

## Full text by Vittoria Bonifati

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### ***The Origins of Natural History Collection: finding stones, fossils, wonder***

Humans have been collecting stones, fossils, and natural objects since the days of antiquity. A student of Aristotle in ancient Greece, Theophrastus of Eresus (372-287 BC), wrote the *Perilithon* (On Stones), an early treatise on minerals that matched empirical observations with popular beliefs regarding the therapeutic and magical properties of stones. Pliny the Elder (23-79 AD) compiled *Naturalis Historia*, a vast encyclopedia that combined mineralogy, zoology and botany that emphasized the importance of knowledge of the natural world in ancient Rome. According to historian Adrienne Mayor, author of *The First Fossil Hunters* (2000), many ancient myths about griffins, cyclops, and giants arose from attempts to interpret the fossil remains found throughout the Mediterranean landscape. In some places, the presence of large bones led even to the construction of shrines and temples, transforming these sites into locations of conservation and wonder where the finds were displayed as tangible signs of a prodigious past, thus intertwining myth with an early form of paleontology.

Just as in those days of old, the imagination of people in the Middle Ages ran wild with popular legends attributing fantastic origins to large fossil remains, often identifying them as the bones of this or that giant or mythological creature. A medieval legend from northern England held that Saint Hilda of Whitby turned the snakes infesting her abbey into stone with prayers. The remains of these animals—now recognized as ammonites—were collected up and down the coast and carved into small heads that made them look more like reptiles. The large fossils that turned up occasionally, were often brought into places of worship and suspended on chains as warnings or relics. Remarkable examples include the shoulder blade of a 'sea monster' displayed in St. John's Church in Lüneburg, Germany, said to have been part of the skeleton of the biblical Goliath, and the 'Giant's Gate' in St. Stephen's Cathedral, which owes its name to a mammoth bone found there in 1443.

It was only during the Renaissance that collecting natural objects assumed a distinct and progressively autonomous form. The first collections of *Naturalia*—consisting of fossils, shells, stones, dried or embalmed animals—developed as complements to collections of antiques, and reflected an all-encompassing humanistic perspective that sought to document the variety of the entire world as it was known at the time. Italy was a pioneer in developing collectionism in the modern sense: according to Julius von Schlosser, familiarity with antiquity, accompanied by the presence of Roman ruins and a widespread historical memory, enabled a cultural continuity unparalleled in Europe.

Inspired by this open-minded and diverse perspective, early Italian antique collectors welcomed items of scientific interest alongside artifacts and art objects (*Artificialia*) from the very beginning. Artists' workshops, such as those of Lorenzo Ghiberti (1378–1455) and Francesco Squarcione (1397–1468), became veritable mini-museums. Private collections were soon opened to wider audiences, as were the Medici gardens, which were made accessible to artists for purposes of study. The sixteenth-century revival of natural history has traditionally been linked to the availability of the ancient texts rediscovered by humanistic philology and the impact of geographical discoveries. Both factors prompted renewed interest in nature and ushered in the era of the aforementioned *Naturalia*. Figures such as Isabella d'Este (1474–1539), Marquise of Mantua, as did her successors cultivated a refined passion for art and the natural world, combining cameos, semi-precious stones, natural curiosities, and instruments of knowledge in collections of their own.

Shortly thereafter, Ulisse Aldrovandi (1522–1605) built a truly encyclopedic museum in Bologna. This colossal undertaking brought together over 7,000 objects that embraced animals, plants, minerals, and fossils and were accompanied by careful graphic and textual documentation. The idea of the collection as a dimension of orderliness in which nature was both an object of investigation and wonder began taking shape among nobles and scholars alike.

In Baroque Rome, this balance between the pure thrill of wonder and the need for strict organization was addressed by Christina of Sweden (1626–1689), a cultured and cosmopolitan queen who after abdicating and converting to Catholicism moved her intellectual court to the Papal capital. Here, she met Athanasius Kircher (1602–1680), a tireless researcher and a Jesuit, whose famous collection at the Collegio Romano—the Kircheriana—combined geological and fossil finds with scientific instruments, “exotic” artifacts, and models of the cosmos. This enormous gallery animated by obelisks, skeletons, and suspended crocodiles set the stage for a wide-ranging theological and cosmographic project in which stones and fossils became tools in better understanding both world history and divinity.

