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Earth in the medieval world: an introduction

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Introduction

Marilina Cesario, Hugh Magennis and Elisa Ramazzina

Throughout history the idea of ‘the elements’ has been central to human understanding of the world in which we live. Across many cultures the elements have been recognised to be fundamental to all existence, whether animate or non-animate. They have been seen, and are seen,¹ as constituting the universe itself and making life possible and have been used to explain the structure and complexity of matter.

It was the pre-Socratic philosopher Empedocles who first formulated a theory envisioning four elements, which was taken up by Plato, Aristotle and other classical writers and proceeded to influence European and Middle Eastern thought in the medieval period (and indeed later).² According to Empedocles, the structures of the world are constituted by four immutable and indissoluble ‘roots’ – fire, air, water and earth – which, combining with one another in different combinations and proportions, produce different structures;³ Aristotle went on to theorise the existence of a fifth element, ‘ether’, which belonged to the celestial

¹ The chapter below, ‘The Transmutation of an Elemental Idea’, suggests that ‘the creation of the periodic table in the mid-nineteenth century by Meyer, Newlands and Mendeleev can be seen as a radical step within an established and ancient tradition’ (00). Jennifer Rampling goes even further by suggesting that elemental theory is at the basis of our ‘modern understanding of the atom as the fundamental unit of a chemical element’: Rampling J., “Elements: A 2,000-Year Story”, *Nature* 565 (January 31, 2019) 563-564.

² Benson J.L., *Greek Color Theory and the Four Elements* (Amherst, MS: 2000).
https://scholarworks.umass.edu/art_jbge/5/. Accessed 13 December, 2023.

³ Russell B., *History of Western Philosophy* (London: 1946) 55.

rather than sublunary realm.⁴ But alongside and interacting with the Western tradition, different conceptions of the elements were in circulation in ancient and medieval times, such as in classical Chinese philosophy, according to which the ‘Five Elements’ or ‘Five Phases’ (*wuxing*) - Wood, Fire, Earth, Metal and Water- underpinned cosmology, socio-political events, and medicine,⁵ or in medieval Buddhist philosophy, where earth, water and fire formed the cosmos together with wind and void, or sometimes the sky, depending on the tradition.⁶ Old Norse mythology, for example, provides another interpretation of the elements with Midgard (or the ‘middle earth’) being the central region of the cosmos where humanity lives and the elements are personified (as in a chapter in the ‘water’ collection of the present

⁴ Aristotle introduces the elements in *On the Heavens* III:i and illustrates their qualities in *Meteorology* I:ii and in *On Generation and Corruption* I:i; he introduces ‘ether’ in *Meteorology* I:3. ‘Ether’ will be the subject of a fifth volume in the elements series. See Aristotle, *On the Heavens*, trans. J.L. Stocks (London: 1922); *Meteorology*, trans. E.W. Webster (trans.), The Internet Classics Archive by D.C. Stevenson (1994-2000). <http://classics.mit.edu/Aristotle/meteorology.mb.txt>. Accessed 13 December, 2023. *On Generation and Corruption*, trans. H.H. Joachim. The Internet Classics Archive by D.C. Stevenson (1994-2000). http://classics.mit.edu/Aristotle/gener_corr.mb.txt. Accessed 13 December, 2023.

⁵ Chen, Y., “Legitimation Discourse and the Theory of the Five Elements in Imperial China”, *Journal of Song-Yuan Studies* 44 (2014) 325-364, 326-330. For a Discussion of the earth element and earthquakes in early and medieval Chinese sources, see Chapter 00 Cesario M., “Shaking the Foundations: Reading Earthquakes in Byzantine and Chinese Sources”.

⁶ Ingram, S., “The Monk Chōgen’s Expansion of Buddhist Relic Circulation to the Common Classes of Medieval Japan Based on His Experience at Ayuwangshan”, *Sino-Japanese Studies* 23 (2018) 43-65, 60-62.

series)⁷, whilst another system of thought distinctive of the Islamic Middle East relies upon the ‘climes’ theory of ancient Persia and Sufism.

Recent years have seen an increased number of publications on the elements in various areas of medieval studies, yet contributions that include a study of all four elements are still very few, with the majority focusing on a single element. Amongst those few, a seminal study in the field of ecocriticism is the collection of essays edited by Cohen and Duckert entitled *Elemental Ecocriticism: Thinking with Earth, Air, Water, and Fire*,⁸ which examines the agency of the material world through the elements, decentering the human being. Combining eco-materialism with speculative realism and bringing together classical philosophy with modern thinking, these essays approach elemental theory as a way of understanding materiality to address modern-day ecological concerns.⁹

⁷ See Birkett T., “‘Where Mighty Rivers Sprayed Poison’: Aspects of Water in Old Norse Myth”, in Cesario M. – Magennis H. – Ramazzina E. (eds.), *The Elements in the Medieval World: Interdisciplinary Perspectives: ‘Water’* (Leiden – Boston: forthcoming) 00-00.

⁸ Cohen J.J. – Duckert L. (eds.), *Elemental Ecocriticism: Thinking with Earth, Air, Water, and Fire* (Minneapolis, MN: 2015).

⁹ Other ecocritical studies include Aberth J., *An Environmental History of the Middle Ages: The Crucible of Nature* (London: 2012), and Hoffmann R., *An Environmental History of Medieval Europe* (Cambridge: 2014). For the Irish context, see Siewers A.K., *Strange Beauty: Ecocritical Approaches to Early Medieval Landscape* (Basingstoke: 2009); for early medieval England, see Estes H., *Anglo-Saxon Literary Landscapes: Ecotheory and the Environmental Imagination* (Amsterdam: 2017).

