G. B. Della Porta is of the first importance – as much as Pico, Ficino and Agrippa – for the story of magic, religion and science in early modern Europe. But this major thinker has been understudied … until now. Donato Verardi's superb new book on *Giovan Battista Della Porta and the Reinvention of Nature. Philosophy, Experience, Artifice* gives badly needed attention and excellent analysis – historical and philosophical – to this prolific and courageous genius, benefitting everyone, but readers of English especially.

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Distinguished Professor Emeritus of Philosophy and History
University of California, Los Angeles (UCLA)

Della Porta has long remained both fascinating and enigmatic. Donato Verardi offers sure guidance here through Della Porta's writings and thoughts, examining not only the three forms of Della Porta's treatise on natural magic published over some fifty years, but his other writings as well; Verardi shows how his studies of natural philosophy developed and changed over the years. Della Porta continued to refine his understanding of celestial influence in the light of experience and study, as Verardi admirably demonstrates.

Ann E. Moyer
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University of Pennsylvania

Donato Verardi is a Marie Skłodowska-Curie Alumnus of Ca' Foscari University of Venice. Previously a Fellow in Paris and at the Warburg Institute, London, he has published extensively on early modern philosophy and science, including *Aristotelianism and Magic in Early Modern Europe* (2023) and *Hunting Secrets* (2025).

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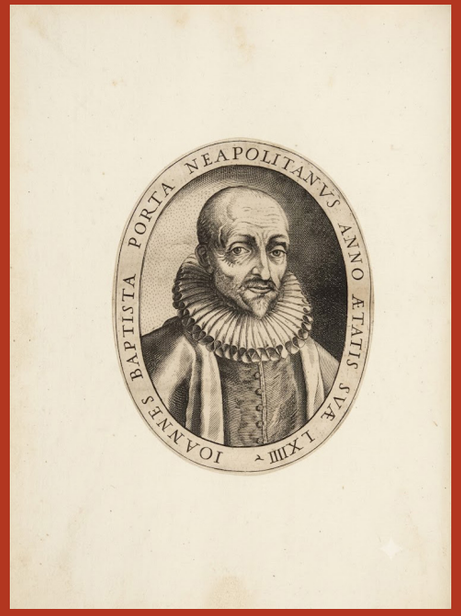
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VERARDI DELLA PORTA AND THE REINVENTION OF NATURE

DONATO VERARDI

GIOVAN BATTISTA DELLA PORTA AND THE REINVENTION OF NATURE

PHILOSOPHY, EXPERIENCE, ARTIFICE



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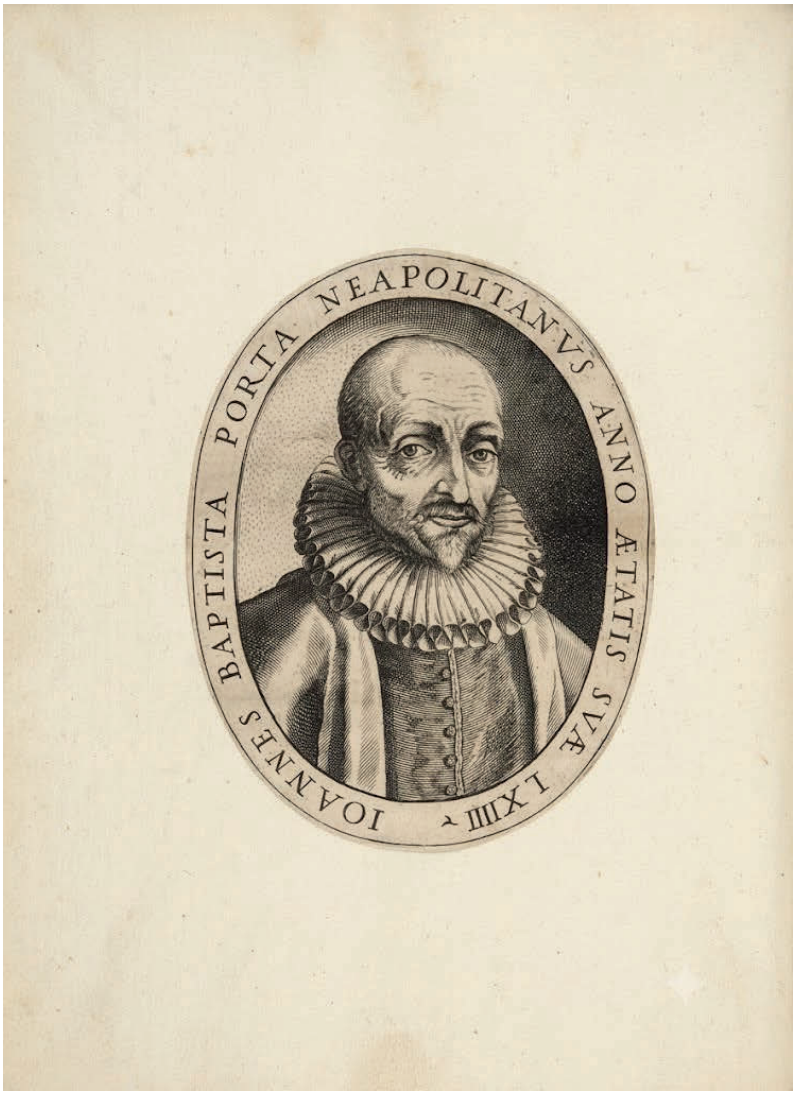
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Giovan Battista Della Porta (*anno aetatis suae LXVIII*). Detail from the engraved frontispiece of *De distillatione* (Rome, 1608).

DONATO VERARDI

GIOVAN BATTISTA DELLA PORTA AND THE REINVENTION OF NATURE

PHILOSOPHY, EXPERIENCE, ARTIFICE



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A NOTE ON THE GENESIS AND AMBITION OF THE BOOK

This book grew out of research carried out within the MSCA project SECRETS. Some of the themes explored here have occupied my research for many years and have also been discussed, in different forms, in my previous work, mostly in Italian, but also in French and English. In the meantime, new questions and perspectives have emerged from my own research, from collaborative work undertaken with other scholars, and from the broader investigations pursued through SECRETS, as new approaches to Della Porta have also emerged in international scholarship. These developments have opened up new ways of bringing together lines of inquiry that I had previously pursued separately. More importantly, I had never considered these themes within the conceptual framework of *reinvention* developed in this book. The present study therefore brings these different lines of inquiry together within a new interpretative framework, placing earlier questions alongside those that have emerged more recently and reconsidering them in relation to the broader argument developed here.

The ambition of this volume is not to offer a comprehensive account of Della Porta's natural philosophy, but to propose a possible interpretative framework through which its different dimensions can be brought into view together. By tracing the ways in which inherited principles are reconfigured in the encounter with particular phenomena, the book seeks to illuminate a recurrent mode of transformation within Della Porta's natural philosophy. It is hoped that this framework may also prove fruitful for further research into the history of natural philosophy and science, and, more broadly, into the history of knowledge.

I am grateful to the two anonymous referees for their careful reading of the manuscript and for their insightful comments, which helped me to clarify and strengthen the argument of the book.

Donato Verardi
Venice, August 2026

A CHRONOLOGY OF THE LIFE AND WORKS

1535.
Giovan Battista Della Porta is born at Vico Equense.

1558.
Della Porta publishes his first work, *Magiae naturalis, sive de miraculis rerum naturalium libri IV*, at the age of twenty-three. The work presents an extensive investigation of occult properties and extraordinary effects in nature.

1558–1579.
Della Porta travels extensively throughout Italy, including Lombardy, Calabria, Sicily, Puglia, and Venice, as well as France and Spain. His travels contribute to the development of his interests in natural phenomena, technical practices, and experimental knowledge.

1563.
De furtivis litterarum notis is published, a work devoted to cryptographic methods.

1566.
L'Arte del ricordare is published in Naples. A Latin version, *Ars reminiscendi*, appears in 1602.

1574–1578.
An inquisitorial investigation is opened following an accusation of complicity with the astrologer Vitale. The proceedings conclude in November 1578 with Della Porta's formal oath of innocence.

1579.
Della Porta enters the patronage of Cardinal Luigi d'Este, for whom he undertakes scientific and technical investigations.

1580.
Della Porta travels to Rome and later to Venice on behalf of Cardinal d'Este, where he oversees the construction of a parabolic mirror and an *occhiale*. He subsequently travels to Ferrara.

1581.
Jean Bodin publishes *De magorum daemonomania*, accusing Della Porta of teaching the preparation of the witches' ointment in the *Magia naturalis*. Della Porta returns to Naples in April.

1583.
Della Porta investigates alchemical transmutation at the request of Cardinal d'Este. He publishes *Pomarium*, devoted to fruit cultivation.

1584.
Olivetum, a treatise on the cultivation of olive trees, is published. Together with *Pomarium*, it anticipates Della Porta's later agricultural writings.

1586.
Sixtus V issues the bull *Coeli et terrae* against divinatory arts and judicial astrology. Della Porta publishes *De humana physiognomonia*.

1588.
The *Phytognomonica* is published in Naples, extending physiognomic principles to plants, animals, and celestial phenomena.

1589.
The expanded *Magiae naturalis libri XX* is published. The twenty-book work substantially reconfigures the four-book *Magia naturalis* of 1558, bringing together natural magic, astronomy, optics, medicine, agriculture, and the study of occult properties. Della Porta presents the work as the fruit of the collective experience of the *Academia degli uomini curiosi*, the circle of investigators who gathered at his house. In the same year, he meets Tommaso Campanella in Naples, and the two publicly debate the nature and legitimacy of magic.

1592.
Villae libri XII is published in Frankfurt, bringing together Della Porta's agricultural knowledge and experience. Della Porta travels to Venice and Padua, where he meets Galileo Galilei. The Venetian Inquisition prohibits the publication in the vernacular of the *Fisonomia dell'uomo* without permission from the Roman Holy Office.

1593.
De refractione optices is published in Naples, providing a systematic treatment of optical phenomena.

1603.
Federico Cesi establishes the Accademia dei Lincei. In Naples, Della Porta's *Coelestis physiognomonia* is published.

1608.
Della Porta publishes *De munitione* in Naples and *De distillatione* in Rome, dedicating the latter to Federico Cesi.

1609.
Following news of Galileo's telescope, Della Porta claims priority for its invention in correspondence with Federico Cesi. He subsequently acknowledges Galileo's decisive improvements and its astronomical use.

1610.
Della Porta officially joins the Accademia dei Lincei.

1611.
The Accademia degli Oziosi is founded in Naples. Della Porta is among its founders. In the same year, the expanded vernacular Italian version of his natural magic, *Della magia naturale*, is published, incorporating new secrets beyond those contained in the earlier editions.

1612.
Della Porta returns to his investigations into the philosophers' stone and seeks permission to publish his *Taumatologia*. He also continues his work on optical instruments.

1613–1614.
Della Porta continues his investigations into parabolic mirrors, lenses, and the improvement of the telescope.

1615.
Giovan Battista Della Porta dies on 4 February at the house of his daughter Cinzia, following a brief illness.

Posthumous reception.
Della Porta's works continue to circulate widely after his death through reprints, translations, excerpts, and appropriations, contributing to European traditions of natural magic, natural philosophy, medicine, optics, and the study of nature.

INTRODUCTION

I.

Giovan Battista Della Porta occupies an important yet distinctive place in the history of early modern natural philosophy, although his work has long stood somewhat apart from broader narratives of its development. Scholarship on Della Porta has nevertheless developed along several important lines of inquiry, variously emphasising the staging of natural wonders, the pursuit and disclosure of secrets, the social and collaborative dimensions of knowledge-making, and the practical and experimental engagement with phenomena.[1] These approaches have brought important aspects of his thought into view.

[1] At least for some of the principal lines of inquiry, see, on the staging of natural wonders and the theatrical dimension of Della Porta's experimental practice, Sergius Kodera, "The Laboratory as Stage: Giovan Battista della Porta's Experiments", *Journal of Early Modern Studies* 3, 1 (2014), 15–38, and Sergius Kodera, "Giambattista Della Porta's Histrionic Science", *California Italian Studies* 3 (2012), 1–27; on the pursuit and disclosure of secrets, as well as the social and collaborative dimensions of knowledge-making, William Eamon, *Science and the Secrets of Nature: Books of Secrets in Medieval and Early Modern Culture* (Princeton: Princeton University Press, 1994); Donato Verardi, *La scienza e i segreti della natura a Napoli nel Rinascimento. La magia naturale di Giovan Battista Della Porta* (Florence: Firenze University Press, 2018); on the physical explanation of natural powers and the problem of occult qualities in Della Porta, Gabriella Belloni Speciale's pioneering study, "Conoscenza magica e ricerca scientifica in G. B. Della Porta", in Giovan Battista Della Porta, *Criptologia*, ed. by G. Belloni (Rome: Centro Internazionale di Studi Umanistici, 1982), 45–101, remains an important point of reference; on the practical and experimental investigation of natural phenomena, Luisa Muraro, *Giambattista Della Porta mago e scienziato* (Milan: Feltrinelli, 1978); Doina-Cristina Rusu and Dana Jalobeanu (eds.), "The Creative Power of Experimentation: Bacon and Della Porta", *Centaurus* 62, 3 (2020), 381–464, and Donato Verardi (ed.),

The present volume turns to a related but distinct question: how is the idea of nature itself reworked when inherited principles are brought to bear on new cases? The question is related to broader historiographical inquiries into the historical construction and changing intelligibility of nature, but focuses on how an inherited natural order is reconfigured in the encounter with particular phenomena.[2]

Previous scholarship has already drawn attention to the openness of Della Porta's natural philosophy to experience and experimentation,[3] while recent work has also emphasised the productive character of his natural magic as a "techno-magical" approach, stressing how its practices could provide a fertile ground for new forms of natural philosophy precisely because they allowed experiences and philosophical frameworks to be created, transformed, combined, or rejected.[4]

In a previous contribution, I have characterised Della Porta's *philosophia naturalis* as "elastic": an open and revisable theoretical framework for experimental inquiry, sufficiently flexible to allow him to erode the boundaries of the occult without entirely abandoning the framework provided by the physics of qualities.[5]

Hunting Secrets: Giovan Battista Della Porta and the Invention of Experimental Magic (Florence: Firenze University Press, 2025).

[2] On the historical construction and changing meanings of "nature" in early modern thought, see Lorraine Daston, "The Nature of Nature in Early Modern Europe", *Configurations* 6 (1998): 149–172.

[3] William Eamon, "A Theater of Experiments: Giambattista Della Porta and the Scientific Culture of Renaissance Naples", in *The Optics of Giambattista Della Porta: A Reassessment (ca. 1535–1615)*, ed. A. Borrelli, G. Hon, and Y. Zik, (Cham: Springer, 2017), 11–38; William Eamon, "Making and unmaking marvels in early modern Europe", in *Aristotelianism and Magic in Early Modern Europe: Philosophers, Experimenters and Wonderworkers*, ed. D. Verardi, London: Bloomsbury, 2023, 83–104.

[4] Arianna Borrelli, "Aristotelianism, chymistry and mechanics in early seventeenth-century Europe: The techno-magical approach", in *Aristotelianism and Magic in Early Modern Europe*, 145–170. See also Arianna Borrelli, "Giambattista Della Porta's Construction of Pneumatic Phenomena and his Use of Recipes as Heuristic Tools", *Centaurus* 62 (2020): 406–424.

[5] Donato Verardi, "Introduction", in *Aristotelianism and Magic in Early Modern Europe*, 1–14, esp. 6. On the problem of occult qualities in debates over early modern natural philosophy and their relationship to the emergence of experimental

The present volume builds on this line of inquiry by examining the different configurations that this elasticity assumes across the course of Della Porta's work. The elasticity of this natural philosophy is inseparable from experimental practice: this is precisely what makes the investigation of particular phenomena possible, while the encounters generated through such investigation can, in turn, require inherited principles to be differently articulated. This rearticulation may affect not only cosmological principles but also the physical categories through which natural processes are described.[6] I use the term 'reinvention' for this ongoing process through which Della Porta's natural philosophy is rearticulated and his understanding of nature consequently reworked.

The volume traces this process across a range of Della Porta's writings, from the first *Magia naturalis* (1558), through the *Phytognomonica* (1588), the expanded *Magiae naturalis libri XX* (1589), the *Villae* (1592), and the *Della magia naturale* (1611), to the *Taumatologia*, a posthumously transmitted and unfinished work on which Della Porta worked during the final years of his life. This process of reinvention is neither linear nor revolutionary. Della Porta does not abandon his inherited cosmological framework whenever a new phenomenon appears. Rather, particular phenomena are brought into it, where they can test, extend, qualify, or redirect the explanatory work performed by its concepts. Some of its core principles, such as celestial *influxus* and sympathy, remain remarkably stable; what changes is their scope, their boundaries, and the explanatory functions they perform in different contexts. It is precisely the persistence of these underlying principles that makes such encounters

philosophy, see John Henry, "Occult Qualities and the Experimental Philosophy: Active Principles in Pre-Newtonian Matter Theory", *History of Science* 24, 4 (1986): 335–381; Karin Hutchison, "What Happened to Occult Qualities in the Scientific Revolution?", *Isis* 73, 2 (1982): 233–253; John Henry, "The Fragmentation of Renaissance Occultism and the Decline of Magic", *History of Science* 46, 1 (2008): 1–48; X. Wang, *Handling "Occult Qualities" in the Scientific Revolution: Disciplines and New Approaches to Natural Philosophy, from John Dee to Isaac Newton* (Leiden: Brill, 2023).

[6] See, for example, Della Porta, *Magia naturalis*, I.4 and I.6.

possible: singular phenomena can find a place within an intelligible order without being reduced to it, and can in turn reshape its contours without breaking or replacing it. Reinvention thus takes place through the continuing encounter between the singular and the universal, through which inherited principles are retained while their configuration is continually reshaped.

Influxus is especially important in this process. Embedded in a cosmological tradition shaped by Aristotelian natural philosophy, Ptolemaic astronomy and astrology, and their medieval and Renaissance elaborations, celestial influence establishes a general structure of causation, while *locus*, matter, motion, and the dispositions of bodies explain how that causation becomes differentiated in particular cases. At the same time, the particular may require these principles to be reconsidered, as differences in bodies, places, and circumstances reveal dimensions of causation that a general formulation alone cannot capture. The cosmological order therefore provides the conditions under which singular phenomena become intelligible, while the differences they reveal can in turn require that order to be differently articulated.

The cases examined in this volume are more than examples: they are sites in which the process of reinvention can be traced. Each brings inherited concepts into contact with a particular phenomenon and reveals what happens to those concepts when they are required to account for phenomena that exceed, complicate, or redirect their established explanatory functions.[7] The question is therefore not primarily how Della Porta produced a given effect, but how the conceptualisation of natural powers changes when a phenomenon has to be accommodated within an existing cosmological order. The result is not the replacement of one conception of nature by an-

[7] On the epistemic significance of strange and particular facts in early modern science, see Lorraine Daston, "The Language of Strange Facts in Early Modern Science", in T. Lenoir (ed.), *Inscribing Science: Scientific Texts and the Materiality of Communication* (Stanford: Stanford University Press, 1998), 20–38; Donato Verardi (ed.), *Strange Things: The Extraordinary in the Sciences of Early Modern Europe*, *Scientiae Studies*, vol. 8 (Leiden–Boston: Brill, forthcoming).

other, but a transformation of what can be understood as a natural possibility within an enduring order of explanation.

Among these cases, the human being occupies a privileged position. The final chapter therefore brings the process of reinvention to a particularly revealing point: the human being is at once a natural body to be investigated and the investigator through whom nature is made an object of knowledge.

The three terms of the subtitle—Philosophy, Experience, and Artifice—name the dimensions through which this process can be examined.[8] Philosophy provides the cosmological space in which natural powers become intelligible; experience confronts that space with singular phenomena; artifice creates configurations in which natural powers can be activated, reproduced, or rendered perceptible. They are therefore not three parallel subjects, but three dimensions of the same process of continual reworking.

A chronological perspective is essential to this inquiry, not because Della Porta's thought follows a linear development, but because his works offer different configurations of recurring problems. The first *Magia naturalis* and the later *Magiae naturalis libri XX*, for example, present related materials within substantially different textual arrangements. The *Phytognomonica*, the *Villae*, and the *Taumatologia* likewise bring questions of natural powers, causation, and efficacy into different contexts. Reading these works across time makes it possible to attend to what persists, what changes, and what acquires a different function when placed in a new configuration.

The argument, consequently, is not that Della Porta moved from magic towards science, or from occult explanation towards mechanical explanation. Rather, the object of inquiry is the historicity of reinvention itself: the changing work of a natural philosopher as he

[8] On the relationship between artifice, experience, and the transformation of nature in early modern natural philosophy, see William R. Newman, *Promethean Ambitions: Alchemy and the Quest to Perfect Nature* (Chicago: University of Chicago Press, 2004); Anthony Grafton, *Magic and Technology in Early Modern Europe* (Washington, DC: Smithsonian Institution Press, 2005); Pamela H. Smith, *The Body of the Artisan: Art and Experience in the Scientific Revolution* (Chicago: University of Chicago Press, 2004).

encounters different problems at different moments of his inquiry and reworks inherited conceptual structures in order to account for them. What emerges, then, is not simply a history of changing ideas about nature, but an inquiry into the historical work through which a natural philosopher continually reconfigures his understanding of nature in the course of investigating it.

In this sense, the history of Della Porta's natural philosophy is the history of a changing relation between what nature is understood to be and how that understanding is reworked through experience.

Experience becomes reflection and concept; these, in turn, reshape the experience through which nature is encountered and understood.

II.

The first chapter establishes the conceptual background from which this process of reinvention can be approached. It begins with the vocabulary of correspondence through which the *Magia naturalis* accounts for connections among bodies and their properties, and follows these principles across the *Phytognomonica* and Della Porta's writings on agriculture. Particular attention is given to the *horoscopus*, the *locus*, and celestial *influxus*, through which the effects of nature can be understood as differentiated according to bodies, places, and circumstances. Observation, comparison, and mathematical reasoning are considered alongside these cosmological principles, especially where natural effects resist explanation through elementary qualities alone. The relation between botanical knowledge and agricultural practice is particularly revealing: correspondences identified in plants can be translated into the organisation of terrestrial space and into concrete techniques of intervention. What emerges from this first inquiry is a conception of nature whose intelligibility depends upon relations rather than isolated properties, and whose effects can vary without ceasing to belong to a coherent natural order. The chapter thus establishes the conceptual conditions under which reinvention becomes possible: nature remains intelligible through a network of relations, while the effects

produced within that network can vary according to bodies, places, and circumstances. The following chapters build on this relational framework by examining what happens when it is brought to bear on increasingly specific and problematic cases.

The second chapter puts this framework under pressure by turning to music, where the problem of natural efficacy intersects with mathematical order and experimental inquiry. Della Porta's treatment of musical power is situated against Ficinian Neoplatonism, Aristotelian natural philosophy, and early modern demonology, traditions that offered markedly different accounts of how music could produce extraordinary effects. In the *Magiae naturalis libri XX*, Della Porta reconsiders effects traditionally attributed to music itself, while the *Taumatologia* shows that the mathematical conception of musical order remains significant within his natural philosophy. Numerical proportion continues to provide a way of articulating relations among qualities, bodies, and effects, even as the conditions under which extraordinary phenomena are produced become the object of closer investigation. Music thus shows that, for Della Porta, mathematical and cosmological principles are not displaced when particular effects are subjected to closer scrutiny. Rather, his investigation may lead him to locate the causal relations through which those principles operate differently within the phenomenon itself. In the case of musical effects, Della Porta does not locate the relevant celestial relation in sound as such, but in the material constitution of the instrument through which the sound is produced. Experience therefore does not overturn the inherited cosmological framework; it leads Della Porta to articulate more precisely the bodies, materials, and conditions through which a natural effect comes about.

The third chapter follows this problem through Della Porta's changing account of magnetism. In the *Magia naturalis* of 1558, magnetic virtue is associated with Cynosura, or the Pole Star. The *Phytognomonica* (1588) instead relates the magnet to Mars, marking an important shift in Della Porta's treatment of magnetic virtue. The *Magiae naturalis libri XX* (1589) develops a broader rethinking of the material and causal conditions of magnetism, which I read in relation to this shift. The significance of this change becomes clearer when the magnetic affinity of iron is distinguished from its celes-

tial correspondence with Mars. Drawing on Ficino's *De vita coelitus comparanda*, Ptolemaic astrology, alchemical traditions, and the Plotinian doctrine of sympathy, Della Porta increasingly differentiates the material properties of individual magnets, including their composition and geographical origin, from the celestial relation through which their virtue can also be understood. What changes, then, is not the existence of celestial causation but its explanatory position. Celestial correspondence can coexist with an increasingly differentiated account of material variability and experience. Magnetism thus makes visible how a cosmological principle can be retained while its explanatory function is substantially reconfigured.

The fourth chapter shifts the focus from natural bodies to an object deliberately fashioned through human artifice: the astrological image. In the first *Magia naturalis*, Della Porta presents these images through the conjunction of celestial *influxus*, material disposition, form, temporal choice, and the activity of the artificer. Human artifice is here part of the configuration through which celestial influence is understood to operate in matter. The treatment incorporates elements inherited from the Albertist tradition alongside seals of purpose, characters, and other features associated with more problematic talismanic practices. Yet astrological images disappear from the *Magiae naturalis libri XX*. Their disappearance is important precisely because the earlier account had made them intelligible as artefacts operating within a natural-celestial causal order. The later omission reveals the limits of that configuration: the image could no longer be easily situated between natural, celestial, and ritual magic without compromising the boundaries Della Porta was increasingly drawing around natural magic. Here the reconfiguration of natural magic takes place not through a new explanation, but through the withdrawal of an object from the explanatory field itself, revealing the limits of what kinds of artifice could continue to participate in Della Porta's natural philosophy.

The fifth chapter takes this problem further by examining Albertus Magnus's legendary talking head. The story belonged to a tradition in which artificial objects could be understood through celestial influences, natural virtues, spirits, and mathematical correspondences. Della Porta instead reclassifies this particular phenomenon

through a mechanical account, explaining the operation of the automaton through the transmission of sound by air and pipes. The significance of this episode lies not in a general replacement of astrology by mechanics. Rather, the mechanical explanation changes what kind of object the talking head is. A phenomenon that had previously belonged to the history of artificial magic can now be treated as an artefact whose hidden operation may be reconstructed, tested, and reproduced. The artefact becomes a means of making a natural effect perceptible and reproducible. Mechanical explanation thus gives the marvellous a different epistemic status, while providing Della Porta with a way of preserving extraordinary effects without recourse to demonic agency or problematic forms of astral magic. The talking head consequently shows how reclassification could alter the place of a marvellous phenomenon within Della Porta's conception of nature.

The final chapter brings these questions back to the human being, the *secretum naturae* par excellence. In the *Coelestis Physiognomonia*, the problem of celestial prediction is neither simply maintained in its traditional astrological form nor abandoned. Celestial influence is instead reformulated through physiognomy as a natural and conjectural inquiry into possible effects. Figures, colours, magnitudes, motions, and aspects of celestial bodies become observable signs through which their indirect relations to terrestrial constitutions may be reconstructed. This approach draws together physiognomy, humoral complexion, and mathematical optics, while also engaging with the Ptolemaic and medical-astrological tradition and with a conception of science capable of accommodating contingent and variable effects. What is at stake, however, is more than the transformation of prediction. The human being becomes at once an object of natural inquiry and a knowing being who observes other human beings as natural bodies, reading in their visible forms the dispositions and relations through which their natures become perceptible. In this sense, the *Coelestis Physiognomonia* brings Della Porta's reinvention of nature to its most explicitly anthropological point: the human being is no longer approached primarily through the category of the *miraculum magnum*, as a being set apart from the rest of creation, but as a living and thinking expression of the divine

and natural order that the natural philosopher seeks to investigate. The observer and the observed thus belong to the same field of nature. To investigate human nature is consequently also to confront the conditions under which a natural being can observe, interpret, and render intelligible the nature of other natural beings—and, in doing so, his own.

Taken together, these chapters show Della Porta working within a relatively stable cosmological order, rather than approaching specific cases in the absence of theory. Natural effects are investigated and made intelligible within an inherited framework whose fundamental principles continue to structure different inquiries. Yet the encounter with particular phenomena can require Della Porta to reconsider the relations among those principles, their scope, their place within the causal chain, and the conditions under which they can be applied. What changes, therefore, is not necessarily the principles themselves, but the configuration through which they are made to account for nature.

1. OF THE CAUSES OF WONDERFUL THINGS: GIOVAN BATTISTA DELLA PORTA AND THE COSMOLOGICAL BOUNDARIES OF NATURE

1. INTRODUCTION

A revealing problem in Giovan Battista Della Porta's natural philosophy is how general principles of nature are brought to bear upon the diversity of particular phenomena, and how those principles themselves are reworked when they encounter effects that resist straightforward explanation. Rare effects, occult virtues, unusual properties, and other phenomena that do not conform easily to ordinary accounts of causation are particularly revealing in this respect, because they require inherited principles to be brought to bear upon forms of nature that cannot be readily accommodated within general descriptions. The question is therefore not simply how extraordinary effects can be explained, but how the principles through which nature is understood are reworked when they encounter the singularity of particular phenomena.

Far from constituting isolated contributions to magic, botany, agriculture, and physiognomy, these works can be read as interconnected components of a developing intellectual enterprise. Their relation, however, lies not simply in the application of a fully formed system to different domains. Rather, they show how recurring principles are differently articulated as Della Porta confronts different objects, problems, and forms of experience. The *Magia naturalis*, the *Phytognomonica*, and the *Villae* thus articulate, in different contexts, a cosmological order structured through the reciprocal relations of *locus*, *influxus*, *sympathia*, and *similitudo*. What appears in one work as an occult virtue, in another as a morphological correspondence,

and in another as a property of a particular place or environment can thus be examined as different configurations of an underlying cosmological order. The activities of the natural philosopher, the phytognomist, and the husbandman can instead be understood as related forms of inquiry and intervention within the same cosmological order: each seeks, in different ways, to decipher and work with the invisible relations through which celestial causality becomes operative within the sublunary world.

This epistemological integration was deeply rooted in an astrological framework that shaped Della Porta's thought from his early education. His intellectual formation took place within a family environment in which astrology, astronomy, and alchemy were cultivated as forms of natural knowledge. His older brother Giovan Vincenzo was particularly important in this respect: later remembered by Giovanni Battista Longo as exceptionally learned in Ptolemaic astrology and alchemy[1]—he provided Giovan Battista with an early exposure to a cosmological conception of nature structured by celestial causation. This familial context is significant not simply as a biographical detail, but because it situates Della Porta's earliest engagement with natural philosophy within an intellectual horizon in

[1] On Giovan Vincenzo Della Porta, see Nicola Badaloni, "I fratelli Della Porta e la cultura magica e astrologica a Napoli nel '500", *Studi storici* 1 (1959–60): 677–715, reprinted in *Inquietudini e fermenti di libertà nel Rinascimento italiano* (Pisa, 2004), 93–126; G. Fulco, "Per il 'Museo' dei fratelli Della Porta", in *Rinascimento meridionale e altri studi, in onore di M. Santoro*, ed. M. C. Cafisse, F. D'Episcopo, V. Dolla, T. Fiorino, and L. Miele (Naples: SEN, 1987), 105–175; Michaela Valente, "Il fascino della finta et imaginaria scientia. Nuovi documenti su Giovan Vincenzo della Porta", *Annali dell'Orientale* (2018): 175–185. Giovanni Battista Longo, in a letter dated Naples, 11 August 1635, preserved among the Lincean materials, recalls that, since Giovan Vincenzo "was a very modest man, he used to say that the transmigration of souls being true, he would have dared to say, that Ptolemy's soul had transmigrated into him, and he boasted of knowing a lot about two things: Astrology and Alchemy, and in truth it was like that." Longo also mentions two unpublished works by Giovan Vincenzo: a commentary on the *Almagest* and one on the *Quadripartite*. See G. B. Longo, *Lettera dell'11. VIII. 1635*, in Giuseppe Gabrieli, "Giovan Battista Della Porta Linceo", *Giornale critico della filosofia italiana* 8 (1927), 360–397 and 423–431; repr. in *Contributi alla storia dell'Accademia dei Lincei*, 2 vols. (Rome: Accademia Nazionale dei Lincei, 1989), 635–685.

which the relations between celestial and terrestrial nature already constituted a central problem of natural explanation.

This early formation was subsequently developed within the broader intellectual environment of late sixteenth-century Naples, where Aristotelian natural philosophy, astrology, medicine, and traditions of natural magic intersected. This strong Ptolemaic foundation[2] was far from a static youthful interest; rather, it became one of the enduring components of Della Porta's intellectual trajectory, undergoing successive reformulations across his works. Already in the *Magia naturalis libri IV* (1558), written during the early phase of his career, Della Porta placed extraordinary natural effects within a cosmological framework in which celestial influence played a fundamental causal role. The subsequent 1560 vernacular translation and, above all, the definitive *Magiae naturalis libri XX* (1589) did not simply preserve this early interest, but progressively reworked it within a broader natural-philosophical system. It remained an important component of a cosmological framework that developed across his writings, extending into the *Phytognomonica* (1588) and the *Villae* (1592).

Crucially, this chapter demonstrates that the cosmological framework refined within these textual layers of the *Magia* also radiates into other, seemingly disparate disciplines of the same period: namely, the *Villae* (1592), devoted to agriculture, and the *Phytognomonica* (1588), dedicated to the botanical application of physiognomy. Ultimately, the analysis of these interconnected texts will show how Della Porta's natural magic puts into operation a sophisticated cosmological framework in which *sympathia*, *antipathia*, *similitudo*, and *influxus* function as interconnected principles for making natural relations intelligible. Grounded in the astrological doctrine of *influxus* and developed through a sustained engagement with ancient and medieval authorities—above all Albertus Magnus and

[2] As Raffaella De Vivo has hypothesized, Giambattista Della Porta may have drawn on his brother Giovan Vincenzo's commentary on the *Almagest* for his own translation of the first book of the same work, published in 1605. See R. De Vivo, "Introduzione", in *Claudii Ptolomaei Magnae Constructionis liber primus, Io Bapt. Porta interprete*, ed. R. De Vivo (Naples: Edizioni Scientifiche Italiane, 2000), XVI n. 36.

Columella, whose works Della Porta explicitly rereads alongside Pythagorean cosmologies and Orphic mineral homologies to establish a mirror-like correspondence between the celestial field, the terrestrial world, and the mineral realm—this framework is articulated through a mathematical and geometric *ratio*. This *ratio* provides not just a theoretical mirror, but a deeply operative mechanism: through the optical and geometric model of the astral pyramid, the signatures decoded in the *Phytognomonica* are translated into spatial coordinates for the architectural and agricultural management of the *Villae*. Reflected in contemporary Neapolitan debates, including the work of logicians such as Francesco Storella, who conceptualised a mathematical logic underlying Ptolemy's astronomy, this rational framework serves to anchor natural magic and the doctrine of the *horoscopus*. Inherited from the Albertist tradition, and also mediated by Renaissance magico-astrological acquisitions, the *horoscopus* serves as the pivotal theoretical device allowing Della Porta to explain the irreducible singularity of empirical phenomena, reintegrating the exceptional into a coherent web of celestial causality where reason, experience, and astral influence converge.

The argument of this chapter is therefore not simply to reconstruct the astrological background of Della Porta's natural magic, but to show how *locus*, *influxus*, *horoscopus*, *sympathia*, *similitudo*, and geometrical *ratio* are progressively articulated and brought to bear across different problems and textual contexts. The following sections first reconstruct the Albertian and astrological genealogy of *locus* and *influxus*, then examine how these principles acquire practical force in the *Villae*, before turning to the articulation of *sympathia* and *similitudo* with the geometrical model of celestial influence in the *Phytognomonica*. The movement is thus from cosmological principle to its differentiated articulation in particular objects, places, and practices.

2. FROM THE *VIRTUS LOCI* TO INDIVIDUAL SECRETS: THE ALBERTIAN INHERITANCE AND CELESTIAL *INFLUXUS*

The problem of natural secrets poses a difficulty that is also a cosmological one: how can nature produce effects that are at once singular,

variable, and yet intelligible within a general order? Della Porta's answer rests on a conception of nature in which no individual thing is entirely detached from the conditions that constitute it. Place, celestial configuration, and the relations between things participate in determining the particular forms and properties through which nature becomes manifest. The concepts of *locus* and *influxus* are therefore crucial not simply because they belong to the vocabulary of astrology, but because they provide a way of accounting for the differentiation of natural effects without reducing that differentiation to mere exception or contingency.

