euclidean *Catoptrica*[114]. The Montpellier practitioner describes the genesis of the infectious spirit issuing forth from the eyes in specific medical terms. As the brain expels the 'windy' and poisonous material through the concave optical nerves toward the eyes, the sick person is agonizing and his or her eyes are immobilized and thus unable to move from place to place. The first ventosity (*prima ventositas*), which is still and steady, continually produces a toxic spirit that seeks accommodation in some nature ('quaerit habitaculum in aliqua natura') into which it can enter and be at rest. If a healthy person gazes at this visible spirit (*spiritum visibilem*), he or she is contaminated by the pestilential disease. To clarify this process, the Montepellier physician adduces the example of the basilisk. As soon as this mythical animal firmly looks at a healthy person who observes it in turn, the venomous aerial spirit issuing forth from its eyes impacts the eyes of the person, poisoning him or her. And the basilisk's sight is by nature attracted by clearer body parts (*membra clariora*), like the eyes.[115]

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111 Practicus de Montepessulano, p. 72: 'omnes enim corruptiones aeris reducuntur in causas coelestes'.

112 Practicus de Montepessulano, p. 72, p. 74.

113 Practicus de Montepessulano, pp. 72–73: 'sed major fortitudo hujus epidemiae, et quasi subito interficiens, est quando spiritus aerius egrediens ab oculis aegroti repercusserit ad oculum sani hominis circumstantis, et ipsum aegrum respicientis'. On this theory, see Stearns, *Infectious Ideas*, pp. 95–96. The idea of contagion through sight is also advanced by Guido de Cauliaco, *Chirurgia Magna*, II, doctr. 2, 5. (see Aberth, *The Black Death*, pp. 63–66: p. 64). Sound remarks on the concept of contagion in the plague tractates here examined are found in Palazzotto, *The Black Death and medicine*, pp. 93–99.

114 Practicus de Montepessulano, p. 73.

115 Practicus de Montepessulano, pp. 75–76: '[…] et aliquando cerebrum expellit hanc ventosam et venenosam materiam, per nervos opticos, concavos ad oculos, et tunc aeger est in agone, tenens oculos quasi non possent moveri de loco ad locum, et ibi prima ventositas recipit proprietatem mirabilem, quae, sic stans et permanens, continuo fit spiritus ille toxicus, et quaerit habitaculum in aliqua natura in quam possit intrare, et quiescere. Et quem spiritum visibilem si quis sanus aspexerit, suscipit impressionem morbi pestilentialis, et intoxicatur […] Exemplum de basilisco, qui quando respexerit fortiter aliquem sanum, ipsum respicientem, statim spiritus visibilis et aereus, et venenosus, egrediens ab oculis basilisci, transiens in objecto, scilicet in oculo respicientis basiliscum, statim et subito intoxicat praedictum hominem; vel alias mutatum sit, quod ipsum mori oportet, et de proprietate ejus est semper respicere membra clariora,

As we have seen above, the poisoned spirit issuing from the eyes of a basilisk has parallels in Albert's works. It would probably be going too far to affirm that the physician of Montpellier depended on Albert as his only and immediate source on this point; it is certain, however, that Albert was one of the most authoritative medieval proponents of the view that the basilisk infects by sight and that he influenced all those who in the late Middle Ages evoked this extraordinary property of the basilisk, including the practitioner of Montpellier.

4.4. Tractatus de mortalitate in Alamannia (De epidimia magna)

Scholarly accounts of Conrad of Megenberg's scientific career have already demonstrated that Albert the Great was a fundamental source for his works.[116] Even though Conrad was not properly a physician, but a master of natural philosophy, he deserves our attention as the author of a tractate in the form of a *quaestio* devoted to the plague, entitled *Tractatus de mortalitate in Alamannia* (*Treatise on the Mortality in Germany*).

It must first be mentioned that before writing the Latin *Tractatus de mortalitate*, dating to 1350, Conrad had addressed the issue of plague in Book 2, Chapter 33 of the *Buch von der natürlichen Dingen* (1348–50), a vernacular encyclopaedia.[117] In contrast to previous scholarship, Dagmar Gottschall has emphasized that in the *Buch* Conrad has the attitude of a scientist concerned with understanding plague as a natural phenomenon of the physical world.[118]

Conrad adopts an identical scientific approach and puts forth the same views on plague in the *Tractatus de mortalitate*.[119] In this work, he singles out four possible causes of the plague: the Jews poisoning sources of drinking water; the celestial

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scilicet oculos'. On this, see Arrizabalaga pp. 263–64. The vapour released from the menstruating woman's eyes too acts on clear bodies — mirrors and eyes: see Albertus, *De anima*, II. 3. 1. p. 97, 82–83, p. 98, 27–33.

116 See in particular Dagmar Gottschall, *Konrad von Megenbergs* Buch von den natürlichen Dingen*: ein Dokument deutschsprachiger Albertus Magnus-Rezeption im 14. Jahrhundert* (Leiden-Boston: Brill, 2004), esp. pp. 25–131.

