

DANTE'S WORLD  
BETWEEN SCIENCE  
AND POETRY



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DEGLI UFFIZI

# From Hell to the Empyrean

Dante's World  
between Science and Poetry

edited by  
Filippo Camerota

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## From Hell to the Emyrean: Dante's World between Science and Poetry

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in collaboration with the  
Uffizi Galleries



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Department: Jacopo Tonini  
(*coordinator*), Luisa Barattin,  
Daniela Vespoli, *in collaboration*  
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*Interactive Video Installations*  
camerAnebbia *with* Licia Buttà

*Website*  
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Massaini, Maurizio Sanesi

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Susanna Cimmino, Francesca  
Fares, Silvia Paoli, Adele Pocchi

*Bibliographical Research*  
Museo Galileo: Sara Bonechi

*Photographic Archive*  
Museo Galileo:  
Sabina Bernacchini

### Exhibition Design

Filippo Camerota, *in collaboration*  
*with* Opera Laboratori

*Graphic Design*  
RovaiWeber design

*Exhibition Construction*  
Design and set up laboratory,  
Upholstery and textile  
restoration laboratory, and  
Carpentry laboratory:  
Opera Laboratori

*Models and Replicas*  
*Concept*  
Filippo Camerota  
*Production*  
Props department:  
Opera Laboratori

*Exhibition Production  
Management*  
Opera Laboratori

*Exhibition Communication*  
Opera Laboratori

*Coordination, Promotion, and  
External Relations*  
Mariella Becherini  
*Press Office*  
Andrea Acampa

*Translation  
of Exhibition Panels*  
Jonathan Mandelbaum

*Lenders*  
Florence, Biblioteca  
dell'Accademia della Crusca  
Florence, Biblioteca  
Marucelliana  
Florence, Biblioteca Medicea  
Laurenziana  
Florence, Biblioteca Nazionale  
Centrale  
Florence, Biblioteca Riccardiana  
Florence, Gallerie degli Uffizi,  
Gabinetto dei Disegni e delle  
Stampe  
Florence, I Tatti - The Harvard  
University Center for Italian  
Renaissance Studies, Berenson  
Library  
Florence, Museo Galileo -  
Istituto e Museo di Storia della  
Scienza  
Modena, Private Collection  
Siena, Biblioteca Comunale degli  
Intronati

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are from the translations by  
Richard Lansing and Mark Musa  
respectively, available on the  
Princeton Dante Project  
(<https://dante.princeton.edu/>).

### Catalogue

*Edited by*  
Filippo Camerota

*Cover by*  
RovaiWeber design

*Essay Authors*  
Antonio Becchi  
Andrea Bernardoni  
Armando Bisogno  
Piero Boitani  
Filippo Camerota  
Stefano Caroti  
Angelo Cattaneo  
Giulio D'Onofrio  
Natacha Fabbri  
Marcello Fagiolo  
Raffaella Franci  
Simon Gilson  
Martin Kemp  
Domenico Laurenza  
Paola Manni  
Annibale Mottana  
Lino Pertile  
Riccardo Pratesi  
Alessandro Scafi  
Giorgio Strano

*Catalogue Entry Authors*  
A.B. = Andrea Bernardoni  
E.B. = Erik Boni  
F.C. = Filippo Camerota  
A.C. = Angelo Cattaneo  
N.F. = Natacha Fabbri  
D.F. = Donatella Fratini  
F.G. = Francesca Gallori  
M.M. = Michaelangiola  
Marchiaro  
E.P. = Elisa Paggetti  
D.S. = David Speranzi  
G.S. = Giorgio Strano  
M.T.C. = Matteo Tora Cellini  
F.T. = Francesca Tropea

*English Translations*  
Matthew Coneys, Thomas  
Haskell Simpson, Jonathan  
Mandelbaum, Oonagh Stransky,  
Elisabetta Tarantino

Opera di Santa Maria del Fiore:  
Luca Bagnoli, Lorenzo Luchetti,  
Rita Filardi  
The British Library: Andrea  
Clarke, Kathleen Doyle

### s i l l a b e

*Editorial Management*  
Renzo Ruggeri  
*Editing*  
Giulia Bastianelli  
*Coordination  
& Graphic Design*  
Laura Belforte  
*Iconographic Research*  
Sabrina Braccini  
*Image Control*  
Saimon Toncelli  
*Editorial Coordination*  
Giulia Perni

### Acknowledgments

Accademia della Crusca: Claudio  
Marazzini, Giuseppe Abbatista,  
Delia Ragionieri

ASI-Agenzia Spaziale Italiana:  
Stefania Arena, Fiorella Coliolo,  
Vittorio Cotronei, Fabrizio  
Zucchini

Biblioteca Comunale degli  
Intronati: Annalisa Pezzo,  
Rossella De Piero

Biblioteca Medicea Laurenziana:  
Maria Paola Bellini

Biblioteca Nazionale Centrale di  
Firenze: Luca Bellingeri, Roberta  
Masini

Biblioteca Riccardiana:  
Francesca Gallori

Franco Cosimo Panini Editore:  
Lucia Panini

Gabinetto dei Disegni e delle  
Stampe degli Uffizi: Laura  
Donati

Infiniti.to Planetario di Torino.  
Museo dell'astronomia e dello  
spazio: Emanuele Balboni,  
Marco Brusa, Eleonora Monge,  
Simona Romaniello

