Studies in Medieval History and Culture

FRAGMENTED NATURE: MEDIEVAL LATINATE REASONING ON THE NATURAL WORLD AND ITS ORDER

Edited by Mattia Cipriani and Nicola Polloni

Fragmented Nature: Medieval Latinate Reasoning on the Natural World and Its Order

The Latin Middle Ages were characterised by a vast array of different representations of nature. These conceptualisations of the natural world were developed according to the specific requirements of many different disciplines, with the consequent result of producing a fragmentation of images of nature. Despite this plurality, two main tendencies emerged. On the one hand, the natural world was seen as a reflection of God's perfection, teleologically ordered and structurally harmonious. On the other, it was considered a degraded version of the spiritual realm – a world of impeccable ideas, separate substances, and celestial movers.

This book focuses on this tension between order and randomness, and the idealisation and reality of nature in the Middle Ages. It provides a cutting-edge profile of the doctrinal and semantic richness of the medieval idea of nature and also illustrates the structural interconnection among learned and scientific disciplines in the medieval period, stressing the fundamental bond linking together science and philosophy, on the one hand, and philosophy and theology, on the other.

This book will appeal to scholars and students alike interested in Medieval European History, Theology, Philosophy, and Science.

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Introduction

Mattia Cipriani and Nicola Polloni

Recollecting his naturalistic explorations of Central America, Alexander von Humboldt famously observed that "Our imagination is struck only by what is great; but the lover of natural philosophy should reflect equally on little things."[1] Big events like the eruption of a volcano (think of Pliny the Elder) or the passing by of a comet (like with Adémar de Chabannes or Raoul Glaber) surely attract the attention of a speculative mind, yet Humboldt's words point out, the work of nature can be appreciated, too, by observing what is tinier, more ordinary, and plain. In Humboldt's case, these "little things" were curious insects and termites he found and catalogued in America. However, considering its far-reaching scope, the study of nature can be and was instantiated by a wide set of disciplines, cases, and perspectives. Centuries before Humboldt's explorations, medieval philosophers and practitioners could find a similar perspective in Aristotle's remark that "ἐν πᾶσι γὰρ τοῖς φυσικοῖς ἔνεστί τι θαυμαστόν" ("every realm of nature is marvellous").[2] Aristotle, too, was referring to the study of the ordinary: lesser animals that some may think they could be neglected in the examination of nature.[3] This should not be the case, according to Aristotle, because the natural world offers glimpses of its intrinsic structure in its every aspect. Such structure was ontologically defined by individual hylomorphic interactions, and its regularity prescribed by the incessant circular motion of the celestial spheres and their impact on the world below the moon and its elements. Yet every single natural entity – elements and humans alike, as well as what is between them in the *scala naturae* – also shows a tendency towards what is best for it: a finalistic progression of the individual course of nature which, again, can and should be appreciated in big and "little things" alike.

From this point of view, it should not be surprising to see how the Latin Middle Ages were characterised by a vast array of different accesses to nature. From the notion of an intrinsic nature regulating the behaviour of every natural entity to the concept of an overall nature directing the clockwork of the physical universe (a *machina mundi*, as Grosseteste described it), medieval Europeans looked at the apparent regularity and order of nature in awe. Different conceptualisations of the natural world were often developed according to the

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specific requirements of many different disciplines. Such richness of epistemes of nature was grounded on a shared conception of nature imbued with finalism and acknowledging that the universe, in its basic structure, is an ordered complex of entities interacting with each other at different levels.

During the early Middle Ages and up to the 12th-century Renaissance, the main narrative about nature was given by Plato's *Timeaus* and his theory of *anima mundi*. Not differently from humans or squirrels, the universe as a whole is a living body endowed with a soul, the World Soul, which governs its behaviour. She reigns over a harmonious universe that has been ordered by the demiurge from an original state of chaos. Accordingly, the regularity of the natural course of things is justified by the original arrangement of the god and the constant work of its presiding principle, the World Soul, whose life affects the existence of every natural entity. The life of the individual and that of the globe, hence, are intrinsically bound: the microcosm of the former is but a reflection of the macrocosm of the latter. With the transition to Aristotelianism and Scholasticism in the early 13th century, Latinate medieval thinkers inherited a different justification of the order of nature based on Aristotle's finalism. As Devin Henry has recently shown, Aristotle's theory is strictly linked to Plato's, yet the mechanism through which the natural order works is reversed.[4] The universal governing principle of the World Soul is fragmented into a multiplicity of formal internal principles that ontologically constitute the natural entity leading it towards the goal prescribed to the individual and its species. In their own study of nature, medieval thinkers made use of both narratives, expanding on their own perspectives and theoretical requirements.