117 Dagmar Gottschall, 'Scienza in volgare: Corrado di Megenberg e la peste del 1348', in *Filosofia in volgare nel medioevo*. Atti del convegno della Società italiana per lo studio del pensiero medievale (S.I.S.P.M.). Lecce, 27–29 settembre 2002, ed. by Nadia Bray and Loris Sturlese (Louvain-la-Neuve: FIDEM, 2003), pp. 107–31. As for Conrad's view on the earthquake as the cause of the plague in his vernacular work, his sources — among them Albert the Great — and the contemporary debates on this topic, see pp. 110–22.

118 Gottschall, 'Scienza in volgare', p. 113.

119 See Dagmar Gottschall, 'Conrad of Megenberg and the Causes of the Plague: a Latin Treatise on the Black Death Composed *c.* 1350 for the Papal Court in Avignon', in *La vie culturelle, intellectuelle et scientifique à la cours des papes d'Avignon*, ed. by Jacqueline Hamesse (Turnhout: Brepols, 2006), pp. 319–32 and the bibliography quoted therein. For the opposite interpretation of the treatise as the moral response of a theologian to the general crisis of his time, see Krüger, 'Krise der Zeit als Ursache der Pest?', pp. 839–62. On the tractate, see also Jens Pfeiffer, 'Macht der Sterne oder Miasmen der Erde: Heinrich von Mügeln und Konrad von Megenberg über die Pest von 1348', in Artes *im Mittelalter*, ed. by Ursula Schaefer (Berlin: Akademie Verlag, 1999), pp. 110–23. An abbreviation of Konrad's treatise, titled *Utrum mortalitas, que fuit hijs annis, fit ab ultione divina propter iniquitates hominum vel a cursu quodam naturali*, has been critically edited by Karl Sudhoff, 'Pestschriften aus den ersten 150 Jahren nach der Epidemie des "schwarzen

virtue due to specific planetary conjunctions; God punishing mankind's iniquities; and corrupted and venomous vapours released by the earth.

What about the presence of Albert in Conrad's *De mortalitate*? As in his other works, Conrad takes Albert's views as an unavoidable reference point, but he does not hesitate to take distance, wherever he finds them incorrect.

After easily rejecting the human agency theory,[120] Conrad examines the astrological explanation at some length. This theory is excluded for several reasons. First, since Saturn completes its orbit around the zodiac sphere in thirty years, mortality would happen every thirty years, but this is not the case. Nor could the conjunctions of Saturn with other planets cause mortality, for no conjunction would last as long as the pestilence, which at the time Conrad was writing the treatise had already been on the rampage for five or six years. Furthermore, whereas what is immediately caused in the sublunary realm by a conjunction occurs according to an orderly process, the pestilence was spreading randomly across regions without following any pattern.[121] For all of these reasons, Conrad concludes that the mortality does not seem to derive from the stars immediately, but in a mediated and very remote way.

Conrad subsequently cites Albert who, along with other natural philosophers, said that, when all planets are aligned in Aquarius, a universal deluge of water occurs by nature, while when they are all in Leo there is a universal deluge of fire. Conrad disagrees with Albert, even though Avicenna entertained the same idea regarding natural deluges.[122]

From another work by Conrad, his commentary on Tempier's *Syllabus* written around 1354, we learn the reason of this disagreement. With regard to article no. 182 of the Piché edition ('Quod possibile est quod fiat naturaliter universale diluvium ignis'), Conrad maintains that if a universal deluge took place naturally, all humankind and all perfect animals could be destroyed in a natural way and afterwards regenerated naturally without sexual reproduction ('naturaliter sine seminum propagacione'). In other words, a universal deluge caused by nature would imply spontaneous generation as the only way to repopulate the world in a natural way. This is an error, Conrad adds, into which Albert fell by following Avicenna's natural

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Todes" 1348. XI. Ausarbeitungen über die Pest vor der Mitte des 15. Jahrhunders entstanden im niederen Deutschland', *Archiv für Geschichte der Medizin*, 11, 1/2 (1918), no. 106, pp. 44–92 (pp. 44–51).

120 Konrad von Megenberg, *Tractatus de mortalitate in Alamannia (De epidimia magna)*, ed. by Sabine Krüger, in Ead., 'Krise der Zeit als Ursache der Pest?', pp. 866–68.

121 Konrad von Megenberg, *Tractatus de mortalitate*, pp. 868–70. The same argument was advanced by *Die Pestschrift des Blasius Brascinonensis*, ed. Karl Sudhoff, *Archiv für Geschichte der Medizin*, 17, 1/3 (1925), no. 273, p. 117, where it is argued that, since the epidemic had lasted 57 years — the treatise dated to 1406 — it could not have arisen from any planet or conjunction of two planets, because these celestial periodicities (planetary orbits or conjunctions) were of different length.

