From T-O to Satellite: A Media Archaeology of Planetary Images

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Abstract. From a media archaeology perspective, we trace the evolution of Earth imagery and its underlying viewing practices. In ancient and medieval religious contexts, images conveyed myths and divine order, shaping theological understanding. The Renaissance marked a pivotal shift, as humans assumed a central position. Humanism diverged into two streams: ethical humanism, which focuses on values and cultural narratives, and scientific-rational humanism, which emphasizes measurement and objective depiction to expand knowledge and power. In the modern era, science and technology recentered Earth's wholeness, as exemplified by the Apollo Earthrise photo and digital visualizations, enabling a non-human perspective. This research uncovers how planetary perspectives were obscured and preserved, re-evaluating human-Earth relations and offering insights for future ecological crises.

Keywords: Media archaeology, Planetary images, T-O map, Earthrise

1. Introduction

Figure 1. AI-generated image midjourney, 2025 prompt:"Blazing storms sweep across the charred land, while cracked earth devours the remnants of civilization. The sky, like a torn net, reveals an endless void of cold silence, as if the Earth were casting a calm, final gaze at the end of its life."

This AI-generated image of a doomsday Earth (Figure 1) required no human eye witness or camera to capture its scene. It was simply an algorithmic calculation, combination, and rendering of a planet in a state of total ecological collapse, drawn from billions of existing images. Frankly, seeing this apocalyptic image leaves anybody feeling completely unfazed, as if I've grown used to it. This sentiment echoes Walter Benjamin's insight on the "Aura [1] " of a work of art, which he defined by its unique, irreproducible "Here and now [1] ". The AI-generated images of Earth that we see today are, perhaps, a classic example of this aura's disappearance [2]. They are like templates—replicable, callable, and endlessly re-combinable. These images no longer shock or inspire awe; their visual language is so similar to that of film CG, disaster illustrations that viewers can instantly grasp their narrative logic. This effortless familiarity, recognizable without explanation, is precisely the most questionable aspect of today's images and their ubiquitous nature [3].

Their universality robs them of the sublime, sacred quality or shocking power that images once possessed. This stands in sharp contrast to the medieval T-O map, which constructed a theological worldview centered on Jerusalem. In that context, an image was not merely a way for us to see the world but a medium that shaped how we thought about it, making the very act of viewing a theological one. The image of the Earth was an interface for Christian rule, not a piece of readily available material. When an apocalyptic Earth becomes a universally accessible AI template, it no longer shakes us with dread. This serves as a stark reminder: the image of the Earth, which once required a convergence of divinity, knowledge, technology, and power to be forged, is now entering our lives in the cheapest way possible. Hidden beneath this seemingly ordinary universality is a historical fault line that only media archaeology can help us uncover. AI-generated doomsday images are, in a sense, a Media Ghost, cloaked by a technological black box, they present a facade of novelty while essentially being an extension and mutation of earlier media and visual experiences [4]. The very tension between these readily available images and earlier planetary representations forces us to reconsider how we view planetary images.

This tension offers a excellent entry point for media archaeology—to re-narrate the historical evolution of Earth images, to dig deep into the visual-perceptual structures hidden behind them, and to re-examine the continuity of different ways of seeing the Earth. This perspective emphasizes that the history of Earth images is not a simple, linear story of technological development but a complex interplay of media and visual logic. Old ways of seeing were never truly eliminated by new technology, they were simply translated and continued to operate in new forms [5]. We need to unearth the unrealized potential residing within the old. In the history of Earth images, this unrealized potential is precisely its obscured planetarity.

The Earth image, as a quintessential planetary image, has yet to be documented in a coherent visual and cognitive history, yet discussions around its modes of viewing, media materiality, and knowledge structures have never ceased. In international scholarship, a re-examination of early Earth images, particularly the Babylonian Map of the World and the T-O map, has led scholars to a crucial realization: these images were not mere physical representations but symbolic expressions of a world order, imbued with mythical and religious significance. For instance, in Paul Delnero’s A Land with No Borders: A New Interpretation of the Babylonian Map of the World, the scientific image of the Earth is obscured by the map's mythical elements [6]. Christoph Mauntel’s The T-O Diagram and its Religious Connotations reveals how the Christian cosmic order permeated the T-O image [7].