As for the anthropological approach, Sears's *The Ages of Man: Medieval Interpretations of the Life Cycle*,¹⁰ which explores different conceptions of elemental theory, from Pythagoras to the Bible and from Dante to Sacrobosco, discusses ideas of time in relation to human life. Sears touches upon astrological, physical, philosophical and theological theories, enhancing our understanding of the medieval worldview. *The Cosmic Elements in Religion, Philosophy, Art and Literature*, by Acharya, Arellano, Iturbe, Pathak and Sakrikar,¹¹ an edited collection notable for its broad geographical spectrum, investigates for the first time, through a philosophical and cultural-anthropological perspective, the cosmogonic aspects of the elements in creation myths of various cultures from Western European to Sanskrit and Vedic traditions, among others. Among cultural studies, Gernot's and Hartmut Böhme's *Feuer, Wasser, Erde, Luft: eine Kulturgeschichte der Elemente*¹² is particularly relevant as it offers a comprehensive cultural history of the four elements from antiquity to modern times. Looking at different ideas of the elements from a historical-philosophical perspective, the authors conclude that today's exclusion of elemental theory from the natural sciences is based on repressions, in their view one of the causes of the present environmental crisis.¹³ As far as literary studies are concerned, to date no

¹⁰ Sears E., *The Ages of Man: Medieval Interpretations of the Life Cycle* (Princeton, NJ: 2019).

¹¹ Acharya K. – Arellano I. – Iturbe M. – Pathak P. – Sakrikar R. (eds.), *The Cosmic Elements in Religion, Philosophy, Art and Literature* (Pamplona: 2015).

¹² Böhme G. – Böhme H., *Feuer, Wasser, Erde, Luft: eine Kulturgeschichte der Elemente* (Munich: 1996).

¹³ Another ground-breaking cultural study, which explores the elements in Pre-Columbian civilisations, is Jimenez Garcia M.A. – Valle Vazquez A.M., "Water, Fire and the Feminine

comprehensive research has been conducted on the four elements. For the early English Middle Ages, Anlezark's *Water and Fire: The Myth of the Flood in Anglo-Saxon England*¹⁴ investigates the literary symbolism of the two elements, especially in relation to the flood as an event of both universal and local significance.¹⁵

Unlike previous, highly specialised and sectoral scholarship, which often deals with a single element or a particular geographical area through the lens of a specific methodological approach, the four volumes which make up the book series *The Elements in the Medieval World: Interdisciplinary Perspectives* highlight instead the complexity and plurality of traditions and interpretations surrounding the elements both in their practical applications in daily life and in their manifold functions within medieval culture, thought and imagination. They do so by initiating a dialogue between different disciplines, perspectives and scholarly approaches, ranging from science, literature, theology and cosmology to the arts. The

in the Pre-Hispanic World: Creation and Destruction of Culture”, *Knowledge Cultures* 6.2 (2018) 132-172.

¹⁴ Anlezark D., *Water and Fire: The Myth of the Flood in Anglo-Saxon England* (Manchester: 2006).

¹⁵ Other literary studies tend to focus either on a single element (predominantly on water and its manifestations), for the English context, for example, see Sobocki S.I., *The Sea in Medieval English Literature* (Woodbridge: 2007), and, for the Carolingian period, Keefe S.A., *Water and the Word, Volume I: Baptism and the Education of the Clergy in the Carolingian Empire: A Study of Texts and Manuscripts* (Notre Dame, IN: 2002) and *Water and the Word, Volume II: Baptism and the Education of the Clergy in the Carolingian Empire: Editions of the Texts* (Notre Dame, IN: 2002), or they focus on a specific text, as in the case of Coda E., *Le forme degli elementi. Isaac Abravanel e la tradizione aristotelica medievale* (Pisa: 2018), on a Portuguese Jewish text.

volumes bring together contributions which combine different approaches in several cultures and traditions, thus emphasising interconnections and cross-sections between different disciplines. These studies investigate the complexity of meanings and functions of the elements, their association with the environment and the role they played in constituting the cosmos, their influence on climate and weather and how they affected the human body, and explore both their physical and their material aspects, as well as their symbolic and metaphorical meanings.

Each of the four interconnected volumes is dedicated to one of the elements and, in line with Isidore's elemental theory, the series begins with 'earth' and 'water', then 'air' and finally fire'.

Medieval Ideas on the Four Elements

Medieval thinkers engaged greatly with the four elements underlying the cosmology of their time, which in turn was, in various degrees, the result of the encounter between different ancient traditions¹⁶ – Christian, Byzantine, Arab and Jewish – and was mainly based on Aristotelian physics, which had been influenced by the theories of Plato and Eudoxus.¹⁷

Isidore's *Etymologies* and *De natura rerum* describe the universe as characterised by a dichotomy between the 'heavenly world' (*caelum*), and the terrestrial or sublunar one. In the latter, matter has four primary qualities that can be divided into two pairs of opposites: hotness-coldness and wetness-dryness. Depending on how these qualities are combined, the *prima materia* ('primary matter') can appear as *terra*, 'earth' (dry and cold), *aqua*, 'water'

¹⁶ Rossi P., *La Nascita della Scienza Moderna in Europa* (Rome – Bari: 1997) xiv-xv.

¹⁷ Ibidem.