122 Konrad von Megenberg, *Tractatus de mortalitate*, p. 870: 'Propter hec et similia non apparet michi hanc mortalitatem immediate fore ab astris, sed pocius mediate ac multum remote. Cuius exemplum pono. Aliqui etenim naturalium opinantur, sicut Albertus super De proprietatibus elementorum, quod omnibus planetis simul dyametraliter existentibus in Aquario fiat diluvium universale aque a natura, et eisdem dyametraliter stantibus in Leone fiat diluvium universale ignis, quod si verum esset, quamvis non credam illud, licet Avicenna fuerit hoc idem opinatus de diluvio naturali [...]'.

explanation of the universal deluges of water and fire.[123] Moreover, Conrad makes clear his rejection of spontaneous generation with regard to Tempier's article no. 188 (the Piché edition).[124]

If Conrad's attitude toward Albert's astrological explanation of universal deluges is negative, why does he quote the passage from Albert's commentary on the *DCPE* in the *De mortalitate*? Even though Conrad contests Albert's theory because it implies spontaneous reproduction of human beings, nevertheless he cites the very same theory as a confirmation that the death of living beings by water or fire would not be immediately produced by the stars, but by the elements. By the same token, Conrad imagines (*imaginor*) that the epidemic of the air ('epidimiam aeris') is caused by a corporeal essence existing in the air.[125] As we shall see, he will reveal the nature and origin of the epidemic of the air further in the text. Conrad's interpretive move is rather interesting: he makes his point that the stars are only remote causes of the pestilence by referring to Albert's very theory that he criticizes for its implication of spontaneous generation.

More relevant are the last two opinions. Conrad believes absolutely true ('veram esse omnino') the opinion — the third — that the epidemic is God taking vengeance

123 Konrad von Megenberg, *Werke. Ökonomik (Buch III)*, ed. by Sabine Krüger (Monumenta Germaniae Historica. Staatsschriften des späteren Mittelalters III, 5. 3) (Stuttgart: Anton Hiersemann, 1984), III. 1, cap. 14, pars 8, p. 155, 12–20: 'Quintus articulus est, quod possibile est, ut naturaliter fiat diluvium universale. Error est, quia tunc secundum viam nature possent omnes homines atque omnia animalia perfecta destrui et naturaliter sine seminum propagacione regenerari, quod est prius reprobatum. In hoc errore dominus Albertus olim nostre Ratisponensis ecclesie episcopus imitatus est Avicennam, sicut patet in commento suo De proprietatibus elementorum, ubi dicit, quod, cum omnes planete dyametraliter fuerint in Aquario, erit diluvium universale aque, sed cum omnes dyametraliter fuerint in Leone, fiet diluvium universale ignis'. Significantly, Conrad drops the mention of 'fire' ('fiat diluvium universale'), thus interpreting Tempier's article 182 as referring to a deluge of water too. On Conrad's understanding of Albert's theory of the deluge, I allow myself to refer to Alessandro Palazzo, 'Deluges, the Great Year, and Great Conjunctions in Albert the Great's Aristotelian Paraphrases', *Giornale critico della filosofia italiana*, s. VII, vol. XVII, a. C (CII), fasc. 3 (2021), pp. 495–520.

124 Konrad von Megenberg, *Werke. Ökonomik (Buch III)*, III. 1, cap. 14, pars 7, pp. 152, 14–153, 5. See David Piché, *La condamnation Parisienne* (Paris: Vrin, 1999) p. 136, no.188(82): 'Quod si in aliquo humore virtute stellarum deveniretur ad talem proportionem cuiusmodi proportio est in seminibus parentum, ex illo humore posset generari homo; et quod homo posset sufficienter generari ex putrefactione'. On the connection between the two articles in Conrad's commentary: see Roland Hissette, '*Le Symbolum Parisinum*: approche de trois commentaires médiévaux et évocation de doctrines significatives d'Albert le Grand', in *Il commento filosofico nell'Occidente latino (secoli XIII–XV)*, ed. by Gianfranco Fioravanti and others (Turnhout: Brepols, 2002), pp. 469–98 (pp. 482–83).

125 Konrad von Megenberg, *Tractatus de mortalitate*, p. 870: '[…] tunc absque dubio mortalitas, qua suffocarentur animata in aqua vel igne, non diceretur immediate fieri astris, sed pocius ab elementis, sicut ymaginor epidimiam aeris, id est interfectionem ipsius, a quodam corporeo esse in illo existente'. Ann G. Carmichael, 'Universal and Particular: The Language of Plague, 1348–1500', in *Pestilential complexities: understanding medieval plague*, pp. 17–52, calls attention to the problematic character of the universal language applied to plague; in this regard, she also refers to the comparison between the allegedly universal plague and the Universal Flood found in Matteo Villani (*Cronica*, I. 1, pp. 5, 1–7, 33) and Conrad of Megenberg (pp. 25–26). Gottschall claims that, according to Conrad, plague, unlike the Universal Flood, is a localized, however widespread, natural event and thus does not affect the whole world: Gottschall, 'Scienza in volgare', pp. 125–26.

on human beings for their wickedness.[126] However, it remains unclear how exactly divine omnipotence puts the punishment into effect. Conrad hesitates between two possible solutions: either God inflicts His punishment by spreading a deadly matter throughout the air and affecting human beings (*inflictive*) or He allows nature to have its course and lets the plague work its evil to punish human iniquity although He could have spared humans from the plague by acting against nature (*permissive*). What is important to note here is that even though both solutions fall into the third opinion as two species within the same genus, the latter (God's punishment *permissive*) leaves room for a natural explanation of the plague epidemic based on the analysis of its proximate causes.