With the rise of humanism during the Renaissance, humans gradually became the central protagonists. The Earth was no longer an object created by God; It became measured, depicted, and planned. Felipe Fernández-Armesto’s article Maps and Exploration in the Sixteenth and Early

Seventeenth Centuries demonstrates how maps became the visual medium for a humanistic understanding of the world, with humans at the center, setting coordinates and assigning meaning—a me-centered visual mechanism was gradually established [8]. The scale, diagrams, and map perspectives were all designed from a human-centered viewpoint. Of course, this human-centeredness in the planetary image itself also evolved, gradually shifting from an image full of humanistic ethics to certain cultural meanings. With the rise of instrumental rationality since the 16th century, maps increasingly became media for empires, wars, colonization, and commerce. The invention of the Mercator projection was a landmark moment, prioritizing mathematical precision and nautical utility while abandoning its ethical dimensions. This shift meant maps no longer emphasized meaning but merely transmitted information, thereby strengthening human control over the world.

Robert Poole's Earthrise: How Man First Saw the Earth recounts the 1968 Apollo 8 mission, when humans first saw their planet rising above the Moon's horizon. That image—Earthrise—marked a turning point in human perception: space exploration suddenly shifted from conquering the unknown to rediscovering and cherishing our only home. It helped shape global environmental awareness and invited reflection on humanity's fragile place in the cosmos [9]. For the first time, technology enabled humans to view themselves from a non-human perspective, opening the imagination toward a new sense of planetarity. Yet half a century later, this mode of seeing has been absorbed into a new digital regime. As Leon Gurevitch notes in Google Warming: Google Earth as Eco-Machinima, automated visualization has turned the planet into a manipulable digital model, blending environmental representation with computer culture. In this process, the experience of global warming becomes mediated by simulation, blurring the boundary between the virtual and the real [10]. The image of the Earth, therefore, is more than a picture—it is a cultural lens through which we understand nature and ourselves. A media-archaeological view reveals how older visual logics persist within new media and how the ecological crisis is also a crisis of perception. Only by moving beyond human-centered thinking, as object-oriented ontology suggests, we begin to see the planet and ourselves.

In summary, the image of the Earth is more than a depiction of a natural landscape; it's a cultural symbol that reflects how we understand nature and our own position on the planet. The media archaeology of the Earth image allows us to see the long-obscured visual mechanisms and planetary dimensions behind it. It forces us to break free from rigid thought patterns and, from a non-human perspective, reconsider how our perspectives on nature, power relations, and cultural ideologies have been translated and inherited across different historical periods. This offers a new way of thinking: the ecological crisis is not just environmental degradation but is deeply linked to human cognition and culture. Perhaps only when we step beyond the traditional human-centered framework—as in object-oriented ontology, which refuses to place human existence above that of non-human objects and posits that all objects in a relationship are ontologically equal—can we truly grasp the essence of the ecological crisis and find new solutions for it.

2. The planetary image as a symbolic icon: from the Babylonian World Map to the T-O map

The planetary image is first and foremost a technological artifact, and its core characteristic lies in its holistic perspective. In the modern context, this characteristic stems from the support of space technologies such as satellite and orbital photography, which allow the Earth to appear as a closed and complete image. Unlike the partial viewing that relied on human sight, this holistic perspective breaks through the limitations of ground position and human physiological vision, transforming the Earth image from a partial geographical representation into a global, holistic visual symbol. It has

become an important foundation for contemporary environmental awareness and globalization narratives. However, this modern sense of wholeness did not appear from nothing. By tracing its historical origins, we find that early Earth images also sought to grasp the whole, but this wholeness was not based on technical observation; it was constructed through mythology, religion, and symbolic encoding. It was the practice of early humans trying to present the Earth in a knowable and controllable form. In other words, the holistic perspective of modern planetary images is a technologically mediated, physically accurate whole, while the whole of early planetary images is a culturally constructed, meaningful whole. The similarities and differences between the two provide an important reference for us to discuss the historical evolution of planetary images and the inheritance and variation of their media characteristics.

Figure 2. Babylonian Map of the World, clay, 12.2 cm (4.8 in)*8.2 cm (3.2 in), cuneiform, after 9th century BC,Neo-Babylonian, early Achaemenid period, Sippar, British Museum (BM 92687)

Tracing early planetary images, the ancient Babylonian Map (6th century BC) of the World (Figure 2) serves as a crucial starting point. This map is inscribed in a circular shape on a clay tablet, with Babylonia at the center, surrounded by neighboring polities, regions, and topographical features, all encased by a body of water. Beyond this water are triangular areas labeled with the Akkadian term nagû, which can mean islands, regions, or mountain [6], and include descriptions of mythical figures and creatures, such as sea monsters and the Babylonian flood hero Utanapishtim [6]. The water around the center is called“marratu”(Bitter Water or Bitter River) [6], symbolizing both a geographical boundary and a division between the known and the unknown. This layout combines real geography with mythological imagery, embodying a cosmology of order at the center and chaos on the edges [6]. The ocean is shown as a continuous river surrounding the Earth, depicted as if drawn with a compass, illustrating how the ancients used geometric visualization to represent a world with an ordered center and a chaotic periphery. As Paul Delnero points out,

The map was intended as a real map of the world (“Weltkarte”) that was more or less accurate in the center, but much less so in the mythological regions outside it [6].