This volume examines a plurality of problems, theories, and images of the order and regularity that medieval philosophers and practitioners saw as structuring the natural world. Such richness of perspectives is directly bound to the plurality of epistemes of nature that characterised European philosophy and science in the Middle Ages and to the specificities of the case-studies discussed by the contributors. While most medieval thinkers agreed on considering nature as an ordered structure of interactions, any glimpse of such structure had its own coordinates. Different domains engaged with nature according to their own methods and assumptions. Consideration of a diverse set of animals or plants may lead to diverse sets of features and theories. And the reading of an authoritative text could apport very different ideas from one period to another, from one tradition to its competitor. Yet in all these cases, philosophers and practitioners not only looked at nature appreciating its order, but had to order nature in return, prescribing (and proscribing) rules, texts, behaviours, and narratives. Hence, the natural order of the universe is based on the theoretical reordering of data, solutions, and theories by interested practitioners.

A quick and general look at some aspects of medieval theories of nature – to be taken with a grain of salt, for obvious reasons – may be useful to the reader engaging with this complex and disciplinarily fragmented theme.

Let it start from the basic components of the universe. Medieval natural philosophers in Europe dedicated an impressive number of pages to the appreciation of how the four elements (fire, air, water, and earth: the qualitative bricks of the physical world below the moon) transmuted into each other and reciprocally interacted, producing simple mixed bodies. These simple continuous bodies were considered the bases of more complex bodies. Endowed with different sets of properties (some of which are visible while others occult) that produce explicit behaviours under specific circumstances, these continuous bodies constitute the rich fabric of the universe. Such medieval ontology of the natural world was grounded on the conviction that interactions among simple and complex bodies were regulated by internal properties of any considered entity. As rules of behaviour under a specific circumstance, these internal properties are expressions of the nature (*natura*) of that entity (corresponding to its formal aspect) in its projection towards environmental conditions and specificities. Fire will always be hot and heat what is close to it. A chunk of metal will always be meltable and make an alloy with another melted metal. And a piece of flesh will always putrefy and corrupt in its constituents when it is not enlivened by a soul. Such regularity of natural behaviour was of course accompanied by a certain number of irregularities: incidental and even non-perspicuous causes may interact with physical processes giving a different causal outcome. Yet the universe seen and thought by medieval European thinkers was a world of order: an ordered universe tending towards what is best for each of its components.

However, the domain in which the order of nature could be better appreciated by medieval natural philosophers was not that of the physical constituents. Following Aristotle's footsteps, biology was the discipline better equipped to understand how nature, in its regular course, always tends towards the individual best. According to Aristotelianism, living beings are compounds of bodies and souls. Enlivening them, the soul presides over all functions and motions of plants, animals, and humans. Yet the body must be disposed to carry out such functions. Aristotle's finalism found a fertile ground in medieval Europe. Natural philosophers and practitioners delved into a consideration of the living body as a complex and well-structured set of organs allowing its soul to carry out its life in the best way. The study of how new living bodies were generated and died, the healing of their illnesses, and even the artificial prolongation of human life were all central themes of medieval practices based on a consideration of the living body as an ordered structure which instantiated in its own way the overall order of the universe (a connection which, in the 12th century, was eminently symbolised by the microcosm/macrocosm narrative mentioned above).

A further strand of medieval reasoning on nature crucially expands on how animals behave, naturally, and can be trained, nurtured, and used. Consideration of the natural behaviour of animals, either individually or collectively, was often used to sustain moralising claims about humans and their lives. In this case, too, the awe of naturalistic practitioners and

thinkers is often accompanied by the theoretical effort to reorder their theories and data to fit with new explanations and narratives. Be it bees, bugs, or falcons, natural thinkers from the European Middle Ages agreed that animals provide a fundamental glimpse of the order and work of nature. Accordingly, the study of animals was considered to facilitate humans in better establishing their own sets of ethical and social behaviours. No salvation, however, was available to lower kinds of living creatures: animals are condemned to live a life of bruteness, which, nonetheless, is still marked by some degree of goodness and goal-directedness.