To understand how Della Porta deploys these concepts, however, it is necessary to reconstruct the cosmological tradition through which he inherited them and the transformations they underwent before entering his natural philosophy. From the point of view of natural philosophy, the idea of an influence of the sky on terrestrial things—which Della Porta adopts as a fundamental component of his system—found an early authoritative formulation in Aristotle.

For Aristotle, the celestial motion produced the incessant process of change taking place in the sublunary world, where circular movement drove coming-to-be and passing away in a cyclical, eternal way.

Furthermore, according to Aristotle, the incorruptible ether of the celestial region was nobler than the terrestrial things composed of the mixture of the four elements. It was therefore appropriate to believe that this higher region caused the changes in the sublunary world. Yet, Aristotle did not delve into the specific physical mechanisms of how this extraordinary transmission occurred—leaving a theoretical gap regarding those particular, hidden virtues that seemed to bypass ordinary elemental qualities.

Although his philosophy cannot be entirely traced back to Aristotle's teaching, Claudius Ptolemy—prince of astrologers and a foundational authority for Della Porta's early education—strengthened the idea of the philosopher from Stagira regarding the sky's influence on earthly things. In his *Tetrabiblos*, known to Latin readers as the *Quadripartitum*, Ptolemy declared:

> A certain power emanating from the ethereal substance is dispersed through and permeates the whole region about the earth, which through-

> out is subject to change, since, of the primary sublunar elements, fire and air are encompassed and changed by the motions in the ether, and in turn encompass and change all else, earth and water and the plants and animals therein.[3]

By asserting that the incorruptible heaven influences the sublunary world subject to change, Aristotle and Ptolemy only partially explained how this process occurred. What remained unresolved, however, was not simply whether celestial causation operated, but how its general efficacy could account for the marked differences observable among particular things. Medieval natural philosophers identified three instrumentalities of the causative power of the heavens: motion (*motus*), light (*lumen*) and influence (*influxus*). As Edward Grant pointed out, "more than any other celestial power or force, influence may be categorized as natural magic".[4]

This physico-astrological modality of justifying the natural order found an exceptional interpreter in Albertus Magnus, a pivotal figure in the subsequent debate on magic and natural philosophy. Albertus Magnus offered a particularly important response to this problem in *De natura loci*, where he addressed the persistent variety encountered in the investigation of the natural world.[5] Albertus argues that it would be impossible to imagine finding one thing in the universe that is completely like another in property, since each point, that is, each "locus" of the earth, has a special virtue that informs what is contained in it. The variability of what is born in different places on earth is determined by the different position of things with respect to the circle of the horizon, that is to say by the diversity of the various points where the stellar rays which transmit the formative virtues

[3] Claudius Ptolemy, *Tetrabiblos*, ed. and trad. F. E. Robbins (Cambridge, MA: Harvard University Press, 1948), I, 2, 5–7.

[4] Edward Grant, *A History of Natural Philosophy: From the Ancient World to the Nineteenth Century* (Cambridge: Cambridge University Press, 2007), 175.

[5] This is a central element in Albertus Magnus's thought which, as Vittoria Perrone Compagni has emphasised, had already found acceptance in the thought of a Renaissance Aristotelian such as Pietro Pomponazzi. See V. Perrone Compagni, "Circe, la 'virtus loci' e il determinismo nel *De incantationibus* di Pomponazzi", *Annali del Dipartimento di Filosofia (Nuova Serie)* 12 (2006): 5–32.

are projected: this occurs both in relation to the accidental properties that derive from matter, as in the case of physical complexions and occult virtues, and in relation to the accidental properties of the form, i.e. customs and ethical behaviours.[6]

The doctrine did not, however, remain confined to a single Albertian formulation. Its subsequent reception repeatedly shifted the emphasis placed on the relation between place, celestial influence, and individual difference. Within medieval and late medieval traditions, the astrological doctrine of place (*locus*) was integrated in this manner by Peter of Abano[7] (who contributed to its astrological systematisation) and was also present in the system proposed by Ramon Llull[8] (who incorporated it into a broader cosmological and combinatorial framework). Between the late Middle Ages and the early Renaissance, the reception of Albertus, intertwined in different ways with the thought of these figures, contributed to the circulation of this doctrine among astrologers and philosophers of Peripatet-

[6] See Albertus Magnus, *De natura loci*, I.5, 8: "Cum igitur ex mutatione horizontis necesse sit mutari totum circulum et ex mutatione circuli tota mutetur figuratio radiorum, cumque quodlibet punctum habitationis unum speciale centrum constituat horizontis, necessario consequitur quodlibet punctum habitationis habere virtutes speciales, quibus informatur id quod locatur in ipso. Et hic locus proprie est, de quo dicit Porphyrius, quod est unum de individuantibus, quia, sicut tradit Boethius, impossibile est etiam imaginari vel intelligi, ut duorum aliquorum sit locus omnino idem". The passage is also quoted and discussed by Perrone Compagni in relation to the importance of this doctrine in Pomponazzi's thought. See Vittoria Perrone Compagni, "Introduzione", in Pietro Pomponazzi, *De incantationibus*, ed. V. P. Compagni (Florence: Olschki, 2011), LVIII–LIX.

[7] Peter of Abano, *Conciliator*, 71, 105*r*a. On this, see Perrone Compagni, "Introduzione", in Pomponazzi, *De incantationibus*, LVII–LVIII.

[8] See R. Lull, *Tractatus novus de astronomia*, in *Corpus Christianorum. Continuatio Mediaevalis*, vol. LXXIX, ed. M. Pereira and Th. Pindl-Büchel (Turnhout: Brepols, 1989), 118: "Luna, ut dicitur in illa figura, quae in ipsa nigra est, accipit influentias, quae sunt de nigro colore, viridi, livido, confuso, et mixto et quae grossam habent materiam et in illa parte, in qua non est illa figura nigra, influentias accipit, quae sunt de colore albo, diaphano, lucido et intenso; et in illo loco, in quo illas recipit influentias, quae sibi a superioribus mittuntur, ipsas tradit instinctibus et appetitibus naturalibus elementatibus et eorum subiectis, sicut sunt plantae, herbae, animalia et fontes, quae, cum magnam siccitatem et calorem patiuntur, appetitum habent ad pluviam et virtutem Lunae, ut pluviam procuret".

ic orientation. Graziella Federici Vescovini identified its role in the work of Biagio Pelacani[9]—a highly lively, rich, and nonconformist personality—who reinterpreted the doctrine, accentuating its naturalistic and materialistic implications, pushing it towards materialistic outcomes that were either absent or merely latent in the teachings of the Master of Cologne.[10]

In the high Renaissance, this view was implicitly adopted among philosophers by Pietro Pomponazzi within an Aristotelian-naturalistic framework,[11] and among astronomer-astrologers by Gabriele Pirovano,[12] who highlighted its centrality within natural magic. Pirovano, who was familiar with and cited Albertus Magnus, adopted this doctrine without attributing it directly either to the Master of Cologne or to Llull, despite drawing extensively on the latter's astrological teachings.[13] The notion of *influxus* was also crucial in Marsilio Ficino's *De vita coelitus comparanda*, where, recognizing

[9] See Biagio Pelacani da Parma, *Questiones de caelo*, IV, q. 2, Ambr., 65*r*b, cited in Graziella Federici Vescovini, *Astrologia e scienza: La crisi dell'aristotelismo sul cadere del Trecento e Biagio Pelacani da Parma* (Florence: Nuovedizioni E. Vallecchi, 1979), 296: "Si locus consideratur non pro superficie continentis, sed ut locus habeat in se virtutem elementarem et supercelestem influxam sibi a caelo, tunc locus potest esse causa formalis gravis motus deorsum et leve sursum. Declaratur quia sic declarando locum pro tali influentia, locus habet producere in locatum talem influentiam, quae erit dispositio conveniens sibi et forma eius accidentalis".

[10] See Graziella Federici Vescovini, "Su alcune testimonianze dell'influenza di Alberto Magno come 'metafisico,' 'scienziato' e 'astrologo' nella filosofia padovana al cadere del secolo XIV: Angelo da Fossombrone e Biagio Pelacani da Parma", in *Albert der Grosse: Seine Zeit, sein Werk, seine Wirkung*, ed. A. Zimmermann and G. Vuillemin-Diem (Berlin: Miscellanea Mediaevalia 14, 1981), 155–176.

[11] See Perrone Compagni, "Introduzione", in Pomponazzi, *De incantationibus*, LIX–LX.

[12] See Donato Verardi, "Lo zodiaco medievale e il confronto con Plotino e Ficino nel *De astronomiae veritate* di Gabriele Pirovano", *Giornale di Astronomia* 3 (2016): 2–6.

[13] Gabriele Pirovano, *De astronomiae veritate* (Basel: 1554), 288: "Corpora superiora influant in inferioribus eorum similitudines secundum loca et regiones, in quibus sunt corpora inferiora". It should be noted that the first edition was published as G. Pirovano, *Defensio astronomiae habita per clarissimum philosophum Gabrielem Pirovanum patritium mediolanesem* (Milan: Alexandro Minutio, 1507), unpaginated.

the role of places in the reception of celestial influences, he chose to cite Proclus as an *auctoritas*, whom he had himself translated alongside other texts of late antique Neoplatonism.[14] Within this Neoplatonic and magical perspective, occult virtues—both natural and artificial—were reinterpreted and traced back to the life and action of the spirit of the world through celestial influences.

This centrality is equally evident in Cornelius Agrippa's *De occulta philosophia*, which further developed this Neoplatonic-magical interpretation. In Agrippa's framework, this concept serves to justify the qualities that God bestows through the soul of the world, driven by the power of images and intelligences, and with the essential contribution of celestial rays and aspects. A profound connoisseur of the teachings of Albertus Magnus, Agrippa chose to integrate this Albertist lesson by intertwining it with the *Naturalis Historia* of Pliny and the Orphic Hymns.[15]

The humanist and astrologer Giovanni Pontano provided a humanistic and astrologically grounded formulation of celestial *influxus*. In his *De fortuna*, Pontano describes what is commonly called *influxus* as a 'propensity' through which the virtues of terrestrial entities are actualised. His formulation recalls Albertus Magnus' doctrine of the *inchoatio formae*: the aspects of the sky provoke virtues inherent in matter, allowing them to pass from potency to act. According to Pontano,

> the initial indications of the sky are set almost in motion, and progressively take their course from potency to act. As happens in plants, which

[14] See Proclus, *De sacrificio et magia*, in Iamblichus, *De mysteriis Aegyptiorum etc.* (Venice, September "M. IIID"]), fol. [unnumbered]. See also Marsilio Ficino, *Three Books on Life: A Critical Edition and Translation*, ed. and trans. C. V. Kaske and J. R. Clark (Binghamton, NY: Medieval & Renaissance Texts & Studies, 1989), III.12, 299–300. In Book III, chapter 1, Ficino specifies how the 'singular' occult virtues of individuals are bestowed by the soul according to the position of the stars and the temporary condition of celestial motions and aspects—that is, on the basis of the horoscope. See Ficino, *Three Books on Life*, III.1, 246.

[15] See Heinrich Cornelius Agrippa, *De occulta philosophia libri tres*, I. 12, ed. V. Perrone Compagni (Leiden-New York: Brill, 1992), 109, and 175. On Pliny in the Renaissance, see *Pline l'Ancien à la Renaissance*, *Archives Internationales d'Histoire des Sciences* 61 (2011), ed. A. Perifano: 1–167.

> at the beginning almost put out buds, then they dress in flowers, then in fruits that gradually ripen. And this fruit is promised from the beginning, and from the opening of the buds.[16]

For Pontano, the *influxus* or 'propensity' that emanates from the stars acts on the vegetal and animal world, but also on the character of human beings, who are also subjected—like the occult virtues found in the world of minerals, plants, and animals—to the laws of astrological influence of the sky.

Within the Neapolitan intellectual milieu of the late Renaissance, this question of how celestial influx could be rendered intellectually tractable generated attempts to provide it with a formal rational structure. In particular, the logician Francesco Storella, who in a certain sense made himself the heir to the legacy of Pontano's tradition within the Neapolitan context, proposed a mathematical conception of logical and causal relations underlying Ptolemaic astrology, suggesting that astral influence could be articulated through a form of mathematical ratio capable of grounding its regularity and intelligibility. In this perspective, astrology was not merely a domain of observational correlation, but a structured field in which celestial configurations could be translated into formal relations, thereby offering a conceptual bridge between cosmological causality and demonstrative reasoning.[17] This attempt to articulate *influxus* through mathematical and logical relations provides a useful intellectual context for the question of how astrological causality could be rendered intelligible within a natural philosophy concerned with both regularity and singularity.

[16] Giovanni Pontano, *La fortuna*, ed. F. Tateo (Naples: La Scuola di Pitagora, 2012), 329.

[17] On Francesco Storella's conceptualisation of *influxus* as an attempt to formalise astrological causality through mathematical and logical structures, and on his proximity to the Neapolitan intellectual milieus surrounding the young Giambattista Della Porta—particularly in relation to debates on Aristotelian natural philosophy, Hermetic traditions, and the epistemological foundations of natural magic—see Donato Verardi, "Aristotelianism and Hermeticism in Renaissance Naples: Francesco Storella and the Secrets of Alchemy", *Ambix* 73, 1 (2026): 3–24.

Adopting and reworking this approach, Della Porta emphasises the importance of the study of *loci*, an element that allows the scientist a complete knowledge of the *ordo naturae*, which does not contemplate exceptions.[18]

In the *Magia naturalis* (1558), Della Porta refers to and accepts this astrological doctrine, attributing it to the lesson of Albertus Magnus.[19]

The anonymous Italian vulgarizer of the *Magia naturalis libri IV* (if not Della Porta himself, certainly a man very close to him and well informed about his philosophy) connects Albertus's doctrine of the *Horoscopus* to that of astrologers. In *Dei miracoli et maravigliosi effetti dalla natura prodotti*, we read:

> Particular things are not devoid of very great virtues which, in operating, have even greater powers which do not come from their species, but from the configuration of the stars and from an occult property. As Albertus says, every particular thing that is born under what astrologers call Horoscopus, and under the influence of the sky, receives a specific property, marvellous in its operation, and endowed with a very great efficacy: a non-specific and common efficacy, but peculiar: that is the reason why various effects and different inclinations are attributed to particular ones, from the various and different influence of the sky.[20]

[18] Pietro Pomponazzi tacitly adopted Albertus Magnus's astrological doctrine of the nature of places to account for metamorphosis, which he regarded as "an extreme (and therefore rare) case of the causal mechanism". See Perrone Compagni, "Introduzione", in Pomponazzi, *De incantationibus*, LVIII.

[19] It is important to underline that, in interpreting the teaching of Albertus Magnus, Della Porta also had in mind a series of texts attributed to the great medieval physicist but more likely attributable to his later followers. Compared with Albertus's authentic works, these texts gave less prominence to their philosophical dimension, although a philosophical framework remained underlying. In the Renaissance, such texts would also attract the attention of other natural magicians, such as Agrippa and Bruno. They accentuated the marvellous character of the secret manifestations of nature, to which the magician sought to provide a plausible explanation at the intersection of reason and experience.

[20] Della Porta, *Dei miracoli et maravigliosi effetti dalla natura prodotti* (Venice: Lodovico Avanzi, 1560), 18*rv*: "Non sono prive le cose particolari di virtù, et grandissime, ma nelle operationi hanno gran potere e maggiori che non glie le porge la sua spetie, per il stato delle stelle, et per occulta proprietà, dice Alberto, ogni partico-

And elsewhere, regarding the *locus*, we can read:

> It often happens that those who do not give due consideration to the locus when collecting herbs, metals, or other similar things fall into error, taking those things that come into their hands without any consideration. If someone wishes to achieve the effect in its entirety, it is of no small benefit to consider the state of Heaven, and the proper locus. Because just as places have different temperatures, so too can diversity occur in plants. Indeed, at times there is so much diversity in plants regarding their virtues that not only are beginners in this science deceived, but even doctors who are little trained in philosophy become entangled in seeking their virtues.[21]

This point is reiterated in the later *Magiae naturalis libri XX* and retained, in expanded form, in the final vernacular *Della magia naturale*. Here Della Porta, again invoking the authority of Albertus Magnus, justifies the existence of occult properties always and only possessed by some individuals and never by species. After having argued, already in the first *Magia naturalis*, that the substance to which he refers is always and only the natural substance (and not the first substance of the metaphysicians), Della Porta can declare that the occult properties of many secrets are individual virtues of natural substances that possess them.

lare che nasce sotto il stato del ascendente del cielo sopra l'Orizonte, che gli astrologi chiamano *Horoscopus*, e sotto l'influsso del cielo, ne piglia una convenevole proprietà, e meravigliosa nell'operare, e una efficacia grandissima, nel patire, non specifica e comune, ma propria e peculiare: la onde à particolari gli si attribuiscano varii effetti, e diverse inclinationi, dal vario, e diverso influsso del cielo". See also Della Porta, *Magiae naturalis sive de miraculis*, II.17, (Naples: Matthias Cancer, 1558), 76.

[21] Della Porta, *Dei miracoli et maravigliosi effetti*, 27*rv*: "Spesso accade, che coloro errano che sprezzano nel pigliare l'herbe, metalli, o altre cose simili, il sito del luogo, ma pigliano quelle cose che gli vengano alle mani senza consideratione alcuna se alcuno desidera consequire l'effetto integralmente, non è di poco giovamento il considerare lo stato del Cielo, e il luogo proprio. Imperoche si come i luoghi ha diverse temperie, così parimente può operare diversità nelle piante. Anzi che alle volte si causa tanta diversità nelle piante circa la loro virtù, che non solamente li principianti in questa scienza si ingannano, ma ancho nel cercare le loro virtù, li Medici che sono poco esercitati nella Filosofia s'avviluppano". See also Della Porta, *Magiae naturalis sive de miraculis*, I.17, 26.

The example reported is that – traced back to Albertus Magnus – of the two brothers "that one of them, touching all the doors and latches with one side, immediately opened, and the other on the contrary closed them all, which had previously remained open".[22] This and other singular virtues, i.e. possessed only by some things and not by others, are traced back by Della Porta to the "site of the sky, as Albertus said […] whereby in various individuals various effects and bowings are found and flourish, from the various influence and various aspects of the sky".[23] Della Porta significantly gives the example of the magnet which, giving iron its virtue, ensures that this specific piece of iron (and not all types of iron) attracts other iron to itself. On the other hand, only "experiences", Della Porta points out, can provide a reasonable explanation of every single effect of the magnet, which would otherwise inevitably be left to superstitious explanations. In fact, the "virtues" of "stones" vary depending on their "places" of origin. Furthermore, small stones have a great attractive capacity, while a very large stone, which Della Porta says he has seen several times, may prove capable of attracting just "an iron of half an ounce".[24]

There are, Della Porta continues, individual occult virtues that are found not "in their entire substance, but rather in some of their parts". Indeed,

> The remora, a small sea fish, holds back a ship by drawing close to it, and this virtue resides not in any single one of its parts, but in its entire

[22] Giovan Battista Della Porta, *Magiae naturalis libri XX* (Naples: Horatium Salvianum, 1589), I.13, 13–14; Giovan Battista Della Porta, *Della magia naturale*, *libri XX*, Tradotti da Latino in Volgare, e dall'istesso autore accresciuti sotto nome di Gio De Rosa (Naples: Carlino & Vitale, 1611), I.13, 25.

[23] Della Porta, *Magiae naturalis libri XX*, I.13, 13–14; Della Porta, *Della magia naturale*, *libri XX*, I.13, 25.

[24] Della Porta, *Della magia naturale*, VII.10, 243. See Della Porta, *Magiae naturalis libri XX*, VII.10, 134. It is necessary to specify that, through notions such as "occult property" and "specific form", medieval physicists such as Albertus Magnus, Arnaldus de Villanova, and Peter of Abano accounted for the magnet's virtue of attracting iron by considering it a species-specific property. In this sense, Della Porta's proposal on magnetism differs from Albertus's, as it is included, like other occult properties of nature, among what N. Weill-Parot has defined as "individual occult properties". See Nicolas Weill-Parot, "Le 'immagini astrologiche'," in *Il linguaggio dei cieli*, *Astri e simboli nel Rinascimento* (Rome: Carocci, 2012), 241–254, esp. 244.

> body. Many examples of this can be read, and there are many things that operate according to their specific parts, just as the basilisk operates with its eyes, and likewise the catoblepas; ants flee the wings of bats, yet they consume their heart and head; they flee the heart of the hoopoe, but not its head or its wings, and this very same principle is well worth considering in all other things.[25]

If phenomena that cannot be explained through elementary complexion can be related to celestial influence, then the study of the relations between celestial and terrestrial places becomes a means of grounding natural inquiry in the occult secrets of nature. Such inquiry has both a theoretical and a practical dimension. It draws, on the one hand, upon the mathematical and geometrical knowledge underlying optics and astronomy; on the other, it depends upon the incessant experience of the investigator.

Della Porta can thus justify his belief that there is a science of all the phenomena found in nature: that is, of all the infinite secrets that make up the "great machine of the world": a science, however, whose *consumatio* can only be found in the incessant empirical research of the experimental magus.

3. CULTIVATING THE COSMIC FIELD: AGRICULTURAL MANAGEMENT AND ENVIRONMENTAL *INFLUXUS* IN THE *VILLAE*

The practical implications of this conception of celestial influence emerge particularly clearly in Della Porta's agricultural writings. In this section, we shall see how these implications intertwine with the cosmological framework articulated in the *Magiae naturalis libri XX*,

[25] Della Porta, *Della magia naturale*, I.13, 26: "La remora, pescicello marino, ritiene una nave accostandosi a lei, e questa virtù non sta in alcuna delle sue parti, ma in tutto il suo corpo. Di ciò se ne leggono molti essempi, e molti sono che oprano sencondo le loro parti, come il basilisco opra con gli occhi, e così il catoblema, de pipistrelli fuggono le formiche l'ali, e si mangiano il core, e'l capo, fuggono il cuor de l'upupa, ma non il capo, overo l'ale, e questo medesimo è ben considerare in tutte l'altre cose". See Della Porta, *Magiae naturalis libri XX*, I.13, 13.

a framework that Della Porta was developing in close chronological proximity to the *Villae*. In *Villae* (1592)—a monumental encyclopedic treatise that integrates his earlier botanical monographs—Della Porta explores in greater practical detail topics similar to those already covered in the agricultural sections of the *Magia naturalis*,[26] in which Della Porta praises the fertility of the earth, as it

> the earth never grows old or becomes exhausted, but everywhere luxuriates spontaneously, inexhaustibly fertile in receiving new seeds and producing new plants, and possessing perpetual growth; and if Nature is marvellous in all things, in plants she wishes to appear more marvellous still.[27]

Already in the proem to the first book of *Villae,* Della Porta reiterates how the farmer's task is to bring the earth and the sky into an optimal relation, just as already explained in the *Magia naturalis*.[28] Like the natural magus, the *pater familias* described in the *Villae* must possess a considerable body of natural and astronomical knowledge, rejecting superstition in favour of a science supported by both the experience of the ancients and direct empirical observation.[29] Rather than presenting itself as a mere compilation of classical *auctoritates*, the treatise frames agriculture as a field in which inherited doctrines are tested against practical experience, presenting it as a

[26] Giovan Battista Della Porta, *Villae [...] libri XII* (Frankfurt: Claudium Marnium & Ioannem Aubrium, 1592).

[27] Della Porta, *Magiae naturalis libri XX*, III, *Proemium*, 43; Della Porta, *Della magia naturale*, III, *Proemio*, 81.

[28] As Luigia Laserra has underlined, the very dense web of implicit references between the *Villae* and the *Magia naturalis* is undeniable. Determining with the precision of a mathematician the extent to which the second edition of the *Magia naturalis* (1589) influenced the *Villae*, or vice versa, is an unsolvable question; in some cases, the debt of the *Magia naturalis* to the *Villae* is undeniable, while in others the opposite is true. See Luigia Laserra, "Disiecta membra colligere: chirurgia testuale della *Villa*", in *Giambattista Della Porta in Edizione Nazionale*, ed. R. Sirri (Naples: Istituto Italiano per gli Studi Filosofici, 2007), 71–79, esp. 77.

[29] See Della Porta, *Villae*, 17–18.

dynamic domain where cosmological principles intersect with human industry.[30]

The natural-astrological framework that binds astronomical dynamics to terrestrial reality is clearly operational in the first book of the *Villae*, particularly in the chapters entitled *De coeli electione pro villa comparando*, *Quomodo coeli vitia emendari possint*, and *De situ villae eligendo*. In these sections, *coelum* is investigated primarily through its physical and sublunary manifestations—such as local climate, sun exposure, and prevailing winds—which are understood as the tangible, seasonal results of astronomical motions.[31] There is, however, an apparent divergence between the celestial terminology of these chapters and their predominantly concrete focus on environmental and microclimatic factors.

This apparent tension disappears once the *Villae* is read alongside Della Porta's broader cosmological framework. In his natural-magical cosmology, heaven and earth are inextricably bound in a web of sympathy and physical correspondences: the macrocosmic environment acts directly on the physical and natural development of the sublunary world, influencing the formation and growth of plants through precise, measurable dynamics—such as light and heat—that vary depending on the orientation of specific terrains.

The decision to privilege physical, environmental descriptions over explicit astronomical or cosmological digressions in the *Villae* is largely a function of the treatise's practical, economic, and operative purpose. While the underlying astrological cosmology is left implicit, it remains the necessary foundation of the entire text. From this perspective, the *Villae* and the *Magia naturalis* should be read in parallel, as structurally related expressions of the same cosmological framework: the *Magia* articulates the principles of cosmic *influxus*, while the *Villae* shows how those principles become operative in the concrete management of the agricultural *locus*.

Rather than viewing adverse atmospheric or cosmic conditions as an immutable destiny, Della Porta insists on humanity's capaci-

[30] See Della Porta, *Proemium* to the *Villae*.

[31] See Della Porta, *Villae*, I.11, "De coeli electione pro villa comparando", 28–30.

ty to mitigate hostile environmental influences through natural expedients, architectural design, and human labor.[32] In chapter XII (*Quomodo coeli vitia emendari possint*), this corrective approach relies heavily on Columella's foundational principle that while a wise householder should not blindly buy land enticed only by its natural abundance, it is the role of human industry (*industriae est*) to make any acquired plot useful and fruitful. For Della Porta, following this agricultural lesson means that the master's knowledge (*domini scientia*) can actively emend a heavy or pestilential atmosphere (*gravioris coeli*) by manipulating the microenvironment. This architectural correction is achieved by precisely calculating the layout and exposure of the estate, specifically through the orientation of porticos, doors, and windows (*porticibus, ostiis, ac fenestris*).[33]

This corrective human agency relies on a dynamic reciprocity between the sky and the land, which is developed further in chapter XIII, *De situ villae eligendo.*[34] Introducing this section, Della Porta states that "a prime location can correct an adverse sky, just as a good climate can compensate for the flaws of the site" (*potest enim optimus situs coeli malignitatem emendare, & bonitas a situ rependi potest*). By invoking Columella's traditional tripartite division of terrains—plain (*campestre*), hill (*collinum*), and mountain (*montanum*)—Della Porta shows how topographies alter the local reception of cosmic heat and light. The choice of the *locus*, therefore, is not merely geographical; it concerns the physical configuration through which celestial influences are received, distributed, and potentially modified. By selecting a site that gently slopes southward or eastward (*ad Orientem, vel ad Meridiem molliter devexis*), the husbandman effectively configures the terrestrial environment as an ideal, balanced recipient for the mathematical trajectories and vital influences of the heavens.

[32] See Della Porta, *Villae*, I.11, "De coeli electione pro villa comparando", 28–30.
[33] See Della Porta, *Villae*, I.12, "Quomodo caeli vitia emendari possint", 30–31.
[34] See Della Porta, *Villae*, I.13, "De situ villae eligendo", 31–32.

4. HIDDEN BONDS AND CELESTIAL PYRAMIDS: *SYMPATHIA*, MORPHOLOGICAL SIGNATURES, AND CELESTIAL *INFLUXUS*

To fully understand Della Porta's interpretation of sympathy (*sympátheia*), the *Phytognomonica* (1588) must be read alongside the *Magia naturalis* (1589) and the *Villae* (1592) as part of the same developing cosmological framework. This conceptual framework directly informs the operative principles observed in the previous sections: if the *Magia naturalis* articulates the role of astrological *influxus*, and the *Villae* shows how celestial and environmental conditions become operative within the agricultural *locus*, it is the doctrine of sympathy, with its deeply operative dimension as systematised in the botanical treatise, that provides a conceptual mechanism binding these domains together. In this cosmological framework, sympathy names the hidden, dynamic relations connecting different orders of nature, while similarity provides one of the visible morphological principles through which those relations can be recognised and put to use.

In *Phytognomonica*, this universal sympathy is decoded through a systematic network of similarities that passes from human beings to animals, from animals to plants, and from these to minerals, having the starry sky as its main referent. Della Porta reiterates how all things existing in nature are bound together by mutual sympathy through their occult properties, which actively manifest themselves through the form, 'imprint', or 'semblance' of natural elements. Through the observation of these external appearances, the investigator can decipher the correspondences, affinities, and contrasts between objects.[35] In the specific case of the plant world, plants or parts that physically resemble a human organ enter into sympathy with it and are able to heal its specific disorders: yellow plants purge bile, milky plants stimulate milk production, and "bony" plants heal bones. Within this framework, the characteristics of plants that "indicate a resemblance and mutual consensus with the celestial stars"

[35] See Giovan Battista Della Porta, *Phytognomonica*, *[…] Octo libris contenta* (Naples: Horatius Salvianus, 1588), *Proemium*, 6–8.

(*coelestium siderum similitudinem et mutuum consensum indicant*) are examined, listing in each case the plants and body parts corresponding to each planet.[36]

In the *Magia naturalis* of 1589, Della Porta describes in detail the importance of the principle of sympathy in relation to the knowledge of the occult virtues of nature. It is through sympathy that the practitioner can discover these secrets:

> There is also, as I may put it, a certain *compassio* inherent in occult properties, in animals, plants, and all species, which the Greeks call *sympathia* and *antipathia*, and which we more properly call agreement and disagreement. For some things are joined together through mutual union and bound together as if by a covenant, while others are hostile to one another and differ through mutual enmity, suffering from blind discord; or they possess something terrible and destructive that cannot be investigated or brought into close association through any reasoning or probable argument. Nor is it proper for a prudent man to seek out the causes of such things, except insofar as Nature herself may have taken delight in this spectacle. For nothing has pleased her to exist without its counterpart, and nothing among Nature's hidden things exists without being endowed with some secret and particular property. From these enmities and affinities, moreover, many remedies were discovered for human use and necessities: when one thing was observed to be hostile to another, it could be employed as a remedy against the harms that the latter might cause. The success of such conjectures favoured the inquiry, and in this way many things were discovered and handed down to the memory of posterity, as we can see from their records.[37]

[36] The last book of the work, Book VIII, is devoted to this specific topic. See Della Porta, *Phytognomonica*, 304–320.

[37] Della Porta, *Magiae naturalis libri XX*, I.7., 6. Della Porta, *Della magia naturale*, I.7, 11: "Dalle occulte proprietà ancora degli animali e delle piante e di tutte le spetie ne nasce un certo compatimento (per dir così) il quale i Greci chiamano Simpatia e Antipatia, noi più convenevolmente la chiamiamo consenso o convenienza o disconvenienza. Percioché alcune cose hanno una certa fratellanza insieme, o stretto parentado accompagnate, altre poi così inimiche, che non si compatiscono, anzi s'odiano mirabilmente, come avessero insieme alcuna nascosta orribilità, che cercano distruggersi insieme, e ciò non si può restringere a ragione, né probabile, né dimostrativa, né è cosa di uomo savio volerne assegnar certe ragioni, se non che la

Far from being an insurmountable epistemological barrier, sympathy represents a crucial cognitive opportunity for the investigator of secrets. Crucially, in Della Porta's view, sympathy represents an occult principle whose operations cannot be fully reduced to the forms of discursive rationality traditionally recognised within Aristotelian natural philosophy, whether probable or demonstrative forms of reasoning. Yet this resistance to conventional logical categories does not diminish its value as a cognitive resource. Rather, by acknowledging the irreducible reality of hidden connections grounded in the cosmological structure of nature, the investigator extends the inquiry beyond the limits of traditionally sanctioned forms of probable and demonstrative knowledge, grounding the inquiry in the direct observation of mutual affinities and their operative effects. But how does this fundamental principle, which regulates the relationships between the entities of the cosmos, function in practice?

In passages that closely resemble passages in Agrippa's *De occulta philosophia*,[38] Della Porta identifies two relations: (1) a sympa-

Natura si è dilettata di quello spettacolo grande, né ha voluto esser cosa nel mondo senza pari, né trovarsi cosa nell'occulto seno della natura che non abbia quivi qualche nascosta virtù piena di ammirazione, o vero forse, che da queste amicizie e inimicizie l'uomo, contemplandole, ne può cavar molti secreti rimedi a sua necessità e uso".

[38] See Della Porta, *Dei miracoli et maravigliosi effetti*, I.9, 13*rv*: "Giove e Venere amano tutti li pianeti, eccetto Marte e Saturno, Venere è amica di Marte, al quale tutti gli altri sono inimici, v'è ancho un'altra Amicitia et inimicitia, per l'oppositione delle case, et delle esaltationi, perché i segni infra di loro s'odiano (et se amano) come disse Manilio ne suoi versi. E più diffusamente si vede ne libri degli Astrologi" ["Jupiter and Venus love all the planets except Mars and Saturn; Venus is a friend to Mars, whom all the others hate. There is also another kind of friendship and enmity, arising from the opposition of the houses and the exaltations, because the signs hate (and love) one another, as Manilius says in his verses. This can be seen more extensively in the books of the astrologers."]. See also Della Porta, *Magiae naturalis sive de miraculis*, I.9, 12. In the final Italian vernacular edition, Della Porta retains the language of *amicizia* ("friendship") among the planets and in relation to "the opposition of the houses and the exaltations" and to the "signs … loving and hostile towards one another": Della Porta, *Della magia naturale*, I.4, 7: "Nel cielo esser Giove e Venere che amano tutti i pianeti, fuorché Marte e Saturno. Venere è amica a Marte, a cui son poi inimici tutti restanti pianeti. Vi è un'altra inimicitia per l'oppositione delle case e per le essaltationi. I segni sono anchora fra loro amorevoli et

thy between the terrestrial elements and (2) a friendship between the planets and the signs of the zodiac. If elementary sympathy draws on a Plotinian tradition, it is here detached from its original spiritual framework and interpreted in light of a characteristic approach within sixteenth-century philosophical medicine, according to which like cures like.[39] The language of friendship belongs to the broader vocabulary of celestial sympathy and affinity found in the astrological tradition and articulated, among other sources, in the works of Ptolemy and Agrippa.[40] In this framework, the zodiac signs can stand in opposition, trine, or quadrature, while planets and signs are interconnected through relationships of domicile, trine, exaltation, and other forms of astrological affinity.

To describe the relationship between the stars and the elements, Della Porta also assimilates the concept of sympathy to cosmological influence or, more precisely, to *influxus*. As he notes in the eighth book of the treatise, "any star in the sky possesses a sympathy with its respective flower on earth, and [...] receives the influx of the stars"

odiosi, come dice Manilio" ["In the heavens there are Jupiter and Venus, who love all the planets except Mars and Saturn. Venus is a friend to Mars, whom all the remaining planets hate. There is another kind of enmity arising from the opposition of the houses and the exaltations. The signs are likewise loving and hostile towards one another, as Manilius says"]. Agrippa similarly writes: "Rursus in coelestibus Saturno amici sunt Mercurius, Iuppiter, Sol et Luna, inimici eius Mars et Venus; Iovis amici sunt omnes planetae praeter Martem, sic et Martem omnes odio habent praeter Venerem [...] Est alia stellarum inimicitia, quando videlicet habent domus oppositas [...] et fortior inimicitia est eorum quorum exaltationes oppositae sunt [...]" ["Again, among the celestial bodies, Mercury, Jupiter, the Sun, and the Moon are friends of Saturn, while Mars and Venus are his enemies; Jupiter's friends are all the planets except Mars, and likewise all hate Mars except Venus [...] There is another kind of enmity among the stars, namely when they have opposite houses [...] and stronger is the enmity of those whose exaltations are opposed [...]"], Agrippa, *De occulta philosophia*, I.17, 118.

[39] See Roberto Poma, *Magie et guérison: La rationalité de la médecine magique (XVIe–XVIIe siècles)* (France: Orizons, 2009), 258–260.

[40] See Agrippa, *De occulta philosophia*, I, 17, 118; Ptolemy, *Tetrabiblos*, I.15–20, 77–97.