I Tatti: Alina Payne

Museo Galileo: Elisa Bonaiuti,  
Elena Fani, Giulia Fiorenzoli,  
Alessandra Lenzi, Elena Montali,  
Sofia Sasopoulou

Opera di Santa Maria del Fiore:  
Luca Bagnoli, Lorenzo Luchetti,  
Rita Filardi

The British Library: Andrea  
Clarke, Kathleen Doyle

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# DANTE IN SPACE

Eike D. Schmidt

Director of the Uffizi Galleries

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The Uffizi Galleries have commemorated the 700<sup>th</sup> anniversary of Dante Alighieri's death with a substantial number of special events both in house and externally in an effort to allow as many sites associated with Dante as possible to take part. On January 1 we rang in the New Year with the on-line publication on our website of the cycle of 88 drawings that comprise Federico Zuccari's *Dante historiato* with comments and transcriptions by Donatella Fratini. The publication is freely available for consultation worldwide (and in the course of the year the drawings have also been published both in paperback form in the Biblioteca Univesale Rizzoli collection and in a luxury edition published by Arti Grafiche Boccia in Salerno). We celebrated *Danteday* with the first *Lectio Dantis* in the Auditorium Vasari, held by Paolo Procaccioli on the theme "For Dante and for Florence, Literary and artistic programmes in the 15<sup>th</sup> and 16<sup>th</sup> centuries", while barely a month later, on 30 April, a major exhibition opened in Forlì entitled *Dante. The Vision of Art* organized in conjunction with the city's Fondazione Cassa di Risparmio, exploring for the very first time the visual fortunes of the poet and of his compositions from his own day down to the early 20<sup>th</sup> century. A few days later and only a few miles away, the church of San Romualdo in Ravenna saw the opening of another exhibition, entitled *The Arts in the Time of Exile* exploring relations between Dante and Giotto, with several major loans from the Uffizi. When the exhibition in Forlì wound up, some of the more significant works of art from it were moved to two sites with a

strong Dante connection in the context of a joint initiative involving the Uffizi and the Fondazione Cassa di Risparmio di Firenze, entitled "Lands of the Uffizi". The initiative kicked off this year with Andrea del Castagno's detached fresco of a larger-than-life-size full-figure portrait of Dante, recently restored by the Opificio delle Pietre Dure, which became the event of the year in San Godenzo—in fact in the tiny neighboring village known as Castagno d'Andrea, where the artist was born—while for the whole of the autumn and winter the Castle of the Conti Guidi in Poppi will be hosting an overview focusing on the *Divine Comedy* including, among other things, a recent Uffizi purchase by Nicola Monti entitled *Francesca da Rimini in Dante's Inferno* (1810). The museum has also made important contributions to exhibitions on Dante at the Galleria d'Arte Moderna Achille Forti in Verona (*From Dante to Shakespeare. The Myth of Verona*), at the Scuderie del Quirinale in Rome (*Inferno*) and at the Museo Nazionale del Bargello in Florence (*The Wonderful Vision. Dante and the Divine Comedy in Symbolist imagery*).

Another high point in the Uffizi's Dante program was a live performance entitled *Between Wood and Stars* directed by Riccardo Massai, a theatrical journey in the Boboli Garden on 6 September retracing Dante's topography of the afterlife in 36 stages with 77 actors, with over 1,000 ambulating spectators watching "tableaux" staged throughout the afternoon. Two weeks after this fully-fledged epic show, the Sala Bianca in the Palazzo Pitti hosted a small play with

only two actors, entitled "*Fleeing the Unjust Pitch. A Debate of Two Exiles*" by Fausto Giunti, in which Dante debated with Bettino Craxi. Also in September the Uffizi Galleries installed a permanent presence in the "House of Dante" with a gallery containing works on themes relating to Dante on medium- and long-term loan from Florence. One of the key events in this galaxy of initiatives associated with Dante is the recent purchase at auction—and subsequent donation to the museum—by the Friends of the Uffizi Galleries of a large painting by Fra Arsenio Mascagni portraying *Count Ugolino* (1611), the earliest painted depiction of this famous subject and at the same time a key work of early 17<sup>th</sup>-century Florentine naturalism. The painting is currently on display in the Room of the Niobids.

We are now winding up Dante year with an exhibition entitled *From Hell to the Empyrean. Dante's World between Science and Poetry*, which we are presenting at the Palazzo Pitti in conjunction with the Museo Galileo for the Christmas festivities and which is due to run until spring next year. This is our third joint venture with our neighbor museum exploring the history of the physical and mathematical sciences after *Water, the Microscope of Nature. Leonardo da Vinci's Codex Leicester* (October 30, 2018 - January 20, 2019), which opened the celebrations commemorating the 500<sup>th</sup> anniversary of Leonardo da Vinci's death and which drew 382,576 visitors, and the *Art of Building a Masterpiece. Trajan's Column* (June 21

- October 6, 2019) which drew fully 428,152 visitors.

Among the various facets of science of which we find traces in Dante's poetry, cosmography—particularly his richly detailed and imaginative onto-geometrical structures in the afterlife—is unquestionably the one with the greatest relevance to our own day, when we are surprised almost yearly by new discoveries and new theories on the conformation, genesis and fate of the infinite universe surrounding our small and fragile planet that regularly question what we have always taken hitherto as a certainty. In a present that has recently learnt that our galaxies revolve around gigantic black holes—what else but the implementation of the mystical medieval concept of the *ipèrphotos gnóphos*?—Dante's reconstructions and visions of the structure of the world outside and beyond our living experience can provide scientists with important cues as they search for (often visual) metaphors to describe phenomena outside and distant from the perception of our senses. The rich graphic material in our Cabinet of Prints and Drawings, which joins the splendid codices generously lent by Florentine libraries to form the backbone of the exhibition, also illustrates the way in which artists of the past sought to translate Dante's vision into visual (and often magnificently abstract) forms. Who can say, as we tackle the cosmic imagery in the *Divine Comedy*, but that Dante the astronaut, between Alexander the Great and Jean-Luc Picard, may not point us down the path leading to Paradise?