(cold and wet), *aer*, ‘air’ (wet and hot) and *ignis*, ‘fire’ (hot and dry). Moreover, every element is present in all the other ones, but each one takes its name from whichever element is predominant.¹⁸ Mixing with one another in different proportions, the elements form other bodies. Each element can be transformed into another if it becomes corrupted and its primary qualities are altered.¹⁹ The hierarchy of the elements depends on their weight, so that earth is the heaviest, and is followed by water and by air, with fire being the lightest element. As Isidore illustrates in chap. 11 of his *De natura rerum*,

Quae [partes] etiam sibi ita commiscuntur. Terra quidem crassa, obtusa et immobilis, cum aquae crassitudine et obtusitate conligatur. Deinde aqua aeri crassitudine et mobilitate coniungitur. Rursus aer igni communionem acuti et mobilis conligatur. Terra autem et ignis a se separantur, sed a duobus mediis aqua et aere iunguntur.²⁰

These [elements] are also mixed together as follows. Earth, which is indeed thick, blunt, and immobile, combines with the thickness and bluntness of

¹⁸ Isidore of Seville, *Etymologies* XIII.iii.3, ed. W.M. Lindsay, *Isidori Hispalensis Episcopi Etymologiarum sive Originum* (Oxford: 1911). Digitised Edition @ University of Chicago: 2010. <https://penelope.uchicago.edu/Thayer/E/Roman/Texts/Isidore/home.html>. Accessed 13 December, 2023. For the English translation, see Barney, S.A. – Lewis W.S. – Beach J.A. – Berghof O. – Hall M. (trans.), *The Etymologies of Isidore of Seville* (Cambridge: 2006).

¹⁹ Mamiani M., *Storia della Scienza Moderna* (Rome – Bari: 2002) 53.

²⁰ Isidore of Seville, *De natura rerum*, Library of Latin Texts (2021). <http://ezproxy-prd.bodleian.ox.ac.uk:2855/llta/pages/Toc.aspx?ctx=1444615>. Accessed 13 December, 2023.

water. Then water is united with the thickness and mobility of air. In turn air combines with fire by reason of their common properties of sharpness and mobility.²¹

Drawing on Isidore, Bede, in his *De natura rerum*, describes the universe as spherical, made of the four elements, and rotating around its lowest, motionless part, the earth globe.²² There, in the sublunary world, the mixing of the elements brings about alteration, change, corruption, and death.²³ By contrast, the celestial world, made of concentric spheres, is immutable and perennial, characterised by infinite, regular, circular motion around the earth.

The dissemination of Latin translations of Aristotle's works from the twelfth century added to the complexity of the 'medieval' universe. According to Aristotle, the planets and the stars revolving around the earth across the Zodiac belt are not made of the four sublunar elements, but of a fifth one, 'ether' or *quinta essentia*, solid, transparent and immutable, which also constitutes the celestial spheres. The Aristotelian universe is finite, as it is delimited by the sphere of the fixed stars. The *primum mobile* ('divine sphere') transmits by contact the circular movement to all other spheres up to the lunar one.²⁴

According to medieval scholars, there is a strong correspondence between the universe, that is the cosmos, and humanity, i.e., the microcosm. Indeed, drawing on Hippocrates and Galen, in Chap. 9 of *De natura rerum*, Isidore explains that '[...] mundus competenter homo significatur, quia sicut ille ex quattuor concretus est elementis, ita et iste ex quattuor constat humoribus uno temperamento conmixtis' ('[...] the world properly signifies

²¹ Kendall – Wallis (trans.), *Isidore of Seville, On the Nature of Things* 130.

²⁴ Kendall – Wallis (trans.), *Isidore of Seville, On the Nature of Things* 130.

²⁵ Mamiani, *Storia della Scienza Moderna* 8-10.

²⁴ Ibidem.

the human being, because just as the former is compounded out of four elements, so also the latter is made up out of four humours mixed together in one temperament’).²⁵ In the *Etymologies*, Isidore clarifies that each bodily humour corresponds to an element in that they share the same primary qualities: thus, black bile imitates the earth, phlegm water, blood air, and yellow bile fire.²⁶ Health depends on the harmony of the four humours, as all diseases arise from their imbalance, and, in particular, from a specific fluid excessively accumulating in one part of the body.²⁷ Each humour also dominates a specific organ: blood the heart (or, in some sources, the liver), phlegm the brain, yellow bile the gall bladder, and black bile the spleen.²⁸ Each humour is also associated with a temperament, determining thus personality: a splenetic behaviour and a melancholic personality are due to an excess of black bile; a phlegmatic character is caused by an overabundance of phlegm and water; a sanguine personality is due to a surplus of blood, and finally, a fiery excess leads to a choleric temperament.²⁹

The analogy of the four elements with the seasons and the cardinal directions is also reflected in the human body, with each season being associated with a predominant humour and, consequently, with different psychological and physiological types or complexions.³⁰

²⁵ Isidore, *De Natura Rerum*, Library of Latin Texts. <http://ezproxy-prd.bodleian.ox.ac.uk:2855/llta/pages/Toc.aspx?ctx=1444615>. Accessed 13 December, 2023.

Kendall – Wallis (trans.), *Isidore of Seville, On the Nature of Things* 127.

²⁶ In some sources, including Bede, yellow bile is replaced by red bile.

²⁷ Isidore, *Etymologies* VI.iv.1-3.

²⁸ Strahern P., *A Brief History of Medicine: From Hippocrates to Gene Therapy* (London: 2005) 10.

²⁹ *Ibidem* 36.

³⁰ *Ibidem* 8.

Additionally, the elements and the humours are connected to the four ages of man and to the winds in a perfect yet complex cosmic harmony, regulated by a very delicate balance, as elucidated by Bede in his treatise on computus, *De temporum ratione* (Chap. 35).³¹

The same correspondences are depicted in a number of diagrams known as *annus-mundus-homo* and mainly preserved in computus manuscripts. The most famous and complex among these diagrams is probably Byrhtferth's (see Fig. 1), contained in Oxford, St. John's College MS 17, fol. 7v,³² dating to the beginning of the twelfth century.³³ The diagram illustrates the harmony between the microcosm and the macrocosm. As Wallis explains, its organising symbolism is that of the *maiestas Domini* ruling over Creation, with the geometric shape of a diamond contained in an eight-shaped frame.