(*Immò quodlibet sydus in caelo cum suo flore in terris sympathiam possidere, stellarumque influxus [suscipere dicunt]*).[41]

For Della Porta, the *medium* connecting the celestial and elementary realms is likewise not Ficino's *spiritus* but, as he argues in the *De aeris transmutationibus*, most probably recalling Pontano's account, the *aer*, that is, air.

In Della Porta's account, astrological *influxus* provides a cosmological framework for understanding the occult virtues of natural secrets. In the first and second editions of the *Magia naturalis*, he states that every natural phenomenon that we observe in the world is brought about through the action of the aspects of the sky. The final vernacular formulation is particularly revealing here, since Della Porta describes celestial virtue as something that "distils" from the divine nature:

> I think there is no doubt that these lower things below serve the superior and celestial ones, and that from that divine nature a certain virtue is distilled down to us, so that corruptible things are generated and corrupted in a certain, continuous order.[42]

And he continues:

> Through contemplation and consideration of this face of the world [of heaven] [...] we judge that one can learn the science of the hidden secrets of nature.[43]

The principle of cosmological sympathy that regulates the relationships between the celestial plane and the terrestrial plane is imme-

[41] Della Porta, *Phytognomonica*, VIII, 304–305.

[42] Della Porta, *Della magia naturale*, I.8, 14: "Penso che non sia cosa dubbiosa che le cose di qua giù basse servano alle superiori e celesti e che da quella divina natura destilli a noi una certa virtù che le cose corruttibili con certo, continuato ordine si generino, e si corrompino". See also Della Porta, *Magiae naturalis libri XX*, I.8, 8.

[43] Della Porta, *Della magia naturale*, I.10, 20: "Dalla contemplazione e considerazione di questa faccia del mondo [del cielo] […] giudichiamo che si possa imparare la scienza delli occulti segreti della natura". See also Della Porta, *Magiae naturalis libri XX*, I.10, 11.

diately visible to the astute gaze of the magus-physiognomist, who grasps it directly through the relationship of similarity.

This structural link between the operative orientation of the *locus* and the geometry of celestial influence had already become explicit in the *Phytognomonica* (1588). In the eighth book of this earlier work, Della Porta had established the final "crown" (*coronidem*) of his botanical project by addressing the explicit consensus between earthly flora and celestial stars. Blending agricultural poetry with Pythagorean cosmology and natural magic, Della Porta introduced the Pythagorean metaphor of flowers as earthly eyes of the stars, alongside a verse he attributed to Columella—*Pingunt et varios, caelestia sydera flores*[44]— to illustrate how the earth mirrors the heavens. To reinforce the universal validity of this cosmic mirror, Della Porta immediately extends it from the vegetal to the mineral realm by summoning the authority of Orpheus's *Lithica*. By introducing the Orphic hexameters in Latin, he emphasises how stones retain these celestial signatures even more permanently than plants due to their incorruptibility (*robur incorruptum*), extending this correspondence across the two realms with the axiom *quot herba, tot lapides.*[45] This poetic harmony is immediately grounded in a rigorous, hermetic-geometric model of astral projection:

> On the contrary, they say that any star in the sky possesses a sympathy with its respective flower on earth, and that it receives the influx of the stars as if through a pyramid, which has its base in heaven and its cone in the flower, and that this demonstrates [their] consensus with the celestial bodies.[46]

Through this cosmic pyramid, Della Porta gave celestial influence a precise spatial configuration: the astral ray expands from a vast base

[44] Della Porta, *Phytognomonica*, VIII, 304.

[45] Della Porta, *Phytognomonica*, VIII, 305.

[46] Della Porta, *Phytognomonica*, VIII.1, 304–305: "Immo quodlibet sydus in caelo cum suo flore in terris sympathiam possidere, stellarumque influxus, veluti per Pyramidem suscipere dicunt, qua in caelo basim, in flore conum habeat, et hoc cum syderibus consensum demonstrare".

(*basim*) in the heavens and converges into a point—the cone (*conum*)—represented by the plant's flower. This geometric node yields palpable physical effects: plants open at sunrise, close at sunset, and turn to track the star's path across the sky even on cloudy days (*etiam nubilo die sequi*). Drawing on Hermes Trismegistus (*Inquit Hermes*), Della Porta argued that lower things receive their properties from above, and since flowers are the purest parts of vegetation (*quum flores sint puriores plantarum partes*), they act as the primary recipients for these celestial virtues. Consequently, Della Porta had explicitly called for a *phytoptes*—an expert observer of plants—who must be well-versed in "astral science" (*syderalis scientiae non ignarum*) to properly understand the cosmic currents within natural matter.[47] The farmer of the *Villae*, the natural magician of the *Magia naturalis*, and the *phytoptes* of the *Phytognomonica* can thus be understood as related figures within Della Porta's broader project of reading and manipulating natural relations.[48]

Read in this context, the practical management of the microenvironment and the architecture of the estate can be understood as ways of responding to, and modifying, the conditions under which celestial influence is received within the physical *locus*.

The importance of similarity, however, becomes clearer once its different modes are distinguished. Della Porta does not treat resemblance as a single relation, but as a graded system of correspondences extending from bodily morphology to animal forms and, ultimately, to celestial configurations. In *Phytognomonica*, plants are ordered by Della Porta into seven classes: in the first class he considers the habitats of plants, distinguishing aquatic plants from terrestrial plants, and terrestrial plants from those growing in the mountains. In the second chapter of the first book, Della Porta considers the similarity of the plant to the various parts of the human body, stating

[47] Della Porta, *Phytognomonica*, VIII.1, 305.

[48] On the longer astrological genealogy of this attentive engagement with natural signs, see Ptolemy, *Tetrabiblos*, I.2, 9, where he notes that experienced farmers and herdsmen can anticipate certain effects of celestial configurations through observation; cf. Cicero, *De divinatione*, I.112, on the practical knowledge acquired by farmers and other skilled observers.

that "a plant has a deep resemblance to man" (*Plantam cum homine multam habere similitudinem*)[49]: some resemble the heart, others the eyes, hair, or teeth. The "form" indicates the part of the human body that must be treated and that benefits from the use of the similar medicinal plant.[50] In chapter XIII, again of the first book, entitled *Quod plantae, quae animalium partium repraesentant similitudinem, eorum virium compotest sunt*, Della Porta instead lists the plants that are similar to animals.[51] In the course of the work, he systematically deals with human diseases, examining plants with animal-like qualities, those with human-like particularities, and those whose forms reflect the stars. Della Porta illustrates the lunar herb, useful in lunar diseases and irregular menstruation, the scorpioid herb, indicated against the bite of scorpions and various other plants, always compared with corresponding celestial figures.[52] But the study of signs—Della Porta notes—must not be limited to the external morphology of the plant. Secondary properties such as colour and taste are also important: red roses and coral are effective against bleeding, while rhubarb, saffron and lemon will cure yellow bile.[53]

In *Phytognomonica*, Della Porta recognises in plants an internal *vis*, a natural gift of the plant, although it remains occult. Through this *vis*, plants possess qualities or properties that may be harmful (*vices*) or beneficial (*virtues*).[54] When a virtue is found in only one plant, Della Porta defines it as simple; when the same quality occurs in different plants, it is defined as mixed. The causes of these qualities can be traced to the climate, the regions, and the particular places or "sites" (mountains, plains, valleys) in which plants grow. Some qualities are manifest, while others remain occult and can be

[49] Della Porta, *Phytognomonica*, I.1, 10.

[50] See Della Porta, *Phytognomonica*, I.2, 10–12.

[51] See Della Porta, *Phytognomonica*, I.14, 22–24.

[52] These themes, anticipated in the first book of the work, receive a more comprehensive treatment in the subsequent books. See Della Porta, *Phytognomonica*, I.9, 17, where the issue is explicitly formulated.

[53] See W. D. Müller-Lahncke, *Die Phytognomonica Giovan Battista Della Porta als medizinische Signaturenlehre*, in *Giovan Battista Della Porta nell'Europa del suo tempo*, ed. M. Torrini (Naples: Guida, 1990), 93–99.

[54] See Della Porta, *Phytognomonica*, I.1, 9.

recognised through their signs and resemblances.[55] Similarity, in this sense, leads to an identity of nature that may be either direct or indirect. It is direct when a plant resembles a part or organ of an animal or human being, and indirect when the resemblance is with a star or planet. Della Porta thus traces a continuous network of correspondences among planets, precious stones, animals, plants, and human physiognomical characteristics.

The link between the human, vegetal, and celestial planes is explicitly reiterated in Book VIII of *Phytognomonica*, where Della Porta writes: "It has been established by the calculations of astrologers and physicians that the two great stars of heaven, the Sun and the Moon, correspond to the two principal organs of our body, the heart and the brain".[56] Having established this analogy between the parts of the human body and the celestial bodies, Della Porta turns to the morphology of different plants in relation to the planets. Plants are accordingly classified as jovial, venereal, saturnine, mercurial, solar, and lunar, with their properties referred to the corresponding celestial bodies.[57] Della Porta further observes that, whereas human beings can use the intellect to overcome the limits imposed by their vices and choose to follow the virtues, plants lack this capacity. Their external appearance can therefore be read by the physiognomist as an expression of their "customs" (*mores*), making morphology a means of discerning the otherwise hidden dispositions of vegetal nature.[58]

[55] On this point, see Augusto Beguinot, "Di alcuni concetti di geografia botanica nell'opera *Phytognomica* di Giovan Battista Della Porta", *Bullettino della Società Botanica Italiana*, XI, 1902: 140–150.

[56] Della Porta, *Phytognomonica*, VIII.1, 305: "Astrologorum et Medicorum calculis sancitum est, principibus duobus nostris corporis visceribus duo magna coeli sydera correspondere, cordi et cerebro, Solem et Lunam".

[57] Della Porta, *Phytognomonica*, VIII.1–17, 305–320.

[58] Beguinot has pointed out that, in Della Porta's view, plants possess specific *mores*, which represent the active manifestations of their internal virtue. Consequently, this inner faculty can only be deciphered through a thorough investigation of both the external and internal anatomy of the various vegetative structures. See Beguinot, "Di alcuni concetti di geografia botanica", 143.

5. CONCLUSIONS

The combined analysis of the *Magia naturalis*, the *Phytognomonica*, and Della Porta's agricultural writings reveals that *sympathia*, *antipathia*, *similitudo*, and *influxus* constitute an interconnected framework through which Della Porta articulates the natural order. They are not merely descriptive terms, nor do they constitute independent explanatory devices. Rather, they articulate different aspects of a nature whose operations are understood as ordered, causal, and intelligible, even when their effects appear occult, singular, or difficult to reconcile with ordinary accounts of natural qualities. Della Porta's natural magic thus emerges as an effort to articulate this order by bringing inherited Aristotelian, astrological, Albertist, and Neoplatonic principles into relation with the phenomena disclosed through observation and experience. What changes in this process is not the existence of an intelligible natural order, but the conceptual means through which its differentiated operations can be rendered intelligible.

Within this process, the doctrine of the *horoscopus*—received through the Albertist tradition and reworked through a complex network of medieval and Renaissance authorities—plays a particularly important role. It provides Della Porta with a conceptual means of explaining the irreducible singularity of natural phenomena without appealing either to supernatural intervention or to the arbitrariness of chance. Occult virtues are not anomalies that interrupt the regular order of nature; they are particular effects generated by the differentiated action of celestial influences upon distinct terrestrial *loci*. The exceptional is thus reinserted into an ordered cosmological structure in which individual properties acquire causal intelligibility through the relations linking the celestial and sublunary realms. The marvellous is therefore not simply expelled from the domain of natural inquiry, but reconfigured within a wider account of physical reality, in which what appears exceptional may disclose forms of causal differentiation not captured by a uniform account of natural qualities. Natural magic consequently becomes a privileged site for investigating the limits and internal differentiation of what can count as natural knowledge.

From this perspective, the principle of sympathy performs an epistemological function no less important than its ontological one. It provides a conceptual means of moving from the apparent fragmentation of experience towards the identification of relations among phenomena, furnishing the natural magus with a principle through which the hidden correspondences permeating the cosmos can be investigated and interpreted. Sympathy does not merely describe a relationship among beings; it constitutes one of the conditions under which their mutual relations become intelligible. Correspondingly, the principle of similarity supplies the operative method through which these relationships become accessible to investigation. Forms, colours, tastes, morphological structures, and figurative analogies cease to be merely accidental sensible features and become natural signs pointing towards invisible properties and deeper causal connections. Read through this lens, the morphological signatures of the vegetative world cease to be mere arbitrary play on the part of nature; rather, they reflect a conception of nature shaped, among other traditions, by a Pythagorean sense of harmony, in which the visible features of terrestrial things correspond to deeper mathematical, geometrical, and cosmological relations. Crucially, this harmony is never a matter of passive contemplation: by deciphering these morphological signatures, the investigator unlocks a genuinely operative power. The natural signs investigated in the *Phytognomonica* and the spatial configurations described in the *Villae* can thus be understood as differentiated expressions of a broader cosmological order, in which the reception of celestial influence depends upon the concrete relations among celestial configuration, terrestrial place, orientation, and material form. In doing so, Della Porta reconfigures the classical figure of the agricultural theorist inherited from Columella by placing the practical management of the *villa* within the same cosmological order that governs his natural magic. The choice of a site, its orientation, exposure, and environmental conditions become part of a practical knowledge of the differentiated relations through which celestial forces act upon the earth. Agricultural knowledge is thus incorporated into a broader natural philosophy in which the management of terrestrial conditions depends upon an understanding of their relation to the larger cosmic order.

Read in this light, Della Porta's persistent emphasis on *experientia* should not be interpreted as evidence of an anti-philosophical stance. On the contrary, experience acquires cognitive value only when embedded within a framework capable of directing it towards the determination of sufficient causes. When Della Porta insists that *experientia sine ratione manca est*, he reaffirms the necessity of a rational framework for the interpretation of observation.[59] In the context of late sixteenth-century Naples, this *ratio* is increasingly understood not merely as an abstract logical procedure, but as a logico-mathematical and geometric principle.[60] For Della Porta, this geometric *ratio* provides one important model through which astral *influxus* can be rendered intelligible, relating the hidden sympathies of the cosmos to an architecture of optical pyramids, spatial relations, and measurable proportions. Thus, experimental inquiry does not replace natural philosophy; it constitutes its indispensable completion.

[59] Giovan Battista Della Porta, *De ea naturalis physiognomoniae parte quae ad manuum lineas spectat libri duo*, with *Chirophysionomia* in the appendix, ed. O. Trabucco (Naples: Edizioni Scientifiche Italiane, 2003), 13–14.

[60] See Verardi, "Aristotelianism and Hermeticism in Renaissance Naples".

2. PYTHAGOREAN HARMONY AND THE REINVENTION OF NATURE: MUSIC, MATHEMATICS, AND EXPERIMENT

1. INTRODUCTION

Music offers a particularly revealing case for examining Della Porta's reinvention of nature because sound could be situated at different levels of natural explanation. It could be understood as a physical phenomenon perceived by the senses, as the expression of numerical proportion, or as a possible vehicle of celestial influence. These accounts did not necessarily exclude one another, but they assigned musical efficacy to different kinds of causes and located it at different points within the natural order. Music thus brought together, within a single field of inquiry, physical processes, mathematical relations, and cosmological principles.

This chapter argues that Della Porta did not resolve the tension between the mathematical, physical, and cosmological dimensions of music by choosing among them. Rather, he redistributed their causal roles. In the *Magiae naturalis libri XX*, effects traditionally attributed to music itself are relocated to the specific occult qualities of the materials from which musical instruments are made. In the later *Taumatologia*, meanwhile, numerical proportion re-emerges as a more general principle for rendering the relations among qualities and bodies intelligible. Music thus becomes a privileged site in which Della Porta's natural philosophy can be seen to reconfigure, rather than simply reject, inherited accounts of harmony and efficacy.

2. PYTHAGORAS, MUSIC, AND THE NATURAL MAGIC TRADITION

In the early modern period, the shadow of Pythagoras—mathematician, philosopher, and magus—hovered ambiguously over scientific and mathematical knowledge. According to a tradition that consolidated in the Renaissance, Pythagoras occupied a privileged place in the genealogy connecting philosophy, mathematics, and magic.[1] Della Porta placed him at the head of a broader genealogy in which the *Magi* were identified with the *sapientes* of Latin tradition and the *philosophi* of Greek tradition.[2] In this historical context, thanks to the reading of Boethius's *De institutione musica*, Pythagoras was also considered to be the one who first based music on mathematics. The success of Ficino's interpretation as well as the great circulation, albeit mostly clandestine, of Agrippa's *De occulta philosophia libri tres* contributed to the affirmation of this image of Pythagoras.

Introducing his own translation of Plotinus, Ficino inserted Pythagoras into the genealogy of "pia philosophia", also making Pythagoras one of the cornerstones of "spiritual" musical magic promoted in *De vita libri tres*. According to Ficino, born in Persia, with Zoroaster, the "pia philosophia" would have developed with Hermes Trismegistus in Egypt, with Orpheus and Aglaofemo near the Thracians, with Pythagoras near the Greeks and the Itali, reaching maturity, before that with Christ, in Athens, with the divine Plato.[3] In the footsteps of Ficino, Agrippa inserted Pythagoras into the genealogy of his own personal "history of magic" and, making the philosopher

[1] Jean-Pierre Brach, "Pythagorean Number Mysticism in the Renaissance: An Overview", in *Brill's Companion to the Reception of Pythagoras and Pythagoreanism in the Middle Ages and the Renaissance*, ed. I. Caiazzo, C. Macris, and A. Robert (Leiden and Boston: Brill, 2021), 457–488.

[2] Della Porta, *Magiae naturalis sive de miraculis*, I.1, 1; Della Porta, *Dei miracoli et maravigliosi effetti*, I.1, 1*r*.

[3] See Plotini Diuini illius e Platonica familia philosophi, *De rebus philosophicis libri LIIII in Enneades sex distributi*, a Marsilio Ficino Florentino e graeca lingua in Latinam versi, et ab eodem commentariis illustrati (Salingiacum: Ioannes Soter, 1540), *Proemium*, AA, 2*rv*. See also Marsilio Ficino, *De Christiana religione* (Florence: Niccolò di Lorenzo, 1476), 3*r*–4*v*; Marsilio Ficino, *Theologia Platonica* (Paris: apud Aegidium Gorbinum, 1559), XVII.1, 309*r*.

of Samos an expert in optical, ceremonial and divination practices, declared, as did Boethius, that Pythagoras was the first to have established the consonances of music.[4] Pythagoras was also credited with the lesson according to which everything is made up of numbers and individual virtues are distributed to all individual things.[5]

Referring to the authority of Pythagoras, in a passage dedicated to the "marvellous effects of music" contained in Chaos, the last of the books of the *Magiae naturalis libri XX*,[6] Della Porta adhered to the idea that music has some therapeutic properties that can be ascertained from experience. Della Porta wrote:

> Cicero relates that Pythagoras pacified and rendered more gentle a certain young man from Tauromenium, drenched in wine and inflamed by love for a courtesan, when he was seeking to burn down the house of his rival, in which the woman was being kept, by having a spondee played in the Phrygian mode. He likewise used to order that, if young men, driven by lust, were attempting some criminal act, they should be drawn away from it while a female flute-player played a spondee, so that, through the gravity of the musical mode, their raging wantonness might subside.[7]

Della Porta claimed that the effects obtained by Pythagoras on the drunk and enamoured young man occurred because the musical instrument was made "of Ivy, or Almond tree wood, especially that

[4] Agrippa, *De occulta philosophia libri III*, II.7, 263–265, esp. 264.

[5] Agrippa, *De occulta philosophia libri III*, II.2, 252–253.

[6] See Rebecca Cypess, "Giovanni Battista Della Porta's Experiments with Musical Instruments", *Journal of Musicological Research* 35, 3 (2016): 159–175; Rebecca Cypess, "Sound and Chaos in Della Porta's *Natural Magic*", in Verardi (ed.), *Hunting Secrets*, 115–130.

[7] Della Porta, *Magiae naturalis libri XX*, XX.7, 298: "Refert Cicero Pythagoram adolescentem quendam Tauriminitanum, vino madidum ac meretricio amore irritatum, cum rivalem comburere domum quaereret, quo detinebatur scortum, Phrygio modo concitatum spondeo resonante pacatum et mitiorem reddidisse. Idemque iubebat: si libidinis causa impulsi adolescentes, facinus aliquod aggrediuntur, tibicina spondeum canente detrahuntur, ut modorum gravitate eorum furens petulantia consedetur"; M. Tullii Ciceronis *scripta quae manserunt omnia*, Part IV, Vol. 3, *Fragmenta*, X, *De consiliis suis, expositio consiliorum suorum* (Leipzig: B. G. Teubner, 1890), 339.

as it is of the wilde tree, for these afford great remedy for drunkenness".[8] The episode relating to Pythagoras as reported by Cicero had already been recalled by Della Porta in the *Magia naturalis libri IV*. Only in the *Magiae naturalis libri XX*, however, does he justify this fact by referring to the power of the materials of which the musical instruments were made. According to Della Porta, the "extraordinary effects" found in certain sounds were attributable not so much to an occult virtue of music, but rather to the occult virtues of the materials of which musical instruments are made.

How did Della Porta arrive at this solution?

The answer requires us to consider the problem not in isolation, but within the changing status of music in Renaissance natural philosophy. The question was not simply whether music could produce extraordinary effects, but what kind of cause could account for them. Music could be understood in relation to numerical proportion and harmony, to celestial influence, or to the physical properties of sound and bodies. These possibilities were not necessarily mutually exclusive within the traditions from which Della Porta drew, but they located musical efficacy at different levels of nature.

The first two of these dimensions had been brought together with particular force in the Neoplatonic tradition of Marsilio Ficino, whose account of musical efficacy connected sound with mathematical harmony, celestial influence, and the human *spiritus*. Agrippa subsequently extended this framework by incorporating musical harmony into a more explicitly magical and theurgic conception of celestial and supercelestial powers. At the same time, Peripatetic naturalists such as Pomponazzi, Fracastoro, and Cardano questioned whether the effects of music should instead be explained through the physical and perceptive conditions of sound. The question Della Porta confronted was therefore also one of causal determination: where, within nature, was the efficacy attributed to music actually located?

This question became particularly pressing because the different explanations carried different implications for the status of natural

[8] Della Porta, *Magiae naturalis libri XX*, XX.7, 298.

magic itself. If musical effects derived from celestial or spiritual agencies, the boundary between natural magic and forms of theurgy or demonology became difficult to maintain. If, on the other hand, they could be referred to the physical qualities and dispositions of bodies, musical marvels could be incorporated into a natural account of causation. The issue was thus not simply whether to preserve or reject the efficacy traditionally attributed to music, but where within nature such efficacy might be located and how it might be explained.

The years preceding the publication of the first edition of the *Magia naturalis*, and those accompanying its first, sensational success, were marked by important methodological and conceptual developments in the physical sciences. Della Porta participated in this changing intellectual environment and drew upon several of the methodological and conceptual developments associated with it. The musical problem can therefore be situated within this changing landscape of natural philosophy, in which inherited accounts of hidden efficacy were increasingly confronted with questions concerning physical process, material constitution, perception, and experimental verification.

The following section therefore turns to the intellectual traditions against which Della Porta's treatment of music can be understood, beginning with Ficino's account of musical efficacy and following the different ways in which his position was appropriated and challenged during the sixteenth century.

3. THE CONTESTED NATURE OF MUSICAL EFFICACY

Let us proceed in order. What, then, was Ficino's position on the powers of music, and how was it appropriated, transformed, and challenged throughout the sixteenth century?

3.1. *Neoplatonic magic on sound*

In his *De vita*, Ficino declared that the matter of song "not only possesses motion and displays passion but even carries meaning like a

mind, so that it can be said to be a kind of airy and rational animal".[9] As a living animal it is akin to man's *spiritus*. The *spiritus* is a very thin fluid generated by or contained in the blood, but which is active only in the brain. Thanks to its intermediate position between the *physis* and the *psyche*, it can influence both. This division of human nature corresponds to a similar division of the universe, conceived as composed of universal matter, universal intellect and *spiritus mundanus*. The stars confer astral qualities through their rays to the *spiritus mundanus*, which, in turn, transmits them to the *spiritus humanus*. Music, by imitating the moral character of the gods from which the various planets take their name, can attract their beneficial influences on the *spiritus humanus* through the *spiritus mundi*, which acts as a vehicle for celestial influences.[10]

Agrippa followed Ficino in attributing the powers of these sounds to the harmonic (mathematical) order put in place by the celestial influence, although he then insisted more openly than Ficino's *De vita* on the intellectual dimension of this order and on the supernatural and divine origin of this power, which lies beyond every star. According to Agrippa, to tap into this power, it was necessary to contemplate the souls of the celestial bodies rather than the heavenly bodies themselves, and the upper world ruled by the supercelestial *daemones* rather than the merely celestial one.[11]

The themes of sound and mathematical harmony were recalled by Agrippa in relation to the very thorny subject of the invocation of the souls of the dead.[12] This argument was also taken up in the apocryphal *Fourth Book of Occult Philosophy*. It is a text that, although prohibited, like all of Agrippa's work, circulated clandestinely throughout the sixteenth century, even in Naples where Della Porta lived and worked. By inserting the theme of music into the very thorny one of necromancy, the *Fourth Book of Occult Philosophy* affirmed that it is necessary for the souls of the dead to be attracted by means of "supernatural and coelestial powers duely administred, even by

[9] Ficino, *Three books on life*, III.21, 361.
[10] Ficino, *Three books on life*, III.21, 363.
[11] Agrippa, *De occulta philosophia libri tres*, II.60, 393–396, esp. 396.
[12] Agrippa, *De occulta philosophia libri tres*, III.42, 357.

those things wich do move the very harmony of the Soul, as well imaginative, as rational and intellectual; as are Voices, Songs, Sound, Inchantments: and Religious things".[13]

With Agrippa, magic incorporated more explicitly theurgic elements that sit uneasily with Della Porta's natural-philosophical project.

These elements could also contribute, in the intellectual and religious context of Della Porta's time, to the suspicion surrounding magic. Considering the ambiguity in which Agrippa (and the pseudo-Agrippa) had catapulted the theme of the powers of music, the effort to distinguish natural magic from demonic interpretations necessarily involved a rethinking of the theoretical status of music and of its marvellous 'magical' effects. A central issue in this rethinking concerned Della Porta's understanding of the relationship between music and mathematics and of the role mathematics might play in rationalising 'musical magic'.

3.2. *The Aristotelian point of view*

In reconsidering the powers attributed to magical words and sounds, Della Porta could draw on a series of philosophical objections to Ficino's system of the magic of sound, mostly coming from authors of Peripatetic inspiration. In fact, although welcomed with great enthusiasm by the magus Agrippa, in the sixteenth century, Ficino's idea that sounds are inserted in a cosmological system governed by the principle of harmony was also subjected to harsh criticism from those Aristotelian naturalists usually attentive to the themes of natural magic.

If Pietro Pomponazzi (1462-1525), in his *De incantationibus* (aimed at understanding in via Aristotelis the 'arcane' phenomena of nature wrongly considered the prerogative of demonological explanations), recognised a merely rhetorical and persuasive power to

[13] Ps.-Cornelius Agrippa, *The Fourth Book of Occult Philosophy*, trans. R. Turner (London: John Harrison, 1655), 71.

sounds and words, Girolamo Fracastoro (c. 1476/8-1553), in his *De sympathia et antipathia rerum*, affirmed that there is no affinity between the soul and harmonic numbers, that is, between the soul and the numbers found in sounds. Although, for Fracastoro, music has an indubitable power, it is not of a mathematical-harmonic order, as for Ficino, but physical-perceptive. Sound, understood in terms of the vibration and propagation of waves, acts on the body because of the constitution of its vibrations and the affinity between these vibrations and the humoral temperament of the human body.[14]

Another important sixteenth-century naturalist, Girolamo Cardano (1501-1576), in book XIII of his *De subtilitate* rejected Ficino's idea according to which the planets are related to the properties of music. As Ann E. Moyer pointed out, in the passages of his works where he deals with musical subjects, Cardano combined "the Pythagorean tradition with an Aristotelian-based notion of the senses and psychology".[15] Although, as Cardano argued in *De subtilitate*, it would be quite easy, as Aristotle did, to pair colours with planets, this would make no sense in the case of sounds, as they do not proceed from the four primary qualities, but from a single principle. Therefore, Cardano believed that no abstract explanation could replace the sense of hearing itself, which must be explained following its intrinsic principles.[16] By bringing Ficino's account into relation with Aristotelian theories of sound, Cardano rejected the possibility of explaining musical effects through a harmonic system governed by celestial influences. According to him, the power of music was instead to be explained primarily in physiological terms.

[14] Girolamo Fracastoro, *De sympathia et antipathia rerum*, ed. C. Pennuto (Rome: Edizioni di Storia e Letteratura, 2008), 14, 100; Concetta Pennuto, "Giovan Battista Della Porta e l'efficacia terapeutica della musica," in *Music and Esotericism*, ed. L. Wuidar (Leiden–Boston: Brill, 2010), 109–127, esp. 121–122.

[15] Ann E. Moyer, *Musica Scientia: Musical Scholarship in the Italian Renaissance* (Ithaca, NY: Cornell University Press, 1992), 158–168, esp. 159.

[16] Girolamo Cardano, *Hieronymi Cardani De subtilitate libri XXI* (Basel: apud Sebastianum Henricpetri, 1582), XIII, 684–688. See Aristotle, *De sensu et sensibilibus*, 4, 442a21–27. On this topic, see J. Prins, "Girolamo Cardano and Julius Caesar Scaliger in Debate about Nature's Musical Secrets", *Journal of the History of Ideas* 78 (2017): 169–189.

3.3. *The demonological objections*

Alongside these criticisms coming from the world of natural philosophy of Peripatetic inspiration, between the fifteenth and sixteenth centuries the Neoplatonic-Ficinian theory on the powers of music was subjected to severe criticism even by the demonological camp.

According to Institoris and Sprenger, the authors of the infamous *Malleus Maleficarum*, no philosophical justification for the effects of music through planetary influences could be sustained.[17] Martin Del Rio (1551–1608) returned to the question of the powers attributed to musical and vocal practices in his *Disquisitionum magicarum libri sex* (1599–1600). In this work, one of the most comprehensive and influential studies of magic produced by early modern demonology, his discussion of Pythagorean and Platonic traditions formed part of a broader critique of claims that numbers, musical sounds, chants, and incantations could possess occult efficacy, whether natural or supernatural.[18]

Although demonologists broadly agreed in criticising the astrological justification of the powers attributed to music by magic, there were significant distinctions within this camp. These distinctions also matter for understanding Della Porta's position, even where they emerge only indirectly. In this regard, Della Porta's controversy with Jean Bodin (c.1530-1596) was exemplary. In *Daemonomanie des sorciers* (1580), Bodin had condemned the entire tradition of Renaissance natural magic by equating it with the practices of sorcery. For Bodin, Della Porta himself was nothing more than a "great sorcerer".[19]

[17] Heinrich Institoris and Jacob Sprenger, *Malleus maleficarum*, ed. and trans. C. S. Mackay, 2 vols. (Cambridge: Cambridge University Press, 2006), 280. On this topic, see Donato Verardi, *La scienza e i segreti della natura a Napoli nel Rinascimento* (Florence: Firenze University Press, 2018), 132–137.

[18] See Martin Del Rio, *Investigation into Magic*, ed. P. G. Maxwell-Stuart (Manchester: Manchester University Press, 2009), 102.

[19] Jean Bodin, *De la démonomanie des sorciers* (Paris: Jacques du Puys, 1580), *Preface*, 2*v*.

For Della Porta, who responded to Bodin's accusations in the *Prologue* of *Magiae naturalis libri XX*, it was not natural magic that was superstitious, but Bodin's demonology. If natural magic explained the marvellous phenomena of nature by reason and experience, Bodin brought them back too hastily to the action of devils. Indeed, his approach was markedly more hostile than that of the *Malleus* to a series of practices accepted or recommended in some Catholic inquisitorial contexts. Strategically, Della Porta thus sent the criticism back to the sender, accusing Bodin himself of heresy.[20] Della Porta's use of the *Malleus Maleficarum*—although he does not follow its line—may therefore also be read as a way of complicating Bodin's criticism.

Indeed, although their controversy was caused by the problem of the naturalness of the witches' ointment, if we look at Bodin's position also regarding the powers of music, Della Porta's accusation of heresy against him was—from the point of view of the Catholicism of the time—anything but baseless. Even if Bodin mentioned the powers of music in the biblical exorcism of Saul (the devil ceased to disturb him, he writes, when "David touchoit sa harpe"), he considered contemporary exorcisms in which music was used as necromantic practices. According to him, in this kind of exorcisms, as happened for Apollonius the Magus, the action of the simulating devil was hidden.[21]

These positions belong to the broader religious and intellectual context within which Bodin's work was received and, eventually, placed on the *Index*.[22]

[20] Michaela Valente points out how the *Démonomanie* carries a vision of superstition that is partly different from that of the *Malleus Maleficarum*. In the *Malleus*, for example, judges are advised to obtain blessed salt, relics of saints, to make the sign of the cross, to question witches from behind, to drink blessed wax and other actions that the *Démonomanie* does not foresee as they are signs of superstition if not of idolatry. Bodin has a vision of faith such that practices dictated by pagan superstition must not corrupt it. These are ideas that probably contributed to marking the fate of the work on the *Index*. See Michaela Valente, *Bodin in Italia: La "Démonomanie des sorciers" e le vicende della sua traduzione* (Florence: Centro Editoriale Toscano, 1999), 96.

[21] Jean Bodin, *De la démonomanie des sorciers*, III, 159*r*–160*v*.

[22] The editorial story of the *Magia naturalis* is closely linked to the bad reputation of the first edition of the work in ecclesiastical circles. In May 1593 the Cardi-

4. RECONFIGURING MUSICAL EFFICACY WITHIN NATURAL MAGIC

In *Magiae naturalis libri XX*, Della Porta reformulated both the natural magic of music and its therapeutic uses in terms increasingly attentive to physical processes and experimental inquiry. Della Porta abandoned Ficino's conception of music as a "mind". Furthermore, unlike Agrippa, he separated the theme of numerical musical harmony from that of the alleged magical power of words, songs, and religious rites. Regarding vocal sound, Della Porta accepted the Aristotelian doctrine according to which sound is a *species* or quality, an "almost corporeal" entity distinct from the motion that accompanies it. In an ingenious experiment, Della Porta even hypothesized that the voice could be captured by means of a mechanical device. The materialization of vocal sound instead shifted the problem from the agency attributed to sound to the physical conditions through which sound might be produced, transmitted, and perceived. In the end, Della Porta postponed the solution to further experimental investigations aimed at testing this possibility. This possibility was later explored, in different forms, by Francis Bacon and John Wilkins.[23]

nal Marcantonio Colonna wrote to Paolo Pico, secretary of the Congregation of the *Index*, asking that account be taken of the substantial difference between the first and second editions of Della Porta's *Magia Naturalis*. The cardinal's request was so well received that in the *Index librorum prohibitorum* of the pontificate of Sixtus V (1585-1590) the *Magia Naturalis* was prohibited only as regards the editions prior to the year 1587, while in the *Index* drawn up under the pontificate of Clement VIII (1592-1605) there was no longer any reference to Della Porta. See Michaela Valente, *Della Porta e l'Inquisizione*, 415–434. See also Neil Tarrant, *Defining Nature's Limits. The Roman Inquisition and the Boundaries of Science* (Chicago–London: University of Chicago Press, 2022).

[23] Della Porta, *Magiae naturalis libri XX*, VI.9, 123; Francis Bacon, *Sylva Sylvarum*, in *The Works of Francis Bacon*, ed. J. Spedding, R. Leslie Ellis, and D. Denon Heath, vol. 4 (Boston: Houghton, Mifflin and Company, 1900), Century II, 265–266; John Wilkins, *Mathematicall Magick* (London: printed by M. F. for Sa. Gellibrand, 1648), 177–178. On this, see Donato Verardi, "Art and Magic of Animated Statues: The Secret Virtues of Albertus Magnus' Talking Head in Giambattista Della Porta's *Natural Magick*", in *Magical Materials in Renaissance Philosophy, Literature, and Art*, ed. R. Compton and D. Verardi (Lugano: Agorà & Co., 2022), 83–106. For the Baconian context of this transformation of experimental practice, and its en-

As for instrumental sound, Della Porta preserved the relational logic of *influxus*, whereby celestial qualities could be transmitted through material bodies and become operative in terrestrial nature, while strategically relocating the celestial virtues that Ficino had attributed to instrumental music to the astrological, but entirely physical, virtues of the materials from which musical instruments were made. The instrument thus became the material point through which celestial influence could enter the causal process of musical effects. The occult virtues of these materials could, in turn, be manipulated through art—that is, through the technical practices of the magician-craftsman—and subjected to experimental verification. Della Porta thus reconfigured elements of the Neoplatonic account of musical efficacy within a natural philosophy in which the effects of musical instruments could be explained through a Peripatetic physics of qualities and subjected to experimental investigation.