The ten contributions included in this volume focus on different instantiations of the medieval study of nature and its ordered structure. Expanding on a diverse set of authors, texts, and problems, these chapters offer the reader with important case-studies, each giving a glimpse of the wide web of instances in which the study of nature was declined in medieval Europe. Most of the chapters focus on the Scholastic period and the cultural inheritance from Greek and Islamicate texts translated into Latin. Nonetheless, besides their specific place in time, all considered authors felt the necessity to address nature and its ordering in a multifarious yet consistent fashion.

Following a chronological order, the volume starts with Emmanuelle Kuhry's contribution, titled "Zoological Inconsistency and Confusion in the *Physiologus latinus*." The chapter focuses on a very influential and curious work, the *Physiologus*, detailing a moralised catalogue of animals. Kuhry concentrates on the Latin adaptation of the *Physiologus*, examining how the text was readapted in order to fit within the genre standardised by Isidore of Seville's *Etymologiae*. Accordingly, the author of the Latin version reordered the original classification of animals, applying, sometimes clumsily, Isidore's traditional categorisation to sets of animals, some of which were quite exotic or unknown. Kuhry examines some intriguing cases of such reordering. Crocodiles result as members of both fishes and quadrupeds. Otters are considered (and depicted) as water snakes. And vivid accounts of hunting expeditions are recalled about the peculiar antlion (supposedly, what results from an ant mating with a lion). Furthermore, the author shows how these rearranged understandings have also led to twisted illuminations of the animals discussed. Through her reconstruction of the textual history of the work, Kuhry points out the interpretative reasons behind the confusion in the reordering of the *Physiologus*, stressing the moral value of the text and its cross-cultural foundations (with both cultural and lexical reinterpretations).

Authored by Bernd Roling, the next chapter is titled "Gerald of Wales and Saint Brigid's Falcon: The Chaste Beast in Medieval and Early Modern Irish Natural History." Roling examines a curious work, the *Topographia Hibernica* written by the polymath Gerald of Wales, and a specific anecdote about the falcon of a monastery founded by Saint Brigid. Supposedly, this centenary falcon did not behave like other animals: challenging its own nature, this beast appeared to have respected the sacrality of the ground in which Saint Brigid chose to establish her community. Yet, can nature be

overcome by such permeating spirituality? Roling dissects the history of the legend referred to by the *Topographia* providing a new interpretation of the account and its curious historiographical implications.

In the following chapter, "Medieval Universes in Disorder: Primeval Chaos and Its Authoritative Coordinates," Nicola Polloni discusses how narratives of a disordered original nature were engaged with by medieval philosophers. Through Plato's *Timaeus*, the conviction that the universe was originally in a state of chaos circulated throughout the Latinate Middle Ages. Looking at the main sources of the debate, Polloni disentangles different interpretation of the "ontology" of that chaos. While the theory was very influential in the 12th century, the emergence of Scholasticism redefined what Polloni calls "the authoritative coordinates" of the debate, substituting Plato, Calcidius, and Ovid with Aristotle, Anaxagoras, and Hesiod. By examining three relevant case-studies (Roger Bacon, Thomas Aquinas, and Albert the Great), Polloni points out that the later medieval debate reshaped the discussion on primeval chaos into a discussion on hylomorphism and natural change.

Mattia Cipriani is the author of the next chapter, titled "Animals under an Encyclopedic Lens: Zoological Misinterpretation in Thomas of Cantimpré's *Liber de Natura Rerum*." Cipriani expands on the zoological catalogues of the Dominican friar Thomas of Cantimpré. In his *Liber de natura rerum* (1230 *ca*.–1255 *ca*.), Thomas of Cantimpré discusses an impressive number of animals, classifying them in classes of quadrupeds, birds, odd aquatic creatures, fishes, snakes, and insects. Although Thomas of Cantimpré follows his sources quite closely, on some occasions the Dominican friar interprets his materials in rather peculiar ways. Cipriani's chapter focuses on the latter and examines Cantimpré's effort in making sense of the "order among animals." By considering curious examples, Cipriani shows the motivations behind Thomas of Cantimpré's reordering of the animal realm.