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Trailer of the exhibition (watch it by scanning the QR code)

## FOREWORD

Marco Ciardi

Scientific Director of the Museo Galileo

Roberto Ferrari

Executive Director of the Museo Galileo

"Dante the scientist" has been the subject of studies and commentaries ever since the fifteenth century. However, this is the first exhibition that offers the public an overview of the scientific aspects of the Poet's work, placing his knowledge in the context of the culture of his time. Works of art, manuscripts, drawings, three-dimensional models, and multimedia presentations on the cosmological system, physical geography, and spiritual geography illustrate the passages of the *Divina Commedia*, the *Convivio*, and Dante's other writings that contain explicit or implicit references to scientific topics.

The exhibition, prepared as part of the Dante celebrations of 2021, enjoys the sponsorship and backing of the Italian National Committee for the commemoration of the 700<sup>th</sup> anniversary of the death of Dante Alighieri.

Our first thanks go to the Italian Ministry of Universities and Research and Ministry of Culture, which have steadfastly supported the activities of the Museo Galileo.

A project so complex would not have been possible without the collaboration of numerous institutions and individuals encompassing a wide range of expertise.

An essential prerequisite for the event has been the generous cooperation of prestigious Italian libraries—particularly those of Florence—which have lent precious manuscripts, drawings, and printed works that represent the highlights of the exhibition. The libraries have also allowed the reproduction of the volumes included in the dedicated digital library. We are therefore especially grateful to these institutions and their directors: Biblioteca dell'Accademia della Crusca, Biblioteca Marucelliana, Biblioteca Medicea Laurenziana, Biblioteca Nazionale Centrale di Firenze, Biblioteca Riccardiana, Gabinetto dei Disegni e delle Stampe degli Uffizi, Berenson Library - I Tatti, Biblioteca Comunale degli Intronati di Siena, as well as Franco Cosimo Panini Editore.

This exhibition has offered a fresh opportunity for cooperation between the Museo Galileo and the Uffizi Gallery, successfully implemented in earlier events; we hope that this partnership will be renewed in future projects. We thank the Gallery's Director, Eike D. Schmidt, for hosting the show at the splendid venue of the Palazzo Pitti, and his staff—in particular, Alessandra Griffo, Elena Pozzi, Simona Pasquucci, Francesca Montanaro, and Cinzia Nenci—for providing crucial support.

Opera Laboratori has produced the exhibition, offering a

vital contribution to its installation, in addition to constructing the sets and individual displays with its customary professionalism.

The RovaiWeber studio is responsible for the graphic design, a key element for creating the evocative backgrounds against which original works and models are presented to the public.

Filippo Camerota, Vice Director and Head of Collections at the Museo Galileo, has played a decisive role as exhibition curator and catalogue editor, two tasks that he has performed with great skill and commitment, assisted by a panel of prominent scholars.

The entire staff of the Museo Galileo has taken part in the project with skill and dedication. Our special thanks go to the Multimedia Department and Web Team, coordinated by Jacopo Tonini and Iolanda Rolfo respectively. They have produced the animations and videos to capture the public's interest and provide an enjoyable way for it to fully understand the topics covered. They have also built the exhibition website. The staff of the Research Library and Digital Library has provided a further crucial contribution. As on many other occasions, Laura Manetti has acted as an unstinting, expert coordinator for every phase of the production process.

Another significant contribution has been that of camerAnebbia, the designers of the captivating interactive video installations that take the visitor on a fantastic journey through Dante's universe. Kathleen Doyle, Lead Curator of Illuminated Manuscripts at the British Library in London, generously granted permission to use the images of Yates Thompson 36—the splendid illuminated codex of the *Divina Commedia*—as the basis for camerAnebbia's video installation. The Italian Space Agency (ISA) provided valuable support for the production of the video and educational materials.

We thank the translators of the English edition, Matthew Coneys, Thomas Haskell Simpson, Elisabetta Tarantino, and Jonathan Mandelbaum, with special thanks to the latter for allowing us to use the verse translation of the *Commedia* by his late father, the eminent poet, translator, and Dante scholar Allen Mandelbaum.