## **From Wunderkammerns to science museums: nature, classification, and power**

In the 17th century, collecting practices that had previously been adopted mainly in noblemen's courts and religious institutions underwent a transformation into a new form: the famous Kunst-und Wunderkammern ("Chambers of Arts and Wonders") of Central and Northern Europe. Here, Naturalia, Artificialia, Exotica, and Scientifica became parts of encyclopedic collections created to house and pre-serve the marvelous. The gradually emerging scientific revolution profoundly changed the way nature was collected and interpreted between the 17th and 18th centuries, and increasingly took the form of an archive to be deciphered, organized, and displayed. The collections that in Wunderkammern context were still designed to amaze and blur the boundaries between artifice and nature began being organized by more rational classification criteria: nature, from "theater of wonder," became an object of systematic study, as exemplified by the precarious division in Aldrovandi's "theater of nature." The reflections of historians such as Paula Findlen highlight how the pragmatic organization of these spaces—display cases, shelves, cabinets, binders, libraries—enabled a true material epistemology in which knowledge could be built by arranging things. Naturalists did not limit themselves to merely observing nature while traveling: they brought finds, instruments, books, and animals to museums to study, dissect, draw, and identify. In this way, Nature entered the museum, where it would be rewritten in the emerging grammars of science.

The trend of "modern" university museums that began in 1683 with the Ashmolean Museum in Oxford was soon followed by many other European universities at which educational activities accompanied exhibitions. With the revival of naturalistic studies, the consolidation of university institutions, and the birth of academies and scientific societies in the 18th century, the idea of the museum as a public space dedicated to education, the circulation of knowledge, and the rational pedagogy of the Enlightenment began taking shape. One significant example is the Maffeian Lapidary Museum founded in Verona by Scipione Maffei (1675–1755) around the middle of the century. Considered one of the first public museum institutions in Europe, it presented hundreds of stone inscriptions organized by philological and educational logic, anticipating the model of modern study collections. Unlike the private collections widespread at the time, the Maffeiano was created with the explicit intention of ensuring access, conservation, and public utility.

A straight line connects these collections, which in time became more and more scientifically systematic, with the large public museums of the emerging modern states that were often affiliated with universities. Many of the latter began as private collections before being institutionalized and opened to the public, as was the British Museum. Founded in 1753, opened to the public in 1759, considered the world's first modern museum, its origins date back to the public acquisition by the English

Parliament of Sir Hans Sloane's vast collection of over 80,000 specimens of natural and artificial objects and rich library.

The Natural History Museum of Florence took form not long after that. Developed around the scientific collections promoted by the Grand Duchy of Tuscany under the House of Lorraine and opened to the public in the second half of the 18th century, this significant example of an Enlightenment Museum was deeply rooted in the long Italian tradition of collecting. Increasing confidence in rational classification could not provide complete protection against ambiguity and misunderstanding, however. A case in point is that of Johann Bartholomäus Adam Beringer, a physician and naturalist who, in 1725, purchased stones carved with figures of animals, symbols, and letters from some students in Würzburg. Convinced of their authenticity, he brought them to public attention the following year in a scientific publication before discovering that they were deliberate forgeries created to deceive him. His attempts to destroy the evidence and save his reputation were in vain. Triggering ridicule at the time, the story clearly shows how scientific museology, still in its infancy at the dawn of the Enlightenment, could confuse the object with its narrative, the stone with the lie.

In the 19th century, new museum displays moved beyond the idea of “theatrical staging” of the most diverse objects. Scholars and collectors gradually relinquished their leading role to directors and curators. They were the ones who interpreted the needs of scholars while setting themselves the new goal of appealing to novel and growing categories of visitors and gradually reinforcing the idea of public utility at the same time. During this period, natural history museums acquired the political function of demonstrating symbolic control over territories and their resources in the shadow of the nascent European colonial empires.