Among the mathematical disciplines, mechanics provided Della Porta with another means of making curious acoustic phenomena intelligible, such as the possibility that deaf people might perceive musical sounds not through hearing but through touch. Possibly referring to the possibility, already discussed by Martianus Capella, that rhythm could also be perceived tactually (Martianus had proposed the example of perceiving the rhythm of the beating of the veins with the fingers),[24] Della Porta suggested that even a deaf person, directly touching the musical instrument or using a rod con-

gagement with phenomena traditionally associated with natural magic, see Dana Jalobeanu, *The Art of Natural History: Francis Bacon in Context* (Bucharest: Zeta Books, 2015).

[24] Martianus Capella, *De nuptiis Philologiae et Mercurii: et de septem artibus liberalibus libri IX*, ed. U. F. Kopp (Frankfurt am Main: F. Varrentrapp, 1836), IX, 753; Cecilia Panti, *Filosofia della musica: Tarda antichità e Medioevo* (Rome: Carocci, 2008), 58.

nected to it, can "listen" to the vibratory sound of the lyre and, in principle, benefit from its marvellous virtues. Della Porta wrote:

> Or else stop your ears with your hands, that you may not hear the sound. Then take fast hold of the instrument by the handle with your teeth, and let another strike on it, and it will make a musical note in the brain, and it may be a sweeter noise. And not only taking hold of the handle with your teeth, but the long neck, near the Harp, and by that you shall hear the sound perfectly, that you may say that you did not hear the Music, but taste it.[25]

In this physical approach, which seems to respond implicitly to the doubts already posed by Pomponazzi, Fracastoro, and Cardano about the intrinsic powers of music, it is also possible to trace an echo of contemporary discussions promoted by music theorists. This is not surprising given the prominent role that music played in sixteenth-century academies, a context in which Della Porta himself was closely involved, cultivating an academy of learned inquiry around his house in Naples. Music attracted considerable attention in humanist circles, not only in Italy but also elsewhere in Europe, as illustrated by the interest in music and its effects at the Florentine Camerata,[26] or at the Baïf Academy, where music became an "image of the whole Encyclopedia".[27]

Between the second half of the sixteenth century and the first decades of the seventeenth century, mathematical and physical approaches to music were articulated in increasingly varied ways, with growing attention to empirical investigation. The acoustic experi-

[25] Della Porta, *Magiae naturalis libri XX*, XX.7. This experiment was taken up again by Athanasius Kircher in Book IX, Part V, *Experimentum VII. Ut surdus musicam percipiat*, of his *Musurgia universalis*, where he refers to the ability of deaf people to perceive sounds through their teeth. Athanasius Kircher, *Musurgia universalis, sive Ars magna consoni et dissoni in X libros digesta*, vol. 2 (Rome: Typis Ludovici Grignani, 1650), 359.

[26] Claude V. Palisca, *The Florentine Camerata: Documentary Studies and Translations* (New Haven–London: Yale University Press, 1989).

[27] Frances A. Yates, *The French Academies of the Sixteenth Century* (London: Warburg Institute, 1947; repr. New York: Routledge, 1988), 87.

ments initially promoted by Vincenzo Galilei (1520-1591) were taken up by his son, Galileo (1564-1642) and, even more, in the works of Marin Mersenne (1588-1648). In the sixteenth century, a significant moment in this transition was marked by the proposal of Giovanni Battista Benedetti (1530-1590). In his *Diversarum speculationum mathematicarum et physicarum liber*, published in 1585, Benedetti formulated an influential theory of consonance on a physical basis, associating the numerical ratios of consonant musical intervals with the blows produced in the air by the motion of the sounding string. Consonance was thus explained in physical as well as numerical terms, opening a different way of relating numerical proportion to the physical production of sound. In this respect, Benedetti's proposal marked an important moment in the contemporary reconfiguration of the mathematical and physical analysis of music. However, Benedetti's position still retained a "numerological" element. Indeed, he glimpsed a "marvellous analogy" between "the proportions of consonant intervals and the proportions of their products".[28]

Della Porta's attempt to locate in the physicality of musical instruments a power that might otherwise have been attributed to music itself was thus grafted into this lively debate about the nature—physical or mathematical—of musical science. Especially in *Magiae naturalis libri XX*, Della Porta gave greater explanatory weight to the physical conditions of musical effects (and this is also how Francis Bacon seems to have received his lesson).[29] Yet this physical emphasis did not amount to an abandonment of musical harmony as a mathematical principle. The relationship between physical qualities and mathematical proportion, however, remained only partially articulated in the *Magiae naturalis libri XX* and would receive a more explicit formulation in the later *Taumatologia*.

[28] Paolo Gozza, "Introduzione", in *La musica nella rivoluzione scientifica del Seicento*, ed. P. Gozza (Bologna: Il Mulino, 1989), 35.

[29] See Penelope Gouk, *Music, Science and Natural Magic in Seventeenth-Century England* (New Haven–London: Yale University Press, 1999), 157–192.

5. PYTHAGOREAN NUMBER AND THE HARMONY OF NATURE

The relocation of the causes of the 'marvellous effects' attributed to music to the physical qualities of natural materials led Della Porta to remodel the notion of harmony inherited from Ficino and Agrippa, adapting it to his own engagement with mathematics and with the experimental investigation of the occult secrets of nature. Although this remodelling was already implicit in the *Magiae naturalis libri XX*, it was explained in detail in the pages of an unfinished work, *Taumatologia* (1604–1615), which Della Porta was developing during his association with the Accademia dei Lincei. The work was conceived in response to a letter from Rudolf II, delivered to Della Porta by Cristiano Harmio, in which the emperor invited him to move to Prague. Della Porta responded by designing a new encyclopaedia dedicated to the emperor. The project was subsequently redirected towards Cardinal Federico Borromeo, Archbishop of Milan. The *Taumatologia*, however, never received the *imprimatur*, and Della Porta ultimately abandoned the project.

The presence of music among the topics discussed in *Taumatologia* testifies to the persistence of an interest that dated back to Della Porta's early years and continued to occupy him during the final phase of his intellectual career, when he was associated with the Accademia dei Lincei (1610–1615). It was during these years that he continued to reflect on the mathematical foundations of music and on their relationship with natural philosophy.

Della Porta's attempt to bring mathematical reasoning into the changing world of the elements was not an isolated undertaking. Yet his proposal is significant because it brought mathematical order into direct relation with the occult qualities and mutable bodies that constituted the proper field of natural magic. Think, to give a significant example, of the success of Proclus's *Commentary* on Euclid's *Element*, translated by Simone Grineo in 1533 and, in 1560, by Francesco Barozzi, the founder of the Academia dei Vivi as well as one of the main mathematics teachers in Padua before Galileo's appointment. During the years in which Della Porta participated in the activities of the Accademia dei Lincei, mathematical approaches to natural phenomena occupied an increasingly significant place in several areas of contem-

porary natural philosophy. At this historical juncture, reflection on numbers and mathematics was also contributing to approaches that unsettled established disciplinary boundaries and prompted new configurations of the relations among different forms of knowledge. This trend is particularly evident in the work of Galileo, who frequented the same scientific circles as Della Porta. Both were prominent figures within the Accademia dei Lincei, where Della Porta held the role of Vice-Prince. If Galileo, developing an approach already pursued by his father Vincenzo, distinguished mathematical demonstration from numerological speculation in his *Dialogue Concerning the Two Chief World Systems* (1632), Della Porta's *Taumatologia* offers a different way of relating mathematical number to the physical nature of things.

Della Porta was undeniably a qualified mathematician. He translated Theon's commentary on the first book of Ptolemy's *Almagest* and published a book entitled *Elementorum curvilineorum libri tres*. Although formally a work in pure mathematics, the book – as Arielle Saiber pointed out – "is less about moving mathematical study forward than about showing the world a catalogue of the curves that he saw in the world and what one must do to master them, to capture them, to tame them through measuring".[30]

A similar attention to the material world informs Della Porta's treatment in *Taumatologia* of the natural power of the "divine" numbers. It is a treatment that can also be read as an attempt to sustain elements of the Pythagorean tradition in the context of contemporary critiques of Pythagorean musical theory associated with Aristoxenian approaches to music.[31] However, it should be noted that, far from being an uncritical defence of the mathematical-Pythagorean approach to music, Della Porta's position was instead an attempt to relate Pythagorean doctrines to forms of empirical inquiry, sepa-

[30] Arielle Saiber, "Flexilinear Language: Della Porta's *Elementorum curvilineorum libri tres*", *Annali d'italianistica* 23 (2005): 89–104, esp. 95. See also Pier Daniele Napolitani, *La matematica nell'opera di Della Porta*, in *Giovan Battista Della Porta nell'Europa del suo tempo*, 114–166.

[31] On this debate in the early modern period, see Paolo Gozza, "La musica nella filosofia naturale del Seicento in Italia," *Nuncius* 1, 2 (1986): 13–47.

rating the numerical doctrines he appropriated from elements of the magical tradition that he considered extraneous to them.

In *Taumatologiae liber secundus*, Della Porta combines Pythagoreanism with a series of doctrines taken from the Neoplatonic and Orphic traditions, which he rereads in the light of the authority of Aristotle or, more precisely, of the pseudo-Aristotelian *Problemata*, already used by Ficino in *De vita*.

By quoting Pythagoras, Della Porta argued that it is the harmony shown by music, structured according to numerical relations, that governs, as if it were a universal law, the relations of sympathy and antipathy between the world and man and between soul and body. In this text, Della Porta also argued for the legitimacy of the power attributed to numbers. Already in *Taumatologiae liber primus*, Della Porta claimed to want to resume and reaffirm, about the power of numbers, the theses attributable to the Platonists and Pythagoreans and to the most secret theologians, that is, kabbalists.[32] As is well known, the kabbalistic power of numbers, an argument related by Della Porta "to the Platonists and the Pythagoreans", was a central theme in the work of Giovanni Pico della Mirandola, an author whom Della Porta cited among the *auctoritates* of *Taumatologiae liber secundus*.[33] This doctrine was also widely discussed in Agrippa's *De occulta philosophia libri tres*. In this work, Agrippa eclectically combined the cabala with his own peculiar form of theurgy, placing the discourse on the powers of numbers in a context that could appear problematic to a late Renaissance natural magician such as Della Porta.

Della Porta thus tried to reinterpret the theme of the power of numbers, which Agrippa had closely associated with theurgy, in relation to a Pythagoreanism that he sought to bring into conversation with Aristotelian natural philosophy. In the context in which Della Porta worked, his was not at all an eccentric operation, if we consider that the same *Secretum secretorum* attributed to Aristotle and edited and commented on in Naples by Storella, included numerology among its

[32] Giovan Battista Della Porta, *Taumatologia e Criptologia*, ed. R. Sirri (Naples: Edizioni Scientifiche Italiane, 2013), I.6, 15.

[33] Della Porta, *Taumatologia e Criptologia*, II, I.25, X.44, XIII.50.

arguments. Storella himself, in his commentary on the chapter dedicated to the power of numbers, explicitly referred to the active virtue of numbers, in particular of the ternary number, thus revealing the concordance between Pythagoras and Aristotle. Among Storella's explicit sources was also Pico della Mirandola's *Conclusiones*.[34]

By relating cabalistic numerology to Pythagorean doctrines of number, and by emphasising points of possible concordance with Aristotle, Della Porta presented the power of numbers as a rational alternative to the demonological interpretation of occult phenomena. His familiarity with the pseudo-Aristotelian *Secretum secretorum* provided an additional precedent for this rapprochement between Pythagorean numerology and Aristotelian natural philosophy.

It is well known that, according to a consolidated tradition, the connections between music and mathematics go back to Pythagoras. A crucial event for Greek science was the discovery of musical proportions. This discovery implied that a subjective quality such as sound corresponds to measures expressed in terms of numerical ratios all having the same supraparticular structure (n + 1: n). This correspondence was established empirically through the monochord, an instrument whose invention was attributed to Pythagoras by Boethius. If a subjective quality such as sound could correspond to measures expressed through numerical ratios, then the mathematical description of musical harmony provided a model for thinking about the quantitative correspondences underlying other sensible qualities. On this basis, Della Porta could thus treat numbers as a mathematical means of articulating relations among the physical qualities operating in the sublunary world, thereby rendering their otherwise hidden correspondences intelligible.[35]

Against this background, and alongside the other body of ancient knowledge expressed mathematically, namely astronomy, Della Porta returned in the *Taumatologiae liber secundus* to the mathematical-cosmological meanings attributed to number, denying any re-

[34] Pseudo-Aristotle, *Secretum secretorum Aristotelis ad Alexandrum Magnum*, ed. Francesco Maria Storella (Naples: Matthias Cancer, 1555), 52*rv*.

[35] See Verardi, *La scienza e i segreti della natura a Napoli nel Rinascimento*, 21–27.

lationship of Pythagoreanism with the tendentious interpretations that demonologists, such as Del Rio, were offering.

Strengthened by the idea that there is a correspondence between number and quality, Della Porta argued that it is possible to cure through the natural power of numbers in much the same way as diseases can be treated with appropriately administered medicinal herbs. But the number to which one should refer, he specified, is not the commercial number of the merchants, but the natural Pythagorean number which, by binding body and soul in a unison vibration, also regulates the harmonic relationships between opposing elements of the cosmos. In the light of this doctrine, it is understandable why, in *Magiae naturalis libri XX*, Della Porta attributed the power usually attributed to music to the materials of which musical instruments are made. In a mathematically structured universe, the sensible qualities of musical instruments could thus be understood as corresponding, at least in principle, to numerical proportions. This idea allowed Della Porta to preserve the central aspect of the Pythagorean lesson, that is, the idea of a world ordered according to musical numbers, affirming its adherence to the peripatetic astrological physics of occult qualities.

The mathematisation of the astrological physics of qualities was therefore not, for Della Porta, a substitute for other forms of natural inquiry, but another means of investigating the relations among natural qualities. If mathematics could disclose measurable relations within the occult, then what was occult was not necessarily unknowable: like every secret of nature, it could become an object of investigation and revelation. This also affected the relation between the occult and the secret: the occult could belong to the rational order of nature, while the secret designated what remained to be discovered within that order. Divine number, in turn, offered a means of 'measuring' what remained hidden within it.

6. CONCLUSIONS

Della Porta's treatment of music reveals a distinctive reorganisation of natural efficacy. Rather than deciding between the mathemati-

cal account of harmony and the physical explanation of qualities, Della Porta reconfigured their explanatory roles. The *Magiae naturalis libri XX* locates the efficacy traditionally attributed to music in the physical and occult qualities of the materials from which instruments are made; the *Taumatologia* subsequently makes more explicit the mathematical relations through which those qualities could be conceived as corresponding. What emerges is therefore not a choice between mathematical number and empirical inquiry, but an attempt to assign them different functions within the same natural philosophy.

This becomes particularly clear in Della Porta's treatment of Pythagorean number. Number does not function simply as an abstract principle imposed upon the physical world. It provides a means of articulating the correspondences through which physical qualities are related to one another. The mathematical structure of musical harmony consequently serves as a model for understanding the relations among sensible qualities more generally. The significance of Pythagoreanism in the *Taumatologia* lies precisely here: Della Porta retrieves the ancient correspondence between number and quality while relocating it outside the theurgic and demonological frameworks within which it had been articulated in parts of the Renaissance magical tradition.

The same reorganisation explains the relation between the *Magiae naturalis libri XX* and the *Taumatologia*. In the former, the efficacy of musical instruments is brought back to the properties of bodies and materials and thus incorporated into a physical account of causation. In the latter, numerical proportion appears as a possible means of expressing the relations underlying those properties. The two works should therefore not be understood as representing a passage from one explanatory model to another. Rather, the *Taumatologia* makes explicit a mathematical dimension that had remained only partially articulated in the *Magiae naturalis libri XX*.

This also clarifies the role of experiment in Della Porta's natural magic. Experiment did not require the abandonment of inherited principles; it provided the means by which their claims could be tested, specified, relocated, or reformulated. Ancient authorities could therefore remain sources of hypotheses without becoming substi-

tutes for experience. Pythagoras could remain an authority without his doctrines being insulated from empirical scrutiny, because Della Porta reconsidered what a mathematical conception of nature might mean within an account of efficacy attentive to physical processes.

The result is a conception of natural magic in which mathematics does not replace experience, nor does experience dissolve mathematical order. The former supplies a language for expressing relations among qualities; the latter provides the means to examine whether and how those relations are manifested in bodies and effects. The 'divine' number thus acquires a specifically epistemic function: it offers a way of measuring, and thereby rendering intelligible, correspondences that are not immediately apparent to the senses.

Della Porta's reinvention of nature can therefore be seen here in a particularly precise form. He neither discarded the harmonically ordered cosmos inherited from Pythagorean and Renaissance traditions nor simply reproduced it. Rather, the particular problem of musical efficacy led him to reconfigure the explanatory relations among principles that had previously occupied different domains. In the *Magiae naturalis libri XX*, musical efficacy is relocated to the physical and occult qualities of bodies and materials; in the *Taumatologia*, Pythagorean number is brought back into relation with those qualities as a means of articulating the correspondences through which they operate. Reinvention thus consists here not in replacing one conception of nature with another, but in altering the explanatory relations, limits, and functions of inherited principles as they are brought to bear on a particular phenomenon. Music provides an exemplary case because it makes visible how number, harmony, material qualities, celestial influence, and experience can be differently configured within a continuing natural order. The unfinished *Taumatologia* does not offer a final synthesis, but it shows Della Porta extending this reconfiguration into a conception in which the hidden relations of nature could become not only intelligible, but measurable and open to experimental investigation.

3. FROM THE POLE STAR TO MARS: MAGNETISM AND THE RECONFIGURATION OF CELESTIAL CORRESPONDENCE

1. INTRODUCTION

Within the fluid landscape of early modern natural philosophy, the phenomenon of magnetic attraction stood as a crucial testing ground for negotiating the relation between the celestial and sublunary worlds. The changing explanations that Della Porta offered for the magnet provide a particularly revealing case. They trace a movement from the stellar framework of the first *Magia naturalis* to the planetary and sympathetic interpretation developed in the *Phytognomonica* and the expanded *Magiae naturalis libri XX*.

Through a close examination of Della Porta's sources and their reworking, I argue that his changing view of magnetism reveals a progressive reconfiguration of the explanatory relations inherited from Ficino's *De vita coelitus comparanda*. While the young Della Porta accepted a framework that associated the occult virtue of the magnet with the fixed and directional axis of the Pole Star (*Cynosura*), his mature works reformulated this explanation by redistributing the relation between celestial correspondence, material quality, and natural virtue. By connecting magnetic attraction to a Plotinian principle of sympathy and to the planetary domain of Mars, Della Porta increasingly located the immediate cause of magnetic action in the properties of terrestrial matter while preserving its place within a broader order of celestial correspondences.

To understand the significance of this development, attention must remain on the internal architecture of Della Porta's philosophy. Rather than evaluating these changes through external narra-

tives of scientific progress, it is more revealing to examine how the reinterpretation of magnetism responded to the demands of Della Porta's own evolving conception of nature. The point, however, is not to replace one explanatory framework with another, but to reconstruct the changing articulation of principles through which the same natural phenomenon was made intelligible. As Eugenio Garin once suggested, such an inquiry requires close attention to the ways in which an author actively manipulates, adapts, and renegotiates inherited traditions.[1]

The movement from the polar framework of the first *Magia naturalis* to the association with Mars in the *Phytognomonica* and the *Magiae naturalis libri XX* therefore forms part of a broader effort to clarify how celestial correspondences relate to terrestrial qualities and their particular manifestations. The change is significant not simply because the celestial reference is altered, but because the alteration coincides with a greater attention to the material composition of the magnet, the variability of its effects, and the circumstances in which its virtue becomes perceptible without implying that such variability undermines the existence of a determinate natural order.

This is particularly evident in Della Porta's treatment of individual lodestones. Their properties cannot always be inferred from a general correspondence, since stones of different places may display different virtues. The problem of magnetism thus brings together several dimensions of Della Porta's natural philosophy: a general correspondence between celestial and terrestrial qualities, the particular conditions under which those qualities become actual, and the need to establish their effects through experience. The significance of these observations lies precisely in the fact that the singular case does not invalidate the general order of nature. Rather, it reveals the extent to which that order must be specified at the level of particular bodies and circumstances. The passage from Cynosura to Mars consequently offers a precise case through which to examine how Della

[1] See Eugenio Garin, *Prefazione* a *Giovan Battista Della Porta nell'Europa del suo tempo*, 10.

Porta negotiated the relation between cosmic order and the singular phenomena encountered in nature.

2. FROM BENENAYS TO CYNOSURA

In the highly successful first edition of the *Magia naturalis*, Della Porta traces the attractive power of the magnet for iron to the influence of the star Cynosura, namely the Pole Star. Three decades later, in the *Phytognomonica*, he would instead place magnetism in relation to Mars. This astrological interpretation of magnetism was later sharply criticised by William Gilbert (1544–1603), whose *De magnete* offered a radically different account of magnetic phenomena. According to Gilbert, the Earth is a giant magnet, a premise from which he deduced its rotation around its own axis. Furthermore, Gilbert polemised against astrologers, specifically criticising the notion—accepted by Della Porta as well—that the qualities of the planets correspond to those of metals. "In what", Gilbert polemically asks, "does the quality of Mars agree with that of iron?".[2]

If we turn our attention to the Renaissance, and specifically to the major figures in the Italian astrological debates, we find that both solutions—the one linking magnetism to the northern stars of the Bear and the one connecting it to Mars—boasted illustrious proponents. One may recall Pontano (who, by reconnecting iron to Mars, emphasised the latter's attractive virtue), Ficino (who apparently connected magnetism to both the Great and Lesser Bears), Gabriele Pirovano (who invoked the virtue of the Pole Star, while also relating this phenomenon to the complexion of mutable signs), and Cardano

[2] See William Gilbert, *De magnete* (Sedini: Typis Götzianis, 1633), 22. In the fourth book, he recalls how Ficino and Cardano attributed magnetism to the Bear (see *De magnete*, 151). No mention is made of Della Porta in relation to the astrological tradition. This leads me to hypothesize that Gilbert was likely only acquainted with Della Porta's second *Magia naturalis*, remaining unaware of the first *Magia naturalis* (where magnetism is traced to the Bear) and the *Phytognomonica* (where it is traced to Mars). Moreover, Gilbert's borrowings and criticisms all point back to the *Magia naturalis libri XX*.

(who traced the magnet's attractive power to a small star forming the tail of the Lesser Bear: the Pole Star itself).[3]

To fully comprehend the contours of this complex issue, one must refer to a passage in Ptolemy's *Tetrabiblos*, which asserts that "Of the stars in the configurations north of the zodiac, the bright stars in Ursa Minor have a similar quality to that of Saturn and, to a less degree, to that of Venus; those in Ursa Major, to that of Mars".[4]

In the four-book edition of the *Magia naturalis* (1558), Della Porta explains magnetic attraction by adopting, though without explicitly citing it, a passage from the third book of Ficino's *De vita*. In the *De vita coelitus comparanda*—a work in which the doctrine of causality advocated by medieval astrological Peripateticism is transformed in light of late Neoplatonism and Hermetism—Ficino denies that magnetic attraction can be traced to a sympathetic principle. He argues that if this were the case, iron would attract iron to

[3] See Giovanni Pontano, *De rebus coelestibus libri XIIII* (Basel: Andreas Cratander, 1530), 249, 128–130, 226–227; Gabriele Pirovano, *De astronomiae veritate* (Basel: Jakob Parcus, 1554), 288; Lucio Bellanti, *Liber de astrologica veritate contra Johannem Picum Mirandulam* (Florence: apud Gherardum de Haerlem, 1498), 187; Girolamo Cardano, *De subtilitate libri XXI* (Lyon: Etienne Michel, 1580), VII, *De lapidibus*, 278. Cornelius Agrippa also refers to the Bear in *De occulta philosophia*. See Agrippa, *De occulta philosophia*, I.32, 68. Authors completely outside the astrological community also rely on the power of the Bear. See Gaudenzio Merula, *Nuova Selva di varia lettione … divisa in sei libri* (Venice: Gio. Andrea Valvassori detto Guadagnino, 1562), 345–346, which is a translation of the Latin work *Memorabilia* (Novara: 1546). The power of the Bear is also discussed in Giulio Cesare Scaligero, *Exotericarum Exercitationum lib. XV, De Subtilitate ad Hieronymum Cardanum* (Frankfurt: Impensis Claudii Marnii haeredum, Ioannis & Andreae Marnii & consortum, 1612), ex. 131, 446–452 (1st ed. Frankfurt: 1576), and in Michele Mercati, *Metallotheca vaticana* (Rome: ex Officina Jo. Mariae Salvioni, 1717), VII.16, 166. A reference to the Bear and, more precisely, to the star Cynosura is found in Erasmus of Rotterdam, *Adagi*, ed. and trans. by E. Lelli (Milan: Bompiani, 2013), adages 457 and 2442, 485 and 1877, who draws from Marcus Tullius Cicero. In referring to Cynosura, Della Porta may have drawn from Cicero, who discusses it in *De natura deorum libri tres*, with the commentary of G. F. Schoemann, ed. Austin Stickney (Boston: Ginn & Heath, 1881), 111.

[4] See Ptolemy, *Tetrabiblos*, I.9, 49. This position is adopted almost verbatim by Pontano in *Iovani Pontani Commentariorum in Centum Claudij Ptolemaei sententias, libri duo* (Basel: Andreas Cratander, 1531), 55.

a greater degree than the lodestone does. Nor, according to Ficino, can it be assumed that the magnet attracts iron by virtue of any superiority of stone over metal; within the hierarchy of bodies, metal is superior to stone. For Ficino, the reason the magnet attracts iron lies elsewhere: although ordered alongside iron within the series linked to the Bear, the magnet occupies a higher degree within the property of that constellation than iron does. By virtue of this hierarchical position, the magnet attracts the metal.[5]

According to Della Porta, iron allows itself to be "pulled" because the lodestone is "much superior to the celestial Bear, with respect to order, so that it does not allow it to descend to the earth, and because circular motion flees violence, a thing it cannot achieve except by being the pillar of the world, so that the motion of the heavens never declines in any part".[6] Elsewhere in the same work, partly following Ficino, Della Porta returns to this problem. In the lodestone—Della Porta claims—one often finds engraved the figure of the star Cynosura, namely the Pole Star, which is capable of attracting iron to itself and making man a participant in its virtue: "In the lodestone there was often found engraved the figure of the star Cynosura, since this stone loves it greatly, so that when it touches iron, it turns it towards that star and makes man a participant in its virtue, which is Saturnian".[7] Indeed, Ficino had already referred to a stone engraved with the figure of the celestial Bear (without specifying whether he meant the Great or the Lesser Bear), attributing Saturnian and Martial influences to both the stone and the figure.[8]

To the lodestone engraved with the star Cynosura, Della Porta attributes a single virtue: a Saturnian one. No mention is made of any potential Martial virtue (a virtue which, together with the Saturnian, is instead attributed to it by Ficino and, subsequently, by Agrippa). Bearing in mind that, as Ptolemy teaches, the virtue of the Great Bear

[5] See Ficino, *Three Books on Life*, III.15, 314 and 316.

[6] Della Porta, *Dei miracoli et maravigliosi effetti*, II.21, 89; Della Porta, *Magiae naturalis sive de miraculis*, II.21, 89.

[7] See Della Porta, *Dei miracoli et maravigliosi effetti*, IV.24, 161*v*; Della Porta, *Magiae naturalis sive de miraculis*, IV.24, 162.

[8] See Ficino, *Three Books on Life*, III.15, 316.

is Martial, while that of the Lesser Bear (and thus of the star Cynosura) is Saturnian, Della Porta's position appears to adhere more closely to the text of the *Tetrabiblos* than his source does.[9] Indeed, at least from a Ptolemaic perspective, the dual virtue attributed by Ficino to the Bear leaves the reader in doubt as to which of the two constellations he is referring to. The matter is further complicated by another passage in Chapter VIII of the *De vita coelitus comparanda*.[10] There, Ficino connects the lodestone to the Hermetic *Benenays*, located in the tail of the Great Bear and identifiable with the star η.[11]

While this reference might initially suggest that the Bear Ficino speaks of in Chapter XV is *Ursa maior*, one must keep in mind that in the passage presented in Chapter XV (to which Della Porta also refers), Ficino speaks simply of "the Bear" (*Ursa*), without specifying the constellation as he had done in Chapter VIII. On the other hand, still in Chapter XV, Ficino also refers to a vaguer "northern pole", to which the magnet that attracts iron is said to be ordered. The expression "northern pole" leaves room for both possible influences. It is therefore not far-fetched to assume that the magnetic phenomenon is related by Ficino to both constellations of the Bear, Major and Minor, both being traceable to the arctic pole. This would also explain the dual virtue, Saturnian and Martial, that Ficino recognises in the magnet, thereby "saving" his previous reference to the Hermetic *Benenays* (the star η of the Great Bear).

Ficino's reliance on a dual tradition—the Hermetic and the Ptolemaic—produces a significant ambiguity in the transmission and interpretation of the correspondence. It is perhaps for this reason that most 'followers' or 'readers' of Ficinian doctrine chose to attribute magnetic virtue solely to the Lesser Bear and, like Della Porta, inter-

[9] Ptolemy clearly distinguishes the Martial virtue of the Great Bear from the Saturnian virtue of the Lesser Bear, of which Cynosura forms a part.

[10] See Ficino, *Three Books on Life*, III.8, 278.

[11] According to Ptolemy, the Great Bear possesses Martial virtue, whereas according to Ficino (and according to his source, the *De quindecim stellis, quindecim lapidibus, quindecim herbis et quindecim imaginibus* of Hermes) it possesses Venerean and Lunar virtue.

pret Ficino's reference to "the Bear" as an invocation of the Lesser Bear alone.

Della Porta seems to realise the equivocation inherent in the Ficinian position on magnetism. It is worth noting, for example, how in a passage from the 1558 *Magia naturalis*, in conformity with Ficinian doctrine, he declares that in stones intended to obtain specific celestial virtues, it is often possible to find the image of the corresponding star. What is interesting is that in the case of "Mars in the form of a soldier, weakened, with a spear or shield in his hand",[12] the corresponding stone is jasper, not the magnet.[13] In this manner, Della Porta emphasises that, in compliance with the lesson of the *Tetrabiblos* according to which the Lesser Bear possesses the quality of Saturn, the virtue to be attributed to the lodestone is exclusively Saturnian, and not Martial.

[12] Della Porta, *Dei miracoli et maravigliosi effetti*; IV.24, 161*v*; Della Porta, *Magiae naturalis sive de miraculis*, IV.24, 162. The image is found in Camillo Leonardi's *Speculum lapidum*. See Camillo Leonardi, *Speculum lapidum*, bk. III (Venice: Giovanni Battista Sessa,1502), 53*v*. It is interesting to note how Leonardi emphasises that the two constellations of the Bear, Minor and Major, possess different astrological virtues. Drawing, without citation, from Ptolemy's *Tetrabiblos*, he recalls that the Lesser Bear has a Saturnian virtue, while the Great Bear has Martial and Venerean virtues. Leonardi, who seems here to follow Chapter XV of *De vita coelitus comparanda*, also appears to share the view of a dual action of the Lesser and Great Bear in the case of certain celestial images, such as a serpentine image that joins both constellations. See Leonardi, *Speculum lapidum*, 54*v*. In Chapter VI of Book II, Leonardi explains the magnetic phenomenon by referencing the teaching of Albertus Magnus, declaring this to be his position on the matter. See Leonardi, *Speculum lapidum*, 15*rv*. The image of Mars as a soldier engraved on jasper also traces back to Leonardi's *Speculum*. See Leonardi, *Speculum lapidum*, 64*r*. Leonardi also catalogues a magnet engraved with an armed man. See Leonardi, *Speculum lapidum*, 57*v*.

[13] Della Porta, *Dei miracoli et maravigliosi effetti*; IV.24, 161*v*; Della Porta, *Magiae naturalis sive de miraculis*, IV.24, 162. Jasper is also deemed Martial by Agrippa in *De occulta philosophia libri tres*, I.27, 139. Ficino connects it to Alchamet, or Arcturus. This is a first-magnitude star in the constellation of Boötes, the Hermetic Alchimech Abramech. See Ficino, *Three Books on Life*, III.8, 278. On this stone and its properties, see Pietro Andrea Mattioli, *I discorsi di M. Pietro Andrea Matthioli … ne i sei libri di Pedacio Dioscoride Anazarbeo della materia medicinale* (Venice: Vincenzo Valgrisi, 1563), 726.

3. THE 1588–1589 TURNING POINT: MAGNETISM UNDER MARS

The conceptual framework shifts substantially with the 1589 *Magia naturalis*, wherein the attraction of the magnet for iron is explained by resorting to the principle of "sympathy", entirely devoid of any further reference to the power of the Pole Star. Indeed, while in the first *Magia naturalis* Della Porta essentially rewrites and accepts Ficino's thesis, in the second he distances himself from it. In this expanded twenty-book edition, Della Porta argues that the lodestone attracts iron because it is composed partly of stone and partly of iron. Within the magnet's composition, stone is quantitatively superior to iron. Driven by a desire for self-preservation, the iron inside the stone attracts external iron. This occurs because the internal iron seeks to compensate for the predominance of stone within the lodestone's mixture. Attraction, therefore, is not attributable to the power of the stone, but rather to that of the iron contained within the composition of the lodestone. This explanation shifts the immediate focus from celestial correspondence to the internal structure of bodies, understood through observable composition and variation in natural cases. In the seventh book of the *Phytognomonica* (1588), published just one year prior to the 1589 *Magia naturalis*, the principle of attraction and repulsion in stones like the magnet is explained through the principle of "sympathy".[14] Furthermore, the magnetic phenomenon is no longer connected to the Pole Star, but to Mars.[15] This does not imply a simple substitution of one celestial cause for another. Rather, the association with Mars becomes intelligible within an explanatory framework in which the celestial reference no longer provides the immediate explanation of magnetic attraction, but situates the material virtue of iron within a wider order of celestial–terrestrial correspondences.

In justifying the historical choice of the constellations of the Bear over the planet Mars within medieval treatises on magnetism, Nico-

[14] Della Porta, *Phytognomonica*, VII.15, 285.

[15] This is a doctrine that Della Porta draws from the *De lapidibus* of Pseudo-Orpheus. See Orpheus, *De lapidibus*, trans. Hannardo Gamerio (Liège: 1578), 15.

las Weill-Parot has shed light on a crucial aspect of the matter: unlike a planet, which is a mobile celestial body, constellations are "fixed" and could thus be seen as better suited to explaining a directional effect by earlier authors. For the Della Porta of the *Phytognomonica* and the second *Magia naturalis*, however, the traditional directional role of the celestial body no longer functions as the explicit and immediate explanation of the magnetic effect.[16]

To fully understand this shift, however, we must expand the discourse to the variable properties observed in actual lodestones found across different regions of the Earth. In Book VII of the *Magia naturalis*, which is entirely devoted to explaining the "wonders" of the lodestone through direct experience, Della Porta strongly emphasises material variation, pointing to the specific geographical location as the primary cause of these fluctuations. Della Porta directs his polemic against those who "too scrupulously persist in investigating the causes of each thing",[17] losing themselves in abstract speculation rather than observing natural particulars. Only concrete experience, Della Porta argues, can provide a reasonable account of every singular magnetic effect, since the "virtues" of these stones vary according to their place of origin. This variability even defies simple physical proportions: while small stones can exhibit immense attractive power, a remarkably large lodestone—which Della Porta claims to have "seen" on several occasions—might barely be capable of attracting a half-ounce piece of iron.[18]

How, then, can we reconcile these textual observations—which emphasise a localised variety of effects—with an astrological framework that traces the power of every lodestone back to a single planet

[16] In truth, even this "experience" has an astrological, albeit implicit, justification. Indeed, even if Della Porta makes no mention of it, one must keep in mind that the constellation of the Great Bear, to which the "directional" role of the needle turning northward is also attributed, possesses qualities similar to those of Mars.

[17] Della Porta, *Della magia naturale*, VII. 9, 305; Della Porta, *Magiae naturalis libri XX*, VII.9, 133.