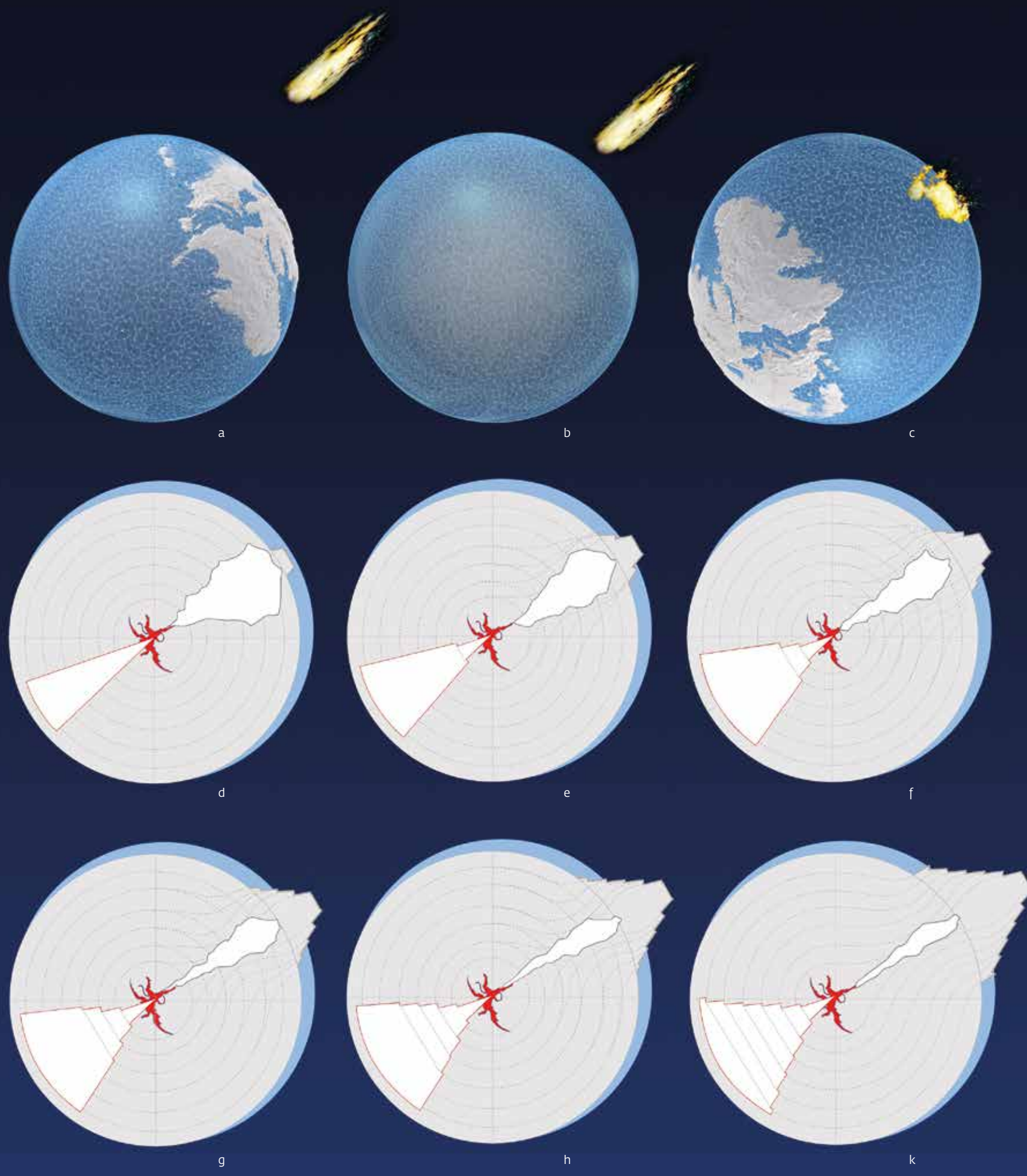
Last but not least, we are grateful to the publisher, Sillabe, for the skill and energy they have invested in the production of the present catalogue, which will remain as a record of this important project well after the exhibition closes.



LASCIA TE OGNI  
SPERANZA VOI  
ENENTRATE

HELMEZUA  
E CHAMPINO  
DIMOSTRA  
VITA MIU  
TRU MPE  
RVNA SEL  
VASCORA  
CHE LADRI  
TIA VUAE  
ASMAET

ACIANTA  
DIPOMLE  
REGOSAD  
VTA ONE  
STASIA  
SILVAGGI  
ASPAEI  
E RITECH  
E NE PEN  
METNO



## INTRODUCTION

# DANTE, COSMOGRAPHER OF GOD

Filippo Camerota

Science and poetry are foundational columns of the work of Dante Alighieri, who was not only a poet and philosopher but also a “chorographer and architect” of the world beyond.<sup>1</sup> His cosmographic narrative known to all as the *Divine Comedy* has been an object of study, commentary, and interpretation for seven hundred years. The attention dedicated over time to Dante the scientist is no less than that reserved for Dante the poet. From the earliest in-depth studies of the topography of Hell by mathematician Antonio di Tuccio Manetti in the mid-15<sup>th</sup> century,<sup>2</sup> reading the *Commedia* in a scientific

(especially astronomical) key has continued uninterrupted to our own day. Commentaries, books, articles, and conferences have been dedicated to Dante the scientist, but never an exhibition, until now.<sup>3</sup> This is the first time the poet’s scientific culture has been presented in terms of the visual dimension his words have brought to life. The extraordinary iconographic production that has accompanied editions of the *Commedia* since the 14<sup>th</sup> century reveals Dante as also a painter: by painting in words, he inspired great artists including Botticelli, Signorelli, Michelangelo and Raphael.

Dante was not, properly speaking, a scientist. Rather, he used science as a structural element of his poetic invention and subordinated scientific truth to the requirements of narrative. But it is precisely this structural element that renders his account of the cosmos credible; an account that dramatizes the inextricable relationship between the worlds of matter and spirit. Different from other cosmographic epic poems of the same era, such as Gauthier de Metz’s *Image du monde*, composed around 1250, or treatises like Ristoro d’Arezzo’s *Composizione del mondo* (1282), the *Commedia* puts on stage the history of humanity, that extraordinary culture produced on Earth by Divine Will (“you were not made to live your lives as brutes, | but to be followers of worth and knowledge”, *Inferno* XXVI, 119-120), and, most decisively of all, the relationship essential to a medieval Christian: that between

on the previous pages

Domenico di Michelino, *Dante with the Commedia, the Three Kingdoms, and the City of Florence*, 1465, tempera on canvas. Florence, Cathedral of Santa Maria del Fiore.