³¹ Wallis F. (trans.), *Bede: The Reckoning of Time* (Liverpool: 1999) 100-101.

³² For the digital edition of the manuscript and Faith Wallis's commentary on the diagram, see Oxford, St John's College, MS 17; fol. 7v. *The Calendar and the Cloister*: Oxford, St John's College MS17 McGill University Library, Digital Collections Program (2007); https://digital.library.mcgill.ca/ms-17/folio.php?p=7v&showitem=7r_2ComputusRelated_20ByrhtferthsDiagram#sec02. Accessed 13 December, 2023.

³³ Another version of the diagram appears in the so-called 'Peterborough Computus' (London, British Library Harley MS 3367) at fol. 8r, which also contains Byrhtferth's *Enchiridion*, a commentary on computus, mathematics, astronomy and medicine. The Peterborough diagram is available on the British Library website: Accessed 20 November, 2023. <https://www.bl.uk/collection-items/computus-collection-including-byrhtferth-of-ramseys-diagram>.

[Fig. 1; Full page]

The diagram illustrates two systems: the twelve months and the four elements. The first one is represented by an eight-shaped green band on which the twelve signs of the zodiac are inscribed, and, below, the corresponding month of the year, the number of days in that month, and the duration of the corresponding lunation.³⁴ The outer diamond is then attached to the zodiacal band by four roundels at the equinoctial and solstice points, labelled with the names of the four elements and coloured differently depending on the element they contain: earth is blue, water green, air is cream, and fire red. The inner blue diamond, then, represents the sublunar world inscribed within the unceasing flow of time. The edges of the diamond contain the names of the four cardinal directions, either in Latin or in Greek, which are in turn connected to the elements by the twelve winds, the names of which are enclosed in the element-roundels themselves according to the seasons. The four elements also cross and unite the realms of time and of space, in that each element is connected to the contiguous one by means of pairs of primary qualities, inscribed on the margins of the inner diamond. The same qualities are used to describe the different seasons, which in turn are connected to the four ages of man, i.e., the four phases of the human life cycle and their duration. Childhood corresponds to spring and lasts fourteen years; ‘adolescence’, that is youth, is linked to summer and ends at the age of twenty-eight; ‘youth’, which we would define as ‘middle-age’ and stands for autumn, lasts until forty-eight; and old age, that is winter, until seventy or eighty. As Wallis notes,

³⁴ Faith Wallis’s comment on Byrhtferth’s diagram. https://digital.library.mcgill.ca/ms-17/folio.php?p=7v&showitem=7r_2ComputusRelated_20ByrhtferthsDiagram. Accessed 13 December, 2023.

None of the separate components of the Diagram is particularly unusual, yet the Diagram as a whole bespeaks a high degree of synthetic creativity in the way in which it superimposes four common medieval schemata: the *syzygia elementorum* (the connection of the elements through their paired qualities, and their analogous relationship to the four seasons, four humours of the body, four ages of man etc. through these pairings), the *rota* of the zodiac, the *rota* of the months, and the windrose with its four cardinal directions. What binds them together is numerical analogies, particularly the number four, a subject on which Byrhtferth himself has much to say in his textbook on computus, the *Enchiridion*.³⁵

Another paramount influence on medieval thought was the works of Avicenna, or Ibn Sīnā, which played a key role in the history of science both in the eastern traditions and in the western late Middle Ages. His *Canon*, a medical compendium based upon humoral doctrine and translated into Latin in the twelfth century, reconciles the teachings of Aristotle, Hippocrates and Galen with those of al-Rāzī.³⁶ Avicenna considers the four elements (*rukūn, arkān*) as the primary parts of the body that cannot be further divided into particles, traditionally characterised by pairs of primary qualities. The interaction between the opposite qualities of each element gives birth to different temperaments or ‘mixtures’. Drawing on classical philosophy, Avicenna also explains how bodily humours are produced through

³⁵ Ibidem.

³⁶ Strahern, *A Brief History of Medicine* 58-60.

various stages of digestion,³⁷ and how each bodily organ is also provided with its own temperament.³⁸

A Voyage through Medieval ‘Earth’

The present series begins with ‘earth’, the heaviest of all elements. As planet in the centre of the universe, element which contributed to forming the sublunary world, ground on which people walked, soil from which they drew nourishment, and raw material from which the God of the Christian, the Jewish, and the Islamic religions created the first human, medieval authors unsurprisingly emphasised the relevance of the earth and the multiplicity of its functions in their works.

Bede in *De natura rerum* (Chap. 3) identifies three functions in his treatment of earth: (1) the earth is a simple element that, combining with the other three, (2) forms the orb, which lies in the centre of the universe and is part of the sublunary world, (3) thus acting as the lower margin to the heavenly world.³⁹

Isidore devotes three entire books of his *Etymologies* to this element, exploring it from different perspectives, with book XIV describing ‘the earth and its parts’, that is continents, regions and geological formations such as mountains, promontories and islands. The following book (XV) focuses on the relationship between earth as a living space and humanity, thus exploring cities, different types of buildings, fortifications, roads and fields. A

³⁷ Ormos I., “The Theory of Humours in Islam (Avicenna)”, *Quaderni di Studi Arabi* 5/6, *Gli Arabi nella Storia: Tanti Popoli una Sola Civiltà* (1987-1988) 601-607, 605.

³⁸ *Ibidem* 602-603.