[18] Della Porta, *Della magia naturale*, VII.10, 306; Della Porta, *Magiae naturalis libri XX*, VII.10, 134.

like Mars? The answer lies precisely in the distinction between the celestial correspondence of a natural entity and the particular circumstances under which its virtue is actualised. By drawing upon the doctrine of Albertian lineage examined in the first chapter, it is possible to reconstruct the underlying coherence of Della Porta's model. As we have seen, the actualisation of occult virtues is consistently understood to depend on a specific *horoscopus*—namely, the celestial configuration relative to the determined *locus* in which the terrestrial entity is situated. The diversity of magnetic properties can therefore be attributed not to a differentiation of the celestial body to which the lodestones are generally referred, but to the shifting geographical position of each stone, which catches a different celestial aspect. Through this lens, the astrological explanation therefore no longer functions as an immediate causal determination of the effect. It instead specifies the celestial order within which a terrestrial virtue is actualised under determinate material and local conditions.

This distinction also helps clarify the status of magnetic directionality. What is crucial here is that even the apparently "directional" effect of magnetism (the tendency of the needle to turn northward) is no longer grounded in a fixed stellar pole as a stable causal anchor, but is instead accommodated within a differentiated articulation of celestial and terrestrial correspondences, in which sympathetic relations and material affinities are activated under specific conditions rather than derived from a single immutable celestial reference. The empirical stability of the effect therefore does not require recourse to a fixed celestial reference as its immediate cause. Della Porta can acknowledge the regularity of the northward movement while explaining the magnetic virtue itself through a more differentiated network of terrestrial and celestial relations.

The sympathy that explains the magnet's attraction over iron is—as the Neapolitan maintains in the *Phytognomonica*—a Plotinian sympathy, which he commits to verifying through direct experimentation.[19] This position diverges from that of Ficino, who had denied that magnetic attraction could be explained by means of "sympa-

[19] See Della Porta, *Phytognomonica*, VII.15, 285.

thy".[20] For Della Porta, however, sympathy provides precisely the conceptual link between the material composition of the magnet and its wider cosmological classification. In both the *Phytognomonica* of 1588 and the *Magia naturalis* of 1589, Della Porta argues that like always attracts like. Consequently, it is iron that attracts iron, by virtue of a principle of resemblance that he had accepted since his first *Magia naturalis*. At this first level, the explanation is therefore entirely terrestrial: the iron contained within the lodestone attracts the external iron because of their shared nature. The celestial correspondence enters at a different explanatory level, when Della Porta asks why this particular material virtue belongs to the magnetic body.

The association between Mars and iron, tracing back to an ancient alchemical-astrological tradition,[21] is compatible with Della Porta's principle of "sympathy". According to this framework, like attracts like. If Mars—as maintained also by the *De lapidibus* of Pseudo-Orpheus, which Della Porta quotes in the *Phytognomonica*—is the planet of iron, it becomes intelligible why the magnetic phenome-

[20] See Ficino, *Three Books on Life*, III.15, 314, 316. As Stéphane Toussaint has pointed out, for Ficino, sympathy is a relation established in the cosmos between two similar entities, whereas the relation between two contrary entities is harmony. Cf. S. Toussaint, "Plotin, Ficin et la Sympathie. ὅσον τὸ συμπαθές (Enn. IV, 4 [28], 41)", *Accademia*, 17 (2015): 123–131, esp. 130. This makes it possible to understand why, according to Ficino, the relation between two contrary elements, such as iron and the magnet, cannot be regarded as 'sympathetic'.

[21] The assimilation of the planet Mars to iron is also present in the *De aluminibus* attributed to Rāzī, a text which, as Michela Pereira states, carries a vision of alchemy "that we will consistently find at the foundation of Western alchemical practice until Paracelsus and to a large extent even beyond," assimilating Mars precisely to the nature of iron. See Michela Pereira, ed., *Alchimia* (Milan: Arnoldo Mondadori Editore, 2006), 272; Rāzī, *De aluminibus et salibus*, in *Alchimia*, 295–296. An interesting contemporary testimony to Della Porta is the work of Evangelista Quattrami, *La vera dichiaratione di tutte le metafore, similitudini et enimmi de gl'antichi filosofi alchimisti. Ove con un breve discorso della generatione de i metalli etc.* (Rome: Vincenzo Accolti, 1587), 186. On Quattrami, see A. Perifano, "Alchimie et philosophie de la nature chez Evangelista Quattrami", in *Alchimie et philosophie à la Renaissance: Actes du Colloque international de Tours (4–7 décembre 1991)*, ed. J.-C. Margolin and S. Matton (Paris: J. Vrin, 1993), 253–264, esp. 258–259.

non is referred to Mars rather than to the Pole Star.[22] The planetary correspondence thus extends the terrestrial principle of resemblance to the celestial level: iron attracts iron by virtue of their material affinity, while Mars corresponds to iron within the wider order of celestial–terrestrial relations.

In the context of a more sustained engagement with alchemical literature and related artisanal practices—which in the twenty-book *Magia naturalis* is reflected, among other things, in the prominent place accorded to distillation[23]—the Neapolitan philosopher could thus bring together two propositions that had previously remained conceptually separate: (1) the principle of "sympathy", whereby like attracts like, and (2) the doctrine that Mars is the planet of iron. From these premises, it follows that (a) iron is attracted by iron and that (b) such attraction is traceable to the planet presiding over iron, namely Mars. Therefore, if—as taught by a certain alchemical-astrological and medical tradition (embraced in Naples as early as Pontano)—Mars is the planet of iron, and if at the elemental level it is iron and not stone that draws iron towards itself (since, according to the Plotinian doctrine of universal sympathy, like always attracts like), the transition from the Pole Star to Mars thus becomes intelligible not as a change from one celestial cause to another, but as a reorganisation of the explanatory levels through which the same phenomenon is understood. Della Porta connects the phenomenon of

[22] See Orpheus, *De lapidibus*, 15. A reference to the Martial nature of the lodestone is found in Francesco detto il Cieco da Ferrara, *Libro d'arme e d'amore nomato Mambriano* (Ferrara: 1509): "Ritien aspetto in se di calamita Marte / e poi tutto ferreo di natura / Come ci mostra il tempio, e sua figura." This is an interpretation that would be adopted over a century later by Pietro Matteacci in his *Dell'origine del mondo, cioè de principi delle cose*, who, despite not citing Della Porta, reports a doctrine that seems borrowed from the work of the Campanian philosopher: "Da questo comprender si può la cagione della simpatia e dell'antipatia delle cose, considerando la lor convenienza ne' colori, ne' sapori, ne' gli odori, e nell'altre lor comuni qualità elementari. El mutuo consenso e dissenso de' pianeti, da cui esse derivano […] Tira la calamita il ferro perché lo spirito di Marte, che abbonda nella calamita, brama d'unirsi al corpo", P. Matteacci, *Dell'origine del mondo, cioè de principi delle cose* (Venice: Giunti, 1639), 143.

[23] See Della Porta, *Della magia* naturale, I.3, 5; Della Porta, *Magiae naturalis libri XX*, I.3, 3.

magnetism to Mars (the planet associated with iron) and no longer to the Pole Star (as he had done in the first *Magia* by implicitly relying on Ficino).

Della Porta's idea, maintained in the *Magiae naturalis libri XX*, according to which iron touched by a diamond turns northward, is not—as has often been believed—the perpetuation of a mere rumour,[24] but the coherent outcome of a premise argued in the *Phytognomonica*. In this work, Della Porta asserts that the diamond is a sort of lodestone. This stone, like the magnet, is associated with Mars. Unsurprisingly, then, in the *Magia naturalis* the diamond is also credited with the power to cause iron to turn northward, though less strongly than the magnet.[25] The example of the diamond is important because it shows that the new astrological framework was not restricted to the lodestone itself. Once the Martial quality associated with iron had been incorporated into the correspondence between Mars and the terrestrial world, other substances could likewise be brought within the same network of celestial–terrestrial relations.

This emphasis on experience indicates that directionality is not treated primarily as a derived cosmological principle, but as a stable empirical effect whose occurrence does not require the identification of a specific celestial mechanism.

The resemblance between Mars and iron is indirect, involving the "celestial nature" of the planet and the "terrestrial quality" of the metal. If the iron present within the lodestone attracts external iron to itself, this is due to an identity of nature, a "direct" resemblance in their "terrestrial quality". At this first level, Plotinian sympathy—evoked by Della Porta in the *Phytognomonica* as a principle of at-

[24] See M. Ugaglia, n. 4 to Leonardo Garzoni, *Trattati della calamita*, ed. M. Ugaglia (Milan: Franco Angeli, 2005), 91.

[25] See Della Porta, *Della magia naturale, libri XX*, VII.55, 232–233; Della Porta, *Phytognomonica*, 529–530; Della Porta, *Magiae naturalis libri XX*, VII.55, 148. An interesting reference to the Martial virtue of the diamond—considered by the author to be the stone *par excellence* subjected to this planet, but which, contrary to what Della Porta believed, was thought to alter the consensus between magnet and iron—is found in Cesare Evoli, *De causis anthipathiae et simpathiae rerum naturalium* (Venice: 1480), 23*rv*. Della Porta denies this in *Magiae naturalis libri XX*, VII.53, 147.

traction between like things—is sufficient to account for the phenomenon of magnetism. The celestial correspondence operates at a different level: Mars provides the celestial counterpart of the terrestrial affinity between iron and iron, situating the "occult virtue" of the metal within a hierarchical cosmos in which celestial and terrestrial natures correspond to one another.

As Della Porta specified in the *Coelestis physiognomonia*, here too, engaging with an inherited astrological framework, form does not proceed from the stars but from temperament. That which—as Pontano had argued—is termed *influxus* only in common parlance is actually that which allows the virtues of terrestrial entities to be actualised. The aspects of the sky "provoke", through the movement of the heavens, the virtues inherent in matter, so that they pass from potency to act.

The celestial bodies act upon the material plane of the world *non formaliter, sed effective*. For Della Porta, the heavens can be studied through their physiognomy because their effects are inscribed in their visible forms: the sky reveals, through its physiognomy, what their motions provoke on the material plane of the sublunary world. Della Porta instead relates celestial action to a natural virtue that belongs to matter and becomes manifest under particular conditions: sympathy accounts for the attraction between like terrestrial substances, while celestial configurations participate in the actualisation of those qualities without imposing their forms upon matter. The passage from Cynosura to Mars thus involves not simply a change in the celestial reference, but a reconfiguration of the explanatory levels through which the relation between celestial order, terrestrial qualities, and observed effects is articulated.

4. CONCLUSIONS

The reconstruction proposed in this chapter further confirms a central feature of Della Porta's conception of nature: inherited principles were not simply retained or discarded, but progressively reworked as they encountered the variability of particular natural phenomena. The reconfiguration of Della Porta's explanation of magnetism from

the *Magia naturalis* of 1558 to the works of the late 1580s provides a particularly revealing example of this dynamic. What emerges is not the abandonment of an earlier framework in favour of a completely new one, but the progressive reconfiguration of a cosmological and natural-philosophical model in which celestial correspondences, occult qualities, and empirical observation could be brought into a common explanatory horizon.

The shift from the Pole Star to Mars is especially significant in this regard. In the first *Magia naturalis*, magnetic attraction is interpreted through a celestial reference point whose fixed position offered a compelling explanation for the directional behaviour of the lodestone. In the *Phytognomonica* and the expanded *Magiae naturalis libri XX*, however, the problem is reformulated from a different perspective. The explanatory focus moves towards the sympathetic relationship linking iron to iron, while the celestial correspondence is reformulated through the planet traditionally associated with that metal. The attraction exercised by the magnet is therefore situated within a broader network of correspondences that connects celestial and terrestrial realities through affinity rather than through a simple model of descending celestial influence.

What makes this reformulation particularly important is its coherence with Della Porta's attention to the variable properties of individual magnets. The investigations presented in the *Magia naturalis* show that magnets do not always behave identically and that their properties may vary according to their place of origin and particular circumstances. The question, therefore, is not simply why magnets possess an attractive virtue, but why this virtue is manifested differently in individual cases.

Here the notion of *influxus* helps clarify the relationship between general correspondence and singular effects. If the celestial body associated with iron is a mobile planet, its relation to a given terrestrial *locus* is never entirely identical. The particular celestial configuration—or *horoscopus*—thus provides the condition through which a general correspondence can be related to the singular natural thing and to the circumstances in which its virtue is actualised. The diversity observed among magnets can consequently be accommodated without treating the singular as an exception to the order of nature.

Its particular properties remain intelligible within that order, but they cannot simply be inferred from a general correspondence. They must be investigated through experience.

Seen from this perspective, the *Phytognomonica* and the second *Magia naturalis* once again emerge as complementary expressions of the same phase of Della Porta's reflection, confirming, in the case of magnetism, the interdependence between the two works established in the first chapter.

The Plotinian principle of sympathy, the association between Mars and iron, and the empirical study of magnetic behaviour converge without becoming reducible to one another. Della Porta's explanation remains attentive both to the relations connecting different levels of nature and to the differences encountered among individual things.

The case of magnetism therefore reveals a conception of nature in which general correspondence does not exhaust the determination of particular effects, and in which empirical investigation does not require abandoning the wider order of the cosmos. The movement from Cynosura to Mars is significant precisely because it shows how the celestial and terrestrial dimensions could remain connected without being collapsed into a single causal relation: the correspondence between celestial and terrestrial qualities remained part of the natural order, while the particular effects through which that order became observable still had to be established through experience.

4. NATURE, CELESTIAL INFLUENCE, MATTER, AND ARTIFICE: ASTROLOGICAL IMAGES

1. INTRODUCTION

In the previous chapter, we saw, in the case of the magnet, how Della Porta related the occult virtues of natural bodies to the natural order governing their operations. But what happens when the operation of a virtue also requires the intervention of art? For Della Porta, there are occult virtues whose operations unfold directly within the natural order, while others become effective only when natural powers are brought into operation through artifice. Astrological images provide a particularly revealing case of the latter possibility. Their efficacy presupposes the *influxus* of the stars, but at the same time depends upon the artificer's intervention in the material, the form of the object, and the moment of its making. The artificer does not create the virtue itself, but intervenes in the material, formal, and temporal conditions through which it can take effect.

It is precisely this dual dependence that makes astrological images significant for Della Porta's natural philosophy: they show how a humanly fashioned object could be conceived as participating in a causal order that remained fundamentally natural and cosmological. The question, then, is not simply one of the legitimacy or efficacy of talismans, but of how Della Porta redefines the relation between the powers of nature and the possibilities of art when the two converge in the production of a single effect.

This chapter examines the question by following the transformation of Della Porta's treatment of astrological images across his works. It asks what becomes of his account of artificial efficacy when a practice in which celestial *influxus*, the disposition of matter, and

the artificer's intervention were closely connected is first elaborated and then removed from his later exposition. The question, therefore, is what conception of nature and technical action emerges from this movement, and what the disappearance of astrological images leaves unresolved about the possibility of art intervening effectively in natural processes. More specifically, the chapter asks what happens when an inherited account of celestial causation is reformulated around the material, formal, and temporal conditions through which its effects may be realised. The astrological image thus provides a precise test of how Della Porta reconfigures the relation between natural causation and human artifice.

2. THE NATURALISATION OF ASTROLOGICAL IMAGES

Astrological images occupied a particularly delicate position in discussions of the relation between art and nature. The central question was not simply whether images could acquire powers from the heavens, but whether their efficacy could be explained as operating through nature itself, without recourse to demons, ritual magic, or other illicit forms of agency.

This problem became especially important in the *Speculum astronomiae*, whose attribution to Albertus Magnus remains disputed.[1] By distinguishing astrological images from necromantic ones, the text sought to preserve the possibility of celestial efficacy while relocating it within the causal order of nature. According to the author of the *Speculum astronomiae*, it was possible to distinguish be-

[1] See *Speculum astronomiae*, critical ed. P. Zambelli, S. Caroti, M. Pereira, and S. Zamboni (Pisa: Domus Galileana, 1977); Paola Zambelli, *The Speculum Astronomiae and Its Enigma: Astronomy, Theology and Science in Albertus Magnus and His Contemporaries* (Dordrecht: Kluwer Academic Publishers, 1992). The attribution to Albertus Magnus defended by Zambelli has been rejected by Agostino Paravicini-Bagliani, *Le Speculum astronomiae. Une énigme? Enquête sur les manuscrits* (Florence: SISMEL–Edizioni del Galluzzo, 2001), and by Bruno Roy, "Richard de Fournival, auteur du *Speculum astronomiae*?", *Archives d'histoire doctrinale et littéraire du Moyen Âge* 67 (2000): 159–180.

tween illicit necromantic images and licit, purely astrological ones. Regardless of whether or not the *Speculum* was written by Albertus, the existence of purely astrological seals is also affirmed in the *De mineralibus*, which can unquestionably be attributed to the master of Cologne.[2]

The problem of astrological images continued to occupy medieval natural philosophers such as Arnald of Villanova and Peter of Abano before entering Renaissance debates on magic, medicine, and natural philosophy. It was taken up, in different ways, by Ficino, Agrippa, Pomponazzi, and, of course, Della Porta. The only work specifically devoted to the subject, however, is Gerolamo Torella's *Opus praeclarum de imaginibus astrologicis*[3] (1456–after 1500), a physician from Valencia who also received part of his education in Italy. In addressing the problem of astrological images, Torella[4] identifies two schools of thought: the 'Albertists', that is, those who, like Albertus Magnus and the author of the *Speculum astronomiae*, believe that purely astrological images can be constructed; and the Thomists, who reject this possibility.[5] Although Torella presents his work as a neutral exposition of the two positions, he ultimately follows the Albertist line. The debate thus remained open, but it was never

[2] See Nicolas Weill-Parot, *Les 'Images astrologiques' au Moyen Age et à la Renaissance. Spéculations intellectuelles et pratiques magiques (XII^e-XV^e siècle)* (Paris: Honoré Champion, 2002), 260–278; and, by the same author, "Causalité astrale et 'science des images' au Moyen Âge. Élément de réflexion", *Revue d'Histoire des Sciences* 52, 2 (1999): 207–240. See also Jean-Patrice Boudet, *Entre science et nigromancie. Astrologie, divination et magie dans l'Occident médiéval, (XII^e-XV^e siecle)* (Paris: Publications de la Sorbonne, 2006), 225.

[3] See Jerome (Gerolamo) Torella, *Opus praeclarum de imaginibus astrologicis*, ed. N. Weill-Parot, *Micrologus* (Florence: SISMEL, 2008).

[4] See Vittoria Perrone Compagni, "Le immagini del medico Gerolamo Torella", *Annali dell'Istituto di Filosofia dell'Università di Firenze, Facoltà di Lettere e Filosofia* 1 (1979): 17–45.

[5] Thomas Aquinas rejected any notion of astrological talismans. Aquinas argued that it was not possible to distinguish between necromantic and astrological images except by the implicit appeal to demons involved in the latter. On the problem of the explicit and implicit pact with the devil, see Alain Boureau, *Satan hérétique. Naissance de la démonologie dans l'Occident médiéval (1280–1330)* (Paris: Odile Jacob, 2004).

simply a debate about astrology or even about the efficacy of images. It concerned the boundary between what art could accomplish and what nature itself could be made to accomplish through art, and thus the possibility of understanding artifice not as an alternative to nature but as a means of entering into its operations.

In the sixteenth century[6] the lapidary tradition continued to offer differently argued accounts of astrological seals. Examples include Camillo Leonardi's *Speculum lapidum*, published in 1502, Franciscus Rueus's *De gemmis*, as well as the works of Petrus Arlensis de Scudalupis and Petrus Constantius Albinius de Villanova, author of a *Magia astrologica*. Della Porta's treatment of seals in the first edition of the *Magia naturalis* belongs to this same tradition.[7] It is within this inherited and already contested field that Della Porta's first treatment of astrological images has to be situated.

Within this tradition, different kinds of astrological seals could be distinguished. Weill-Parot has proposed a useful distinction between "seals of origin", bearing the image of a planet or constellation and characteristic of the medieval medical-astrological tradition, and "seals of purpose", whose engraved image refers to the end to be achieved and which derive from the *De imaginibus* of Thebit.[8]

This distinction is particularly useful for understanding Della Porta, because his treatment does not remain confined to images that reproduce celestial figures. Alongside the so-called seals of origin, Della Porta includes seals of purpose. Among his sources he also cites Ptolemy, referring to the *Opus imaginum* of pseudo-Ptolemy,

[6] Nicolas Weill-Parot, "Le 'immagini astrologiche'", in *Il linguaggio dei cieli*, 224–254, esp. 251.

[7] Despite the numerous misunderstandings and omissions introduced in the translation, Book IV of the *Magia naturalis libri IV*, where astrological seals are discussed, remains entirely faithful to the Latin source. See Laura Balbiani, *La Magia Naturalis di Giovan Battista Della Porta. Lingua, cultura e scienza in Europa all'inizio dell'età moderna* (Bern: Peter Lang, 2001), 26–35. See also Laura Balbiani. "La ricezione della *Magia Naturalis* di Giovan Battista Della Porta." *Bruniana & Campanelliana* 5 (1999): 277–303.

[8] See Nicolas Weill-Parot, "Les images corporéiformes du *Picatrix* et la magie astrale occidentale", in *Images et magie. Picatrix entre Orient et Occident*, ed. A. Caiozzo, J.-P. Boudet, and N. Weill-Parot (Paris: Honoré Champion, 2011), 117–136.

which he regards as an authentic work of the Alexandrian scientist. The presence of seals of purpose in Della Porta's text certainly places them within a magical context, but not in the sense of a 'destinative' magic, that is, as an operation directed towards a supernatural or preternatural recipient.[9] Rather, their inclusion raises a specifically natural-philosophical question: how can an artefact whose form is determined by a human purpose nevertheless derive its efficacy from the same natural and celestial order that governs other occult properties?

Here again, Della Porta could appeal to an established tradition for which the *Speculum astronomiae* had already sanctioned both the seals of Thebit and the *Opus imaginum* attributed to Ptolemy. With regard to Thebit's seals of purpose, Weill-Parot has shown that, according to the author of the *Speculum*, "the statement of the purpose of the operation by the operator was not to be taken as a cultic formula, and the inscription of the purpose on the image was

[9] See Lorraine Daston and Katharine Park, *Wonders and the Order of Nature, 1150–1750* (New York: Zone Books, 1998), 141. On the notion of nature in the Renaissance, see Vittoria Perrone Compagni, "Natura maga. Il concetto di natura nella discussione rinascimentale sulla magia", in *Natura. XII Colloquio Internazionale*, ed. D. Giovannozzi and M. Veneziani (Florence: Olschki, 2008), 243–267. On Ficino, see Daniel Pickering Walker, *Spiritual and Demonic Magic. From Ficino to Campanella* (London: Warburg Institute, 1958); Robert Klein, *La Forme et l'Intelligible* (Paris: Gallimard, 1970), 89–119; Ioan Petru Culianu, *Eros et Magie à la Renaissance* (Paris: Flammarion, 1984); Michael J. B. Allen, "Marsilio Ficino: Demonic Mathematics and the Hypothenuses of the Spirit", in *Natural Particulars: Nature and the Disciplines in Renaissance Europe*, ed. A. Grafton and N. Siraisi (Cambridge, MA: MIT Press, 1999), 121–137; Cesare Vasoli, "Ficino, la profezia e i sogni, tra gli angeli e i demoni", *La parola del testo* 3 (1999): 147–163; Stéphane Toussaint, *L'ars de Marsile Ficin, entre esthétique et magie*, in *L'art de la Renaissance, entre science et magie*, ed. Ph. Morel (Paris: Somogy éditions d'art, 2006), 453–467; "Introduction" to Iamblichus, *De mysteriis Aegyptiorum* [...] (Venice: 1497). See also Stéphane Toussaint, "Ficino's Orphic Magic or Jewish Astrology and Oriental Philosophy?", *Accademia* 2 (2000): 19–32. On Pomponazzi, see Tristan Dagron, "La doctrine des qualités occultes dans le De incantationibus de Pomponazzi", *Revue de métaphysique et de morale* 49 (2006): 3–20, and the pages by Perrone Compagni in the introduction to Pomponazzi, *De incantationibus*, XI–LXXI. For a comparison of the argumentative strategies of Pomponazzi and Della Porta, see Donato Verardi, *Logica e Magia* (Lugano: Agorà & Co., 2017), 85–103.

not to be understood as equivalent to magical characters".[10] Seen in this light, Della Porta's treatment of astrological images in the first *Magia naturalis* appears less as an isolated experiment than as an attempt to situate a potentially problematic practice within an established natural-philosophical framework. It is quite plausible to suppose that, while composing *Magia naturalis libri IV*, Della Porta had the texts of Thebit and pseudo-Ptolemy before him.[11] On the basis of the interpretation proposed in the scholarship, it is also possible that Della Porta was familiar with the teaching of the *Speculum astronomiae* from a relatively early stage, and with the works of the so-called 'Albertists'. Indeed, at the time when the first *Magia naturalis* was composed, the interpretation of astrological and purpose seals offered by the *Speculum* and the Albertists does not seem to have been regarded as particularly dangerous, since the section on seals was not among the various passages censored and suppressed in the Italian vernacular translation.[12] At this point in the history of the debate, therefore, the question still appears to have been open and relatively unconstrained.

3. Artifice within nature: Della Porta's astrological images

The real difficulty, then, lies in determining what Della Porta did with this inheritance. In what sense, and to what extent, can his treatment of astrological images be regarded as Albertist? More importantly, what does this inheritance become when it is incorporated into Della Porta's natural magic? It is this second question that is decisive for understanding his treatment of artificial efficacy.

[10] Weill-Parot, "Le 'immagini astrologiche'", 250.

[11] In *Magia naturalis*, Book IV, Della Porta rewrites the doctrines derived from his sources with a considerable degree of autonomy. Della Porta frequently and deliberately alters their original meaning. This becomes evident, as noted above, from a comparison of *Magia naturalis*, Book IV, with Agrippa's *De occulta philosophia*.

[12] On this point, see Balbiani, *La Magia naturalis di Giovan Battista Della Porta*, 31.

In the *De mineralibus*, Albertus maintains that astrological seals can be constructed.[13] According to Albertus, by choosing the appropriate astrological moment, the maker of a seal inserts his action into the course of nature rather than acting independently of it. This consideration makes it possible to regard not only purely astrological seals but also seals of purpose as licit. Both the author of the *Speculum astronomiae* and Della Porta in the *Magia naturalis libri IV* adopt a broadly similar approach to this problem. Della Porta's position becomes clearer when he turns from the general principle to particular examples. The Neapolitan philosopher declares himself convinced of the existence of "natural ligatures".[14] The virtues of solar and lunar stones, he observes, "always gain greater virtue from the rays of the sun and moon". The "selenite stone", he writes, "not only imitates the figure of the Moon, but also its motion, because when it moves and follows its course, it also produces the lunar spirits and infuses the virtues of the Moon". Likewise, he adds, acts "the stone called Helioseminon, which displays the conjunctions of the Sun and the Moon; when worn, it makes a person partake of the virtue of both". Alongside these natural "ligatures",[15] however, Della Porta admits that there are images which "do not operate simply through the virtue of nature". Although "the operations" of these figures "are from nature", in certain cases nature is "assisted by certain hours, times, and signs", in accordance, he writes, with what Ptolemy,[16] and "our ancients" affirmed, those who, he adds, "performed

[13] On this point, see Weill-Parot, *Causalité astrale et 'science des images' au Moyen Âge*.

[14] Della Porta, *Dei miracoli et maravigliosi effetti*, IV.20–22, 155*v*–160*r*; Della Porta, *Magiae naturalis sive de miraculis*, IV.20–22, 155–159.

[15] The discussion proper of astrological talismans begins here. Talismans differ from amulets in that the latter possess their power naturally, whereas the power of talismans is conferred upon them through: (1) the figure or form given to them by the operator; and (2) the rituals accompanying their construction. On this distinction, see B. P. Copenhaver, "Scholastic Philosophy and Renaissance Magic in the *De vita* of Marsilio Ficino", *Renaissance Quarterly*, 37 (1984): 523–554.

[16] The reference here is to the pseudo-Ptolemy, not to the Ptolemy of the *Tetrabiblos*.

marvellous things by composing and describing images".[17] The distinction is subtle but fundamental to Della Porta's conception of artificial efficacy. The image does not possess an autonomous power capable of overriding nature; rather, its efficacy depends upon the moment at which it is produced and upon the celestial conditions under which its material form is constituted. Drawing on a celebrated aphorism from the pseudo-Ptolemaic *Centiloquium* (*verbum* 9)[18] widely invoked in debates concerning astrological images, Della Porta states that "the things and figures of this world below are subject to the figures and aspects of heaven".[19] The principle is therefore clear: the efficacy of the image depends not on an autonomous power of art, but on the artificer's ability to place matter, form, and the moment of production within the appropriate celestial conditions. Artifice is effective precisely because it does not stand outside nature: it works by arranging material and temporal conditions in accordance with the causal order of the heavens.

Once the celestial conditions of efficacy had been established, however, another problem remained: what exactly was to be represented on the material support of the image?

Drawing probably on Ficino's *De vita*,[20] Della Porta states that these are the various "visible and imaginable" images of the constellations. There are, however, also images produced by "fantasies", as well as by human figures and "gestures", corresponding to what one

[17] Della Porta, *Dei miracoli et meravigliosi effetti*, 157*v*; Della Porta, *Magiae naturalis sive de miraculis*, IV.24, 161–162.

[18] Ps. Ptolemeus, *Centiloquium cum commento Hali*, trans. Platon of Tivoli (Venice: 1484); and Ps. Ptolemaeus, *Quadripartitum*, (Venice: 1493), 107*v*, *verbum* 9: "Vultus huius seculi sunt subiecti vultibus celestibus et ideo sapientes qui imagines faciebant stellarum introitum in celestes vultus inspiciebant et tunc operabantur quod debebant".

[19] On this point, see Weill-Parot, "Les 'images astrologiques'", 80–83.

[20] Ficino, *Three Books on Life*, III.18, 332: "Sunt ibi praeterea formae quam plurimae, non tam visibiles quam imaginabiles per signorum facies, ab Indis et Aegyptiis Chaldaeisque perspectae vel saltem excogitatae". The arguments that immediately follow also appear to draw upon ch. XVIII of the *De vita coelitus comparanda*, but they are developed independently and do not simply reproduce *sic et simpliciter* Ficino's position.

wishes to obtain through the virtues of those figures. "If, for example, they desire to make themselves loved", magicians carve "sweet embraces, gestures and similar words"; if, on the other hand, their intentions are evil, they "carve two people turning their backs on one another, fleeing from each other and abhorring one another". The result, Della Porta observes, always depends upon observing the "hours and times" in which the operations are performed, so that the virtues of the stars may "flow" more "powerfully" into the stones and the "figures".[21] Seals of purpose are thus, in this respect, also astrological seals, since their construction remains subject to the same celestial "hours and times". The efficacy of the operation therefore depends upon observing the times determined by the stars. The distinction between natural virtue and artificial intervention is therefore not a distinction between two independent sources of efficacy: artifice becomes effective insofar as it organizes matter according to the temporal and celestial conditions through which natural virtue can be activated. Since the stars are physical bodies, recourse to seals entails nothing magical in the sense of a 'destinative' operation, whether the seals are purely astrological—that is, corresponding to a celestial figure—or directed towards a specific purpose. By acting in accordance with an astrological law inherent in nature, the philosopher does not oppose nature through artifice, but places his operation within nature itself, assisting its course.

Yet it is precisely at this point that Della Porta's account begins to move towards a more problematic territory. Della Porta further observes that it is not uncommon to find on certain precious stones "many characters written against various misfortunes", which "were engraved on certain stones beneficial for this very purpose, so that, by strengthening one another, they might operate more powerfully". In doing so, the ancient sages "among all other things selected those stones" that could most readily "receive celestial influences". These stones were subsequently set into a ring, but only after "various characters and various letters" had been engraved upon them, always "at

[21] Della Porta, *Dei miracoli et maravigliosi effetti*, IV.23–25, 160*v*–163*r*; Della Porta, *Magiae naturalis sive de miraculis*, IV.23–25, 159–163.

determined times, days, and hours". The presence of "characters" and "letters" evokes a tradition associated with Solomonic ritual magic, and is not compatible with the definition of the astrological image provided by the *Speculum astronomiae*. The latter regards such elements as "somewhat less objectionable", but nevertheless as "detestable".[22] In this passage, Della Porta thus appears to reconnect, at least in part, with the fifteenth-century talismanic tradition.[23] His treatment thus brings together materials that could be accommodated within a natural-philosophical account of celestial causation and others that pointed towards a more problematic talismanic and ritual tradition. The resulting ambiguity is therefore not merely classificatory: it concerns the very conditions under which human artifice could be regarded as participating in the operations of nature.

This tension is crucial for understanding what happened to the discussion in the second *Magia naturalis*, because what disappears is not simply a problematic magical practice, but one of Della Porta's most explicit accounts of how artifice could participate in a natural causal order. The presence of these elements might, however, be explained by the "historical" approach through which the philosopher declares that he is treating the subject. Yet the subsequent treatment suggests that Della Porta became increasingly aware of the conceptual and disciplinary difficulties posed by this material and, perhaps in order to avoid ambiguity, chose not to reproduce it in the second *Magia*. Indeed, he goes further, suppressing the discussion of astrological images altogether.

The change is significant because the second *Magia naturalis* was not simply a revised version of the first work in which isolated passages happened to disappear. By 1589, the intellectual and disciplinary circumstances surrounding astrology had become substantially more difficult, particularly in the wake of Sixtus V's *Coeli et terrae* (1586).[24] In such a climate, it would have been difficult for

[22] See Weill-Parot, "Le 'immagini astrologiche'", 242.

[23] See Weill-Parot, "Le 'immagini astrologiche'", 244–247.

[24] See Francesco Barbierato, "La letteratura magica di fronte all'Inquisizione veneziana fra '500 e '700", in *Magia, Alchimia, Scienza dal '400 al '700. L'influenza di*

Della Porta to reproduce, even under a historical and descriptive approach, a sustained discussion of astrological images.[25]

The suppression of the subject, however, should not necessarily be taken as evidence that Della Porta had abandoned the underlying natural-philosophical principle. The later *Magia* provides no positive evidence that he had ceased to regard astrological images as efficacious; nor, however, does it allow us to establish that he continued to endorse their efficacy. What can be established more securely is that he no longer chose to articulate the possibility of their efficacy within the framework of his natural magic.

In the treatment of individual occult properties in the *Magiae naturalis libri XX*, Della Porta makes an important distinction between occult virtues that belong to a substance as a whole and those that belong only to particular parts of it. In tracing these virtues back to the aspects of the heavens, he concludes that "this same thing should be considered in all other things".[26] Although he does not explicitly extend this consideration to astrological images, the passage raises the question of whether they, too, should have been examined within the same natural-philosophical framework. This leaves open the possibility that, in 1589, Della Porta did not necessarily regard astrological images as incompatible with the framework represented by the *Speculum astronomiae* and the *De mineralibus*.

Why, then, avoid any treatment of the subject rather than defend the Albertist position on this matter as well?

The answer may lie precisely in the difficulty of keeping the different elements assembled in Della Porta's first treatment within the same conceptual and disciplinary boundaries. If Della Porta did still

Ermete Trismegisto, 2 vols., ed. C. Gilly and C. van Heertum (Florence: Centro Di, 2005), vol. I, 135–158, esp. 135.

[25] See Weill-Parot, "Le 'immagini astrologiche'", 250–255. Under Sixtus V, the work of Gaetano became the object of suspicion and was included among the texts requiring emendation. The question of whether, and according to which criteria, the cardinal's work should be expurgated had already arisen under Pius V and remained unresolved. On this, see Saverio Ricci, *Inquisitori, Censori, filosofi sullo scenario della Controriforma* (Rome: Salerno, 2008), 262–267.

[26] See Della Porta, *Della Magia naturale*, I.13, 33–34; Della Porta, *Magiae naturalis libri XX*, I.13, 13–14.

believe in astrological images, the subject would nevertheless have been burdened by too many ambiguities for someone under the close scrutiny of the Inquisition. This was all the more so given the eclecticism with which he had treated the subject in the first *Magia naturalis*.[27] The problem was not simply whether astrological images could be defended as natural. It was that, in Della Porta's own treatment, the natural-philosophical justification of celestial efficacy stood alongside practices, sources, and forms of representation that could readily be interpreted as belonging to other kinds of magic. These difficulties may also be connected with the broader problem posed by characters and letters within Della Porta's natural magic, particularly in a context increasingly shaped by censorship and self-censorship.