1. Formation of Hell and Mount Purgatory after the fall of Lucifer: a) land first emerged in the southern hemisphere (which in the Aristotelian tradition was the highest part of the world); b) when Lucifer approached the land it sunk in horror; c) the element Earth fled before reappearing in the opposite hemisphere, while Lucifer fell into the ocean; d) the Earth’s terror at contact with Lucifer resulted in the opening of the cave (the “natural dungeon”) that allowed him to fall to the center of the Earth, the point at which all weights converge; e-k) while Lucifer remained embedded in the coldest place, and the furthest from God, the Earth continued to open up, forming the great abyss of Hell and, through the same tectonic movement, the lofty peak of Purgatory.



God and man. While faithful to the cosmographic tradition of his time, Dante's world transcends reality to bind earthly life to eternal life, modelling itself on the certainties of the highest science, Theology, the "Divine Science" which, "because of the supreme certainty of its subject, which is God," is absolute and unquestionable (*Convivio* II xiv 19).

Dante's "scientific poetry" interwove itself efficaciously into the pictorial innovations produced by the school of Giotto and the mathematical conception of the universe promoted by humanist culture. It was most likely this realistic component of the *Commedia* that so inspired generations of artists, humanists, and scientists: a penitential, redemptive journey that was also an *imago mundi*, a representation of the world that was credible despite picturing the unknown and unverifiable. Dante described the spiritual world as a constituent part of the material world, granting physical reality to the world beyond—Hell and Purgatory are geographically locatable—thus making the incommensurable immensity of God almost measurable. Exploring as a living person the kingdom of the dead, the poet precisely describes its cosmography, anticipating, in Ulysses' oceanic voyage, the conquest of the New World, and prefiguring the conquest of space as far as the ultimate borders of the Universe, where no man will ever adventure. Dante, therefore, was a cosmographer of God, eyewitness to a world Christianity had imagined without ever dreaming of being able to witness, if not after death.

Christian Europe's pre-modern image of the world was the result of a theological vision that sought to reconcile the physical dimension with the spiritual one. The first of these, derived from classical cosmography and the mathematical achievements of Islamic astronomy, concerned the real world where the brief lives of mortals flowed under the influence of the planets. The spiritual dimension, on the other hand, sunk its roots in the Biblical account of Creation and the eschatological doctrine of the fathers of the Church. It concerned the world beyond, where souls after death exist in eternal damnation or divine beatitude. Between these two worlds lay a transitional zone that sought to geographically identify the place where souls passed over into the realm of the dead. For Greek culture, it was in the land of the Cimmerians, north of the Ocean sea. Roman tradition found it in Lake Avernus and the mouth of the Tiber, while other traditions spoke of the Fortunate Isles or the Isles of the Blessed, sometimes identified with the Elysian Fields. Access to Hades was possible

only *post-mortem*, but all mythologies seem to have had at least one hero who pushed open the gates of Hell while still living and returned to tell the tale. Ulysses journeyed across the land of the Cimmerians to encounter Tiresias in Hades and sailed beyond the Pillars of Hercules in search of knowledge, never to return. In the *Republic* (X, 614b), Plato tells of Er, the valiant soldier who returned from the land of the dead to describe how the judges of souls separate the just from the evil, sending the first to heaven and the latter to the underworld. Guided by the Cumaean Sybil, Aeneas entered Hades near Lake Avernus to meet his father, Anchises. Orpheus descended into Hell to bring his beloved Eurydice back to life. Closer to Dante's time, Saint Patrick had a revelation of the entrance to the otherworld in a cavern on a small island in a lake, Lough Derg in northerly Ireland; this place could still be found in 1492 on Martin Behaim's globe of the Earth.<sup>4</sup>

Inspired by these heroes, Dante undertook a voyage through the otherworld to purify his own soul and seek a path to salvation. But instead of limiting himself to entering Hades, he continued further, descending into the Tartarus of Greek mythology (the Christian Hell), and then traversed the heavens to go where no human had ever dared: into the presence of God. The journey from the Inferno to the Empyrean is a path of atonement that Dante experiences in the world beyond as a living man, a voyage that delineates a new image of the world, where the spiritual and physical dimensions meld into a single, credible, cosmographic reality. Thus it is as cosmographer that the poet describes the world he explores, periodically furnishing the astronomical coordinates that situate his itinerary through the bowels of the Earth and into the highest spheres of heaven.