This analysis is the fourth opinion, Conrad's own theory, according to which the immediate and independent cause of the epidemic is a corrupted and poisonous exhalation from the earth ('exalacio terrestris corrupta et venenosa'). For several pages (877–83) Conrad engages in a demonstration of the validity of this conception and the rejection of several counterarguments.[127] Tacitly quoting from Albert's *Met.*, Conrad explains aerial contamination as due to a vapour which, long trapped in the bowels and caves of the earth, is made poisonous. He also mentions the example of the well, for in Conrad's lifetime something similar happened in Regensburg.[128]

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126 Konrad von Megenberg, *Tractatus de mortalitate*, p. 877: 'Sic ergo tot et tantis talibus(que) viciis mundo depravato irascitur deus et homines peccatores per diversa mundi climata stravit. […] Quam opinionem credo veram esse omnino, quia vel permissive aut inflictive de sua omnipotentia magistravit corpora hominum infirmari et sanguinem in ipsis corrumpi'. For several pages he depicts the cultural and philosophical decline of his time leading to the pestilence: Konrad von Megenberg, *Tractatus de mortalitate*, pp. 871–77. On the cultural crisis portayed by Conrad, see Krüger, 'Krise der Zeit als Ursache der Pest?', pp. 844–57.

127 It should be noticed that Conrad initially introduces this thesis conditionally and hypothetically. Only at the end of the treatise the question addressed at the beginning (whether the great epidemic of those years was brought about by God's revenge or by the course of nature) will be answered definitely: see Konrad von Megenberg, *Tractatus de mortalitate*, p. 877: '(Q)uapropter hanc quartam pono opinionem in sensu condicionis et locucionis ypotetice […]'. By contrast, the theory that plague is caused by corrupt vapours coming out of the earth (fourth opinion) is deemed as the most likely by the abbreviation published by Sudhoff: see *Utrum mortalitas, que fuit hijs annis* […], ed. by Sudhoff, pp. 47, 131–32: 'Qua propter quarta opinio, quam probabiliorem alijs credo […]'.

128 Konrad von Megenberg, *Tractatus de mortalitate*, pp. 877–78: '[…] aer vaporosus et plenus fumo terrestri diu clausus et incarceratus in aliquo mansorio terre adeo corrumpitur, ut venenum efficacissimum efficiatur humane nature et precipue in cavernis et ventribus terre, ubi per novum et recentem aerem adventari non poterit. Illud probatur experienciis quam plurimis sumptis a puteis longo tempore desertis et superius obstructis per plurimos annos. Nam quando tales putei aperiuntur et purgari debent, accidit nonnumquam, quod primus qui ingreditur, statim suffocatur et quandoque plures sibi mutuo succedentes. Sic accidit olim in Veneciis, ut recitat Albertus, in quodam puteo longis annis obstructo, in quo duo homines velociter moriebantur et tercius volebat videre, cur primi duo tantum moritentur et quid facerent, et accedens puteum respexit deorsum, qui statim cecidit et iacuit per triduum non loquens neque compos sui. Simile huic accidit temporibus nostris in Ratispona civitate Bawarie, ubi in apercione cuiusdam putei longis annis deserti tres ingredientes in illum mortui sunt, et vulgares causam ignorantes basiliscum putabant intus latitare et iterato eundem puteum obstruxerunt et obruerunt'. See, p. 881: '[…] videtur michi aer infectus et venenatus per vapores corruptos et exalaciones venenosas in terre motibus exalantes et egredientes causa esse et fuisse sepedicte mortalitatis'.

Conrad is not the only one to describe a contemporary event similar to the one experienced by Albert in Padua — Henry of Herford does the same. Therefore, it is reasonable to suppose that in the fourteenth century Albert's anecdote became a narrative frame for recasting accounts of real events. Conrad also evokes the belief that a basilisk lurking in a well was the cause of poisonous vapours, but disqualifies it as a belief held by 'commoners' (*vulgares*). On this point, one should notice that Henry of Herford has a different position, since he adduces the basilisk theory as a possible explanation for toxic exhalations. In general, by considering the basilisk explanation irrational, Conrad runs counter to Albert's theory that the breathing of some animals is one of the causes of air corruption.

In sum, Conrad advocates the specific version of the 'aerist' theory predicated on Aristotle's and Albert's natural-philosophical explanation of the earthquake as the effect of fumes enclosed in the bowels of the earth.[129]

This etiological explanation of the plague outbreak seems to be confirmed by the famous earthquake which in 1348 took place in Carinthia and nearby areas of Austria, southern Germany, and Friuli and released noxious vapours, killing human beings in several regions of the world.[130] In other words, to Conrad's mind a real contemporary catastrophe corroborates Albert's explanation of pestilences as a consequence of an earthquake.[131] Albert is also cited as the source of one of the arguments adduced in support of this theory. According to this passage, during some earthquakes human beings are transmuted into rocks, particularly salt rocks, due to the strong mineral virtue of earthly vapours.[132]

4.5. Henry of Herford's Chronicon *and* Catena aurea entium

Henry of Herford was a German Dominican friar of the fourteenth century (*c.* 1300–1377). The scanty information about his life and career has already been investigated,

129 Konrad von Megenberg, *Tractatus de mortalitate*, p. 878: 'Secundum fundamentum est, quod motus terre causatur ab exalacione terrestri seu fumo clauso in visceribus terre, qui quando pulsat cum impetu ad latera terre et exire non potest, terram quassat et movet illam. Ista causa de motu terre ab omnibus philosophis sciencie naturalis est approbata, nec oportet hic raciones philosophorum ad hoc inducere'.