This confirms that the spatial organization of the map is not only a representation of geography but also an arrangement of cosmic order. In other words, this map is not a neutral spatial depiction, but a medium carrying a theological worldview. Through its spatial layout, it materializes and visualizes theology, allowing the mythical order to be solidified into a transmissible visual memory. As Meissner says,

I am amused when I see that not one of all the people who have drawn maps of the world has set it out sensibly. They show Ocean as a river flowing around the outside of the earth, which is as circular as if it had been drawn with a pair of compasses, and they make Asia and Europe the same size [11].

Like all other sciences in Mesopotamia, geography ultimately derived from theology. Because of this, this ancient Babylonian map reveals the inseparable mythical background of ancient scientific practice.

Figure 3. T-O Map, from the first printed version of Isidore's Etymologiae, identifies the three known continents as populated by descendants of Sem (Shem), Iafeth (Japheth) and Cham (Ham)

Through symbolic simplification and spatial organization, the ancient Babylonian Map of the World could both educate viewers and perpetuate cultural. This pictorial cosmic order found expression in the symbolic representation of the medieval T-O map. The T-O map(Figure 3)was popular in medieval Europe. Its structure also used a circular outline, but the inside was divided into three parts by a T-shape: Asia at the top, Europe on the left, and Africa on the right. The three continents were separated but together surrounded Jerusalem at the center of the map [7]. This seemingly simple geometric structure—a circular earth divided by a T-shaped water and constructed a world view with strong theological symbolism. The T-O map placed Jerusalem at the center not because it was geographically central, but based on the Christian theological cosmos, to facilitate the communication of God's will and the cosmic order under the Christian church. The map placed the East at the top, where the sun rises [12], because the East symbolized light and divine revelation, the location of the Garden of Eden [7]. It was the core of the Christian cosmos. The T-O map integrated the world into a religious order through theological symbolic codes. It is clear that from ancient Babylonia to the Middle Ages, although the symbol system are different, such as cuneiform and Latin, mythical and Christian. The media means of constructing the world through symbolization maintained a strong continuity. The medieval T-O map also interpreted its symbolic logical interior.

The influence of early symbolic planetary images reflected in their visual structure their social function. They were a cognitive tool. In an era lacking extensive exploration and scientific observation, maps provided a way to transform the unknown into the knowable. By incorporating the world into a visualized whole, people gained a psychological sense of control over their environment and the cosmos. Secondly, they were an order tool. Whether the Babylonian map placed Babylonia at the center or the T-O map made Jerusalem the axis, these images gave specific locations power and legitimacy through a centralized layout. Mauntel indicates,

Another early Christian addition to the diagram was the inclusion of the names of the three sons of Noah, which shifted the meaning of the diagram from a geographic to a religious level... the three

continents were increasingly linked to areas believed to be settled by the sons of Noah and thus... connected the idea of the continents to a biblical passage [7].

It can be seen that the T-O diagram represents not only a geographical division, but also a theological order, integrating biblical narratives into a visualized planet. The map thus became a visualized power technology, solidifying mythical and religious order in visual space. The T-O map not only showed the world of its time, but also served as a medium for preserving and transmitting the memory of religious order. Mauntel notes,

From the first known exemplars from the seventh or eighth centuries up to the fifteenth-century printed editions of the Etymologies of Isidore of Seville, the T-O diagram remained virtually unchanged... They have been discovered in manuscripts... bibles and genealogical tables; also... on medieval altarpieces, paintings of Christ, and even... the walls of churches [7].

The diagram was copied for centuries in manuscripts, exegetical texts, and educational contexts, becoming part of Christian cultural memory. And the threefold division was connected to biblical history and the sons of Noah, often accompanied by references to Paradise and the Holy City [13].

The T-O map was embedded in medieval religious and cultural practices, widely circulated in manuscripts, church texts, and religious teaching, alongside Bible stories and theological interpretations. The T-shaped composition remained almost unchanged for hundreds of years, and this stability also helped it become a memory device that solidified the worldview and social order. They were constantly used in religious ceremonies, manuscript illustrations, and teaching. Those manuscripts were copied by generations and eventually became a part of the collective memory.

The T-O map as a symbolic memory complex links religious stories to spatial layouts, showing the world ordered by God with a hierarchy. It reflects that human history, salvation, and geography are interconnected. Viewing it reinforced religious order and shaped cognition and social structures, serving as a vessel for cultural memory and religious hierarchy. The image became central to the theological worldview, vital for understanding the sacredness of pictures and their later desanctification within the media archaeology of planetary images.