With respect to classical mythology, which divided souls between Tartarus and the Elysian Fields—that is, between Hell and Paradise—Dante added an intermediate realm for the purification of those souls who, in life, had been neither just nor entirely evil. Purgatory was a geographic novelty in Christian doctrine, which had only marginally contemplated a period of time—but not actually a place—for the expiation of sins.<sup>5</sup> On the other hand, Christians had specifically identified, although not in full agreement as to exactly where, the Earthly Paradise, which the Bible had located in the Far East, thus indicating its general direction while prohibiting access, forever lost after the original sin.<sup>6</sup> Medieval world maps, usually oriented to the east—toward the rising Sun, which

Christian symbology associated with the Second Coming of Christ—located Eden at the top of the map at the far border of inhabited lands. The uppermost part of the map would show the Redeemer's head, and his hands would appear at the Arctic and Antarctic poles as though holding up the world. In that extreme Orient, the Earthly Paradise is often portrayed, for limitations of space, as an island just off the terra ferma, but in the reality of the spiritual world, it was believed far beyond earthly reach.<sup>7</sup>

Dante located that island in the middle of the ocean at the antipodes from Jerusalem, in what today we call the Pacific Ocean, and he conceived it as an extremely high mountain, the highest in the world. At its summit was the Earthly Paradise; along its slopes the souls in Purgatory were distributed on seven levels mirroring the circles of Hell. But the poet did not limit himself to indicating the geographical placement of the mountain of Purgatory; he elaborated a variant on *Genesis*, explaining exactly how the mountain had been formed before God's creation of the human race.

It is Virgil who recounts this portentous event in *Inferno* XXXIV, after having led Dante to the far shore of Giudecca, beyond the center of the Earth and thus into the austral (southern) hemisphere. Disoriented by the way Virgil had turned upside down so that the two men were climbing up the woolly flanks of Lucifer towards the way out of Hell—when a moment before they had seemed to be climbing down—and confused by the fact that suddenly "here" it is morning, while "there", a moment before, it had been evening, Dante asks his guide for an explanation. Virgil concisely educates the pilgrim on two aspects of planetary physics: the center of gravity and the shape of the Earth. Virgil had been compelled to turn upside-down when they reached the center of the Earth and passed the point of convergence of all weight:

And you were there as long as I descended;  
but when I turned, that's when you passed the point  
to which, from every part, all weights are drawn.  
(*Inferno* XXXIV, 109-111)<sup>8</sup>

Dante had already learned this from his great teacher, Brunetto Latini, who had rendered the concept with brilliant clarity in the second book of his *Tresor*: "if it were possible for a man to dig into the Earth and make a well reaching from one side of the Earth to the other, and then the man threw a huge rock into this well or other heavy object, I declare that that rock would not go through; on the contrary, it would stop in

the middle of the Earth, that is, it would stop at the point of the compasses, going neither forward nor backward."<sup>9</sup>

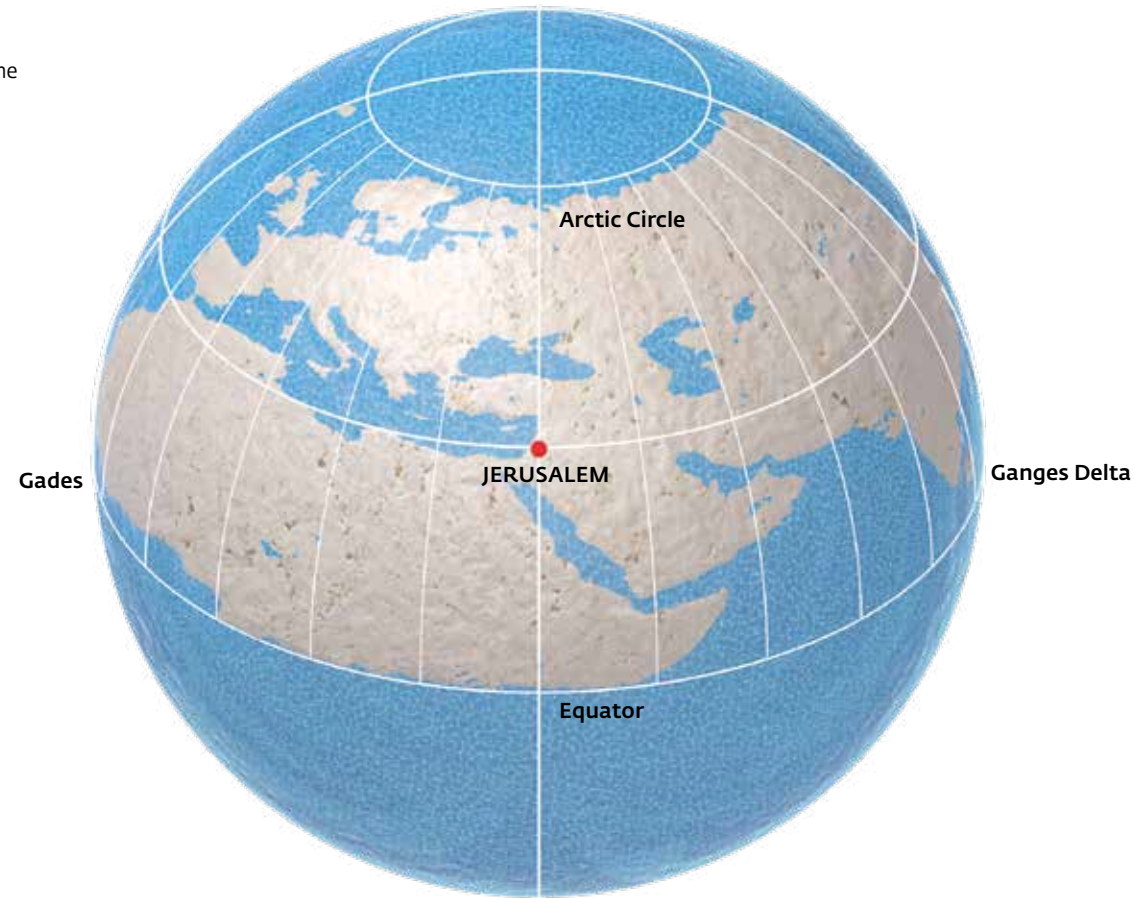
Like a stone falling from the sky, the immense body of Lucifer, more than a kilometer high, had gotten stuck at that central point by his own weight, forever trapped in the icy bite of the frozen lake of Cocytus. The rebel angel had been hurled down to the place farthest from God, and his impact on the Earth provoked a cataclysm such as to alter the divine design of the terrestrial globe.