130 Konrad von Megenberg, *Tractatus de mortalitate*, pp. 878–79. Conrad dates the earthquake to 1347.

131 Arno Borst, 'Das Erdbeben von 1348. Ein historischer Beitrag zur Katastrophenforschung', *Historische Zeitschrift*, 233 (1981), pp. 529–69 (pp. 542–45) on Conrad of Megenberg's reactions. On the earthquake, see Christa Hammerl, *Das Erdbeben vom 25. Jänner 1348 — Rekonstruktion des Naturereignisses* (Phd diss.: University of Vienna, 1992); Christian Rohr, 'Man and Natural Disaster in the Late Middle Ages: The Earthquake in Carinthia and Northen Italy on 25 January 1348 and its Perception', *Environment and History*, 9 (2003), pp. 127–49, who adopts a bound-mentality approach.

132 Konrad von Megenberg, *Tractatus de mortalitate*, p. 880: 'Octava racio est, quia visum est, ut recitant experti philosophi Avicenna et Albertus, quod in aliquibus terre motibus homines in lapides sunt transubstanciati et precipue in lapides salis propter fortem virtutem mineralem in vaporibus terrestribus existentem'. See Albertus, *De mineralibus*, ed. Auguste Borgnet (Alberti Magni Opera omnia, 5), (Paris: Vivès, 1890), I. 2. 8, p. 21b. The story of the transformation of people into salt rocks (salt pillars in the *Buch von der natürlichen Dingen*) became widespread in Early Modern Times: see Rohr, 'Man and Natural Disaster', p. 142, n. 42.

so there is no need here to insist on it.[133] His literary production was astonishingly vast and diversified, embracing several areas of study. His two main works are relevant for our analysis because they also address, among other issues, epidemics and the plague outbreak of the mid-fourteenth century. They are the *Chronicon*, a universal chronicle spanning all of human history, from the beginning of the world to Henry's lifetime,[134] and the *Catena aurea entium*, a large encyclopedia addressing in ten books all aspects of reality, from God to the elements, from the realms of minerals, plants, and animals to human beings.[135]

Henry's *Chronicon* is one of the richest historical sources on the Black Death in the German lands. The text, completed in 1355 — which is when Henry stops his historical account — recounts the tragic effects of the pestilence.[136] Henry provides us with first-hand information on the flagellants and the attacks on Jews, accused of propagating the epidemic by poisoning water sources.[137]

Yet Henry is far from giving us a merely fact-based account of the events. Not only because he reshapes contemporary facts through the Ovidian account of the plague on the island Oenopia in the time of king Aeacus,[138] but also because the pages he devotes to the plague are an astonishing interweaving of wondrous events,

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133 See Klaus Peter Schumann, 'Wundergeschichten des Mindener Dominikaners Heinrich von Herford', *Mitteilungen des Mindener Geschichtsvereins*, 55 (1983), pp. 87–102; Id., *Heinrich von Herford. Enzyklopädische Gelehrsamkeit und universalhistorische Konzeption im Dienste dominikanischer Studien-bedürfnisse* (Münster: Landschaftsverband Westfalen-Lippe, 1996).

134 On Henry's historiographic activity, see Rosemarie Schlemmer, 'Die Bedeutung Heinrichs von Herford für die Westfälische Geschichtsschreibung', *Jahresbericht des historischen Vereins für die Gradschaft Ravensberg 1962–1963*, 65 (1964), pp. 125–66.

135 Small sections of the *Catena aurea entium* have been published in critical edition to date: Enrico di Herford, *Catena aurea entium. Tabula quaestionum I–VII*, ed. by L. Sturlese (Pisa: Scuola Normale Superiore, 1987); Id., *Catena aurea entium. Tabula quaestionum VIII–X*, ed. by A. Palazzo (Pisa: Scuola Normale Superiore, 2004); Henricus de Hervordia, *Catena aurea entium. Liber VI (De mineralibus)*, ed. M. Loconsole (CPTMA, 7. 4) (Hamburg: Meiner, 2023); Id., *Catena aurea entium. Liber VII Ansae 1–2 (De plantis)*, ed. M. Panarelli (CPTMA, 7. 5) (Hamburg: Meiner, 2023).

136 Henricus, *Chronicon*, pp. 273–74: '[…] epydimia tam ingens, atrox et seva violenter incanduit […]'. The interpretation of the plague outburst as a deluge of fire is noteworthy: '[…] tam ingens, tam pestifer ignis epydimialis conflagravit' (p. 274). To depict the devastation produced by the plague, Henry evokes images that were widespread in historical and literary sources (e.g. in Boccaccio's *Decameron*): people were abandoned by their loved ones, towns and the countryside were left empty, and cemeteries were overflowed. On the relationship between the medical treatises (i.e., the *consilia* of Gentile da Foligno and Giovanni della Penna) and Boccaccio's depiction of plague-stricken Florence, see Shona Kelly Wray, 'Boccaccio and the doctors: medicine and compassion in the face of plague', *Journal of Medieval History*, 30 (2004), pp. 301–22 and the literature quoted therein; Marafioti suggests an influence of the *Decameron* on later plague treatises, see Martin Marafioti, 'Post-*Decameron* Plague Treatises and the Boccacian Innovation of Narrative Prophylaxis', *Annali d'Italianistica* 23 (2005), *Literature & Science*, pp. 69–87.