Thomas of Cantimpré's discussion of animals is also the subject of Julia Burkhardt's chapter, titled "Learning from Bees, Wasps, and Ants: Communal Norms, Social Practices, and Contingencies of Nature in Medieval Insect Allegories." The chapter focuses on the description of the bees' community in Cantimpré's *Bonum universale de apibus*. Burkhardt discusses Cantimpré's engaging attitude in allegorising the social behaviour of bees as exemplary of an ideal community of humans. Such attitude was grounded on direct observation and study of bees and other insects. Cantimpré's appreciation of the order of animal communities offers yet another case of the dynamic of ordering and reordering that has marked much of the human encounter with nature in the Middle Ages. Tending towards goodness, the ordered community of bees speaks of a human society that can and should be concretised. Yet, as Burkhardt points out, such ideal projection of human communities into the natural realm changes with a changing society. As the author observes, the 15th-century debate would focus on different societal values, which could nonetheless be exemplified by the behaviour of insects (namely, ants) and their communities.

Next in line, Grégory Clesse's contribution, "Defining and Picturing Elements and Humours in Medieval Medicine: Text and Images in Bartholomew the Englishman's *De proprietatibus rerum*" focuses on a specific ingredient of living bodies: humours and their elemental composition. Clesse examines a curious and consequential text, *De proprietatibus rerum* by Bartholomew the Englishman, and uncovers how the latter's attempt at deciphering the work of nature at the level of biological composition was based on a reinterpretation of traditional medical sources like Constantine the African and Avicenna. Clesse analyses Bartholomew's difficult understanding of how elements, elemental qualities, and humours were interconnected, echoing the problematic debate on elements and qualities that marked much of the history of ancient and medieval medicine. A remarkable appendix to such pivotal discussion, Clesse includes a short discussion of how elements and humours were visualised and represented in medieval miniatures. Such representations shed light on how medieval scholars mentally depicted this unperceivable level of the order of nature.

With Dominic Dold's "Why Do Animals Have Parts? Organs and Organisation in Thirteenth- and Fourteenth-century Latin Commentaries on Aristotle's *De animalibus,*" the volume shifts to the epistemological consideration of the order of nature. Dold's contribution provides an analytic examination of five commentaries on Aristotle's *De animalibus*, authored by Peter of Spain, ps. Peter of Spain, Albert the Great, Gerard of Breuil, and ps. Buridan, respectively. More specifically, Dold discusses how these commentaries treated a specific problem of the medieval debate on animals: how are their internal parts ordered organically and functionally within the animal body? As Dold brilliantly shows, the answers given by the five authors share important doctrinal points proceeding from both metaphysical and physical considerations. By dissecting the "Schematic Argument" employed by Peter of Spain to justify the organic compositions of animals, Dold leads a philosophical expedition into the epistemology of the living world that is both analytical and historical, pointing out the logical structure of the arguments formulated by the five authors and the historical context of their elaboration. In the case of animal organs, too, the speculative approach of medieval philosophers is aimed at reconstructing a fundamentally ordered structure within the natural world that is both deduced and induced, obtruded and protruded by the human intellectual encounter with nature.

Albert the Great's unique glance into the natural world is also examined by the next chapter included in the volume. Authored by Isabelle Draelans, "La reproduction imparfaite: les "gusanes" et l'état larvaire des insectes chez Albert le Grand" delves into Albert the Great's consideration of insects and larvae. Medieval thinkers were fascinated by the bizarre world of insects, which showed both seeming continuities with the human world (e.g., in the case of bees) and problematic ruptures within the animal world (e.g., with the problem of spontaneous generation). After presenting the main coordinates of medieval entomology from Ambrose

of Milan to Vincent of Beauvais, Draelans examines Albert's reliance on Avicenna. The Persian philosopher provided Albert with fundamental materials to discuss how insects reproduce, their sexual dimorphism, and the metamorphic processes that they seem to undergo. In her rich discussion, Draelans also points out the relevance of the term "gusanes" as referred to worms and larvae that would later grow into diverse types of insects.