Before the fall of Lucifer and his cohort of rebel angels, Virgil explains, the exposed land masses were grouped together in the austral (southern) hemisphere, which according to Aristotelian tradition was the upper part of the world, the part Christian cosmology held to be directly facing the Omnipotent One. Horrified by the imminent impact of the demons crashing down, the Earth's lands rushed away in such a way as to re-emerge into the opposite hemisphere, where they formed the "great dry lands" seen on all the world maps of the era (fig. 1):

And now you stand beneath the hemisphere  
opposing that which cloaks the great dry lands  
and underneath whose zenith died the Man  
whose birth and life were sinless in this world.  
Your feet are placed upon a little sphere  
that forms the other face of the Judecca.  
Here it is morning when it's evening there;  
and he whose hair has served us as a ladder,  
is still fixed, even as he was before.  
This is the side on which he fell from Heaven;  
for fear of him, the land that once loomed here,  
made of the sea a veil and rose into our hemisphere.  
(*Inferno* XXXIV, 112-124).

This shift of the exposed lands raises an important question about the relationship between Water and Land, which at the time constituted a key topic of philosophical debate. Dante would later discuss it (if we grant the attribution) in the treatise *Quaestio de Aqua et Terra*, and later cosmographers would continue to study the matter, advancing more or less innovative propositions, such as the version found on Fra Mauro's world map (c. 1450, cat. I.2.4) or the one in Leonardo's Leicester Codex (c. 1506).<sup>10</sup> Given the new configuration of the Earth imposed by divine will after the banishment of Lucifer from his Empyrean beatitude, it little mattered whether the emergence of the lands was due to magnetic attraction by the stars (as held by the author of the

2. The world of Dante:  
The lands emerged from the sea occupied one quarter of the terrestrial globe.



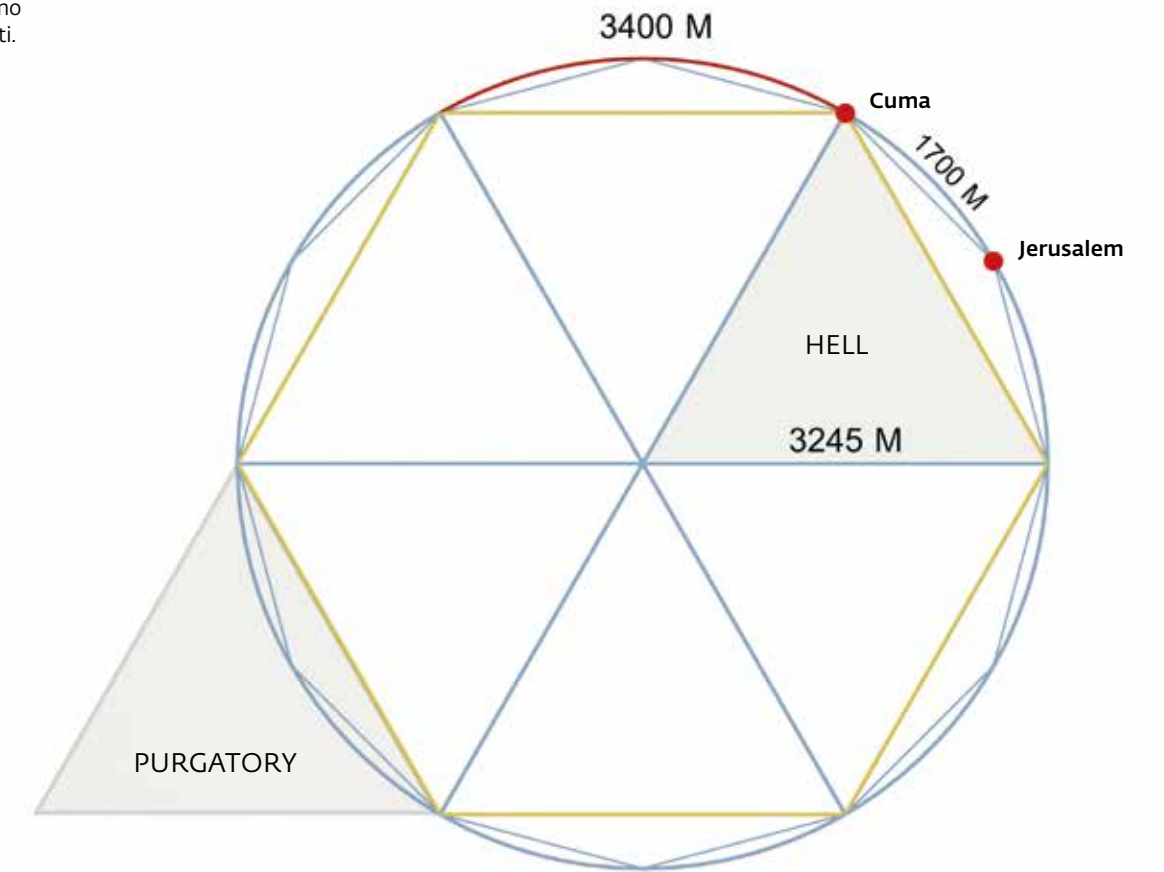
*Quaestio*), by the varying densities of land masses (as maintained by Fra Mauro), or whether it had to do with a tectonic resettling of caverns (as Leonardo claimed).