The difficulty of keeping these different elements within the same conceptual and disciplinary boundaries becomes particularly clear when Della Porta's treatment is placed beside that of Agrippa. One of Della Porta's most strictly prohibited sources, Agrippa's *De occulta philosophia*, places its treatment of astrological images not within the book devoted to natural magic, but in that devoted to celestial magic. In light of this, Della Porta's youthful attempt to incorporate

[27] Doubts concerning the actual efficacy of astrological talismans are expressed already in the first *Magia*, particularly at the conclusion of the treatment of the subject. Mere caution? The relative freedom allowed to other treatments of the subject during the years in which the work was composed might suggest that these were doubts genuinely entertained by Della Porta. The Neapolitan philosopher nevertheless states that he is treating the subject on the basis of what he himself has experienced. See Della Porta, *Dei miracoli et maravigliosi effetti*, IV.21–25, 158*v*, and 163*r*; Della Porta, *Magiae naturalis sive de miraculis*, IV.21–25, 158–159, 163. Astrological seals (already envisaged by Albertus Magnus) could in fact be applied in so-called astrological medicine, which Sixtus V exempted from his condemnation. But Della Porta's elaboration of the notion of the 'astrological image', extending well beyond the medical sphere, would probably have forced him to take a position in a *querelle* that was both precarious and, perhaps, not essential to his argument. Della Porta's primary aim, after all, was to see the *Magiae naturalis libri XX* published. Hence, in all likelihood, his decision to remove this subject from the work: in the first *Magia naturalis* it had been treated with a degree of freedom and eclecticism that it was perhaps preferable not to bring once again to the attention of the inquisitors.

astrological images into a treatment framed entirely within natural magic appears particularly significant: it sought to contain within natural magic a practice whose traditional formulations could easily extend into celestial and ceremonial magic. What matters, therefore, is not simply the relocation of the practice, but the attempt to determine the conditions under which an operation with a mixed magical genealogy could nevertheless count as natural. In doing so, he was not merely relocating a magical practice from one category to another; he was testing whether an operation traditionally associated with celestial and ritual magic could be reconceived as an operation of nature itself. From a purely conceptual standpoint, the appeal to the tradition of the *Speculum astronomiae* might have justified such an inclusion; nevertheless, it would have been difficult to persuade the inquisitors of the legitimacy of such an operation, especially given the persistent echoes in Della Porta's writings of forbidden and suspect sources such as Agrippa. The *De occulta philosophia*, moreover, also refers to the possibility—subsequently envisaged by Della Porta—that seals might bear an image of the end towards which the operation is directed. Agrippa justifies this possibility through a strategic appeal to the *Speculum* of Albertus, while at the same time radically overturning its implications.[28] As Weill-Parot has argued, Agrippa's project is, in fact, "a global project that seeks to hold together natural magic, celestial magic, and ceremonial magic, a project intrinsically incompatible with the very notion of the 'astrological image'".[29]

Della Porta's decision to remove astrological images from the second *Magia naturalis* can therefore be understood less as a simple rejection of their efficacy than as a withdrawal from a particularly unstable terrain in which the boundaries between natural causation, celestial influence, and artificial intervention had become increasingly difficult to maintain. What he withdraws from, in other words,

[28] See Agrippa, *De occulta philosophia libri tres*, II.49, 370.

[29] Weill-Parot, "Le 'immagini astrologiche'", 250. See also Vittoria Perrone Compagni, "Il 'De occulta philosophia' di Agrippa. Parole chiave: uomo microcosmo, 'prisca theologia', cabala, magia", *Bruniana & Campanelliana*, XIII (2007): 429–448.

is not necessarily celestial causation, but the explicit theorisation of an artefact as a technically produced participant in that causation. Della Porta's precautions—whose immediate aim was above all to secure the publication of his work—were successful. The *Magiae naturalis libri XX*, revised in this way, received the imprimatur and was not subsequently included in the *Index librorum prohibitorum*.[30]

4. CONCLUSIONS

The astrological image occupies a particularly revealing position in Della Porta's treatment of artificial efficacy because its operation depended upon a specific cosmological relation between heaven, matter, and artifice. In the first *Magia naturalis*, the image could be incorporated into the natural order through the *influxus* of the stars: the artificer selects and prepares the material, determines its form, and chooses the appropriate time, thereby placing the artefact within the celestial conditions through which its efficacy may become operative. The problem was therefore not simply whether artifice could produce a natural effect, but how technical intervention could enter into a cosmological order whose causes preceded and exceeded it. The importance of the image therefore lies less in the particular magical object it describes than in the conceptual operation it makes visible: the possibility that artifice might become effective without ceasing to be part of nature.

The disappearance of astrological images from the *Magiae naturalis libri XX* leaves this question open rather than resolving it. Del-

[30] The substantial differences between the early and later editions of Della Porta's *Magia naturalis* were already recognised by the Roman authorities, who distinguished the later version from the work's earlier formulations. The history of its censorship thus reflects not simply a judgment on Della Porta's natural magic as such, but also an awareness of the transformations the work had undergone. See Michaela Valente, "Della Porta e l'Inquisizione. Nuovi documenti dell'Archivio del Sant'Uffizio," *Bruniana & Campanelliana* 5 (1999): 415–434; Oreste Trabucco, "Il corpus fisiognomico dellaportiano tra censura ed autocensura," *Rinascimento* 43 (2003): 569–599.

la Porta continued to admit, in his discussion of individual occult properties, that particular properties could be related to celestial configurations, at least at the level of natural causation; what disappears is therefore not celestial causation as such, but the explicit account of how a humanly fashioned object might be technically inserted into that causal order. This omission is especially significant because the first *Magia* had brought together traditions that did not sit easily alongside one another: the Albertine conception of the astrological image, the medical-astrological seal, the image of purpose, and elements drawn from talismanic practice. Their coexistence had made the category both intellectually productive and difficult to delimit.

The musical instruments discussed in the second chapter provide a useful comparison. There, Della Porta retained their healing efficacy in the *Magiae naturalis libri XX*, but no longer attributed it to the sound itself: the efficacy was relocated to the occult, astrologically conditioned properties of the materials. He did not, however, specify whether, or to what extent, the technical transformation of those materials into instruments—their shaping and construction as artificial objects—contributed to their efficacy. The same problem therefore remained open, but the artificial object itself remained within the account, allowing the relation between material properties and technical construction to remain conceptually available. With the astrological images, the choice was more radical: the entire subject disappears from the *Magiae naturalis libri XX*, leaving no reformulation from which to determine whether their efficacy was retained, modified, or abandoned.

What emerges, then, is not a settled position on the efficacy of astrological images, but a revealing limit within Della Porta's continuing effort to rethink the operations of nature and the place of human artifice within them. To what extent, then, can Della Porta be regarded as an Albertist in his treatment of astrological images? The answer cannot be reduced either to adherence or rejection. Rather, Della Porta repeatedly returns to the Albertist problem of how an artefact may participate in celestial causation without departing from the natural order, reworking in the process the relation between celestial influence, material disposition, form, and human artifice. His

Albertism is therefore less a fixed doctrinal allegiance than a process of appropriation and reformulation, through which the inherited problem of the astrological image is transformed into a broader question about the conditions under which human artifice can participate in the operations of nature.

5. THE TALKING HEAD: ARTIFICE, EXPERIENCE, AND NATURAL EXPLANATION

1. INTRODUCTION

In the Renaissance, the concept of automata was closely linked to the hermetic theme of animated statues. According to Ficino's *De vita*, the animation of statues was achieved by ancient magi, such as Hermes Trismegistus, by means of planetary spirits perfectly inserted in the Neoplatonic natural order proposed by Plotinus. In the context of animated statues, Ficino also included a reference to the anecdote concerning the mechanical wooden dove built by Archita of Taranto, in which life was infused.[1] Agrippa, who related the animated statues of Hermes to the talking heads made by Albertus Magnus and William of Paris, as well as to Archita's mechanical wooden dove, attributed the animation of these artificial magical objects—which were built through the magus's expertise in optics, geometry, and mechanics—to the mathematical (cabalistic) power of numbers and the intellectual action of supercelestial spirits.[2] Taking up the thesis of the author of the *Asclepius*, both Ficino and Agrippa insisted that the materials of which these statues were composed had in themselves a natural force of divinity. The magus, profound connoisseur of the laws of the cosmos, assembled these statues, facilitating, through the *ars*, the emergence of the natural and divine powers of the materials from which these objects were made.

[1] Ficino, *Three Books on Life*, II.13, 306.

[2] Agrippa, *De occulta philosophia libri tres*, II.1, 249; Heinrich Cornelius Agrippa von Nettesheim, *De incertitudine & vanitate scientiarum declamatio invectiva* (N[ovesianus], 1531), 43, unnumbered.

According to sixteenth-century demonologists, who followed the traditional Thomistic approach—which denied the possibility of a rational natural explanation for the animation of statues—the devil's agency lay behind this kind of artificial magical object. These thinkers considered the refined distinctions between planetary daemons, supercelestial spirits, and evil spirits of the Renaissance magi to be meaningless, as well as their ideas about the divine and natural power of materials. Martin Del Rio, for instance, reinterpreted the doctrines of the Renaissance magi in the light of Christian demonology and angelology, stating that "when it comes to voice from fire, air, water, dead bodies, severed heads, statues, and trees [...] the speech is the work of an angel [...] Sometimes, with God's permission, the Devil works pseudo-miraculous tricks".[3] Jean Bodin (1530-1596), a great opponent of Renaissance natural magic and a fierce critic of Della Porta's *Magia naturalis libri IV*, had no doubts: the animated statues were a "trick" of Satan who wanted to be worshiped.[4]

As we saw in the first chapter, Della Porta recognised the importance of grounding his investigations in natural magical objects (such as plants and stones with marvellous virtues) in the astrological physics of qualities.[5] In Della Porta's *Magiae naturalis libri XX*, the astrological physics of qualities, free from any link with the daemonic plane, could still explain the occult virtues of some artificial magical objects. This is the case of the occult powers of musical instruments, which we examined in the second chapter, whose virtues were traced back to those of the materials from which they were made. Della Porta reasserted the significance of the materials of which some artificial objects were composed, stating that like the talking statues that were said to have been built by the ancients, these objects were able to attract celestial influences by mixing many materials. However, overshadowing the hermetic theme in the animation of the statues, Della Porta firmly chose to support a purely mechanical explanation of these types of artificial magical objects,

[3] Del Rio, *Investigation into Magic*, 102.

[4] Bodin, *De la demonomanie des sorciers*, 247.

[5] Ficino, *Three books on life*, III.1, 246; Agrippa, *De occulta philosophia libri tres*, I.11, 107–108; I.12, 108; I.13, 109–112.

transforming them, as the case of Albertus's talking head shows, into marvellous automata whose effects could be explained through mechanical causes rather than celestial or spiritual agency.

Through a complex reform of natural magic, which also benefited from the return of some late antique texts on mechanics, such as the *Mechanics* attributed to Aristotle and the works of Heron of Alexandria, Della Porta tried to free the animation of statues (developed in Neoplatonic terms by Ficino and in Cabalistic terms by Agrippa) from the demonologists' charges of superstition. In his artificial magic, which undergoes a sort of 'fragmentation', the astrological solution retained its significance, but was reconfigured in relation to the specific nature of the objects under consideration. In the case of some artificial objects, such as Albertus's talking head, Della Porta instead privileged a mechanical approach.[6] This chapter argues that Della Porta's turn to mechanics transformed not only the explanation of these artificial wonders, but also the conception of nature within which they became intelligible. For these objects, mechanical explanation made it possible to recast phenomena traditionally addressed by natural magic in celestial or spiritual terms as questions concerning the operation of an artefact: their wonder thus became a problem of mechanism, open to observation, testing, and reproduction. Della Porta's importance therefore lies not simply in a passage from astrology to mechanics, but in the reconfiguration, through mechanics, of artificial magic as a field of experimental inquiry.

[6] This mechanical treatment should not, however, be understood as entailing the removal of such objects from the domain of natural magic. As Thomas L. Hankins and Robert J. Silverman have emphasised, instruments and practices associated with natural magic could persist while acquiring different meanings and being incorporated into different forms of inquiry. What matters, therefore, is not a linear transition from magic to mechanics, but the reconfiguration of particular objects, practices, and explanations within changing contexts of knowledge. Della Porta's talking head is significant precisely in this respect: its mechanical explanation does not mark the disappearance of natural magic, but a redistribution of explanatory possibilities within it. See Thomas L. Hankins and Robert J. Silverman, *Instruments and the Imagination* (Princeton: Princeton University Press, 1995), 4.

2. FROM PHYSICS TO MECHANICS: DELLA PORTA'S MAGIC AND ALBERTUS MAGNUS'S TALKING HEAD

In the first book of *Magiae naturalis libri XX*, Della Porta briefly cited a passage from Proclus's *De Sacrificio et Magia* relating to the possibility of building statues capable of attracting celestial influences by mixing many materials.[7] As we have seen in the second chapter, in relation to the powers attributed to musical instruments, Della Porta had resorted to the intrinsic power of materials to rationalise their occult virtues. In chapter 1 of book 19, titled "Whether material Statues may speak by any artificial way", Della Porta's approach was instead mechanical.[8] The astrological and magical explanations proposed for the talking statue were set aside in favour of a pneumatic account, thereby relocating the phenomenon from the sphere of celestial or magical agency to that of the physical transmission of sound.

The ideal of the automaton as a marvellous object that provokes the desire to know and leads to philosophy can already be traced to Aristotle's *Metaphysics*.[9] During the Renaissance, ancient works were recuperated on the related fields of mathematics, geometry, and mechanics, as works by Euclid, Archimedes, Heron of Alexandria, Pappus, and Vitruvius were translated into Latin.[10] The process of incorporating mechanics into natural philosophy began with the recovery of the work *Mechanica,* attributed to Aristotle and first translated into Latin by Vittore Fausto (1480-c. 1551) in 1517. One of the most important contributors to this process was Cardano who, as John Henry states, easily moved back and forth in his *De subtil-*

[7] Della Porta, *Magiae naturalis libri XX*, I.18, 17. Della Porta, *Della Magia naturale*, I.18, 43–44.

[8] Della Porta, *Magiae naturalis libri XX*, XIX, 1, 288; Della Porta, *Della Magia naturale*, XIX.1, 688–689.

[9] Aristotle, *Metaphysics*, trans. W. D. Ross (Oxford: Clarendon Press, 1908), 983a, 12–15.

[10] Minsoo Kang, *Sublime Dreams of Living Machines. The Automaton in the European Imagination* (Cambridge, MA: Harvard University Press, 2011), 80.

itate (1550) "between explaining natural phenomena and the way machines work".[11]

In the *Magiae naturalis libri XX*, Della Porta rejected both an astrological and a magical explanation for Albertus's talking head.[12] He writes:

> I read also in many men of the highest authority that Albertus Magnus constructed a head that could speak. Yet, to speak frankly, I place little trust in a man of this kind, for everything that we have ourselves tested from his works we have found to be false, except for some things that he excerpted from others. Let us consider, then, whether a statue might be made that could speak. Some say that Albertus accomplished this remarkable feat by means of astrological elections of times. But, good God, how could this have been accepted by learned men, when they had not themselves experienced such powers in the stars? There are others who believe that he achieved it through magical arts. This is what we believe least of all, since no one has yet been found who professes to know such arts, except impostors and mountebanks, who deceive ignorant men and simple women. Nor do I think that a pious man would have professed such detestable arts; rather, I conjecture that it could have been accomplished by means of pneumatic principles.[13]

Della Porta noted that some writings attributed Albertus Magnus's achievement to either astrological elections or magical arts. He rejected both explanations. Yet his objection to the latter was framed not simply in terms of its efficacy, but also in terms of the moral and

[11] John Henry, "The Fragmentation of Renaissance Occultism and the Decline of Magic", 24.

[12] Oreste Trabucco, *L'opere stupende delle arti più ingegnose. La recezione degli* Πνευματικά *[Pneumatikà] di Erone Alessandrino nella cultura italiana del Cinquecento* (Florence: Olschki, 2010), 129–147; Verardi, *La scienza e i segreti della natura a Napoli nel Rinascimento*, 106–109; See also Giovan Battista Della Porta, *Pneumaticorum libri tres*, ed. O. Trabucco (Naples: Edizioni Scientifiche Italiane, 2008), I.1, 5.

[13] Della Porta, *Magiae Naturalis*, XIX.1, 288. Della Porta, *Della Magia naturale*, XIX.1, 688.

religious character of the practices involved: "Nor do I think that a pious man would have professed such detestable arts".[14]

Which writings, we might ask, were being referred to by Della Porta? As Elly Truitt has shown, within a few years of Albertus's death, written texts that detailed the many wonders he had created began to circulate.[15] It is possible that the source of the "Talking Head" legend can be found in the description of a device called an Aeolipile, or fire-blower, in Albertus's work *De meteoris*, described by Heron of Alexandria in the first century AD and originally presented by Vitruvius in his *De architectura*. According to Vitruvius's description, "Aeolipilae are hollow brazen vessels, which have an opening or mouth of small size, by means of which they can be filled with water. Previous to the water being heated over the fire, but little wind is emitted; as soon, however, as the water begins to boil, a violent wind issues forth".[16] Albertus Magnus describes a similar object, a "sufflator", which was anthropomorphic in shape. Albertus thought the device offered an analogy to the expulsion of water from the earth during earthquakes and volcanic eruptions.[17]

The first discussion of Albertus's talking head appears in Matteo Corsini's *Rosaio della Vita* (ca. 1363), a moral treatise that illustrates

[14] Della Porta was certainly aware of Giovanni Pico della Mirandola's position on the impossibility of considering Albertus Magnus an author of the *Speculum astronomiae*. The theme is placed side by side with that of Albertus's talking head in Gianfrancesco Pico's *De rerum praenotione*; Giovanni Pico della Mirandola *Disputationes adversus astrologiam divinatricem*, ed. E. Garin (Turin: Nino Aragno 2004), I.1, 94; Giovanfrancesco Pico della Mirandola, *De rerum praenotione* (Strasbourg: Ioannes Knoblochus imprimebat, 1507) VII.2, 202.

[15] Elly Truitt, *Medieval robots. Mechanism, Magic, Nature, and Art* (Philadelphia: University of Pennsylvania Press, 2015), 92.

[16] Vitruvius, *The Architecture of Marcus Vitruvius Pollio in Ten Books* (London: Lockwood, 1874), 21.

[17] Truitt, *Medieval robots. Mechanism, Magic, Nature, and Art*, 93. Albertus Magnus, *Meteora*, ed. P. Hossfeld, vol. 6.1 of *Opera Omnia* (Münster: Aschendorf, 2003), 146–147. On the Aeolipile, see Craig Martin, "The Aeolipile as experimental Model in Early Modern Natural Philosophy," *Perspectives on Science*, 24/3 (2016): 264–284. In the Renaissance, this fire-blower is cited as an artificial magical object by Agrippa in *De vanitate scientiarum*. See Agrippa, *De incertitudine & vanitate scientiarum*, 202, unnumbered.

various virtues and vices; each image of a virtue or vice is followed by a story. The legend of Albertus Magnus's talking head exemplifies the virtue of wisdom. For Corsini, wisdom corresponded to the perfection of reason achieved by Albertus thanks to the "sagacious" application of natural and non-necromantic astrological science. Corsini's text recounts that a friar called on Albertus in his cell when he was not there, and that the statue replied. Believing it to be an idol of evil nature, the friar broke it. When Albertus returned, he said that it had taken him thirty years of work to make it, and he could not make another talking head for thirty thousand years, because that planet has made its course and would not return for that length of time. Regarding the functioning of Albertus's talking head, Corsini thought it could be clarified through astrology, although he denied the possibility of a necromantic explanation for this phenomenon.[18] In the fifteenth century, Alonso Tostado (ca. 1410-1455) identified the friar who broke the talking head as Thomas Aquinas.[19]

Della Porta may also have known the passage from the *Trattato dell'arte della pittura*, by the mannerist artist Giovanni Paolo Lomazzo (1538-1592), in which the episode of Albertus's talking head was reported. According to Lomazzo, Albertus built a bronze head. Hearing it speak, Thomas Aquinas broke it, believing it to be the work of the devil. For Lomazzo, the talking head had been built according to the laws of mathematics.[20] In *Trattato dell'arte della pittura*, among the marvellous things achieved by means of the laws of mathematics, Lomazzo included both those traditionally in the prerogative of astrology (such as the statue of Hermes) and those evidently mechanical (such as the flying birds made by Leonardo da Vinci).[21]

[18] A. Matteo de' Corsini, *Rosaio della Vita*, Trattato morale ... composto nel 1373 (Florence: Passigli, 1845), 15–16.

[19] Alonso Tostado (c. 1400-1455) *Commentaria in Numeros* (Venice: Sessa, 1596), 21, quaestio 19, vol. 2, 22*v*.

[20] In *Idea del tempio della pittura*, Lomazzo states that mathematics—or, as he specifies, astrology—is a fundamental discipline in the artist's education. See Giovanni Paolo Lomazzo, *Idea del tempio della pittura* (Milan: Paolo Gottardo Pontio, 1590), 33.

[21] Giovanni Paolo Lomazzo, *Trattato dell'Arte della Pittura* (Milan: Paolo Gottardo Pontio, Pietro Tini, 1585), II.1, 106. See also Thibaut Rioult, "The Secrets of

In Agrippa's *De incertitudine et vanitate scientiarum*, which Della Porta knew well, the phenomenon of a talking brazen head made by Albertus Magnus was related to that of a talking statue of Hermes and of the mechanical wooden dove made by Archita.[22] Although Agrippa foresaw the possibility of making mechanical statues, thanks to the laws of optics and geometry, both the statue of Hermes and Albertus's talking head were considered products of heavenly influences, obtained not with natural virtues but by mathematical learning (i.e., of the Cabala).[23] By Della Porta's time, Thomistic objections to attributing the efficacy of artificial magical objects to celestial influence had become an important constraint on attempts to explain such objects astrologically. In his work *De operationibus occultis naturae*, Thomas Aquinas had described occult qualities of some natural objects as effects of specific or substantial forms, showing how these qualities could weaken or strengthen in various individuals of the same species "according to a diverse distribution of matter and the different configuration of the heavenly bodies at the coming into

Illusionism in Della Porta's *Natural Magic*: Between Science, Mannerism and Magical Traditions", in *Hunting Secrets*, 71–95.

[22] Paola Zambelli, *White Magic, Black Magic in the European Renaissance* (Leiden-Boston: Brill, 2007), 13–34; Verardi, *La scienza e i segreti della natura a Napoli nel Rinascimento*, 22–27.

[23] In the second book of *De occulta philosophia*, dedicated to celestial magic, Agrippa declared that the phenomena of talking statues of Hermes could be achieved through the use of optics and geometry, while that of talking heads (of William of Paris), made under the rising of Saturn, could be achieved through the power of numbers (i.e., of the Cabala). Agrippa, *De occulta philosophia libri tres*, II.1, 249. In *De incertitudine et vanitate scientiarum*, the reference to the possibility of obtaining animation through an influence of the heavens (without natural virtues, but thanks to mathematical learning) appeared as a sibylline reference to the cabalistic power of numbers which Agrippa also advocated in the second book of *De occulta philosophia*. He made this comment regarding the talking head made by William of Paris, through which he tried to justify both the animated statue by Hermes and the talking head made by Albertus Magnus. The fact that in *De incertitudine*, Agrippa condemned the Cabala, did not contradict this position. As Vittoria Perrone Compagni has effectively demonstrated, Agrippa's skepticism always turned to the misuse of a discipline but did not involve the noble part of it. See Vittoria Perrone Compagni, "'Dispersa Intentio': Alchemy, Magic and Scepticism in Agrippa", *Early Science and Medicine* 5, 2 (2000): 160–177.

being of this or that individual".[24] Regarding the possibility of astrologically justifying the occult qualities of artificial magical objects, as effects of specific or substantial forms, Aquinas was much more prudent than his teacher Albertus Magnus. According to Albertus, human beings did not have the demiurgic power to create new substantial forms. However, by choosing the appropriate astrological moment, the craftsman made himself an instrument of the stars and nature, thereby closing the gap between art and nature.[25]

Before Della Porta, Ficino had come to terms with Thomas Aquinas's objection to the lawfulness of artificial magic in his *De vita coelitus comparanda*. Particularly interesting for this discussion is the solution concerning the talking statues of Hermes (which, as we have seen, Agrippa and Lomazzo later connected to the talking head of Albertus Magnus).[26] In the concluding chapter of *De vita coelitus comparanda*, which deals with the notorious god-making passage in the *Asclepius*, Ficino explicitly cited Thomas Aquinas' condemnation of this phenomenon.[27] According to Aquinas, this phenomenon was

[24] Thomas Aquinas, *De operationibus occultis naturae ad quemdam militem ultramontanum. A letter of Thomas Aquinas to a certain knight beyond the mountains on the occult workings of nature or concerning the causality of heavenly bodies*, trans. J. B. McAllister (Washington D.C.: Catholic University of America Press, 1939). See Copenhaver, *Magic in Western Culture: From Antiquity to the Enlightenment* (Cambridge: Cambridge University Press, 2015), 119. See also Brian P. Copenhaver, "The Occultist Tradition and Its Critics", in *The Cambridge History of Seventeenth-Century Philosophy* (Cambridge: Cambridge University Press, 1998), vol. I, 454–512.

[25] Albert the Great, *The Book of Minerals*, trans. Dorothy Wyckoff (Oxford: Clarendon Press, 1967), II.3, 135: "We do not doubt that everything which is somehow the cause of a cause is also somehow the cause of whatever results. If, then, the force and inspiration of the stars pour some influence, causing art into the artisan, surely nothing prevents their pouring something of their own power into all works made by art." See Weill-Parot, "Causalité astrale et 'science des images' au Moyen Âge", 221.

[26] Frances A. Yates, *Giordano Bruno and the Hermetic Tradition* (Chicago: University of Chicago Press, 1964), 62–83; Copenhaver, *Magic in Western Culture*, 19–24; 69–83; Denis J.-J. Robichaud, "Ficino on Force, Magic, and Prayers: Neoplatonic and Hermetic Influences in Ficino's *Three Books on Life*", *Renaissance Quarterly* 70/1 (2017): 44–87.

[27] "Plotinus uses almost the same examples in that place where, paraphrasing Hermes Trismegistus, he says that the ancient priests or Magi used to capture in

to be considered a superstition both from the point of view of philosophy and from the point of view of the Holy Scriptures.[28] While considering Aquinas' position, Ficino justified, alongside Plotinus, the possibility of creating talking statues, which have within themselves, as he states in echo of the author of *Asclepius*, "a natural force of divinity".[29]

In the first book of his *De occulta philosophia* (a book of natural magic), Agrippa, like Ficino, accentuated the divine component of natural magic; however, unlike Ficino, he linked the animation of statues to the higher, intellectual level of Being. As Iamblichus, Proclus, Synesius, and "the whole school of the Platonists confirm", Agrippa argued, some kinds of matter have a natural divine power. Therefore, it is possible, thanks to the application of the rules of natural philosophy and astronomy, to attract not only "celestial" and

statues and material sacrifices something divine and wonderful. He holds, moreover, with Hermes Trismegistus that through these materials they did not, properly speaking, capture divinities wholly separate from matter but deities who are merely cosmic [...] Indeed, the same Hermes, whom Plotinus follows, holds that daemons of this kind – airy ones, not celestial, let alone any higher – are themselves present all along in the materials and that Hermes himself put together statues from herbs, trees, stones, and spices, which had within themselves, as he says, a natural force of divinity. [...] I think, in the first place, in accordance with the opinion of the blessed Thomas [Aquinas] that if they made speaking statues at all, it was not the mere influence of the stars itself that formed the words within, but daemons. Secondly, if by chance it happened that these daemons did enter into statues of this kind, I think they were not bound there by celestial influence but rather deliberately indulged their worshippers, intending to deceive them in the end. To be sure, a superior nature of this kind is sometimes won over by an inferior, but it cannot be constrained". Ficino, *Three books on life*, III.26, 388–391.

[28] See Thomas Aquinas, *Summa contra gentiles*, trans. V. J. Bourke, *Providence* (New York: Image Books, 1956), III.104, 8, 92 and 104, 13, 93.

[29] To the question "And the quality of these gods who are considered earthly – what sort of thing is it, Trismegistus?", the Author of *Asclepius* replies that: "It comes from a mixture of plants, stones and spices, Asclepius, that have in them a natural power of divinity. And this is why those gods are entertained with constant sacrifices, with hymns, praises and sweet sounds in tune with heaven's harmony: so that the heavenly ingredient enticed into the idol by constant communication with heaven may gladly endure its long stay among humankind. Thus does man fashion his gods", *Asclepius*, 38, in The Greek *Corpus Hermeticum* and the Latin *Asclepius*, trans. B. Copenhaver (Cambridge: Cambridge University Press, 1992), 90.

"vital" gifts, but also "certain intellectual, daemonic and divine gifts [...] And Mercurius Trismegistus writes, that a statue rightly made of certain proper things, appropriated to a particular daemon, will presently be animated by that daemon".[30] As we have seen, in *De incertitudine et vanitate scientiarum*, the celestial intellectual gifts, which would have animated the talking statues of Hermes and Albertus, were also cryptically identified by Agrippa with those of the numbers of the Cabala. By superimposing the notion of daemon to that of number, both of which were catalogued in the context of intellectual, astrological gifts, Agrippa greatly complicated the problem of the animation of the statues, at least from the perspective of a late-Renaissance reader.

In Della Porta's time, proposing a justification of artificial magic through celestial influence (whether it be physical, spiritual, or intellectual) would have been imprudent, to say the least. Between the Council of Trent (1545–1563) and the papal bull *Coeli et terrae*, issued by Sixtus V in 1586, astrology came under increasingly strong condemnation and was equated with illicit magic.[31] The majority position in the Catholic sphere on astrology was the Thomistic one, interpreted in the light of a severe Augustinianism. Within this increasingly restrictive context, explanations of artificial efficacy based on celestial or magical agency became increasingly difficult to defend openly.[32] If, as Thomas Aquinas taught, no new substantial

[30] Agrippa, *De occulta philosophia libri tres*, I.38, 155–156.

[31] *Constitutio S.D.N.D. Sixti Papae Quinti contra exercentes Astrologiae Iudiciariae Artem, Et alia quaecumque divinationum genera, librosque de eis legentes, ac tenentes* (Rome: 1586). See Donato Verardi, "Les enseignements sur l'astrologie d'Augustin d'Hippone et Thomas d'Aquin selon la Coeli et terrae de Sixte V", *Revue des Sciences philosophiques et théologiques* 101/1 (2017): 125–133.

[32] These are perfectly evident difficulties in Della Porta's treatment of another artificial magical object, i.e., astrological images. In the first edition of *Magia naturalis*, in the wake of the lesson of Albertus Magnus, Della Porta proposed a justification for these artificial magical objects, built by the magician under certain constellations, and useful in the field of astrological medicine. In the second edition of *Magia naturalis*, published three years after Sixtus V's *Coeli et terrae*, this topic disappears. It is difficult to establish whether the choice not to address this topic is due to Della Porta's real departure from the belief in this form of astrological magic or whether it is an obsequious, but not very sincere, adaptation to the official positions of the

form could be introduced into an artificial object, a mechanical explanation offered Della Porta a way of accounting for the phenomenon without invoking daemonic interference. The acquisition of mechanics was thus placed by Della Porta at the service of one of the central aims of his natural magic: to wrest marvellous phenomena from demonological explanation.

This point also illuminates Della Porta's controversy with Jean Bodin. As discussed in the chapter on music, Bodin's demonological reading of natural magic exemplifies the kind of explanation that Della Porta sought to resist. The mechanical account of the talking head can therefore be understood not simply as an alternative description of its operation, but as part of the broader effort to show that marvellous phenomena could be explained without recourse to demonic agency.

Placing himself in the wake of both, the author of the pseudo-Aristotelian *Mechanics* and Heron of Alexandria (c. 10–c. 70), Della Porta established the explanation of the automaton in the element of air, which carries sounds:

> We see that the voice, or sound, is carried whole through the air, not instantaneously, but gradually and over time. We see that bronze guns, which by the force of gunpowder make a tremendous report, even when they are a thousand paces away: we see the flame long before the sound reaches our ears. Likewise, the reports of handguns are carried to us over some distance, even taking several minutes of time, for such is the nature of sound. Sounds therefore travel through time and remain whole, without interruption, unless they collide with something. The echo provides evidence of this: it strikes the walls intact, rebounds, and is reflected like a ray. Moreover, as we have said in this work, words and voices travel

Catholic Church. See Donato Verardi, "Giovan Battista Della Porta e le 'immagini astrologiche'", *Bruniana & Campanelliana* 21/I (2015): 143–154.

> together as a unit and, when carried through very long conduits, remain intact, just as they come from the mouth of the speaker.[33]

Accordingly, the sound of the voice could be carried from one end of a pipe to the other:

> With these points therefore established as true, if someone were to make very long lead pipes, two or even three hundred paces in length (as I myself have tried), and were to speak some words, indeed many words, into them, they travel through those pipes and are heard at the other end just as they come from the mouth of the speaker. Therefore, if that voice travels through time and flows along intact, if, while speaking, someone closes the mouth of the pipe, and another does the same at the other end, the voice can also be intercepted in the middle and shut up, as it were, in a prison; and when the opening is uncovered, the voice will flow out, just as it did from the mouth of the speaker. But since pipes of such length cannot be made without difficulty, they can also be bent back upon themselves in the manner of a tube, so that the longest conduit may be contained within a small space and compressed, and so that, when the opening is uncovered, the words can be understood.[34]

Della Porta therefore hypothesized that the intact voice could be conveyed from one end of a lead pipe to the other and, under suitable conditions, intercepted and temporarily enclosed within the pipe, so that it could later be released. As we saw in the chapter devoted to music, these affirmations were possible because Della Porta worked within an Aristotelian conception of sound as a species in its own right, distinct from the motion that accompanies it. The Aristotelian qualitative conception of sound was combined during the Renaissance with other philosophies of nature. Ficino's "music-spirit" theory, for example, was a synthesis of the scholastic representa-

[33] Della Porta, *Magiae naturalis libri XX*, XIX, 1, 288; Della Porta, *Della Magia naturale*, XIX.1, 688.

[34] Della Porta, *Magiae naturalis libri XX*, XIX.1, 288; Della Porta, *Della Magia naturale*, XIX.1, 688.

tion of sound with medical, Stoic and Neoplatonic doctrines.[35] Della Porta accepted this same qualitative conception of sound, but he pointed out the crucial role of the experiment in understanding the secret mechanism of Albertus Magnus' talking head. Mechanics thus provided not a final explanation, but a hypothesis whose truth remained to be established through experience. The qualitative conception of sound, accepted by Della Porta, was therefore not synonymous with a speculative, abstract approach. Every physical and qualitative characteristic of sound was an important object of observation thanks to an empirical and inductive attitude that made use of the conceptual categories of Aristotelianism. Sound, although not itself a body, was treated as possessing properties that made it behave in certain respects as though it were bodily. According to this approach, the sound qualities were found in the species, carried up to the ear, and existed independently of the listener. This almost corporeality of the sound made the hypothesis that it could be captured in a pipe plausible. With this perspective, Della Porta presented the possibility of capturing the voice in a pipe as a theoretical hypothesis to be tested experimentally. Della Porta said: "We are now testing the matter. If, before the printing of the book, the outcome proves as we hope, we shall write it down; if not, God willing, we shall write about it elsewhere".[36] What mattered, therefore, was not that Della Porta had definitively explained the talking head, but that he had transformed its explanation into an experimentally testable problem.

[35] Daniel Pickering Walker, *Spiritual and Demonic Magic: From Ficino to Campanella* (London: Warburg Institute, 1958), 3–29; Gary Tomlinson, *Music in Renaissance Magic: toward a Historiography of Others* (Chicago and London: The University of Chicago Press, 1994); Angela Voss, *Marsilio Ficino, the Second Orpheus*, in *Music as Medicine*, ed. P. Horden (London and New York: Routledge, 2000), 154–172; Gouk, *Music, Science, and Natural Magic in Seventeenth-Century England*.

[36] Della Porta, *Magiae Naturalis libri XX*, XIX.1, 288; Della Porta, *Della Magia naturale*, XIX.1, 688.

3. CONCLUSION

In Della Porta's magic, physics and mechanics belonged to a broader process of reconfiguring inherited accounts of nature through the encounter with experience. On the one hand, in his account of natural magical objects, Della Porta continued to work within the astrological physics of qualities inherited from natural magic. On the other hand, in his treatment of artificial magical objects, he opened a different explanatory path by turning to mechanics. This shift did not simply replace one explanatory system with another: it reconfigured the relation between inherited principles, artificial production, and experience, creating a space that would later be taken up by John Wilkins, who transformed Agrippa's artificial magic, still linked to celestial and cabalistic magic, into a new magic of mechanical wonders.[37]

For Della Porta, the extraordinary virtues of natural materials such as plants and stones could still be understood within the astrological physics of qualities inherited from traditional natural magic. This physics rested on the idea that a natural influence of the heavens could account for the emergence of an occult virtue in a particular object. It therefore offered a way of making the extraordinary properties of natural magical objects intelligible without removing them from the order of nature. At the same time, however, these occult virtues became objects of inquiry and manipulation: experience could test their effects, reveal their practical possibilities, and, in turn, modify the scope of the principles used to explain them.