3. The evolution of the medieval worldview: from fable to science

The medieval image of the Earth was not just a tool for spatial depiction but also held deep cultural and religious significance. It used visual symbols to shape religious and cultural understanding. The symbolic role of sacred space was vital in cultural cognition, and images were key in spreading faith and knowledge. Medieval maps, through visualized spatial order, not only educated viewers but also reinforced the medieval society's view of the cosmos. However, as geographical knowledge grew and maritime trade expanded, the world images of the late Middle Ages gradually changed. This allegorical worldview was increasingly challenged, and maps no longer simply conveyed theological meanings but began to incorporate empirical observations and cultural insights from around the world exchanges.

The Fra Mauro map exemplifies this transitional period. Created by the Venetian monk and cartographer Fra Mauro around 1450, this circular world map is made of parchment and framed in wood, measuring over 2 meters in diameter. It features a complex design with over 3,000 textual annotations, many ports, trade routes, and geographical details (Figure 4). It reflects 15th-century geographical knowledge and is considered a landmark of medieval cartography [14]. The map marks a significant shift: medieval maps usually centered around Jerusalem as the world's navel, symbolizing the sacred heart of Christianity. It emphasizes human civilization while placing people within a broad network of knowledge and trade. Its detailed depiction of the Indian Ocean and Eurasia reveals not only geographical information but also highlights the vast ports, routes, and

cultural exchanges—underscoring the lively flow of knowledge and global interaction. As a medium, the map does more than record the world; it influences how viewers perceive and understand it. Through its materiality, the Fra Mauro map visualizes, consolidates, and standardizes distant geographical concepts.

Figure 4. Fra Mauro: Fra Mauro Map, by the Italian (Venetian) cartographer Fra Mauro, 1450, in the Biblioteca Nazionale Marciana in Venice in Italy

This evolution process can be understood through multi-level analysis. First, on the technical and knowledge level, Fra Mauro, unlike Ptolemy, explicitly rejected relying entirely on Ptolemy's mathematical grid system, and instead emphasized eyewitness experience and the verbal accounts of persons as verification standards:

In my time I have striven to verify the writings by experience, through many years' investigation, and intercourse with persons worthy of credence, who have seen with their own eyes [15].

He even criticized Ptolemy that in his time it was unknown, admitting that ancient knowledge had terra incognita, thereby understanding the map as a result that can be revised over time. In addition, he included new surveys of the west coast of Africa and the Indian Ocean by Portuguese expeditions, emphasizing,

they have framed new charts of these regions and given names to the rivers, bays, capes, and ports. I have many of these charts in my possession [15].

Fra Mauro also candidly stated that Ptolemy's life was brief and experience fallible, so it should be allowed for later generations to have "better produced or …have more definite information" [15]. These statements show that he viewed knowledge as a dynamic, updated, and openly revisable process, rather than an unchangeable authoritative system. It is under this practical ethic that the map became a new type of knowledge tool that integrated port networks, traveler accounts, and nautical charts. Although it did not achieve modern accuracy, it had transformed from a medieval symbolic image into a geographical information atlas centered on human experience. During this period, cartography had entered a stage close to modern science, reflecting a strong humanistic ethical color, acknowledging the complexity of the world, respecting human experience, and emphasizing the continuous expansion of human knowledge horizons through dialogue and revision.

Secondly, on the cultural and conceptual level, the Fra Mauro map shows a humanistic ethical color, that is, understanding the world on a human scale. His positioning of Jerusalem is no longer based on Divine or religion, but on population and human affairs,

Jerusalem is indeed the center of the inhabited world latitudinally, though longitudinally it is somewhat to the west, but since the western portion is more thickly populated by reason of Europe,

therefore Jerusalem is also the center longitudinally if we regard not empty space but the density of population [15].

This explanation highlights the significance of human distribution and social life, indicating that theology is no longer regarded as a pure absolute center. Among these references, he mentions Pomponius Mela's account of Eudoxus's network. Fra Mauro contrasts classical and medieval authoritative texts, such as Pliny, Strabo, and Fazio degli Uberti, with modern nautical observations, fostering a cross-temporal knowledge dialogue that places ancient wisdom alongside contemporary nautical experience. Among them, he cites Pomponius Mela's account of Eudoxus' circumnavigation.

Eudoxus, fleeing the king of Alexandria, sailed from the Persian Gulf to Cadiz, thus rounding the Cape of Good Hope. From this he deduced that the Indian Ocean was not a landlocked sea, adding that this is what is said by all those who sail this sea and live in those islands [15].