³⁹ Kendall – Wallis (trans.), *Bede: On the Nature of Things and On Times* 75.

third book (XVI) deals with the products of the earth, that is stones and metals, including dust, marble and gems.⁴⁰ Isidore explains the different meanings of *terra* ('earth'): in the singular it indicates *orbis* ('globe'), whereas in the plural it designates its different parts, listing different terms connoting it, including *humus* ('soil'), *tellus* ('ground'), and *arvum* ('arable land').⁴¹ He proceeds stating that *aridum* ('dry land') represents earth's primary quality: dryness. Isidore then elucidates how *orbis* takes its name from its round shape; the ocean spreads over the whole earth's circumference creating a wheel-like shape, which is in turn divided into three parts, that is the continents: Asia, the biggest one, occupies half of the world, while Europe and Africa cover the other half.⁴² Stylised T-O maps, often relying upon the last chapter of Isidore's *De natura rerum* on 'the parts of the earth' and for centuries at the basis of T-O *mappae mundi*, well represent this subdivision with the 'Orbis Terrarum' (the world) depicted as a circle (hence the O), representing both the globe and the oceanic perimeter, divided into three parts, i.e. the known continents, by a T allegorically representing Christ's crucifixion ruling over the world.⁴³

Isidore further illustrates the subdivision of the globe into five parallel regions or climatic belts (*De natura rerum*, Chap. 10): two cold and uninhabitable zones – the Arctic and the Antarctic circles –, two temperate and habitable ones, and the central equatorial

⁴⁰ For a detailed discussion of Book XVI, see Fear A. "Isidore of Seville and the Bounty of the Earth", 000.

⁴¹ Isidore, *Etymologies* XIV.i.1.

⁴² Ibidem XIV.ii.1-3, and *De natura rerum* Chap. 48; Kendall – Wallis (trans.), *Isidore of Seville, On the Nature of Things* 175.

⁴³ For cartographic representations of the earth in medieval maps, see Tedford M., "De terra et partibus: Visions of the Earth in Early Medieval Mapping, c. 800-1300".

circle, which is torrid and therefore also uninhabitable.⁴⁴ Bede proposes a further division of the earth into eight latitude circles, which represent zones of variation in the duration of daylight according to different latitudes and are therefore connected to time-reckoning (*De natura rerum*, Chaps. 47-48).⁴⁵

Augustinian theology permeates Bede's exegesis of God's creation, and this is reflected in his treatment of earth. In his commentary on the biblical Genesis, Bede explains how earth and water are foundational, as these two elements, together with heaven, are created simultaneously at the very beginning of creation.⁴⁶ The other two elements were indeed already present in the earth itself as seminal causes, for, as already mentioned, each element contains all the other ones and takes its name from the prevailing one. In particular, fire was contained in stones, iron, and other metals and was brought forth by hot springs of water, thus emerging onto the earth's surface.

The prominence of earth and water is further confirmed by the interdependence of the two elements and by the essential role they play in the creation of life. On the third day, the dry land, previously hidden, mixed with the withdrawing water which formerly covered the entire surface of the globe, form a muddy soil from which the first plants sprout.⁴⁷ Therefore, vegetable life is created precisely from mud itself and not from seed.⁴⁸ Earth, then, is the raw material from which all animals, except for fish and birds (created from water), were created

⁴⁴ Kendall – Wallis (trans.), *Isidore of Seville, On the Nature of Things* 128-130.

⁴⁵ Kendall – Wallis (trans.), *Bede: On the Nature of Things and on Times* 162.

⁴⁶ Kendall C.B. (trans.), *On Genesis: Bede* (Liverpool: 2008) 68-73.

⁴⁷ The ambivalent function of 'mud' is discussed in Clarke C., "Thinking with Mud: Dirt, Imagination and Early Medieval English Culture" 00.

⁴⁸ Kendall (trans.), *On Genesis: Bede* 78-80.

on the fifth day.⁴⁹ Adam, the first man, is also made from earth or, more precisely, from the mud formed by a spring of water that flows out of the dry land, watering it.⁵⁰

Bede explores the interrelation between earth and water further in *De natura rerum* (Chap. 44), where, discussing the spherical shape of the world as surrounded by water, he considers how the two elements are fundamental to its structural integrity. The earth, being extremely dry, could not cohere without water's moisture; likewise, the waters would fall without the earth's support so that earth and water *mutuo implexu iungerentur* ('are joined in a mutual embrace'),⁵¹ with watery veins flowing through the earth, acting like bonds holding it together.

The position of the earth within the universe was another important theme for medieval thinkers. To Isidore, the spherical earth is the geometrical centre of the cosmos, *omnibus partibus caeli in modum centri aequali intervallo consistens*.⁵² It rests upon the air in perfect balanced equilibrium, 'immobilised like a sponge because of its mass', and

⁴⁹ Ibidem 85-89.

⁵⁰ Ibidem 89-91.

⁵¹ Bede, *De Natura Rerum*, Library of Latin Texts (2021). <http://ezproxy-prd.bodleian.ox.ac.uk:2855/llta/pages/Toc.aspx?ctx=1473312>. Accessed 13 December, 2023.

Kendall – Wallis (trans.), *Bede: On the Nature of Things and On Times* 98.

⁵² Isidore, *Etymologies* XIV.i.1, ed. Lindsay, Digitised Edition @ University of Chicago: 2010; https://penelope.uchicago.edu/Thayer/L/Roman/Texts/Isidore/14*.html#1. Accessed 13 December, 2023. '[...] equidistant from all other parts of the sky'; Barney – Lewis – Beach – Berghof – Hall (trans.) 285.

inscrutable divine laws, precluded to human understanding, prevent it from sinking, overturning, or tilting.⁵³