With Agrippa, the explanation of artificial magical objects had become increasingly entangled with religious elements of Hermetic and Cabalistic inspiration, elements that Della Porta did not incorporate into his own account of natural magic. These elements also contributed to making astral magic increasingly problematic in Della Porta's time. A return to a purely physical-astrological justifi-

[37] Maarten Van Dyck and Koen Vermeir, "Varieties of Wonder: John Wilkins' Mathematical Magic and the Perpetuity of Invention," *Historia Mathematica* 41, 4 (2014): 463–489.

cation of artificial magical objects, such as that proposed by Albertus Magnus, would likewise have been difficult to sustain, at least in the case of objects as compromised and compromising as animated statues. As we have seen in the previous chapter, something similar, although along different lines, seems to have occurred with astrological images, where Della Porta adapted and reworked his Albertine commitments from within. In the case of Albertus's talking head, he took a different path. By identifying mechanics, rather than the astrological physics of qualities, as the explanatory model for objects such as Albertus's talking head, Della Porta altered the terms in which the relation between art and nature could be understood: mechanics made it possible to conceive of art as capable of reproducing effects that had previously been attributed to nature or to the heavens.[38] In doing so, he once again reinterpreted Albertus himself, retrospectively repositioning him within a history of natural knowledge centred not on astrological influence, but on mechanical explanation and experimental inquiry.

For Della Porta, mechanics could thus account for the phenomenon of the talking head without requiring recourse either to the astrological physics of occult qualities, with its Albertine associations, or to daemons—whether understood as spirits of the stars, supercelestial intelligences, or the devils of Christian demonology. What had traditionally been approached through celestial influence or the intervention of higher spiritual powers could, in the case of the talking head, be reformulated as a question concerning the operation of an artificial device. In this sense, mechanics did not simply provide a different explanation of the same phenomenon; it changed what kind of phenomenon the talking head could be understood to be. The problem was no longer how celestial or spiritual forces could

[38] This overcoming can also be traced in Roger Bacon's *De secretis artibus et naturae*, a well-known work in the Renaissance which, in all likelihood, Della Porta also knew. See Roger Bacon, *Epistola de secretis operibus artis et naturae* (Paris: Fine, 1542). On Roger Bacon, see Nicolas Weill-Parot, *Le Vol Dans Les Airs Au Moyen Âge: Essai Historique Sur Une Utopie Scientifique* (Paris: Les Belles Lettres, 2020), 92–95; 152–158.

animate an artificial object, but how an artefact might reproduce an effect that appeared to belong to living nature.

A central feature of Della Porta's approach was the provisional status he assigned to inherited accounts of nature and to ancient and medieval claims concerning magical objects. According to this approach, these inherited accounts–many of which had been accepted in the texts of Ficino, Agrippa, and other Renaissance authors–had to be treated as starting points for inquiry, rather than as its final conclusions. As in the case of Albertus's "Talking Head" legend, these truths were working hypotheses that had to be verified through an experimental procedure. Della Porta's natural philosophy thus did not require him to abandon inherited principles, but allowed him to test, modify, and, when necessary, reconfigure their explanatory scope in the light of experience. He accordingly presented his own investigations as contributions to an ongoing history of natural knowledge, leaving open the possibility that subsequent observers might improve upon them. He wrote: "I will set down what both I myself have done in it, and what I have received from other friends: I have performed the best I could, to shew others an opportune way of making better".[39]

[39] Della Porta, *Magiae naturalis libri XX*, VI.9, 123. Interestingly, although Wilkins was familiar with Della Porta's text, where it was argued that the voice could be stuck in a tube thus allowing the automaton to speak, in the act of denying this phenomenon he preferred to refer to Johannes Walch. See Wilkins, *Mathematicall Magick*, 177–178; Johannes Walch, *Decas Fabularum Humani Generis Sortem, Mores, Ingenium, varia studia, inventa at[que] opera, cum ad vivum, tum mythologice adumbrantium: Theologis Sacra: Iureconsultis Iusta: Medicis Salubria: Philosophis vera: stolidis incongrua dictantium* (Argentorati: Lazarus Zetzner, 1609), 223–224. Quoting Bacon, Wilkins stated that some natural elements, such as air, could create sounds similar to those of the letters of the human alphabet, thus explaining the phenomenon of talking heads. Francis Bacon, *Sylva Sylvarum*, in *Works of Francis Bacon*, ed. J. Spedding, R. Leslie Ellis and D. Denon Heath (Boston: Houghton, Mifflin and Company, 1900) vol. 4, Century 2-200, 265–266. Wilkins' choice not to criticise Della Porta was dictated by the fact that the Italian philosopher, unlike Walch, presented the possibility of capturing the voice in a pipe as a theoretical hypothesis to be tested experimentally. Already Bacon had accepted from Della Porta only the idea (experimented by the Italian philosopher) that air could better carry sounds inside a pipe, abandoning instead the hypothesis (still not verified by Della Porta

The history of the talking head thus reveals the broader logic of Della Porta's natural philosophy: inherited principles remained starting points for inquiry, while experience could reconfigure their explanatory scope. This experimental attitude would secure Della Porta's authority among the 'experimenters of wonders' for centuries to come.

himself) of being able to capture sound. Those of Bacon and Wilkins are interesting examples of the fortune and respect that Della Porta enjoyed, as an experimenter, in the first English experimental context.

6. CELESTIAL CONFIGURATION AND HUMAN NATURE: THE *COELESTIS PHYSIOGNOMONIA*

1. INTRODUCTION

The preceding chapter examined the possibility of artificial animation: the moment at which an artefact might reproduce an effect that appeared to belong to living nature. The *Coelestis Physiognomonia* moves from the artificial reproduction of life to the investigation of the human being as a living and thinking expression of nature. The relation between celestial configurations and human nature occupies a distinctive place within Della Porta's natural philosophy. For Della Porta, the human being was a particularly revealing site for investigating the hidden operations of nature through their effects on individual constitution. The *Coelestis Physiognomonia* asks how human beings, as both objects and observers of nature, were situated within the celestial order, and how they could come to understand the celestial conditions of their own constitution.

At first sight, *Coelestis Physiognomia* (1603) might appear to represent a retreat from the natural magic developed in Della Porta's earlier works: a cautious reformulation of astrology undertaken in response to the increasingly hostile theological and ecclesiastical climate of the late sixteenth century. Yet the chronology of the work makes such an interpretation difficult to sustain. *Coelestis Physiognomonia* was composed in the same period in which Della Porta was developing the successive versions of his *Magia naturalis*. Its relationship with astrology should therefore be understood not as a withdrawal from his earlier natural philosophy, but as part of its continuing development.

As we saw in the discussion of astrological images, Della Porta did not simply abandon celestial causation when revising his natural magic. Rather, he withdrew from an explicit account of how an artefact could be technically inserted into the causal order of the heavens, leaving celestial *influxus* intact while limiting the contexts in which its operation could be explicitly theorised. A further dimension of this reconfiguration emerges in his treatment of musical instruments. As we saw in Chapter Two, Della Porta relocated powers that the magical tradition had traditionally associated with music and sound to the material of the instrument itself, shifting the operation of *influxus* from the sound produced to the matter of which the instrument was composed. This provides another instance in which celestial influence was not denied, but reassigned within the causal structure of the phenomenon. A different but related shift can be observed in the treatment of the talking head, where phenomena that might previously have been interpreted through celestial influence were increasingly explained through the mechanical mechanism underlying the effect, rather than through celestial causation. The expanded second edition of the *Magia naturalis*, in twenty books, was therefore itself redefining the place of astrology. In particular, Della Porta distinguished between cases in which *influxus* could be reassigned within a natural causal account and those in which it could be dispensed with altogether when a mechanical explanation was available.

The *De humana physiognomonia*, its closest companion within Della Porta's physiognomic project, reveals the same broader reconfiguration of the function of celestial influence. Across the successive redactions of the work, culminating in the Italian vernacular edition of 1610, the astrological dimension was not progressively reduced or eliminated. On the contrary, it became increasingly prominent. The expansion of this material suggests that, alongside the reconfiguration of *influxus* in the *Magia naturalis*, Della Porta was not gradually distancing physiognomy from astrology, but redefining the role of celestial influence within his account of human nature.

This redefinition becomes most significant at the level of the individual. The question was not simply whether celestial influence con-

tinued to operate, but how it entered into the particular constitution of each human being. *Coelestis Physiognomonia* thus shifts attention from celestial influence as an abstract causal principle to the ways in which it was expressed through individual complexion, disposition, and bodily constitution. Its celestial dimension belongs to Della Porta's continuing effort to understand how the heavens participate in the formation of human nature without determining it in any simple or uniform way.

The argument of this chapter develops from this problem. First, I examine how Della Porta transforms astrology into celestial physiognomy, paying particular attention to the relation between celestial forms, terrestrial temperaments, and the physiognomic principle of resemblance. Second, I reconstruct the epistemological foundations of this transformation, focusing on the medieval and Renaissance traditions of probabilistic science, mathematical astrology, and optical knowledge that allowed contingent effects to become legitimate objects of rational inquiry. Finally, I situate celestial physiognomy within Della Porta's wider cosmology and his conception of the individual, showing how *influxus*, analogy, visual knowledge, and experimentation converge in a model of nature in which human nature remains intelligible only within its relation to the celestial order.

2. CELESTIAL FORMS AND TERRESTRIAL NATURE

2.1. *From Astrology to Celestial Physiognomy*

The significance of the *Coelestis Physiognomonia*[1] lies not simply in Della Porta's treatment of astrology, but in the transformation he gives to the very object and epistemic status of astrological knowledge. The work relocates celestial prediction within a broader theory of natural knowledge. Its point of departure is the traditional

[1] Giovan Battista Della Porta, *Coelestis physiognomonia*, ed. A. Paolella (Naples: Edizioni Scientifiche Italiane, 1996).

problem of celestial influence, but its conceptual destination is different: a science of signs capable of establishing probable relations between visible celestial configurations and terrestrial dispositions, and thereby of making limited predictions about their possible effects.

Della Porta's declared critique of astrology should therefore not be read as a rejection of the epistemological problem that Renaissance astrology had itself sought to solve. The astrological tradition to which he was exposed had long distinguished conjectural knowledge of contingent effects from prophetic certainty, and had developed precisely the idea that celestial configurations could provide probable knowledge of what might occur. Della Porta was well aware of this intellectual resource. His strategy was instead to appropriate it without openly reaffirming astrology as a discipline: what Renaissance astrologers had formulated as a conjectural science of celestial influence, he recast as a physiognomic science of visible signs and natural correspondences.

This relocation explains the apparently paradoxical character of the work. Della Porta publicly distances himself from some of the forms of astrology associated with his earlier investigations and presents the *Coelestis Physiognomonia* as a critical reconfiguration of astrological knowledge. Yet the book does not abandon the possibility of deriving knowledge of human affairs from the heavens. Rather, he recasts that possibility within the natural-philosophical framework of physiognomy. What matters is therefore not whether Della Porta accepts or rejects astrology in the abstract, but how he transforms its object, method, and epistemic scope.

The historical backdrop to Della Porta's endeavours was profoundly shaped by the Church's new directives on astrology as divination. This was no simple matter, for it involved delineating what counted as scientific knowledge versus what was deemed superstitious and demonically inspired. As Sixtus V had asserted in his bull *Coeli et terrae* (1586), the knowledge of contingent futures belonged exclusively to God. Any claim to predict human destiny was therefore branded as a superstitious act, with the very rationality invoked by astrologers dismissed as fundamentally flawed. Astrology, like all magical and sorcerous practices, was to be regarded as a diaboli-

cal deception. Thus, divinatory astrology, as any art claiming to predict the future, faced a dual condemnation: (1) scientifically, as it allegedly failed to meet Aristotelian scientific canons; and (2) morally, due to its perceived danger to faith.[2]

A central point of contention revolved around the epistemological limits of human knowledge. The Church's official stance, articulated for the first time in a formal document, established divine prophecy as the sole legitimate form of future prediction. Astrologers, and anyone else asserting the ability to predict future events through rational technique, were to be branded as false prophets and followers of Satan.[3]

It was within this increasingly restrictive context that Della Porta positioned his own intervention.

In the proem to the *Coelestis Physiognomonia*, Della Porta explicitly characterized his earlier astrological pursuits as a youthful error of which he had come to repent, and declared his intention to refute astrology. Yet his treatment of Matteo Tafuri, the magus-astrologer who had frequented his home in his youth, reveals a more precise shift. Tafuri appears as a figure endowed with prophetic gifts, whose knowledge belongs to the sphere of inspired prediction that the Church increasingly sought to reserve for divine revelation. Della Porta does not need to determine the ultimate source of Tafuri's inspiration, nor does he engage directly with the theological question of whether such inspiration might have a demonic origin. Instead, he sidesteps the problem altogether. He separates his own procedure from the prophetic mode of knowledge represented by Tafuri and relocates prediction within a human, technical, and conjectural practice of reading natural signs.

This move effectively cuts through the central difficulty posed by the theological condemnation of divination. If prophecy depended

[2] *Constitutio S.D.N.D. Sixti Papae Quinti Contra Exercentes Astrologiae Iudiciariae Artem*. Donato Verardi, "Les Enseignements Sur L'astrologie d'Augustin d'Hippone Et De Thomas d'Aquin Dans La Bulle Coeli Et Terrae De Sixte V", *Revue Des Sciences Philosophiques Et Théologiques* 101, 1 (2017): 125–133.

[3] Donato Verardi, "L'occulte en Italie entre astrologie, athéisme et nigromancie (XIV–XVII siècle). Éléments de réflexion", *Cahiers de recherches médiévales et humanistes / Journal of Medieval and Humanistic Studies*, 33 (2017–1): 419–434.

upon inspiration, and inspiration belonged properly to God, then a natural philosopher seeking knowledge of future effects could neither claim prophetic authority nor rely upon an inspired faculty. Della Porta's solution was to dispense with prophecy as a category of knowledge. What remained was a technique: observation of celestial configurations, comparison of their visible characteristics, and inference from established correspondences to probable effects. The future was therefore not accessed through revelation, but approached through conjecture. In this sense, the distinction between Tafuri and Della Porta is not simply one between two attitudes towards astrology. It marks a change in the epistemic status of prediction itself: from inspired prophecy to a fallible technique of natural knowledge.

The distinction between prophecy and conjecture thus defines the epistemic ground on which Della Porta's celestial physiognomy operates. He grounded this form of prediction in observation, comparison, and the interpretation of visible signs, supported by scientific-mathematical principles, optics, and astronomy. In the *Coelestis Physiognomonia*, the visible characteristics of celestial bodies— their forms, colours, magnitudes, and motions—become the basis for establishing probable relations between celestial configurations and terrestrial effects. The heavens could thus be investigated as a field of observable signs, while their relation to human nature could be approached through conjecture rather than revelation.

In *De Humana Physiognomonia*, drawing from the dual etymological explanations of both the ancient tradition of Michael Scot and the later one of Peter of Abano (who derived "physiognomy" from *physis* and *onoma*, or *physis* and *nomos*), Della Porta declared his ambition to establish physiognomy as a law, a norm of nature. It was with this objective—to provide knowledge of individual physical-psychological characteristics (and consequently predict potential developments in human action)—that he formulated his physiognomy.[4] His claim to philosophical and scientific legitimacy was

[4] Giovan Battista Della Porta, *De humana physiognomonia libri sex*, ed. A. Paolella, vol. 1 (Naples: Edizioni Scientifiche Italiane, 2011), 20–25, 87.

then extended across his physiognomic corpus, which explored relations among human, vegetal, and celestial nature.

Della Porta postulated that human qualities, much like the physical properties of stones, plants, and animals, could be traced back to those of the planets and constellations. Echoing the sophisticated astrologers of the Renaissance Ptolemaic tradition,[5] Della Porta maintained that the stars operate not through their substantial form (*formaliter*), but *effective*. The individual's form, he argued, derived not from the stars directly, but from temperament, which was influenced by celestial bodies. Celestial influence therefore did not produce an identical human type, but entered into the particular constitution of each individual, where it was expressed through temperament and complexion. The problem of celestial physiognomy was thus to account for how celestial configurations could be related to the singular constitution of human beings. This allowed Della Porta to formulate a system of conjectural prediction based on observed correlations between celestial configurations and individual dispositions.

Della Porta elucidated this perspective:

> We have also added a not useless doctrine: how astrologers could, at a glance, by looking up at the sky and contemplating the stars, learn what they had learned over a long period of time and with various experiments, since it is clearly known from their physiognomy, colour, motion, quantity, beauty, and ugliness. The star of Jupiter and Venus, shining with a most pleasant and joyful splendour, in such a way that it excels in celestial clarity, denotes a certain majesty of nature and promises similar effects; it makes men gracious and magnanimous, gives glorious life, splendour, and perpetual riches, and is therefore called salutiferous. On the contrary, the star of Saturn, because it is almost livid with an ugly and foul pallor, and in a certain way offending the eyes, makes men melancholic and subject to similar infirmities. The star of Mars, horrible and

[5] Donato Verardi, *Arti magiche e arti liberali nel Rinascimento. Da Ariosto a Della Porta* (Lugano: Agorà, 2018).

> threatening, makes men red, irascible, sanguine, and promises wars, leprosy, and fierce and adverse things, unhappy offspring.[6]

He continued by emphasising: "In this first book, we will describe the physiognomy of the planets and what customs they give, what infirmities, what magistracies, and what fortunes, and how these things can be known from their appearance, and that these things do not derive from the influence of the stars, but from the very qualities of the elements".[7] Indeed, in the first book, Della Porta asserted: "the form that astrologers say comes from the stars, we say comes from nowhere else than from the particular temperament of each; and that royal character and disposition from no other cause than the temperate quality of the elements and their excellent proportion".[8] Furthermore, the philosopher clarified, "if they had looked up at the sky, from the aspect of the planets themselves they would have been able to know sooner and better what they learned with long observation".[9] Elsewhere, he articulated:

> That greatest Maker of all things, as if with an observant painting, has depicted the occult forces and properties, so that each might show very well its forces and properties; and the same Maker, alone, in almost all his works, has observed the same order [...] Therefore, by looking and carefully contemplating the aspects, figures, sizes, colours, motions, and other accidents of the stars, one can more truthfully and with greater convenience conjecture the figures, sizes, colours, motions, and other things of men.[10]

This method, rooted in the idea that God has "depicted the occult forces and properties" externally, made it possible to approach hidden properties through their visible manifestations. In the *Coelestis Physiognomonia*, this principle of resemblance establishes a cor-

[6] Della Porta, *Della Celeste fisonomia*, in *Coelestis physiognomonia*, 190.
[7] Della Porta, *Della Celeste fisonomia*, 190.
[8] Della Porta, *Della Celeste fisonomia*, 199.
[9] Della Porta, *Della Celeste fisonomia*, 200.
[10] Della Porta, *Della Celeste fisonomia*, 207.

respondence between celestial forms and terrestrial dispositions, allowing the visible characteristics of the stars to become signs of qualities that are not themselves directly perceptible. The significance of the procedure lies not simply in making the occult visible, but in establishing a basis on which relations between celestial configurations and human characteristics could be inferred and tested. The visible form thus becomes the starting point for a conjectural passage from what can be seen to what remains hidden.

Significantly, all these elements—aspects, figures, sizes, colours, motions—were subjects of specific study within *perspectiva* or optics. The geometrical and optical analysis of these properties provided the conditions under which celestial appearances could be treated as precise objects of observation. Thus, when Della Porta remarked that "what astrologers have gone begging with various experiences, they could have taught us immediately by the physiognomy of the stars"[11] he was not simply dismissing the experiential basis of traditional astrology. Rather, he proposed a different way of organising that experience: what had been accumulated through prolonged observation could be approached through the systematic reading of visible celestial signs. Likewise, when he stated that what astrologers had learned "with long experience and observation" could have been obtained by looking at the signs of the zodiac,[12] he presented physiognomic observation as a means of establishing relations between celestial appearance and terrestrial effect. The point was therefore not to eliminate experience, but to reorganise it within an observational and analogical procedure grounded in the visible properties of the heavens.

This procedure is particularly evident in Della Porta's treatment of the zodiacal signs. He demonstrated that if "hair comes from excessive heat and from the same comes frizziness", as "we said in the Physiognomy", astrologers could derive an analogous principle by observing that "in the horns of the starry form of Aries there are

[11] Della Porta, *Della Celeste fisonomia*, 104.
[12] Della Porta, *Della Celeste fisonomia*, 274.

many stars". [13] The same logic appears in his discussion of Taurus, where he advocated comparing the "human form" with the "bovine form".[14] The comparison does not merely establish a symbolic resemblance between a celestial image and an earthly creature. It provides a way of relating visible configuration to qualities and dispositions attributed to the corresponding terrestrial form. The zodiac thus becomes a field in which celestial appearances can be read in relation to terrestrial nature, and ultimately to human constitution. The same procedure is extended to Gemini, Cancer, Leo, Libra, Scorpio, Sagittarius, Aquarius, and Pisces.

Della Porta systematically categorised each celestial sign, moving from familiar individual signs to "images found outside the zodiac".[15] He provided a precise description of the "customs" and "forms" that each individual star "signified" within the twelve zodiacal signs. This meticulous description of celestial and human signs in the fifth book even extended to "moles" and "spots" on various parts of the body.[16] Moles offered him a further instance of correspondence: just as celestial images could be related to earthly forms, marks on the body could be read as signs of particular individual characteristics. The body thereby becomes a field of correspondence between the individual and the wider natural order. What matters here is the movement between different levels of nature: from celestial configuration to terrestrial form, and from terrestrial form to the singular features of the human body. Physiognomic knowledge thus makes the individual readable within the larger order to which it belongs.

The doctrine of the physical complexions of the planets further clarifies how this correspondence operated at the level of the individual. Della Porta's physiognomy classifies psychological traits according to the Galenic typology of humoral complexions and relates these to planetary complexions. The four humoral types—phlegmatic (phlegm), sanguine (blood), bilious (yellow bile), and melancholic (black bile)—provide the medical framework through which ce-

[13] Della Porta, *Della Celeste fisonomia*, 276–277.
[14] Della Porta, *Della Celeste fisonomia*, 276–277.
[15] Della Porta, *Della Celeste fisonomia*, 292.
[16] Della Porta, *Della Celeste fisonomia*, 297ff.

lestial qualities can be related to bodily constitution. First outlined in *De Humana Physiognomonia*, this doctrine is elaborated in the *Coelestis Physiognomonia*, where the study of celestial physiognomies is connected with the analysis of visible qualities through the rules of *perspectiva*.

Here, as in the discussion of Columella's pyramid in the first chapter, Della Porta's procedure consists in translating an apparently occult relation into a visible and intelligible structure of correspondences. Yet in the celestial case, the purpose of this procedure is to account for the passage from celestial qualities to the constitution of the individual. The stars do not reproduce their own forms directly in human beings; their effects are mediated through temperament and complexion. The individual's physical and psychological characteristics can therefore be related to celestial qualities through the principle of indirect similarity already formulated in the *Phytognomonica*, without being reduced to a direct or uniform determination by the stars.

This distinction is also what gives the system its conjectural character. Celestial configurations provide signs from which probable effects can be inferred, but the effects are realised within the particular constitution of each individual and remain subject to variation. Della Porta's celestial physiognomy consequently does not establish an invariable correspondence between a star and a human type. It provides a method for interpreting how celestial qualities may be expressed through different bodily constitutions and dispositions. This is why, referring to astrology in the proem, Della Porta could assert that "whatever truth it has, it has it... only from mere physiognomy".[17]

2.2. *Conjectural science, vision, and mathematical knowledge*

We have seen that Della Porta presented physiognomy as a form of knowledge capable of establishing relations between visible signs

[17] Della Porta, *Della Celeste fisonomia*, 187.

and the hidden qualities and dispositions of natural things. But what conception of science made such knowledge possible? More specifically, what kind of scientific validity could he attribute to a discipline whose objects were individual, variable, and contingent, and whose conclusions could therefore not possess the necessity traditionally associated with scientific knowledge?

Della Porta's answer belongs to a long-standing conception of science that had remained active in sixteenth-century Italy among physicians, natural philosophers, and astrologers, both within and beyond the universities. Rather than restricting scientific knowledge to the demonstration of necessary causes, this tradition admitted forms of rational inquiry concerned with contingent effects and with what could be established as probable on the basis of experience, observation, and mathematical reasoning. It was within this epistemological space that astrology, and related disciplines such as physiognomy, could claim scientific status.

Among the figures who embodied and transmitted this tradition, Peter of Abano occupied a particularly important place. His writings remained a major point of reference for Della Porta, as the explicit citations in his physiognomic works attest. Peter of Abano was, moreover, one of the foundational figures of the Peripatetic and Ptolemaic conception of natural astrology that continued to inform Renaissance medicine and conjectural prediction, as well as related practices such as physiognomy.[18]

What, then, did this conception of science entail? Peter of Abano interpreted Ptolemy's account of astrology in the *Tetrabiblos* as a form of knowledge concerned with the possible. Similarly, Pelacani—another crucial figure in this revision of predictive science, whose ideas seem to have circulated in milieus frequented by Della Porta, although a direct transmission cannot be established—understood science as prediction of the possible. Both contended that a science of the contingent and the transiently possible could

[18] Donato Verardi, "The image of Aristotle as a Magus, and the Aristotelian Foundation of Magic in Early Modern Italy", in *Aristotelianism and Magic in Early Modern Europe: Philosophers, Experimenters and Wonderworkers*, ed. D. Verardi (London; New York: Bloomsbury, 2023), 49–65.

indeed be constructed. Science, on this account, did not necessarily consist in necessary truth alone, but could also establish a possible truth, probabilistic in nature. Astrology could therefore be understood as a prediction of the possible.[19] These theses found broad acceptance and vigorous defence among Renaissance astrologers seeking to legitimise their discipline against increasing criticism. Figures such as Pontano, whom Della Porta knew well and cited explicitly, and other Renaissance defenders such as Lucio Bellanti and Gabriele Pirovano, developed and defended these arguments in support of astrology's intellectual and scientific standing.[20] Like Della Porta, they understood astrology as an intermediate science, situated between theory and practice and capable of producing probabilistic knowledge of contingent effects.

This conception did not necessarily contradict Aristotle himself. Critics of astrology, often relying on a restrictive interpretation of Aristotelian science, argued that if science entails knowledge of universal causes and therefore possesses necessary validity, astrology—which purports to predict effects from uncertain and contingent causes—must be false. Yet Aristotle himself admitted that knowledge could concern corruptible and movable realities and that demonstrations in natural, practical, and productive sciences could hold not universally, but "for the most part".[21] The question was therefore not whether contingent phenomena could be known scientifically, but what kind of scientific knowledge they permitted.

Pelacani pushed this possibility further by reducing necessary truth, or truth of reason, to factual truth and transforming the necessary cause into a sufficient cause—a distinction that Della Porta would later adopt in the *Magia naturalis*, where the magus was to address sufficient causes. In this framework, mathematical sciences could be grounded simultaneously in empirical experience and in theoretical reasoning: on the one hand, in visual experience and fac-

[19] Graziella Federici Vescovini, *I sistemi del mondo. Il cammino dell'astrologia da Tolomeo a Copernico* (Lugano: Agorà, 2018).

[20] On these authors and the topics in question, see Verardi, *Arti magiche e arti liberali nel Rinascimento.*

[21] On this, see Verardi, *Logica e magia*, 14–30.

tual truth; on the other, in mathematics and geometry.[22] This epistemological configuration is crucial for understanding the scientific status Della Porta attributed to celestial physiognomy.

Its foundations belonged to a long optical tradition. The mathematical analysis of vision developed by Alkindi and Alhazen and transmitted through Peckham, Roger Bacon, Witelo, Pelacani, and others provided a model in which sensory experience could be subjected to geometrical verification. Pelacani, in particular, developed Alhazen's influential account in *De Aspectibus* of the verification of sight through mathematical calculation. Graziella Federici Vescovini has stressed the importance of this optical tradition in sixteenth-century Italy, and particularly in Naples, in relation to both Maurolico and Della Porta, showing how both drew upon the Alhazenian conception of optical knowledge as it had been received in the sixteenth century.[23] Della Porta himself explicitly referred to Alhazen in the *Magia Naturalis*, *De Refractione*, and *De Aeris Transmutationibus*, where he employed the Arab philosopher's optical theory to explain the visual foundations of his meteorology.[24] Della Porta's interest in *perspectiva* also appears to have been nourished by a tradition that, within his milieu, can be traced to Giovanni Abioso da Bagnolo, a mentor to his elder brother, Giovan Vincenzo. Abioso advocated an optical-geometrical approach to astrology that closely anticipated the conception of celestial knowledge later developed by Della Porta.[25]

The conception of science underlying the *Coelestis Physiognomonia* thus emerges from the intersection of conjectural reasoning, visual experience, and mathematical analysis. To study the physiognomy of the heavens meant examining the aspects, magnitudes, fig-

[22] See Vescovini, *Astrologia e scienza*. See also Graziella Federici Vescovini, "L'importanza della matematica, tra aristotelismo e scienze moderne in alcuni filosofi padovani della fine del secolo XIV", in *Aristotelismo veneto e scienza moderna*, ed. L. Olivieri, 2 vols. (Padua: Antenore, 1983), 2, 661–684.

[23] Graziella Federici Vescovini, "L'ottica italiana nel XVI secolo: Francesco Maurolico e Giambattista Della Porta", in *Storia della scienza*, vol. 3, *La civiltà islamica* (Rome: Istituto della Enciclopedia Italiana, 2002), 700–701.

[24] Giovan Battista Della Porta, *De aeris transmutationibus*, ed. A. Paolella (Naples: Edizioni Scientifiche Italiane, 2000), 30ff.

[25] Verardi, *La scienza e i segreti della natura a Napoli nel Rinascimento*.

ures, motions, and other accidents of the stars through the rules of *perspectiva*. In this respect, the epistemological foundations of celestial physiognomy substantially overlap with those of mathematical astrology,[26] particularly in its attention to the visual lines through which the sun, moon, and stars become objects of measurable observation.

What distinguishes the human being within this framework is therefore not separation from the natural world, but the possibility of making intelligible the relations within which the individual is situated. Celestial configurations could be observed; their visible characteristics could be compared; and their possible effects could be inferred through established correspondences. The result was neither necessary demonstration nor prophetic revelation, but a form of conjectural knowledge whose validity remained proportionate to the evidence and relations on which it was based. It is in this sense that Della Porta's celestial physiognomy could function as a *Physiognomy of the World*: a science of relations between visible celestial forms and the particular constitutions of terrestrial beings.

3. CONCLUSIONS

The significance of the *Coelestis Physiognomonia* lies less in its position towards astrology than in the way it redefines the relation between the heavens and the human individual. Celestial influence is neither treated as an autonomous power producing predetermined effects nor excluded from the constitution of human beings. It becomes intelligible through the particular constitution in which celestial qualities are expressed: temperament, complexion, bodily disposition, place, time, and the conjunction of other natural

[26] A clear example of this interpretation of astrology, which was also adopted by Leonardo da Vinci, is found in Henry of Langenstein's questions on perspective and in the treatise *De visione stellarum* attributed to Nicole Oresme. Graziella Federici Vescovini, "Note di commento a alcuni passi del 'Libro di pittura.' L'astrologia che nulla fa senza la prospettiva", in *Leonardo e Pico. Analogie, contatti, confronti*, ed. F. Frosini (Florence: Leo S. Olschki, 2005), 99–129.

conditions. The individual is therefore not simply subjected to the heavens; he is constituted within a network of relations that makes celestial influence variable, observable, and open to conjectural interpretation.

This has an important consequence for the status of prediction. Della Porta's physiognomy does not seek to overcome contingency by transforming it into necessity. Its scientific ambition lies precisely in making contingent relations intelligible without denying their contingency. The prediction of human characteristics and actions remains therefore a matter of inference from signs and correspondences, rather than an act of revelation or a deduction from an immutable causal chain. What matters is the possibility of establishing rational relations between observable configurations and probable effects, while recognising that those effects take shape differently in individual constitutions.

The human being consequently occupies a peculiar position within Della Porta's natural philosophy. He is neither outside the natural order that celestial physiognomy seeks to investigate nor simply one more passive recipient of celestial forces. His body bears the effects of natural relations, but it also provides the signs through which those relations can be investigated. The individual thus becomes both a site of natural manifestation and a site of knowledge: nature is expressed in the human body, while the human observer can learn to read those expressions as part of the same order to which he belongs.

This double position brings together two dimensions of Della Porta's thought that are often considered separately. On the one hand, the individual is intelligible only through the relations that connect him to the wider cosmos. On the other, those relations become accessible through the visible characteristics by which nature manifests itself. The epistemic movement is therefore not from an abstract celestial cause to a predetermined human effect, but from visible configurations to their possible relations with particular terrestrial constitutions. Celestial physiognomy makes this movement explicit by placing the human individual at the point where celestial and terrestrial nature become mutually readable.

Here the optical dimension of Della Porta's natural philosophy acquires its fullest significance. The attention to figures, aspects,

magnitudes, colours, and motions is not simply a technical requirement of celestial observation. It expresses a more general conception of nature as something whose hidden relations can become intelligible through vision, comparison, and mathematical analysis. What emerges is an *ocular philosophy of nature* in which seeing is not merely the reception of sensible information, but part of the process through which concealed relations are reconstructed. The mathematical analysis of vision gives this process a rational structure, while conjecture allows that structure to accommodate the variability of natural effects.

Celestial physiognomy therefore reveals something fundamental about Della Porta's understanding of nature: intelligibility does not require uniformity. A natural order can remain intelligible even when its effects vary according to individual constitutions and circumstances. Indeed, the very possibility of natural knowledge depends upon attending to these differences rather than eliminating them. The individual is not an obstacle to knowledge because he is singular; his singularity is precisely what must be understood if celestial influence is to be traced into terrestrial life.

This also clarifies the place of *Coelestis Physiognomonia* within Della Porta's broader investigation. The work does not simply extend a pre-existing physiognomic method to another domain. It brings the problem of individual constitution into direct relation with the celestial order and, in doing so, tests how far a conjectural science can reach when its object is neither universal nor mechanically determined. The result is a conception of natural knowledge capable of moving between the visible and the hidden, the general order and the singular constitution, without reducing one to the other.

The human being consequently provides a particularly revealing case of Della Porta's broader reinvention of nature. To understand the individual is to place him within the same network of relations that connects celestial bodies, terrestrial matter, living beings, and their observable properties. But to do so is not merely to subordinate anthropology to cosmology. It is to redefine what it means for a human being to belong to nature: not as an entity detached from its order, but as a being whose constitution is formed within that order

and whose capacity for observation makes the order itself available to inquiry.

It is precisely this double status—object and observer, part of nature and interpreter of its signs—that gives physiognomy its wider significance: by relocating humanity among the other beings it investigates, Della Porta once again reinvents nature itself.

CONCLUSIONS

Nature does not enter Della Porta's natural philosophy as a finished object of knowledge. What changes is the way in which its powers, relations, and operations are understood through the questions he asks of it and the practices through which he seeks to make them intelligible and to render them operative.

The examination of Della Porta's principal works, from the first *Magia naturalis* of 1558 to the expanded *Magiae naturalis libri XX*, the *Phytognomonica*, the *Villae*, the *Della magia naturale* of 1611, expanded with new secrets, and the late *Taumatologia*, reveals neither a fixed doctrine nor a collection of disconnected investigations. It reveals a sustained effort to understand the powers of nature and the conditions under which they become operative. The questions remain recognizably the same across his career: how are the properties of things produced? Under what conditions do they become effective? How can they be known? And what can human artifice do within the operations of nature? The answers, however, are repeatedly reformulated as Della Porta's investigations bring new experiences, sources, and problems into view.

What gives coherence to this long trajectory is therefore neither the preservation of a single explanatory system nor the abandonment of an inherited cosmological order. It is the continuous process through which the investigation of particular things and effects repeatedly reconfigures how nature can be understood. Della Porta does not begin with a completed definition of nature and simply apply it to experience. Rather, his inherited cosmological framework is brought into contact with particular bodies, properties, places, and operations, through which the relations among natural powers, causes, and operations can be rearticulated. As these encounters

generate new explanations, the ways in which natural powers, causes, and operations can be articulated within that order are correspondingly redefined. The history of his natural philosophy is consequently also a history of changing conceptions of nature.