137 Henricus, *Chronicon*, p. 277, pp. 280–81.

138 Henricus, *Chronicon*, p. 285; Ovidius, *Metam.* VII. 523–613. Kay Peter Jankrift, 'The Language of Plague and its Regional Perspectives: The Case of Medieval Germany', in *Pestilential complexities: understanding medieval plague*, pp. 53–58, argues that the concept of universality applied to epidemics in medieval records never refers to the "whole world", but to a specific region: this would be clear from the re-use of previous sources' descriptions of past epidemics that were confined to limited areas. This very same mechanism is also at work with Henry of Herford: in this regard, Jankrift alludes to Henry's mention of famine and mortality 'throughout the world' in 1003: pp. 55–56.

apocalyptic images, and naturalistic explanations. Laura A. Smoller has claimed that 'perhaps nowhere [i.e., in the plague literature] is this overlap and ambiguity between the natural and the supernatural more apparent than in the chronicle of Heinrich of Herford'.[139] In this work, we find a catalogue of several "miraculous" and supernatural events, which we might read as the consequence of the distress tormenting a plague-stricken society: fire fallen down from the sky; a rain of owls and snakes lasting several days;[140] devils haunting and killing people;[141] a lamb with two heads being born;[142] monsters, portents, and ghosts seen across Germany;[143] terrible visions sparking fear.[144] Moreover, Henry regards the appearing of the flagellants as a prefiguration of the coming of the Antichrist.[145] He describes them as being 'without a head' (*sine capite*) because they were lacking a leader (*caput*) to unite and guide them.[146] In this way, Henry hints at the famous Cedar of Lebanon prophecy (*quasi prophetice*), which had been circulating since around 1240, but in the fourteenth century had been redated to 1347 and was widely interpreted as foreshadowing the disaster of the plague.[147] Furthermore, Henry informs us that a Dominican named friar Robert (of Uzès?) had prophesized the great pestilence as God's punishment for human sins in 1317, thirty-three years before the plague outburst.[148]

This supernatural interpretation of the events related to the plague pandemic makes Henry of Herford far removed from Albert's scientific study of the pestilences. Despite this general difference, Albert's presence in the *Chronicon* remains nonetheless strong in several ways.

In the wake of Albert, Henry has recourse to scientific theories predicated on astrology and natural philosophy. The two-headed lamb is a monstrous birth due to

139 Smoller, 'Of Earthquakes, Hail, Frogs, and Geography', p. 177 (p. 178: 'No longer are these portents seen through the lens of an either/or dichotomy, either as natural events or as supernatural apocalyptic signs'. She examines Henry's *Chronicon* at pages 168–71, 177–82.

140 Henricus, *Chronicon*, p. 269: '[…] ignis de celo cadens […] pluit aliquot diebus bufones et serpentes'.

141 Henricus, *Chronicon*, pp. 269–70.

142 Henricus, *Chronicon*, p. 270: 'Item hoc anno [scil. 1346] in Sosato opido Westphalie natus est agnus cum duobus capitibus'.

143 Henricus, *Chronicon*, p. 277: 'Principium autem regni Karoli istius multum videtur memorabile propter monstra et portenta et singularia plurima, quae tunc apparuerunt […] Et fantasmata per diversas Theutonie partes et portenta varia similiter apparebant'; see also p. 279.

144 Henricus, *Chronicon*, pp. 277–78.

145 Henricus, *Chronicon*, p. 277: 'Gens sine capite flagellariorum adventum Antichristi prenuntiavit'.

146 Henricus, *Chronicon*, p. 280: 'Ex eodem anno gens sine capite […] exsurgunt, cruciferos se vel flagellarios appellantes. Dicebantur quasi prophetice sine capite, vel quia ad litteram caput non habebant, quo unirentur vel dirigerentur […]'.

147 Robert E. Lerner, *The Powers of Prophecy. The Cedar of Lebanon Vision from the Mongol Onslaught to the Dawn of the Enlightment* (Berkeley-Los Angeles-London: University of California Press, 1983), pp. 114–22 (p. 110).

148 Henricus, *Chronicon*, p. 233: 'Item frater Robertus ordinis predicatorum domus Avinionensis, genere quidem nobilis, sed sanctitate et devotione nobilior, pestilentiam generalem predixit ad annos 30, priusquam fieret'.

astral influence causing the seed to produce a form different from its quality.[149] On this subject, Henry adduces the scientific explanations of monstrous and spontaneous generation found in Albert the Great's commentaries on the *Physica* and the *Met.*[150] Moreover, in line with Albert's emphasis on conjunctionist astrology, Henry quotes the passage from Gherard of Cosvelde's tractate stating that an astral configuration had foreshadowed the flagellant movement.[151]

It is also worth noting that Henry, like Albert, bases some of his accounts on first-person observations. For instance, Henry recounts an event occurred in the town of Hameln near Minden, which was similar to Albert's anecdote about the events in Padua. There are only a few differences: the well of Albert's anecdote becomes a pit in the *Chronicon*; a fourth man is added to the three referred to by Albert.[152] These changes suggest that Henry is describing an event that occurred in reality. In other words, Henry, like Conrad a few years earlier, adapts a real fact to the narrative frame of Albert's anecdote.