Using text and eyewitness experience to support the possibility of circumnavigating Africa, thus breaking Ptolemy's setting of the Indian Ocean as a closed inland sea, and explicitly opened up the Sea of India. The four auxiliary circles on the map's edge, the Ptolemaic cosmic structure diagram, the four-elements diagram, the diagram of Paradise, and the globe image, further construct a multi-layered knowledge framework, placing local observations within a macroscopic historical and cosmic order. This media practice makes the map both a carrier of historical memory and a strategic tool for future exploration. For the Portuguese at that time, the data shows,

the chief cartographical need... was not so much a map... but a map that would give the opinion of learned geographers... [15].

What they needed was the integration and deduction of geographers' knowledge to provide cognitive support for future routes. Fra Mauro's map not only retained the theoretical resources of classical texts but also meticulously annotated the feasibility of navigation, trade networks, and local knowledge, organically combining historical memory, contemporary experience, and future actions. It can be seen that the Fra Mauro world map is not a passive record but an active media tool that reorganizes cognition.

In conclusion, by integrating technology, knowledge, cultural ideals, and ideological coding within a power-economic network, Fra Mauro’s map fostered a human-centered worldview. Although it appears to diverge from traditional cartography, it inherits the visual logic of ancient Babylonian and medieval T-O maps—like cosmic order and center-periphery relationships—adapting this to a global trade and cultural exchange network. This shift doesn't end tradition but redistributes older mechanisms, uniting them through the map's materiality. Human practice, experience, and judgment are central, making the map more than an exploration tool — a vessel for humanistic ethics. Its order and coding subtly obscure the Earth's planetary perspective. While showing global networks, its cognitive framework remains human-focused, limiting understanding of Earth as an independent planet. Ultimately, the Fra Mauro map blends scientific, strategic, and cultural influences, embodying an anthropocentric logic that emphasizes humanistic ethics over planetary wholeness narrative.

4. From image to data: geographical mapping practices from the Renaissance to the Enlightenment

From the Renaissance to the Enlightenment, the way the world was represented underwent a major change. While the late medieval Fra Mauro map is considered a pinnacle of humanistic mapmaking, the mapping techniques of the Renaissance clearly demonstrate a shift toward practical logic and a more scientific approach. Humans remained central to this way of thinking, but this new human-

centered perspective no longer focused on ethics or culture. Instead, it emphasized practical applications like navigation, surveying, scientific classification, and colonial expansion. Maps evolved into tools driven by mathematics, scale, and data rather than by historical, mythological, or philosophical stories. This shift indicates a new form of human-centrism—one motivated by scientific methods. Notably, maps from this era not only depicted the world's spatial structure but also incorporated specific ideologies, transforming them into a medium where science power and colonial expansion mutually reinforced one another.

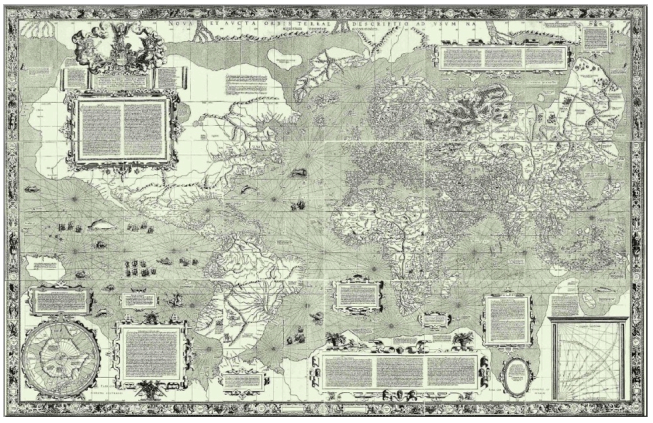

Figure 5. The 1569 Mercator map of the world. Gerardus Mercator

We can begin our analysis by focusing on the technical and knowledge aspects, with Gerardus Mercator's 1569 map (Figure 5) serving as a prime example of this evolution in technical and media qualities. Mercator used mathematical projection to turn the Earth’s curved surface into a straight-line grid, enabling sailors to plot constant-bearing routes and making spatial representation a practical, operational tool. Fernández-Armesto observes that 16th-century explorers rarely depended on maps, often relying on rutters (written sailing directions) instead of charts, indicating no direct causal link between cartography and exploration [8]. This explains why Mercator was dissatisfied with the map merely as a navigational aid. Instead, he integrated it into a framework of philosophical reasoning and scientific deduction, transforming it from a simple geographical depiction into a component of the scientia system. As Zuber highlights out,

Mercator’s theory of the unknown southern continent was tied to a context shaped by socio-professional as well as economic concerns. Deduced from first causes and thus connected to the Aristotelian ideal of scientia, it also served to complete the world picture—a big selling point in an age that experienced an immense demand for maps and, hence, increased competition among cartographers [16].