While the Aristotelian geocentric model was not questioned until Copernicus proposed his heliocentric system, the prevailing early medieval idea of an immobile earth at the centre of the universe began to be questioned with the rise of scholasticism and the spreading of universities, when the possibility of axial motion was hypothesised to explain the rising and setting of the stars. The growing popularity of the twelfth and thirteenth century Latin translations of the works of Heraclides and Aristarchus challenged the idea of the earth's stillness, promoting instead the hypothesis of its diurnal axial rotation with a motionless sky surrounding it.⁵⁴ Thomas Aquinas as early as the thirteenth century had discussed the relativity of terrestrial motion in his *De Caelo*, hypothesising that the earth could rotate daily around the equinoctial poles from west to east, so that it seems to observers of the sky that the stars are moving in the opposite direction. In the fourteenth century, Jean Buridan and Nicole Oresme⁵⁵ theorised a possible rotation of the earth, without however reaching a definite conclusion, stating that it was impossible to determine through sensory experience alone whether it is the heavens or the earth that rotates daily.⁵⁶

Different conceptions of the earth and of its position within the universe enormously influenced cosmology and, consequently, the development of medieval science. A case in

⁵³ Kendall – Wallis (trans.), *Isidore of Seville, On the Nature of Things* 172-173.

⁵⁴ Grant E., *Physical Science in the Middle Ages* (Cambridge: 1977) 60-82.

⁵⁵ Their works drew on the ideas of Johannes Sacrobosco and, in turn, greatly influenced Copernicus and Giordano Bruno.

⁵⁶ Grant E., *Planets, Stars, and Orbs: The Medieval Cosmos, 1200-1687* (Cambridge: 1996) 618-679.

point is Ptolemy, whose *Almagest* was extremely influential in the Western European, Byzantine and Islamic Middle Ages. Ptolemy had transformed the Aristotelian mechanical astronomical system while retaining its main concepts, introducing for example the apparent irregularity of planetary motions for an observer on earth. The concept that most influenced the medieval worldview, however, was that of the force emanating from the ethereal and eternal nature of heaven, exerting its effect on the immobile earth, the source of astrological beliefs.⁵⁷ Every human activity, including agriculture, warfare and medicine was seen as influenced by the position and movements of the planets and of the stars.

Medieval visions of earth also contributed to the development of another discipline, alchemy, which drew on theories from the Arab world, and, in particular, from the works of al-Rāzī, Avicenna and the great Persian scholar Geber, and spread into western Europe around the twelfth century. Medieval alchemical theories are based on the Aristotelian conception of the transformation of substances and aim at transforming one metal into another. The element 'earth' is at the basis of the entire alchemical science, as metals are considered to be generated by the exhalations of the earth, of which they retain the primary qualities (cold and dry). According to Geber, the dry exhalations produce sulphur, the humid ones mercury, while all other metals derive from the combination of these two in different proportions; the blending of pure sulphur and pure mercury, instead, gives gold.⁵⁸ The alchemist, therefore, aims at transforming the other known metals into gold by reducing them to raw material, removing their properties, and replacing them with those of gold through an agent - the elixir, or philosopher's stone - which carries out the transmutation.⁵⁹

⁵⁷ Mamiani, *Storia della Scienza* 31-36.

⁵⁸ Ibidem 55-57.

⁵⁹ Ibidem.

The Present Volume

The fourteen chapters of this volume reflect the centrality of the element earth in medieval thought and life, a centrality inherited, as outlined in the first part of the introduction, from classical antiquity, and fundamental too in Judaeo-Christian and Islamic traditions. The chapters also reflect the multifarious nature of the ways that earth was experienced and understood in the Middle Ages.

The idea of the centrality of earth is epitomised in the belief that humankind itself was made from earth at the beginning of history (Genesis 2:7) – Isidore of Seville reinforces this understanding of human origin when he declares that ‘homo’ is so called because it comes ‘ex humo’ – and in the recognition that earth is an essential ubiquitous presence in the sublunary world: it is fundamental to existence and provides the setting of all cultural life. As explained by Isidore and illustrated widely in this book, earth itself can be understood to be inactive and inert and yet, as several chapters below demonstrate, it can also be viewed as having agency, representing what one contributor here refers to as ‘vital materialism’ and ‘animacy’ (see 00). And earth is ever changing when combined with other elements, becoming something different, for example, when suffused with water. Paradoxically, then, earth is both passive and active, permanent and changing, a reality observed by thinkers such as Robert Grosseteste and exploited for practical purposes in everyday medieval life, most obviously in agriculture and construction. As the following chapters bring out, earth impinges on all aspects of human life in a multitude of ways.

The collection ends with a poem by Bernard O’Donoghue, which, among other relevant themes, contemplates this paradoxical combination of permanence and transmutability represented by earth. The poet reflects on and revisits places from his past

and present, with images of agriculture and horticulture set in different earthen landscapes and a sense throughout of the effects of time on the landscapes that the poet observes.

O'Donoghue incorporates a quotation from the poem on transience *Tara is Grass* by the Irish writer and political leader Pádraig Pearse, 'Tara is grass and behold how Troy lieth low', reflecting a sentiment familiar in the medieval world.

As will be the case with the other books in the series, the coverage of the following chapters spans the whole medieval period (and indeed beyond) and is widely spread geographically. This volume presents both comprehensive cross-cultural and historical overviews and also more narrowly-focused studies. Contributions of the former kind cover topics as diverse as land management and cartographical tradition, while more narrowly-focused studies range from, for example, an examination of the formative role of earth in the material and ideological lives of Christian monks in Egypt from the fourth century, to the reception of medieval Italian cosmological literature in the renaissance period, and from beliefs about miracles involving earth in eleventh- and twelfth-century Wales to writings of Sufi mysticism of the Middle East of roughly the same period.