As regards the origin of the poisonous vapour, Henry relates two widespread opinions. According to some, a basilisk snake was living in a small cavity inside the pit, infecting through sight or with its breath whatever got close to it. It should be noticed that the ability of the basilisk to infect through sight, which is documented in Albert's works, was absent in Conrad. Others thought that the earth had become poisonous because long before the pit had been used as a latrine. Henry admits that nobody knew what the truth was ('Quid autem esset in veritate, penitus a nullo sciebatur').

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149 For the interpretations of this anomalous generation given in the course of histoy, see Sergey Ivanov, 'It's Raining Calves: History and sources of a spurious citation from Avicenna in Albert the Great's *Meteorology*', *Mediterranean. International journal on the transfer of knowledge*, 5 (2020), pp. 1–49.

150 Henricus, *Chronicon*, 270. See Albertus Magnus, *Physica. Pars 1 Libri 1–4*, ed. by Paul Hossfeld (Alberti Magni Opera omnia, 4. 1) (Münster i.W.: Aschendorff, 1987), II. 3. 3, p. 138, 33–46; *Met.*, II. 1. 21. p. 58, 26–38; III. 3. 20. pp. 171, 80–172, 3. On Albert's abnormal births, see Luke Demaitre and Anthony A. Travill, 'Human Embriology and Development in the Works of Albertus Magnus', in *Albertus Magnus and the Sciences*, pp. 405–40 (pp. 432–39); Theodor Wolfram Köhler, Homo animal nobilissimum. *Konturen des spezifisch Menschlichen in der naturphilosophischen Aristoteleskommentierung des dreizehnten Jahrunderts* (Leiden-Boston: Brill, 2008), pp. 387–411; Gabriella Zuccolin, *I gemelli nel medioevo. Questioni filosofiche, mediche e teologiche* (Como-Pavia: Ibis, 2019), pp. 144–57; Irven M. Resnick, 'Albert the Great on Nature and the Production of Hermaphrodites: Theoretical and Practical Considerations', *Traditio*, 74 (2019), pp. 307–34.

151 Henricus, *Chronicon*, pp. 283–84.

152 Henricus, *Chronicon*, pp. 285–86: 'Quarto anno Karoli in opido Hamelen supra Mindam in metis Westphalie et Saxonie pestis quedam singularis oboritur. Siquidem fovea fodiebatur, purgabatur et eruderabatur in area civis cujusdam ibidem. Fossor existens in imo, subito, nescitur a quo tactus, corruit et exspiravit. Alius descendit ad extrahendum primum jam frigidum, et ipse quoque mox extinctus est. Fama per opidum et terram diffunditur. Omnes admiratione metuque percelluntur. Lues quidem videbatur, sed causa non apparuit. Tertius cautius agere volens, fune forti cingitur circa corpus, per quem de fovea, cum opus esset, extraheretur. Ad medium fovee descendens pervenit, totoque corpore stupidus esse cepit et rigere. Signum dat. Semivivus extrahitur, aliquamdiu sic permanens. Post reviviscens, tempore longo decubuit, et tandem sanatur. Quartus descendens in foveam similiter ut primi duo periclitatur. Quidam opinabantur, in aliqua cavernula fovee serpentem basiliscum habitare, qui visu et anhelitu suo, quidquid sibi propinquat, dicitur vitiare; aliis putantibus, terram in fovea qualitatem aliquam venenosam contraxisse, quia prius et tempore multo latrina fuerit in eodem loco. Quid autem esset in veritate, penitus a nullo sciebatur'. See also, Smoller, 'Of Earthquakes, Hail, Frogs, and Geography', pp. 181–82.

Henry's failure to find the cause of the *lues* in Hameln is the clearest sign of his distance from Albert's scientific discourse on pestilences.

Significantly, while Albert — and Conrad in his wake — saw a connection between the intoxication produced by a well and the processes leading to the earthquake, which causes a pestilence, Henry does not. This is even more more significant if one considers that Henry's *Chronicon* also describes the terrible consequences of the 1348 earthquake of Carinthia.[153] Yet Henry does not claim the existence of a natural cause-and-effect relationship between the earthquake, which he dates to 1345,[154] and the plague epidemic, considering the earthquake to be an extraordinary harbinger, but not a cause, of the epidemic to come.

Henry also deals with plague and epidemics in the *Catena aurea entium*. This work is a collection of extracts from different sources (Albert the Great, Thomas Aquinas, Peter of Auvergne, Aristotle, Avicenna, Latin poets, *Timaeus*, medical literature, etc.) adduced to answer thousands of questions. Albert's works are the key sources for all the issues of natural philosophy addressed by Henry; therefore, it is hardly surprising to find almost all Albert passages pertaining to pestilences being cited by Henry too. Besides Albert, Henry draws on several other sources on pestilential vapours, poisons, pestilences, and contagious diseases. For instance, he deals with the impact of seasonal changes on diseases several times, drawing upon Hippocras, Galen, Constantine the African, and Pseudo-Aristotle's *Problemata* (V. 1. 127; II. 5. 13; X. 4. 118bis). Moreover, the section devoted to fevers and contagious diseases (X. 4) is based on medical literature (Galenus, Rogerius Salernitanus, Isaac Israeli's *De febribus*, Iohannes de Sancto Paulo, etc.). It is noteworthy that plague does not feature among the topics discussed in this section, with the only exception of question 119bis, which is however a mere cross-reference to previous questions (V. 1. 136; V. 2. 7). By contrast, leprosy is given particular attention as the subject of six questions. The reliance on Albert's natural philosophy and the other medical sources gives the examination of pestilences in the *Catena autea entium* a scientific tone that distances it from the tendency to the supernatural typical of the *Chronicon*.