This initiative, which went beyond the practical demands of his time, is what makes his work unique. From a technical standpoint, as Gaspar observes,

All planimetric information was directly imported to the novel world map without correction [17].

This indicates that Mercator relied on rational logic and systematic operations to organize information, rather than merely adhering to religious tradition or empirical authority. His innovation was to theoretically solve the mathematical problem of straightening rhumb lines. Although Mercator’s world map of 1569 was useless for navigation at the time it was created [17], the theoretical value of his projection underscores a humanism of scientia, distinct from humanism in the sense of ethical education. At both the technical and intellectual levels, the Mercator map is more

than a tool for geographical representation; it signals a transition from ethical description to a rationalized, systematic methodology.

Mercator's cartographic practice was more than just a technical skill; it embodied a rational, humanist perspective. He compared his invention to squaring the circle—emphasizing its geometric precision and pursuit of logical order. As a cosmographer and mathematician, Mercator had a deep understanding of projection principles, elevating the map from mere craftsmanship to scientific reasoning. His genius lay in assuming a rational solution and utilizing available tools, turning cartography into a form of rational speculation. This approach was rooted in a broader cultural context belief.

Renaissance cosmographers and pilots wrongly assumed that a square grid of meridians and parallels was somehow implicit to their geometry. This assumption, shared by Gerard Mercator and other cosmographers, led directly to the conclusion that approximate values of latitude and longitude could be read directly from the charts, which was obviously false [17].

The square chart myth exposes a common belief among cartographers that maps should be arranged in a symmetrical, orderly grid. This concept underpins the cultural and philosophical status of Mercator's map. The quest for symmetry, balance, and proportion in geography traces back to classical traditions, from Aristotle to medieval thinkers. This philosophical view of space influenced Renaissance mapmaking and shaped views of the southern continent. In this cultural setting, maps went beyond mere geography; they embodied the spirit of scientific humanism, combining mathematical precision with philosophical thought to explore unfamiliar lands order.

Third, from a media perspective, the Mercator world map functions as a dynamic medium. Mercator drew on various sources to define the southern continent, and the map could incorporate incomplete or conflicting data, presenting it in a way that allowed viewers to perceive a complete worldview rather than just original geographic information. Filling in the blank areas of the southern continent exemplifies the medium's proactive role. In the largely unexplored Southern Hemisphere, Mercator created a sense of detailed visualization by contrasting different versions of place names and layering information from multiple languages and sources. This technique fostered credibility despite the absence of authoritative data and guided viewers' impressions. It demonstrates how maps influence perception through layout and symbolism, confirming that the Mercator map did portray part of the coastline of the southern continent. As Zuber points out,

In order to sell, maps had to look detailed and new, even if some areas were virtually unknown and innovations (for instance regarding toponyms) not always for the better [16].

Subsequent printings, such as those by Rumold, inherited and sometimes magnified these errors and innovations, illustrating how maps as commodities circulated knowledge while influencing perceptions. As a medium, maps not only preserve knowledge during their circulation but also continually reshape viewers' perceptions of the world through reprinting, adjustments, and misinterpretations, demonstrating their historical influence circularity.

Unlike the Fra Mauro map discussed earlier, Mercator's 1569 world map offers a humanistic perspective of the Earth rooted in scientific principles. Its grid of meridians and parallels, along with proportionality and logical reasoning, introduced a new comprehension of the planet's totality. Nonetheless, this global view was still somewhat limited at the time: although the map provided a scientific basis for worldwide representation in theory, practical constraints such as navigational methods, the longitude problem, and traditional cartographic influences persisted. Despite this, Mercator's map clearly established the foundation for subsequent ideas of a whole Earth, gradually fostering the imagination of a unified planet reality.

5. From geographic maps to photographic images: the visual revolution of the whole-earth

During the 1950s and 1960s, Earth sciences experienced a major shift toward global integration, expanding research focus from local regions to the entire planet. Scientists started combining diverse observational data to better understand Earth's system as a whole. This transformation was heavily influenced by military technologies developed during World War II and the Cold War era. Breakthroughs in satellite imaging, nuclear test detection, ocean exploration, and seismic recording offered scientists access to unparalleled global data, facilitating the growth of planetary-scale research and modeling sciences.

In 1968, during their fourth lunar orbit, Apollo 8 astronauts unexpectedly took the iconic Earthrise photo (Figure 6)—a historic milestone for humanity. The picture depicted a blue-and-white Earth gradually emerging above the moon's barren surface. Surrounded by the darkness of space and the stark lunar terrain, Earth appeared as the only colorful celestial body, looking especially beautiful, fragile, and small. Covered in clouds and mainly in shades of blue and white, it seemed full of life and created a vivid contrast with the surrounding cosmic emptiness. This was the first moment in history that humanity viewed the entire Earth from space—no longer just a collection of maps and symbols, but a real, alive entity. This iconic image represented a significant turning point in human history vision.