Cross currents and interconnections are to be found in the treatment of earth across the collection (and it is intended that such links will be a feature across the series as a whole) but structurally the chapters here are grouped into four thematic sections, each highlighting a major strand of thinking about or using earth in the medieval world: the first section, 'Foundations of the Earth', considers key texts and ideas recognised as underlying and informing medieval thought; the second, 'Reception of the Earth', examines how ideas on the earth, both as an element and as a globe, were received, interpreted and re-elaborated in different traditions and in different manifestations of culture, including literature, cartography and the arts; the third section, 'Materiality of the Earth', explores the 'nitty-gritty', as it were, of earth on symbolic and practical levels and the relationship of earth, as mud or soil/dirt,

with living beings in real life and literary texts; the fourth and last section, ‘Portents and Magic’, considers the abstract, supernatural, and magical properties of earth from different perspectives.

Chapters and Connections

‘Foundations of the Earth’ consists of three chapters focusing on mainstream intellectual tradition in Europe and on Byzantine and Chinese sources. The first of these, a scene-setting chapter by Andrew Fear, presents an account of the authoritative ideas on earth of Isidore of Seville. Viewing humankind as a creature of earth and distinguishing between earth in the singular (*terra*, signifying the whole earth) and earth in the plural (*terrae*, marking out different parts of that whole), Isidore’s writings explore the relationship of earth with the other elements, using abstract diagrams to do so, and discuss the properties, including magical, of different types of stones. Fear emphasises that Isidore’s thinking formed the basis of European understandings of earth for centuries.

The second chapter, by Tom McLeish, Sophie Abrahams, Sigbjørn Sønnesyn and Hannah Smithson, building on the first one, brings us to the Scholastic period and to the intellectually demanding work of the thirteenth-century polymath Robert Grosseteste, who transformed Isidorean teaching on the elements through the application of Aristotelean natural philosophy, now accessible in the west in Latin translations from the original Greek and/or from Arabic. Channelling Aristotle, Grosseteste is shown to have developed his own complex theory of combinations of the elements (among which earth is the ‘foundational’ element) as a means of explaining material properties and, especially, changes in material properties. The authors suggest that Grosseteste carried out scientific observations to corroborate his abstract theorising (which, à la Isidore, he also represented in complicated diagrams), experiments

that they have striven to replicate in the modern laboratory. In a thought-provoking conclusion, they view Grosseteste's abstract, geometrical ordering of elements as part of a scientific tradition stretching from ancient times to the creation of the periodic table in the nineteenth century.

Marilina Cesario attends to the destructive power of the earth in Chapter Three, on the frightening phenomenon of earthquakes as examples of cosmic disturbance and disorder. When the earth, which should support everything that depends on it, starts to waver and loses its stability, psychological trauma, fear, political and social chaos are inevitable. This chapter offers a transcultural comparative study of how seismic phenomena were encoded, transmitted and interpreted in selected Byzantine and Chinese sources from the late antique and early medieval period. It also considers the moral and allegorical implications of earthquakes as a sign of punishment, but at the same time as an act of God's *philanthropia* and a means to repentance, as elucidated by Chrysostom in his Homily on the 'Earthquake' and in fifth and sixth-century Byzantine chronicles. Furthermore, earthquakes became powerful political instruments used to express both political and social anxieties in early and medieval China, but also to celebrate certain monarchs.

The second section, 'Reception of the Earth', begins with a chapter by Sinéad O'Sullivan on the reception of the works of Virgil in the Carolingian Europe of the ninth and tenth centuries, a key period in the intellectual history of the medieval west. O'Sullivan highlights in particular the influence of the classical idea of the *orbis terrarum*, the Latin counterpart of the Greek *oikumenē*, i. e. the inhabited earth, as reflected in the writings of the Roman poet. After tracing the history of this idea in antiquity, O'Sullivan demonstrates how it shaped the worldview of Carolingian thinkers, as illustrated in the annotations, diagrams, images and excerpts on physical geography found in Virgilian manuscripts. For Carolingians the unifying concept of the *orbis terrarum* underpinned astronomical, cosmological,

intellectual and political culture, and as part also of the cosmic order it was associated with the four elements and their properties and with all kinds of natural phenomena.

Following on from O'Sullivan, physical geography is also central to Margaret Tedford's chapter on early medieval cartography. Tedford explores how maps from early medieval Europe visualise the earth as both an element in the cosmos and the physical environment that is home to humanity. As described by ancient and early medieval authorities, the earth is understood both in terms of *terra*, the element, the planetary body and the dry land upon it, and in terms of *mundus*, the world and the cosmos. The chapter examines how pictorial maps display an understanding of the earth in elemental terms and its relation to the wider cosmos. It demonstrates how knowledge of the elements and cosmology influenced the vision of the earth reflected in maps produced in Europe from the ninth to the thirteenth centuries.

The theme of visualisations of the earth is also taken up in the chapter by Virginia Iommi Echeverría. Moving forward in time and in a different cultural context, Iommi Echeverría examines Italian poetry of the thirteenth and fourteenth centuries, concentrating particularly on a work by Cecco d'Ascoli but also referencing Dante Alighieri. Considering theoretical difficulties faced by natural philosophy when explaining the existence of dry land in the system of concentric spheres, d'Ascoli and others pondered the shape of the earth at the centre of the universe, the differences between the northern and the southern hemispheres and the importance of stellar attraction as a physical explanation for the rising of earthly continents. The chapter goes on to discuss the reception of such ideas in the Renaissance period, when, contrary to received authority, navigation had proved the existence of dry lands in the southern hemisphere.

In the final chapter of the ‘Reception of the Earth’ section, Danielle Joyner reflectively explores responses to *terra*, as representing both the globe of the world and the element, in medieval art and also in prayer and song, ranging widely from the ninth century and earlier to the fifteenth century in western Europe. She brings to bear features of the diagrams of Isidore and others and incorporates a veritable history of western iconography of earth, including personification of *terra*, but concentrates particularly on the towering thirteenth-century figures Francis of Assisi and William of Auvergne (contemporaries also of Robert Grosseteste, of course), whom she identifies as articulating new paradigms for perceiving *terra* and its relationship with humanity. In her interpretation of medieval representations of *terra* Joyner applies the term ‘sacred ecology’, a view of human society as part of a web of life within the divinely governed ecosystem.