To properly assess Henry's dependence on Albert's theory of pestilences in the *Catena*, a careful analysis of all the questions where Albert's texts are quoted would be required. Here a few remarks will suffice. In the *Catena*, all of Albert's main views about epidemics re-emerge: the distinction between astrological and physical causes of miasmatic contamination (IV. 3. 43); the role played by poisonous vapours and their origin from marshes and stagnant waters (II. 4. 25; II. 4. 33); the notion that the tainted air is more harmful to the human body than food and drink. As far as Henry's style of quotation is concerned, he either transcribes literally or paraphrases passages from Albert's works (II. 4. 25; II. 4. 33). A comparison between the questions of the *Catena* and the original passages quoted reveals that sometimes Henry slightly, but

153 Henricus, *Chronicon*, pp. 268–69.

154 Henry's account of the earthquake comes from correspondence between the convent of Friesach in Carinthia and the prior of the Dominican province of Germany: Rohr, 'Man and Natural Disaster', p. 140, n. 26. The inaccuracy of the dating may be due to the use of second-hand sources.

significantly, modifies his source. For instance, question II. 4. 25 explains why places that are very humid and not very warm are poisonous and pestiferous by quoting a passage from Albert's *DNL* (1. 13).[155] In this case, however, Henry mentions two swampy regions, the March of Brandeburg and Frisia, confirming his tendency to accommodate his sources — especially Albert quotations — within the framework of his own experience (II. 4. 33; IV. 4. 91). Moreover, Henry's quotation omits the last part of Albert's passage, the one that explains the relationship between the pestilential vapours and their natural environment (humid areas) in terms of the connaturality of the *locatum* with its *locus* ('locus et locatum connaturalitatem multam habent').

5. Conclusion

Albert's analysis of pestilences was conditioned by ineliminable historical limitations. Having died in 1280, about 70 years before a devastating plague pandemic — the so-called Black Death broke out in Europe in 1347–48 — he did not have the chance to experience and study plague in reality. As a consequence, he did not use the words *pestis* o *pestilentia* to refer to plague in the proper sense, caused by the bacterium *Yersinia pestis*, but to unspecified epidemics and contagious diseases, leprosy, miasmatic contamination, or malaria-like illness. Moreover, Albert's pages on pestilences mainly had a bookish origin, rather than being grounded in personal experience and observation.

However, despite all these objective limitations, his analyses deserve careful attention from the historian of philosophy and of medicine. Albert based his investigation into the causes and, in a few cases, the clinical progress of the disease on a solid scientific basis, relying on the conceptual resources of Aristotelian natural philosophy, the Hippocratic-Galenic and Avicennian medical tradition, and world astrology (i.e., the theory of conjunctions). His study of pestilences was thus a part of an all-encompassing attempt to explain all natural phenomena in scientific terms, without the need of a fideistic recourse to God's will. This was not tantamount to denying God's causality or His miraculous interventions, but to expelling supernatural factors from the realm of philosophical and scientific enquiry.

Moreover, his rigorous scientific approach was one of the reasons why Albert's analyses were widely echoed in the fourteenth-century plague treatises. Confronted with the unprecedented nature of the devastating pandemic of plague of their time, the authors of these tractates could only devise prophylactic remedies and therapeutic

155 Henricus de, *Catena aurea entium*, II. 4. 25. Erfurt, Universitätsbibliothek, cod. Ampl. F 371, fol. 81rb: 'Cur loca multum humida et parum calida sunt venenosa et pestifera ut Marchia Brandeburgensis et Frisia et similiter loca paludosa. Responsio Alberti ibidem: Quia loca talia plus habent humidi, quam calor consumere possit, et ideo calor idem adhuc plus multiplicat ipsum et vapores multos elevans corrumpit et loca pestifera facit. Et iterum in locis illis fiunt tonitrua et coruscationes et corrumpunt et inficiunt multum, ita quod inducunt in homines et alia animalia gravem mortem. Quod est quia aer humidus fit et corruptus et venenosus et penetrat indigestus ad interiora vitalium et perimit subito. Et loca paludosa similiter talia sunt'.

measures with a limited effectiveness. When it came to understanding the origin and the process of the dissemination of plague, the etiological models established by Albert played a major role. His analyses were a constant reference point for the fourteenth-century *Pesttraktate*. Indeed, they were the basis for the late-medieval discourse on plague — a discourse destined to remain basically unchanged for several centuries, until Alexandre Yersin discovered the bacterium *Yersinia pestis* in 1894, thus making clear the chain of contagion and the actual mechanism of transmission of the disease. It is ironical that in the fourteenth century Albert's concepts, which had been set forth to account for various pestilences and infections, but not for plague, were massively used for the construction of the etiological and nosological identity of this 'new' destructive disease.

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