This is the sense in which the history of natural philosophy is also a history of changing forms of intelligibility. What changes is not nature itself, but the idea of nature through which its powers, relations, and operations are made intelligible. Experience transforms knowledge; knowledge, in turn, modifies the ways in which natural causes, properties, and operations can be identified and related within an inherited conception of the natural order. Della Porta's work makes this process particularly visible because he repeatedly returns to natural powers with different questions and explanatory arrangements.

Yet this transformation does not take place in an intellectual vacuum. Della Porta works within an inherited cosmological framework in which nature is conceived as an ordered and intelligible whole, in which things possess determinate powers, relations, and ends, and in which celestial and terrestrial processes are connected through intelligible forms of causation. This framework provides the conditions within which particular phenomena can be investigated and explained. Its fundamental principles do not simply disappear as new phenomena are encountered; rather, their relations, scope, causal position, and conditions of application may be altered in the course of investigation. The cosmological order thus provides continuity without determining in advance how particular phenomena will be situated within it. It is in this changing relation between inherited principles and particular phenomena that the historical process examined here as reinvention becomes visible.

This is particularly important for the principles of *influxus* and *locus*. They are not provisional concepts devised for individual cases, but foundations of Della Porta's cosmology. Celestial influence establishes a general structure of causation, while *locus* helps explain how that causation becomes differentiated in the terrestrial world. The effects of celestial powers depend upon the particular bodies, places, constitutions, and circumstances through which they are received. Universal causation can therefore accommodate singularity without ceasing to be universal. A given stone, plant, place, or arte-

fact does not stand outside the cosmological order; its efficacy is intelligible precisely through its position within that order.

This relational conception of nature also allows Della Porta to connect cosmology with practical investigation. Human artifice can intervene because natural effects depend upon determinate conditions. To know nature is consequently also to identify the conditions under which its powers can be activated, redirected, or reproduced. *Ars* does not constitute a domain opposed to nature. It works from within nature by selecting and arranging its dispositions. This is why the practical activities scattered across Della Porta's writings belong to the same natural philosophy as his cosmological arguments: both concern the determination of what nature can do and under what conditions it can do it.

This also clarifies the place of *experientia*. Experience is not secondary to Della Porta's natural philosophy, but one of the means through which its claims are tested and refined. Observation, comparison, trial, and manipulation provide the singular material through which general claims about nature can be examined, while those observations acquire meaning within an account of causes. His statement that *experientia sine ratione manca est* therefore expresses a practical feature of his natural philosophy: experience and reason belong to the same investigation of nature, operating at different levels of it.

The distinction is important because Della Porta's speculative activity should not be opposed to experimentation as though they belonged to different intellectual programmes. Experimentation is the operational activity of the natural philosopher. The construction of instruments, the manipulation of materials, the cultivation of plants, the testing of effects, and the observation of singular properties are ways of investigating the powers attributed to nature. Their purpose is not simply to accumulate empirical facts, but to determine how particular effects relate to the larger order in which they are situated.

The same historical process can be seen in Della Porta's treatment of the occult. He remains a natural magician because occult qualities remain constitutive of natural magic. His project is therefore not one of progressively abolishing occult causation. At the same time, the occult and the secret are not interchangeable. A secret may be

hidden because its mechanism has not yet been disclosed; an occult virtue may remain occult even when the conditions of its operation have been identified. The disclosure of a secret therefore does not necessarily eliminate the occult character of the power involved. What changes is the degree and kind of explanation that can be given for its efficacy.

Della Porta's relation to inherited knowledge reflects the same dynamic of transformation. His natural philosophy was formed through the appropriation, displacement, and reformulation of concepts drawn from different intellectual traditions. He did not simply transmit an inherited body of knowledge, nor did he reject it in favour of something entirely new. He repeatedly placed established concepts in new configurations and tested their explanatory reach against the particular problems raised by his investigations. His natural magic was therefore constituted through a continuous transformation of inherited knowledge.

This gives a particular significance to the boundaries among natural magic, medicine, agriculture, botany, physiognomy, optics, acoustics, mechanics, and astrology. Della Porta does not simply dissolve these fields into one another. Rather, he repeatedly investigates what can be carried across their boundaries and what happens when a concept or practice is placed in a new context. His natural philosophy is therefore flexible without being formless. Its categories retain their force precisely because they can operate across different domains of inquiry.

Della Porta's natural philosophy can thus be described as elastic. Its elasticity lies not in the instability of its principles, but in the capacity of a relatively stable cosmological structure to assume different configurations when confronted with different bodies, phenomena, forms of experience, and practical operations. The cases examined in this volume have shown how this elasticity operates in practice: Della Porta repeatedly stretches the explanatory reach of inherited principles, extends their applications, and sometimes shifts their internal relations, without abandoning the cosmological order in which they remain grounded. It is this capacity for reconfiguration, without rupture, that makes the process of reinvention traced here possible.

What Della Porta's work ultimately makes visible is not simply that conceptions of nature change over time, but that the ways in which nature can be made intelligible have a history. Nature is neither a product of the natural philosopher nor does the material world change with its interpretations. What becomes historical is rather the conceptual configuration through which its powers, causes, relations, and possibilities are recognised and related to one another. An inherited cosmological order provides the conditions for this intelligibility, but encounters with particular phenomena can alter its internal articulations and redefine what can count, within it, as a natural possibility. Della Porta's work thus reveals the history of natural philosophy as a history of the changing forms through which an inherited cosmological order is made to account for experience, including the human being who, as both an object and an observer of nature, remains part of the same history of reinvention.

BIBLIOGRAPHY

Agrippa, Heinrich Cornelius. *De incertitudine & vanitate scientiarum declamatio invectiva* (N[ovesianus]: 1531).

Agrippa, Heinrich Cornelius. *De occulta philosophia libri tres*, ed. V. Perrone Compagni (Leiden–New York: Brill, 1992).

Agrippa, Cornelius (ps.), *The Fourth Book of Occult Philosophy*, ed. R. Turner (London: John Harrison, 1655).

Albertus Magnus, *Book of Minerals*, trans. D. Wyckoff (Oxford: Clarendon Press, 1967).

Allen, Michael J. B. "Marsilio Ficino: Demonic Mathematics and the Hypothenuses of the Spirit", in *Natural Particulars: Nature and the Disciplines in Renaissance Europe*, ed. A. Grafton and N. Siraisi, 121–137 (Cambridge, MA: MIT Press, 1999).

Aquinas, Thomas, *De operationibus occultis naturae*, trans. J. B. McAllister (Washington, DC: Catholic University of America Press, 1939).

Aristotle. *Metaphysics*. Trans. W. D. Ross (Oxford: Clarendon Press, 1908).

Bacon, Francis. *Sylva Sylvarum*, in *The Works of Francis Bacon*, ed. J. Spedding, R. Leslie Ellis, and D. Denon Heath, vol. 4 (Boston: Houghton, Mifflin and Company, 1900).

Bacon, Roger. *Epistola de secretis operibus artis et naturae* (Paris: Fine, 1542).

Badaloni, Nicola. "I fratelli Della Porta e la cultura magica e astrologica a Napoli nel '500." *Studi storici* 1 (1959–60): 677–715. Reprinted in *Inquietudini e fermenti di libertà nel Rinascimento italiano*, 93–126 (Pisa: ETS, 2004).

Balbiani, Laura. "La ricezione della *Magia Naturalis* di Giovan Battista Della Porta." *Bruniana & Campanelliana* 5 (1999): 277–303.

Balbiani, Laura. *La Magia naturalis di Giovan Battista Della Porta: Lingua, cultura e scienza in Europa all'inizio dell'età moderna* (Bern: Peter Lang, 2001).

Barbierato, Francesco. "La letteratura magica di fronte all'Inquisizione veneziana fra '500 e '700", in *Magia, Alchimia, Scienza dal '400 al '700. L'influenza di Ermete Trismegisto*, ed. C. Gilly and C. van Heertum, 2 vols., vol. I, 135–158 (Florence: Centro Di, 2005).

Beguinot, Augusto. "Di alcuni concetti di geografia botanica nell'opera *Phytognomica* di Giovan Battista Della Porta", *Bullettino della Società Botanica Italiana* 11 (1902): 140–150.

Bellanti, Lucio. *Liber de astrologica veritate contra Johannem Picum Mirandulam* (Florence: Gherardus de Haerlem, 1498).

Belloni Speciale, Gabriella. "Conoscenza magica e ricerca scientifica in G. B. Della Porta", in Giovan Battista Della Porta, *Criptologia*, ed. G. Belloni, 45–101 (Rome: Centro Internazionale di Studi Umanistici, 1982).

Berti, Errico. "La classificazione aristotelica delle scienze in Pietro d'Abano", *Trans/Form/Ação* 37 (2014): 17–32.

Bodin, Jean. *De la démonomanie des sorciers* (Paris: Jacques du Puys, 1580).

Borrelli, Arianna. "Giambattista Della Porta's Construction of Pneumatic Phenomena and his Use of Recipes as Heuristic Tools", *Centaurus* 62 (2020): 406–424.

Borrelli, Arianna. "Aristotelianism, chymistry and mechanics in early seventeenth-century Europe: The techno-magical approach", in *Aristotelianism and Magic in Early Modern Europe: Philosophers, Experimenters and Wonderworkers*, ed. D. Verardi, 145–170 (London: Bloomsbury, 2023).

Boudet, Jean-Patrice. *Entre science et nigromancie. Astrologie, divination et magie dans l'Occident médiéval (XIIe–XVe siècle)* (Paris: Publications de la Sorbonne, 2006).

Boureau, Alain. *Satan hérétique. Naissance de la démonologie dans l'Occident médiéval (1280–1330)* (Paris: Odile Jacob, 2004).

Brach, Jean-Pierre. "Pythagorean Number Mysticism in the Renaissance: An Overview", in *Brill's Companion to the Reception of Pythagoras and Pythagoreanism in the Middle Ages and the Renaissance*, ed. I. Caiazzo, C. Macris, and A. Robert, 457–488 (Leiden and Boston: Brill, 2021).

Capella, Martianus. *De nuptiis Philologiae et Mercurii: et de septem artibus liberalibus libri IX*. Ed. U. F. Kopp (Frankfurt am Main: F. Varrentrapp, 1836).

Cardano, Girolamo. *De subtilitate libri XXI* (Lyon: Étienne Michel, 1580).

Cardano, Girolamo. *Hieronymi Cardani De subtilitate libri XXI* (Basel: Sebastian Henricpetri, 1582).

Cicero, Marcus Tullius. *De natura deorum libri tres*, with commentary by G. F. Schoemann, ed. A. Stickney (Boston: Ginn & Heath, 1881).

Copenhaver, Brian P. "Scholastic Philosophy and Renaissance Magic in the *De vita* of Marsilio Ficino", *Renaissance Quarterly* 37 (1984): 523–554.

Copenhaver, Brian P. "The Occultist Tradition and Its Critics." In *The Cambridge History of Seventeenth-Century Philosophy*, vol. I, 454–512 (Cambridge: Cambridge University Press, 1998).

Copenhaver, Brian P. *Magic in Western Culture: From Antiquity to the Enlightenment* (Cambridge: Cambridge University Press, 2015).

Corsini, Matteo, *Rosaio de la Vita*, ed. F. L. Polidori (Florence: Società Poligrafica Italiana, 1845).

Culianu, Ioan Petru. *Eros et Magie à la Renaissance* (Paris: Flammarion, 1984).

Cypess, Rebecca. "Giovanni Battista Della Porta's Experiments with Musical Instruments", *Journal of Musicological Research* 35, 3 (2016): 159–175.

Cypess, Rebecca. "Sound and Chaos in Della Porta's Natural Magic", in *Hunting Secrets: Giovan Battista Della Porta and the Invention of Experimental Magic*, ed. D. Verardi, 97–113 (Florence: Firenze University Press, 2025).

Dagron, Tristan. "La doctrine des qualités occultes dans le *De incantationibus* de Pomponazzi", *Revue de métaphysique et de morale* 49 (2006): 3–20.

Daston, Lorraine, and Katharine Park. *Wonders and the Order of Nature, 1150–1750* (New York: Zone Books, 1998).

Daston, Lorraine. "The Nature of Nature in Early Modern Europe", *Configurations* 6 (1998): 149–172.

Daston, Lorraine. "The Language of Strange Facts in Early Modern Science", in *Inscribing Science: Scientific Texts and the Materiality of Communication*, ed. T. Lenoir, 20–38. (Stanford: Stanford University Press, 1998).

De Vivo, Raffaella. "Introduzione", in Claudius Ptolemy, *Claudii Ptolomaei Magnae Constructionis liber primus, Io Bapt. Porta interprete*, ed. R. De Vivo (Naples: Edizioni Scientifiche Italiane, 2000).

Del Rio, Martin. *Investigation into Magic*, ed. P. G. Maxwell-Stuart (Manchester: Manchester University Press, 2009).

Della Porta, Giovan Battista. *Magiae naturalis sive de miraculis rerum naturalium libri IV* (Naples: Matthias Cancer, 1558).

Della Porta, Giovan Battista. *Dei miracoli et maravigliosi effetti dalla natura prodotti* (Venice: Lodovico Avanzi, 1560).

Della Porta, Giovan Battista. *Phytognomonica, […] octo libris contenta* (Naples: Horatius Salvianus, 1588).

Della Porta, Giovan Battista. *Magiae naturalis libri XX* (Naples: Horatium Salvianum, 1589).

Della Porta, Giovan Battista. *Villae […] libri XII*. (Frankfurt: 1592).

Della Porta, Giovan Battista. *Della magia naturale, libri XX, tradotti da Latino in Volgare, e dall'istesso autore accresciuti sotto nome di Gio de Rosa* (Naples: Carlino & Vitale, 1611).

Della Porta, Giovan Battista. *Della Chirofisionomia overo di quella parte della humana fisionomia, che si apprende alla mano libri due*. Trans. from the Latin manuscript by Pompeo Sarnelli (Naples: Antonio Bulifon, 1677).

Della Porta, Giovan Battista. *Coelestis physiognomonia*, ed. A. Paolella (Naples: Edizioni Scientifiche Italiane, 1996).

Della Porta, Giovan Battista. *De aeris transmutationibus*, ed. A. Paolella (Naples: Edizioni Scientifiche Italiane, 2000).

Della Porta, Giovan Battista. *De ea naturalis physiognomoniae parte quae ad manuum lineas spectat libri duo*, with *Chirophysionomia* in the appendix, ed. O. Trabucco (Naples: Edizioni Scientifiche Italiane, 2003).

Della Porta, Giovan Battista. *Pneumaticorum libri tres*, ed. O. Trabucco (Naples: Edizioni Scientifiche Italiane, 2008).

Della Porta, Giovan Battista. *De humana physiognomonia libri sex*, ed. A. Paolella. Vol. 1. (Naples: Edizioni Scientifiche Italiane, 2011).

Della Porta, Giovan Battista. *Taumatologia e Criptologia*, ed. R. Sirri (Naples: Edizioni Scientifiche Italiane, 2013).

Eamon, William. *Science and the Secrets of Nature: Books of Secrets in Medieval and Early Modern Culture* (Princeton: Princeton University Press, 1994).

Eamon, William. "A Theater of Experiments: Giambattista Della Porta and the Scientific Culture of Renaissance Naples", in *The Optics of Giambattista Della Porta (ca. 1535–1615): A Reassessment*, ed. A. Borrelli, G. Hon, and Y. Zik, 11–38 (Cham: Springer, 2017).

Eamon, William. "Making and Unmaking Marvels in Early Modern Europe", in *Aristotelianism and Magic in Early Modern Europe*, 83–104.

Evoli, C. *De causis anthipathiae et simpathiae rerum naturalium* (Venice: 1480).

Federici Vescovini, Graziella. *Astrologia e scienza: La crisi dell'aristotelismo sul cadere del Trecento e Biagio Pelacani da Parma* (Florence: E. Vallecchi, 1979).

Federici Vescovini, Graziella. "L'importanza della matematica, tra aristotelismo e scienze moderne in alcuni filosofi padovani della fine del secolo XIV", in *Aristotelismo veneto e scienza moderna*, ed. L. Olivieri, 2 vols., vol. 2, 661–684 (Padua: Antenore, 1983).

Federici Vescovini, Graziella. "Su alcune testimonianze dell'influenza di Alberto Magno come 'metafisico,' 'scienziato' e 'astrologo' nella filosofia padovana al cadere del secolo XIV: Angelo da Fossombrone e Biagio Pelacani da Parma", in *Albert der Grosse: Seine Zeit, sein Werk, seine Wirkung*, ed. A. Zimmermann and G. Vuillemin-Diem, 155–176. *Miscellanea Mediaevalia* 14 (Berlin: 1981).

Federici Vescovini, Graziella. "Note di commento a alcuni passi del 'Libro di pittura.' L'astrologia che nulla fa senza la prospettiva", in *Leonardo e Pico. Analogie, contatti, confronti*, ed. F. Frosini, 99–129 (Florence: Leo S. Olschki, 2005).

Federici Vescovini, Graziella. "L'ottica italiana nel XVI secolo: Francesco Maurolico e Giambattista Della Porta", in *Storia della scienza*, vol. 3, *La civiltà islamica*, 700–701 (Rome: Istituto della Enciclopedia Italiana, 2002).

Federici Vescovini, Graziella. *I sistemi del mondo. Il cammino dell'astrologia da Tolomeo a Copernico* (Lugano: Agorà, 2018).

Ficino, Marsilio. *De Christiana religione* (Florence: Niccolò di Lorenzo, 1476).

Ficino, Marsilio. *Theologia Platonica* (Paris: apud Aegidium Gorbinum, 1559).

Ficino, Marsilio. *Three Books on Life: A Critical Edition and Translation*. Ed. and trans. C. V. Kaske and J. R. Clark (Binghamton, NY: Medieval & Renaissance Texts & Studies, 1989).

Fracastoro, Girolamo. *De sympathia et antipathia rerum*, ed. C. Pennuto (Rome: Edizioni di Storia e Letteratura, 2008).

Fulco, Giuseppe. "Per il 'Museo' dei fratelli Della Porta", in *Rinascimento meridionale e altri studi, in onore di M. Santoro*, ed. M. C. Cafisse, F. D'Episcopo, V. Dolla, T. Fiorino, and L. Miele, 105–175 (Naples: SEN, 1987).

Gabrieli, Giuseppe. "Giovan Battista Della Porta Linceo", *Giornale critico della filosofia italiana* 8 (1927): 360–397, 423–431. Reprinted in *Contributi alla storia dell'Accademia dei Lincei*, 2 vols. (Rome: Accademia Nazionale dei Lincei, 1989).

Garin, Eugenio. "Prefazione", in *Giovan Battista Della Porta nell'Europa del suo tempo*, ed. M. Torrini, 7–10 (Naples: Guida, 1990).

Gilbert, William. *De magnete* (Sedini: Typis Götzianis, 1633).

Gouk, Penelope. *Music, Science and Natural Magic in Seventeenth-Century England* (New Haven–London: Yale University Press, 1999).

Gozza, Paolo. "La musica nella filosofia naturale del Seicento in Italia", *Nuncius* 1, 2 (1986): 13–47.

Gozza, Paolo, ed. *La musica nella rivoluzione scientifica del Seicento* (Bologna: Il Mulino, 1989).

Grafton, Anthony. *Magic and Technology in Early Modern Europe* (Washington, DC: Smithsonian Institution Press, 2005).

Grant, Edward, *A History of Natural Philosophy: From the Ancient World to the Nineteenth Century* (Cambridge: Cambridge University Press, 2007).

Hankins, Thomas L., and Robert J. Silverman. *Instruments and the Imagination* (Princeton: Princeton University Press, 1995).

Henry, John. "The Fragmentation of Renaissance Occultism and the Decline of Magic", *History of Science* 46, 151 (2008): 1–48.

Henry, John. "Occult Qualities and the Experimental Philosophy: Active Principles in Pre-Newtonian Matter Theory", *History of Science* 24, 4 (1986): 335–381.

Hutchison, Karin. "What Happened to Occult Qualities in the Scientific Revolution?", *Isis* 73, 2 (1982): 233–253.

Institoris, Heinrich, and Sprenger, Jacob. *Malleus maleficarum*, ed. and trans. C. S. Mackay. 2 vols. (Cambridge: Cambridge University Press, 2006).

Iamblichus. *De mysteriis Aegyptiorum* (Venice: 1497).

Jalobeanu, Dana. *The Art of Natural History: Francis Bacon in Context* (Bucharest: Zeta Books, 2015).

Kang, Minsoo. *Sublime Dreams of Living Machines: The Automaton in the European Imagination* (Cambridge, MA: Harvard University Press, 2011).

Klein, Robert. *La Forme et l'Intelligible* (Paris: Gallimard, 1970).

Kircher, Athanasius. *Musurgia universalis, sive Ars magna consoni et dissoni in X libros digesta*. Vol. 2. (Rome: Typis Ludovici Grignani, 1650).

Kodera, Sergius. "Giambattista Della Porta's Histrionic Science", *California Italian Studies* 3 (2012): 1–27.

Kodera, Sergius. "The Laboratory as Stage: Giovan Battista della Porta's Experiments", *Journal of Early Modern Studies* 3, 1 (2014): 15–38.

Laserra, Luigia. "Disiecta membra colligere: chirurgia testuale della *Villa*", in *Giambattista Della Porta in Edizione Nazionale*, ed. R. Sirri, 71–79 (Naples: Istituto Italiano per gli Studi Filosofici, 2007).

Leonardi, Camillo. *Speculum lapidum* (Venice: Giovanni Battista Sessa, 1502).

Longo, Giovanni Battista. *Lettera dell'11. VIII. 1635*, in Giuseppe Gabrieli, "Giovan Battista Della Porta Linceo", *Giornale critico della filosofia italiana* 8 (1927): 360–397, 423–431.

Lomazzo, Giovanni Paolo. *Trattato dell'Arte della Pittura* (Milan: Paolo Gottardo Pontio, Pietro Tini, 1585).

Lomazzo, Giovanni Paolo. *Idea del tempio della pittura* (Milan: Paolo Gottardo Pontio, 1590).

Lull, Ramon. *Tractatus novus de astronomia*, in *Corpus Christianorum. Continuatio Mediaevalis*, vol. 79, ed. M. Pereira and T. Pindl-Büchel (Turnhout: Brepols, 1989).

Martin, Craig. "The Aeolipile as Experimental Model in Early Modern Natural Philosophy", *Perspectives on Science* 24, 3 (2016): 264–284.

Matteacci, Pietro. *Dell'origine del mondo, cioè de principi delle cose* (Venice: Giunti, 1639).

Mattioli, Pietro Andrea. *I discorsi di M. Pietro Andrea Matthioli … ne i sei libri di Pedacio Dioscoride Anazarbeo della materia medicinale* (Venice: Vincenzo Valgrisi, 1563).

Mercati, Michele. *Metallotheca vaticana* (Rome: ex Officina Jo. Mariae Salvioni, 1717).

Merula, Gaudenzio. *Nuova selva di varia lettione … divisa in sei libri* (Venice: Giovanni Andrea Valvassori detto Guadagnino, 1562).

Moyer, Ann E. *Musica Scientia: Musical Scholarship in the Italian Renaissance* (Ithaca, NY: Cornell University Press, 1992).

Müller-Lahncke, W. D. "Die *Phytognomonica* Giovan Battista Della Porta als medizinische Signaturenlehre", in *Giovan Battista Della Porta nell'Europa del suo tempo*, 93–99.

Muraro, Luisa. *Giambattista Della Porta mago e scienziato* (Milan: Feltrinelli, 1978).

Napolitani, Pier Daniele. "La matematica nell'opera di Della Porta", in *Giovan Battista Della Porta nell'Europa del suo tempo*, 114–166.

Newman, William R. *Promethean Ambitions: Alchemy and the Quest to Perfect Nature* (Chicago: University of Chicago Press, 2004).

Orpheus. *De lapidibus*. Trans. Hannardo Gamerio (Liège: 1578).

Palisca, Claude V. *The Florentine Camerata: Documentary Studies and Translations* (New Haven–London: Yale University Press, 1989).

Panti, Cecilia. *Filosofia della musica: Tarda antichità e Medioevo* (Rome: Carocci, 2008).

Paravicini-Bagliani, Agostino. *Le Speculum astronomiae. Une énigme? Enquête sur les manuscrits* (Florence: SISMEL–Edizioni del Galluzzo, 2001).

Pennuto, Concetta. "Giovan Battista Della Porta e l'efficacia terapeutica della musica", in *Music and Esotericism*, ed. L. Wuidar, 109–127 (Leiden–Boston: Brill, 2010).

Perrone Compagni, Vittoria. "'Dispersa Intentio': Alchemy, Magic and Scepticism in Agrippa", *Early Science and Medicine* 5, 2 (2000): 160–177.

Perrone Compagni, Vittoria. "Circe, la 'virtus loci' e il determinismo nel *De incantationibus* di Pomponazzi." *Annali del Dipartimento di Filosofia (Nuova Serie)* 12 (2006): 5–32.

Perrone Compagni, Vittoria. "Il *De occulta philosophia* di Agrippa. Parole chiave: uomo microcosmo, 'prisca theologia', cabala, magia", *Bruniana & Campanelliana* 13 (2007): 429–448.

Perrone Compagni, Vittoria. "Natura maga. Il concetto di natura nella discussione rinascimentale sulla magia", in *Natura. XII Colloquio Internazionale*, ed. D. Giovannozzi and M. Veneziani, 243–267. (Florence: Olschki, 2008).

Perrone Compagni, Vittoria. "Le immagini del medico Gerolamo Torella", *Annali dell'Istituto di Filosofia dell'Università di Firenze, Facoltà di Lettere e Filosofia* 1 (1979): 17–45.

Pico della Mirandola, Gianfrancesco. *De rerum praenotione* (Strasbourg: Ioannes Knoblochus, 1507).

Pico della Mirandola, Giovanni. *Disputationes adversus astrologiam divinatricem*, ed. E. Garin (Turin: Nino Aragno, 2004).

Pirovano, Gabriele. *Defensio astronomiae habita per clarissimum philosophum Gabrielem Pirovanum patritium mediolanesem* (Milan: Alexandro Minutio, 1507).

Pirovano, Gabriele. *De astronomiae veritate* (Basel: Jakob Parcus, 1554).

Poma, Roberto. *Magie et guérison: La rationalité de la médecine magique (XVIe–XVIIe siècles)* (France: Orizons, 2009).

Plotinus. *De rebus philosophicis libri LIIII in Enneades sex distributi*. Translated from Greek into Latin and commented by Marsilio Ficino (Salingiacum: Ioannes Soter, 1540).

Pomponazzi, Pietro, *De incantationibus*, ed. V. Perrone Compagni (Florence: Olschki, 2011).

Pontano, Giovanni. *De rebus coelestibus libri XIIII* (Basel: Andreas Cratander, 1530).

Pontano, Giovanni. *Iovani Pontani Commentariorum in Centum Claudij Ptolemaei sententias, libri duo* (Basel: Andreas Cratander, 1531).

Pontano, Giovanni. *La fortuna*, ed. F. Tateo (Naples: La Scuola di Pitagora, 2012).

Pseudo-Aristotle. *Secretum secretorum Aristotelis ad Alexandrum Magnum*, ed. F. Storella (Naples: Matthias Cancer, 1555).

Pseudo-Ptolemy. *Centiloquium cum commento Hali*. Trans. Plato of Tivoli (Venice: 1484).

Pseudo-Ptolemy. *Quadripartitum* (Venice: 1493).

Ptolemy, Claudius. *Tetrabiblos*, ed. and trans. F. E. Robbins (Cambridge, MA: Harvard University Press, 1948).

Quattrami, Evangelista. *La vera dichiaratione di tutte le metafore, similitudini et enimmi de gl'antichi filosofi alchimisti. Ove con un breve discorso della generatione de i metalli etc.* (Rome: Vincenzo Accolti, 1587).

Rāzī. *De aluminibus et salibus*, in Michela Pereira, ed., *Alchimia*, 295–296 (Milan: Arnoldo Mondadori Editore, 2006).

Rioult, Thibaut. "The Secrets of Illusionism in Della Porta's *Natural Magic*: Between Science, Mannerism and Magical Traditions", in *Hunting* Secrets, 71–95.

Robichaud, Denis J.-J. "Ficino on Force, Magic, and Prayers: Neoplatonic and Hermetic Influences in Ficino's *Three Books on Life*", *Renaissance Quarterly* 70, 1 (2017): 44–87.

Roy, Bruno. "Richard de Fournival, auteur du *Speculum astronomiae*?", *Archives d'histoire doctrinale et littéraire du Moyen Âge* 67 (2000): 159–180.

Rusu, Doina-Cristina, and Dana Jalobeanu, ed. "The Creative Power of Experimentation: Bacon and Della Porta", *Centaurus* 62, 3 (2020): 381–464.

Saiber, Arielle. "Flexilinear Language: Della Porta's *Elementorum curvilineorum libri tres*", *Annali d'italianistica* 23 (2005): 89–104.

Scaliger, Giulio Cesare. *Exotericarum Exercitationum lib. XV, De Subtilitate ad Hieronymum Cardanum* (Frankfurt: Impensis Claudii Marnii haeredum, Ioannis & Andreae Marnii & consortum, 1612). First edition 1576.

Speculum astronomiae. Critical ed. P. Zambelli, S. Caroti, M. Pereira, and S. Zamboni (Pisa: Domus Galileana, 1977).

Smith, Pamela H. *The Body of the Artisan: Art and Experience in the Scientific Revolution* (Chicago: University of Chicago Press, 2004).

Tarrant, Neil. *Defining Nature's Limits. The Roman Inquisition and the Boundaries of Science* (Chicago–London: University of Chicago Press, 2022).

Tomlinson, Gary. *Music in Renaissance Magic: Toward a Historiography of Others* (Chicago-London: University of Chicago Press, 1994).

Torella, Jerome (Gerolamo). *Opus praeclarum de imaginibus astrologicis*, ed. N. Weill-Parot. *Micrologus* (Florence: SISMEL, 2008).

Tostado, Alonso. *Commentaria in numeros*, vol. 2 (Venice: Sessa, 1596).

Toussaint, Stéphane. "Ficino's Orphic Magic or Jewish Astrology and Oriental Philosophy?", *Accademia* 2 (2000): 19–32.

Toussaint, Stéphane. *L'ars de Marsile Ficin, entre esthétique et magie*. In *L'art de la Renaissance, entre science et magie*, ed. P. Morel, 453–467. (Paris: Somogy éditions d'art, 2006).

Toussaint, Stéphane. "Plotin, Ficin et la Sympathie. ὅσον τὸ συμπαθές (Enn. IV, 4 [28], 41)", *Accademia* 17 (2015): 123–131.

Trabucco, Oreste. "Il corpus fisiognomico dellaportiano tra censura ed autocensura", *Rinascimento* 43 (2003): 569–599.

Trabucco, Oreste. *L'opere stupende delle arti più ingegnose. La recezione degli Πνευματικά [Pneumatikà] di Erone Alessandrino nella cultura italiana del Cinquecento* (Florence: Olschki, 2010).

Truitt, Elly. *Medieval Robots: Mechanism, Magic, Nature, and Art* (Philadelphia: University of Pennsylvania Press, 2015).

Valente, Michaela. *Bodin in Italia: La "Démonomanie des sorciers" e le vicende della sua traduzione* (Florence: Centro Editoriale Toscano, 1999).

Valente, Michaela. "Della Porta e l'Inquisizione. Nuovi documenti dell'Archivio del Santo Uffizio", *Bruniana & Campanelliana* 5 (1999): 415–434.

Valente, Michaela. "Il fascino della finta et imaginaria scientia. Nuovi documenti su Giovan Vincenzo della Porta", *Annali dell'Orientale* (2018): 175–185.

Van Dyck, Maarten, and Koen Vermeir. "Varieties of Wonder: John Wilkins' Mathematical Magic and the Perpetuity of Invention", *Historia Mathematica* 41, 4 (2014): 463–489.

Vasoli, Cesare. "Ficino, la profezia e i sogni, tra gli angeli e i demoni", *La parola del testo* 3 (1999): 147–163.

Verardi, Donato. "Della Porta e le 'immagini astrologiche'", *Bruniana & Campanelliana* 21, 1 (2015): 143–154.

Verardi, Donato. "L'occulte en Italie entre astrologie, athéisme et nigromancie (XIV–XVII siècle). Éléments de réflexion", *Cahiers de recherches médiévales et humanistes / Journal of Medieval and Humanistic Studies* 33 (2017): 419–434.

Verardi, Donato. "Les enseignements sur l'astrologie d'Augustin d'Hippone et Thomas d'Aquin selon la *Coeli et terrae* de Sixte V", *Revue des Sciences philosophiques et théologiques* 101, 1 (2017): 125–133.

Verardi, Donato. *Logica e magia. Giovan Battista Della Porta e i segreti della natura* (Lugano: Agorà, 2017).

Verardi, Donato. *Arti magiche e arti liberali nel Rinascimento. Da Ariosto a Della Porta* (Lugano: Agorà, 2018).

Verardi, Donato. *La scienza e i segreti della natura a Napoli nel Rinascimento. La magia naturale di Giovan Battista Della Porta* (Florence: Firenze University Press, 2018).

Verardi, Donato. "Art and Magic of Animated Statues: The Secret Virtues of Albertus Magnus' Talking Head in Giambattista Della Porta's *Natural Magick*", in *Magical Materials in Renaissance Philosophy, Literature, and Art*, ed. R. Compton and D. Verardi, 83–106 (Lugano: Agorà & Co., 2022).

Verardi, Donato, ed. *Aristotelianism and Magic in Early Modern Europe* (London: Bloomsbury 2023).

Verardi, Donato, ed. *Hunting Secrets: Giovan Battista Della Porta and the Invention of Experimental Magic* (Florence: Firenze University Press, 2025).

Verardi, Donato. "Aristotelianism and Hermeticism in Renaissance Naples: Francesco Storella and the Secrets of Alchemy", *Ambix* 73, 1 (2026): 3–24.

Vitruvius. *The Architecture of Marcus Vitruvius Pollio in Ten Books*. (London: Lockwood, 1874).

Voss, Angela. "Marsilio Ficino, the Second Orpheus", in *Music as Medicine*, ed. P. Horden, 154–172 (London–New York: Routledge, 2000).

Walch, Johannes. *Decas fabularum humani generis sortem* (Argentorati: sumptibus Lazari Zetzneri, 1609).

Walker, Daniel Pickering. *Spiritual and Demonic Magic: From Ficino to Campanella* (London: Warburg Institute, 1958).

Wang, X. *Handling "Occult Qualities" in the Scientific Revolution: Disciplines and New Approaches to Natural Philosophy, from John Dee to Isaac Newton* (Leiden: Brill, 2023).

Weill-Parot, Nicolas. "Causalité astrale et 'science des images' au Moyen Âge. Élément de réflexion", *Revue d'Histoire des Sciences* 52, 2 (1999): 207–240.

Weill-Parot, Nicolas. *Les 'Images astrologiques' au Moyen Age et à la Renaissance. Spéculations intellectuelles et pratiques magiques (XIIe–XVe siècle)* (Paris: Honoré Champion, 2002).

Weill-Parot, Nicolas. "Le 'immagini astrologiche'", in *Il linguaggio dei cieli: Astri e simboli nel Rinascimento*, 241–254 (Rome: Carocci, 2012).

Weill-Parot, Nicolas. "Les images corporéiformes du *Picatrix* et la magie astrale occidentale." In *Images et magie. Picatrix entre Orient et Occident*,

ed. A. Caiozzo, J.P. Boudet, and N. Weill-Parot, 117–136 (Paris: Honoré Champion, 2011).

Weill-Parot, Nicolas. *Le Vol dans les airs au Moyen Âge: Essai historique sur une utopie scientifique* (Paris: Les Belles Lettres, 2020).

Wilkins, John. *Mathematicall Magick, or, The Wonders That May Be Performed by Mechanical Geometry* (London: printed by M. F. for Sa. Gellibrand, 1648).

Yates, Frances A. *Giordano Bruno and the Hermetic Tradition* (Chicago: University of Chicago Press, 1964).

Yates, Frances A. *The French Academies of the Sixteenth Century*. (London: Warburg Institute, 1947). Reprint, (New York: Routledge, 1988).

Zambelli, Paola. *The Speculum Astronomiae and Its Enigma: Astronomy, Theology and Science in Albertus Magnus and His Contemporaries* (Dordrecht: Kluwer Academic Publishers, 1992).

Zambelli, Paola. *White Magic, Black Magic in the European Renaissance* (Leiden–Boston: Brill, 2007).

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