In the chapters of ‘Materiality of the Earth’ we encounter earthy earth – earth in everyday and economic life in the form of mud (earth combined with water) and soil, and earth as perceived as operating in the life of animals. Catherine Clarke contemplates perceptions of the meanings of mud for present-day observers of mud-encased objects from the early English past, for whom mud offers a mode of imaginative connection between modernity and the medieval world; she also considers mud in modern literary engagements with the muddy past, notably in the poetry of Seamus Heaney. Clarke’s chapter goes on to contrast such modern engagements with understandings of mud in the medieval period itself, where it is seen as forming part of an ethical aesthetics in Old and Middle English, often acting as a moral agent which calls attention to worldliness, vanity and pride, or which forges an antithesis between the good or noble and desecration/corruption.

Following directly on from Clarke, the chapter by Stephen Davis considers the significance of mud in the lives of the Coptic monks of late antiquity and the early Middle Ages both materially, as building material and in the form of clay pottery, and ideologically,

as illustrated in stories in the lives and sayings of Egyptian monastics. Taking issue with perceived anthropocentric biases in archaeology and adopting instead the perspectives of ‘vital materialism’ and ‘animacy’, Davis argues that mudbricks and clay pottery played a crucial role in the making of monks. Rather than being merely passive he sees earth as an animating element in the world of Egyptian monasticism, having an agential role in relationship with the monastic body.

James Davis addresses the topic of earth and economics, focusing on the practicalities of land management in the agriculture of thirteenth-century England. Davis considers the evidence of soil maintenance and sustainability contained in two English manuals on estate management of the period, texts which outline a range of methods to improve the land and soil. Davis places the English treatises in a broader historical and geographic context, with reference to texts from Italy and Arabic Al-Andalus, some of which incorporate knowledge of elemental theory as well as practical advice. The treatises discussed provide evidence of an ‘ecological sensibility’ in England, as more widely the medieval world, that encouraged a careful management of resources, though Davis stresses that such a sensibility was often profit-led, rather than arising from concern about the environmental footprint.

Finally, under ‘Materiality of the Earth’, Alexandra Paddock identifies symbiotic relationships between animals and earth as featured in bestiary and related early medieval literature and art. Earth is portrayed in this tradition as an element with conflicting properties: it is both base and vital, a site of fertility and birth, as in the spontaneous generation of some creatures, but also of death, as reflected in the belief that graves were robbed by the hyena; it provides a dwelling space and a place of refuge and fortification. Paddock finds that the animals of the bestiary tradition are seen as having a knowledge of the earth not available to humans, though they have no access to the spiritual knowledge to which humanity should aspire.

The concluding section, 'Portents and Magic', brings together a series of chapters touching on mysterious and supernatural aspects of earth. Daniel Anlezark surveys representations of the elements, with particular reference to earth, in Anglo-Saxon England. Anlezark outlines Bede's influential thinking on the elements and earth, thus attending to one of the foundational figures in western tradition referred to in our first section. He then turns to vernacular poetry, which stresses the need to develop wisdom as a way of understanding the properties and behaviour of the elements, before finally considering the healing capacity of earth as reflected in accounts of miracle cures in Bede's *History* and in charm literature, the latter being viewed as reflecting pre-Christian beliefs about earth fused with Christian ritual practice. The healing stories are taken to be complementary to, rather than alternative to, Bede's scientific teachings.

Miracles involving earth are highlighted again in Francesco Marzella's chapter on Latin lives of early (fifth to seventh centuries) Welsh saints, the corpus of which dates mostly from the eleventh and twelfth centuries. Marzella surveys this corpus noting the inseparable bond of the saints with *terra/tellus* (in the sense 'ground', but also 'land', 'territory', 'territoriality'), a relationship that demonstrates God's agency in support of them. The saints claim and modify new land, liberating it from monstrous beings and exercising control over it with prodigious help from the 'animated' earth itself, which intervenes under divine direction to help the saint or, destructively, to punish his or her opponents, notably by swallowing them up. As well as edifying their audiences, Marzella argues that such stories politically reinforce the power and authority of the Welsh church in the period in which they were produced.

Patrick Naeve discusses the significance of the earth in Islamic exegesis, historiography and mysticism, paying special attention to how the earth is portrayed as a site of encounter between the living and the dead. The chapter begins by considering the relationship between earth and humankind in the Qur'an, in which earth signifies the

terrestrial world its entirety and the specific material which comprises it, and is also the dwelling place of the dead, who are destined to re-emerge in the eschatological 'day of resurrection'. Naeve goes on to examine treatments of these principles in Qur'anic commentary and interpretation, focusing in particular on the foundation of the earth and on idea of a speaking earth, according to which earth is granted a voice to bear witness to the truth of Islamic conceptions of the universe. In a link with Cesario's chapter, earth's communication with humankind is seen as including earthquakes, which are a sign of earth's ultimate destruction and transformation. In the last part of his contribution Naeve discusses the Sufi idea of 'listening' to the earth in order to heighten mystical perception of God and understanding of the nature of reality.

Naeve's is the concluding chapter of a collection that ranges far and wide, from what O'Donoghue refers to in his poem as 'the toil and trade of farming' and 'the wildness and the wet' of uncultivated nature to the rarified world of abstract natural philosophy. Whether philosopher, poet or farmer, medieval people's view of earth was underlain by a recognition of their own destiny as creatures made from earth who will return to earth (Genesis 3:19), but, as the following chapters demonstrate, medieval people were also driven by a desire to know about earth, its nature and its properties.