Lucifer, then, plunged into the middle of today's Pacific Ocean, in a place situated 32 degrees latitude south, at the global antipodes of the site where the city of Jerusalem would one day rise. In addition to fleeing from the fallen demons, the Earth sought to avoid touching them by forming a giant abyss, pushing out its earthy matter so as to form the mountain of Purgatory, which definitively covered the immense "well" of Hell. Lucifer remained stuck in the center of the terrestrial globe, with his legs in the austral hemisphere and his bust in the boreal (northern) hemisphere, where the giant chasm of Inferno was formed, symmetrical to the mountain of Purgatory. The "well" which supplied the material necessary to form the mountain of Purgatory corresponds to the "dungeon built by nature", the enormous, pitch-black cavern through which Dante and Virgil would climb to return to the surface, the only sound that of a stream of water flowing down from Purgatory. In contrast to this great formless cave, the Inferno that formed in the northern hemisphere took on a geometrically defined shape: that of an immense stepped cone, its vertex occupied by Lucifer and its base covered by a giant cap whose

diameter equalled one-sixth of the terrestrial meridian.<sup>11</sup>

At the center of the cap, on the surface of the exposed lands, was the city of Jerusalem, which for Dante and the geographers of his era was also the center of the inhabited world.<sup>12</sup> Dante's principal geographic sources were the presbyter Paulus Orosius (4<sup>th</sup>-5<sup>th</sup> century), whom Dante cites in the *Quaestio de Aqua et Terra*, and the poet's master teacher, Brunetto Latini, who dedicates significant space in the *Tresor* to a geographic description of the Earth.<sup>13</sup> As explained first in the *Convivio* and later in the *Quaestio*, Dante maintained that the emerged lands all gathered into half of the boreal hemisphere, forming a sort of half-moon.<sup>14</sup> The "great dry lands" extended in latitude from the equator to the Arctic north pole (66°30'), and in longitude from "Gade" (Cadiz or the Fortunate Isles) to the Ganges Delta. The longitudinal amplitude covered an arc of 180 degrees, such that Jerusalem was located, by Dante's calculations, at the intersection between the 90<sup>th</sup> meridian and the 33<sup>rd</sup> northern parallel (fig. 2). The coordinates of the exposed lands are found in similar terms in many medieval *mappaemundi* which, although representing the habitable world as round, still indicate the western and eastern extremes with the toponyms "Gades" and "Ganges flumen".<sup>15</sup> The great world map in Hereford Cathedral (cat. I.2.7) of c. 1290, for example, shows Jerusalem at the

3. Geometric schema of Inferno according to Antonio Manetti.



center of the circle that circumscribes the exposed lands; above, to the East, is the Earthly Paradise near the Ganges Delta, and at the bottom Cadiz with the Pillars of Hercules. The city of Jerusalem was generally located at the intersection of the two lines by which T-O maps geometrically divided the three parts of the habitable world (Europe, Africa, and Asia). This geographical configuration of the inhabited, known world would survive until the European discovery of the New World. The so-called nautical chart of Columbus, drafted in Portugal during the first half of 1492 (cat. I.2.5), is still strongly conditioned by this cartographic matrix.

In geographic fact, Jerusalem (35° E) is actually located at the midpoint of a line from the Canary Islands (20° W) to the Ganges Delta (90° E), but the longitudinal arc between the two extremes of the inhabited world as indicated by Dante equals 110 degrees, not 180. On the other hand, the distance between the two extremes, measured in miles, shows a close approximation to geographic fact. Taking his numbers from Alfraganus (Al-Farghānī), Dante in the *Convivio* gives the circumference of the Earth as 20,400 miles.<sup>16</sup> The Arabic mile equalled 1,972 kilometers (4000 cubits of 49.3 cm) and thus the circumference of the Earth, 20,400 miles, was equal to 40,248 km, a value quite close to the actual measurement of 40,068 km. The distance between the Fortunate Isles and the

Ganges Delta, measured over 180 degrees, would result in a figure of 20,124 km, while in truth it is ca. 12,000 km. Dante's value for the mile, however, was most certainly not that of his Arabic precursor. The poet probably had in mind the mile "by land" or "Lombard league", which his teacher Brunetto Latini specified as one thousand five-foot steps, thus related to the Roman mile of 1,482 km.<sup>17</sup> Measured by this value, the longitudinal extension of the exposed lands comes to approximately 15,000 km. But it is also probable that Dante was thinking of the nautical mile, which in the Mediterranean basin oscillated around 1,250 km. In these terms, the distance under consideration would measure 12,750 km, a value very close to geographic reality. Clearly, if the unit of measurement adopted by Dante was the Mediterranean nautical mile, his Earth was much smaller than the one measured by Alfraganus, coming to only 25,500 km.

Antonio Manetti was undoubtedly referring to the nautical mile when in the mid-15<sup>th</sup> century he undertook a mathematical calculation of the size, form, and location of Dante's Inferno (cat. I.1.2, I.1.3).<sup>18</sup> In the Florentine mathematician's reconstruction, the Inferno is a cone with an angle of 60 degrees at its vertex, and its intersection with the sphere of the terrestrial globe generates a circumference of a diameter equal to that of the generator. In other words, the