Albert the Great's polymathic attitude characterises the next chapter, too, which is authored by Athanasios Rinotas. More specifically, in his "Elixir as Means of Contrasting with Nature in Albert the Great's Alchemy," Rinotas examines Albert the Great's interest in alchemy and his discussion of the elixir. After having provided a concise introduction to the main alchemical theories about the elixir, Rinotas delves into Albert the Great's treatment of said alchemical device, showing that although he does not offer a systematic discussion, the Dominican thinker was indeed familiar with the notion of "elixirs." Interestingly, Albert the Great interprets the elixir mostly in connection to the composition of metals. However, he applies to it relevant functions that had been ascribed to the "medical elixir" by the Islamicate alchemical tradition. Albert the Great projects such functional intertwining of metallurgical and medical considerations of the elixir into a discussion of how the elixir can be used with metals. Notwithstanding the desires of alchemists, Albert the Great is resolute in denying any possibility that the elixir be able to realise a complete substantial transmutation. Examining the notion of "incomplete transmutation" and the theory of *symbola*, Rinotas shows Albert's endeavour to understand the basic components of the non-living world and the possibilities of a human alteration of nature at its most elementary level.

The last chapter of the collection, "From Prime Matter to Chaos in Ramon Llull," is dedicated to Ramon Llull. Authored by Carla Compagno, the paper disentangles Llull's complicated theories of matter and chaos. In the *Liber chaos*, Llull elaborates a theory of creation grounded on primordial chaos. All bodily substances proceed from this original disorder. With a far-reaching perspective, Compagno examines Llull's reflections on the four elements, prime matter, and chaos from the *Liber contemplationis* to the *Arbor scientiae*, showing how the theory of prime matter became a substantive aspect of Llull's doctrine of chaos. Llull's unique speculative approach, exemplarily concretised by his *Ars*, is at work also in his consideration of the origins of the bodily world. As a result, the realm of nature as it is, and as it was at its temporal beginnings, finds an epistemic order by Llull's recourse to geometry and logic. Either ordered or disordered, nature can be grasped by the human mind at different levels, unveiling some aspects of its intrinsic tendency towards goodness.

The history of both philosophy and science is based on the human encounter with nature. From the pre-Socratic consideration of the natural elements as matrix of the universe to contemporary environmental theories redefining the human place in our planet, the natural world has been a main stage

for human reflections and speculations. The ten case-studies discussed in this volume are exemplary of the fundamental and seeding role that the reasoning about nature has had for European literary cultures. Scrutinising the natural world, medieval philosophers and practitioners were inspired by its apparent regularity and organisation. Like images reflected in a magnifying mirror, these instances of order were amplified and projected back to their origin. Such projection created impressive theories about an unperceivable and hidden order that nature must have in its basic constituents (elements, mixtures, organs) as well as in what is manifested to us. The reordering of the order of nature also implied practitioners to reorder the materials they had at their disposal: manuscripts, texts, and authorities. And the same effort governed the questioning of classifications of living and non-living beings alike to grasp the fundamental structure of nature inscribed within every natural being by God's act of creation.

With the turn to early-modern philosophy in the 17th century, Scholastic philosophy and Aristotelianism would gradually be superseded by a different approach to nature. The fundaments of Aristotelian natural philosophy – hylomorphism and continuity – would grow outdated and be replaced by corpuscular and mechanical explanations of the world. Yet the awe of nature, the appreciation of its far-reaching yet sometimes hidden orderly structure, would increase even more, displaying at least in this case an explicit continuity in attitude, although not in the deployment of similar explanatory devices. Bordering philosophy and science, reason and sentiment, the query to unfold the order of nature still marks the advancement of human science and knowledge, from the study of far-away stars to the consideration of the hidden matter of everything. And incessantly longing for nature, we find ourselves reflected into nature like in a distorted mirror, often unable to recognise our own shapes.

Notes

1. Alexander von Humboldt, *Personal Narrative of Travels to the Equinoctial Regions of America During the Years 1799–1804*, tr. Thomasina Ross (London: Bell and Sons, 1885), vol. 2, 288.
2. Aristotle, *Parts of Animals* I 5, trans. by William Ogle, in The Complete Works of Aristotle, ed. by Jonathan Barnes, vol. 1 (Princeton: Princeton University Press, 1991), 14.
3. See Aristotle, *Parts of Animals* I 5, trans. by William Ogle, 14: "For if some have no graces to charm the sense, yet nature, which fashioned them, gives amazing pleasure in their study to all who can trace links of causation, and are inclined to philosophy. Indeed, it would be strange if mimic representations of them were attractive, because they disclose the mimetic skill of the painter or sculptor, and the original realities themselves were not more interesting, to all at any rate who have eyes to discern the causes. We therefore must not recoil with childish aversion from the examination of the humbler animals."
4. Devin Henry, *Aristotle on Matter, Form, and Moving Causes* (Cambridge: Cambridge University Press, 2019).