Figure 6. Earthrise, taken on December 24, 1968, by Apollo 8 astronaut William Anders

The astronauts' immediate reaction to Earthrise was one of pure, instinctual wonder. They hurried to document the moment. Commander Borman described it as the most beautiful and heartbreaking sight of his life [18], evoking a profound sense of homesickness and connection to Earth. James Lovell emphasized that the only thing possessing any color in the entire universe is the Earth [19], while Bill Anders remarked that they came all this way to explore the Moon, and the most significant discovery was Earth itself [9]. Notably, NASA's mission plan had not prioritized photographing the Earth; its primary objective was to demonstrate humanity’s outward expansion and mastery of space, exemplified by the Moon landing. Nevertheless, the outcome unexpectedly reinforced humanity's appreciation for Earth. Norman Cousins encapsulated this sentiment, stating,

what was most significant about the lunar voyage was not that men set foot on the Moon, but that they set eye on the Earth [20].

This visual experience changed humanity's view of Earth from a conquerable universe to a lonely, valuable home, inspiring unity across borders. Earthrise became a cultural icon, appearing on magazine covers, poetry, and environmental posters, and remains a symbol of the blue planet and our shared future home.

A systematic natural history depicted Earth's unity and interconnectedness, originally titled "Gaia [21]", symbolizing ecological holism. James Lovelock later expanded this concept with his Gaia hypothesis, suggesting that Earth operates as a self-regulating, unified organism. The images from Apollo visually corroborated these ideas. From ancient organicism and 19th-century ecological holism to 20th-century biogeochemistry and the Gaia hypothesis, the modern whole-Earth photograph exemplifies a distinctive intersection of technology and philosophical thought, illustrating the medium's enduring influence across science, technology, and related disciplines ideas.

The images of the Earth captured during the Apollo program sparked a shift in thinking from a traditional geographic view to a comprehensive planetary perspective. Before, images of Earth mainly focused on local areas and familiar features, but didn't convey the entire picture. As Spier Fred notes:

Until that time, common depictions of the Earth had been mostly geographic in nature. Now, suddenly, people saw Earth with their colorful ball swinging through space. As a result of such photos, a major change in perception of Earth took place around that time, which appears similar to the one that happened after Europeans began to connect the world by trans-ocean voyages [22].

By presenting Earth in a cosmic context for the first time, photos from Apollo 8 and other spacecraft sparked a cognitive revolution similar to that of the Age of Exploration. This visual shift also reflected a de-centering of humanity. Earth was viewed as a distinct, self-contained body in the universe, rather than a world centered on humans or nations, thereby fostering a global environmental consciousness. As Spier Fred recalled:

These pictures showed for the first time to me how different Earth was from its cosmic surroundings. It also made other people around the globe wonder what we were doing to our home in space. This led to an unprecedented upsurge of environmental awareness, including the establishment of the first Earth Day in 1970 [22].

The whole-Earth image made people realize that Earth is not merely a stage for human activity but an independent planet floating in space, prompting a re-evaluation of human history and future on a planetary scale. Researchers have noted:

The Apollo photos of Earth at a distance, most notably perhaps Earthrise, did not only lead to a reappraisal of all of that. For some people it also raised the question of how to understand its past, in the hope that a better understanding of the history of ourselves and of our position in time and space at the grandest possible scale would lead to better decisions about how to act in the future [22].

By viewing themselves from a cosmic vantage point, humanity began to consider its existence on a macroscopic scale of time and space, leading to new ways of thinking about future actions. This visual experience also reinforced a sense of world citizenship and global unity. As the poet Archibald MacLeish wrote:

To see the earth as it truly is, small and blue and beautiful in that eternal silence where it floats, is to see ourselves as riders on the earth together, brothers on that bright loveliness in the eternal cold – brothers who know now they are truly brothers [22].

The Blue Marble photograph (Figure 7), captured during Apollo 17 in 1972, became the most iconic image of Earth, showing the entire planet floating in space. It powerfully highlighted Earth’s completeness, vibrant colors, and fragile nature, reinforcing the concept of global unity. Quickly, it became an emblem for the environmental movement and worldwide consciousness. In public discourse, the Blue Marble symbolized shared responsibility and ecological interconnectedness. Scholars connected it to systems thinking, viewing Earth as a self-regulating ecosystem or a single living entity organism [23].

Figure 7. The Blue Marble, taken by Harrison Schmitt of the Apollo 17 crew in 1972

Mirzoeff's concept of Anthropocene visuality suggests that planetary-scale maps and models often adopt the visual traditions of empires or battlefields, situates the ubiquity of planetary maps and models as extensions of imperialist visualizations of battlefields and industrial-age paintings of smog. Anthropocene visuality, he suggests, is a mode of environmental visualization that obscures rather than reveals both environmental and social injustices [24].

6. In conclusion

Thus, we can see how map images from different historical periods, without their occlusion, reveal the "spectral [3] " potential of historical gaps. From the ancient T-O map to modern remote sensing images, this progression creates a visual lineage that shows how the Earth has been viewed, understood, and interpreted. The continuity and breaks in media enable us to re-examine the Earth image not just as a visual object but as a complex result of social, cultural, and cognitive influences structures.

In the context of today environmental and planetary crises, reviewing this history of images offers valuable insights. It reminds us that the visual representation of the whole Earth has never been neutral; it has always been shaped by specific technical systems and ideologies. Yet, as Siegfried Zielinski reminds us, “the history of the media is not the product of a predictable and necessary advance from primitive to complex apparatus” [5]. Although modern images appear objective, they remain embedded in specific technical systems and ideologies, continuing the overall logic of visual order and, to some extent, inheriting the symbolic and operational significance of the past whole Earth concept. This reflects, through technology and culture, the translation of the latent order of historical visual modes into the perceptual patterns of modern scientific understanding images.

The perspective of the early T-O map stemmed from God's omniscience, emphasizing human reverence for and obedience to the cosmic order. In this stage, planetarity was embedded within symbols and spatial structures, obscured by a religious-theological center. Only through careful media archaeological analysis can we gradually uncover it and recognize its implied globality. With the shift from the late Middle Ages to the Renaissance, humans became the measure and interpreters of the world, embodying both the ethical pursuits of humanism and the ability to operate and analyze the Earth, enabled by scientific tools. Proportion, measurement, latitude and longitude grids, and triangulation gradually revealed the Earth's overall contours, moving planetarity from latent to explicit. In the modern era, satellite remote sensing and digital Earth images present the Earth as a full, interconnected, and complex ecosystem. Technology extends human perspective but no longer

places us at the center. The ecological crisis has intensified this shift toward a de-centered perspective; the image of Earth now serves as an ecological warning, reminding us that we are just one part of the Earth system. This ongoing lineage—from divine order to human order to Earth's own order—shows that planetarity is not an innate natural fact but has been gradually revealed through the accumulation of symbols, technology, and knowledge over history, exposing the complex relationship between vision, understanding, and power. The development of Earth's image highlights a flaw in centralized vision: from God-centered in antiquity, to human-centered in the Middle Ages and Renaissance, to science-centered today. Despite these changes, the image always prompts the question, 'How do we see the world?' shaping but also constraining our understanding of Earth as a complex ecosystem. Scientific images are not neutral; they are connected to power and culture. The ecological crisis deepens this de-centered view, serving as a reminder that we are just one node in Earth's interconnected system. This lineage—from divine to human to Earth's order—demonstrates that planetarity is a historical construct shaped by symbols, technology, and cognition, emphasizing the dynamic interaction between vision, knowledge, and power.

Media archaeology offers a tool to trace history and re-imagine future perspectives. As Shi Chang stated, it is an adventure through which, by exploring the past of media, we can identify familiar patterns in visual logic, uncover historically hidden choices, reflect on unchosen possibilities, and envision the future we want [3]. The history of the Earth image is, in fact, the story of how humans understand their relationship with nature and other living beings. By uncovering these historical threads, we can reveal the hidden logic behind current visual practices and re-examine whether our view of modern planetary images has truly moved beyond anthropocentrism, or if it has merely adopted a new, invisible center. Within media archaeology, we not only deepen our understanding of the Earth image's evolution but also see the complex relationship of inheritance and translation between modern and historical visual modes, offering resources to explore new perceptions and spaces of imagination. On this foundation, we can develop a planetary ecological consciousness that goes beyond traditional centralism. While modern remote sensing and digital Earth images are scientific, their visual strategies still seem limited in addressing the global ecological crisis. Zielinski warns that the current state of technology does not necessarily represent the best possible state, in the sense of Gould’s excellence [5], and therefore, contemporary visual technologies should not be mistaken for ultimate solutions. By revisiting history through media archaeology, we aim to draw on past wisdom and visual potential to shape a future-oriented ecological perception. Space exploration is no longer just an external conquest but also an internal process of self-reflection self-identity.

Therefore, within this framework, planetary images are a cultural, political, and ecological arena that both reveals governance logics and offers possibilities for subversive reinterpretation and alternative practices, construct a new visual genealogy. Its purpose is to place environmental risk and justice at the heart of contemporary visual culture and art history, thus providing a richer conceptual toolkit for understanding the relationship between humanity and our planet.

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