The arrangement of objects—whether based on evolutionary scale, geography, or morphology—reflects a world order that is also social and, indeed, colonial. It is no accident that many large public collections of the time were based on global supply networks intertwined with contemporaneous imperial circuits, such as the one Sir Hans Sloane built by exploiting his connections and resources in British colonial territories. This underlines how the construction of scientific knowledge was intertwined with the colonial dynamics—economic, political, and even military—of the day.

Even animals were enlisted in this imperial diplomacy: dromedaries, giraffes, parrots, lions, and bears were offered as state gifts between colonial powers, living symbols of alliance or supremacy. When they died prematurely in captivity—as did the Bengal tigers donated by Indira Gandhi to Georges Pompidou—they ended up embalmed in natural history museums, transformed into museum trophies. Other emblematic figures include the giraffe Zarafa, donated by the Pasha of Egypt to Charles X in 1827 and still preserved today in the Natural History Museum of La Rochelle, and the elephant Fritz, donated in the same year by the Viceroy of Egypt Mohamed Ali to

the King of Sardinia and whose embalmed remains can still be admired in the Regional Museum of Natural Sciences in Turin.

Fossils, stones, and animals came to serve a dual purpose, providing material evidence of a universal natural history as specific elements that anchor scientific knowledge to territories and geological and environmental characteristics, on one hand, and as strategic assets in the political “great game” that de-fines the power relations between territories, on the other.

### **Geology, nation, museum: collections and architecture of knowledge in Italy after uni-fication**

As the 19th century progressed, scientific museums played a key role in the construction of the modern state. The only museums built specifically for the purpose at the end of the century in Italy focused mostly on natural history. The national unification process ushered in a period of systematization of knowledge, which was expressed in the foundation of public institutions dedicated to the study of the territory. Geological research, in particular, emerged as a strategic discipline: studying the composition of the soil and the distribution of fossil species while evaluating mineral resources meant not only being able to initiate new processes of industrialization, but also consolidating a unified vision of the new nation’s geography.

This was the context in which Italy's great natural history museums were established: those in Milan (1888-1893) and Genoa (1867), and the Zoological Station in Naples (1872). These institutions were inspired by European and North American models, but with the specific post-unification intent of shaping a new national scientific consciousness that was accessible, visible, and useful to citizens. Museums became tools for scientific literacy as well as study. Their architecture, often made of iron and glass, reflected the positivist spirit—transparency, functionality, educational monumentality—and, in many cases, was inspired by the neo-Gothic style then dominant among scientific and university institutions in England and the United States.

Reinterpreted in Italian context, the adoption of this stylistic language helped put the new museums on the international map of knowledge while simultaneously legitimizing them as authoritative institutions of modern science. Heated debates on museographic apparatus and layout took place. Experiments in dividing exhibits and objects for study using environmental reconstructions and distinguishing between research collections and educational collections were conducted. The method of display recalled the principles already formulated in private museums in the 16th

century, such as Aldrovandi's, where direct access to objects was considered fundamental for scientific observation.

This was the spirit in which the Royal Geological Committee was formed in 1867, later becoming the Geological Service of Italy. The institution promoted the systematic collection of fossil, mineral, and rock materials, as well as the production of national geological maps. The collections formed in this context—now kept by ISPRA, the Italian Institute for Environmental Protection and Research—testify to its intense activity in mapping, studying, and representing Italian soil. A prime example are the three-dimensional models—the first 3D geological representation of Italian territory—that established the configuration of Italy immediately after unification.

Among the lithographic collections formed between the 18th and 19th centuries, those of Faustino Corsi (1771–1845), Tommaso Belli (1805–1877), Federico Pescetto (1817–1882), and Pio De Santis stand out for their different types and purposes. The first two, originating in the field of antiquities, bear witness to the growing interest in the classification of ancient marbles—particularly in the work of Corsi, who in the early 19th century collected and described marbles, especially from the Roman period, standardizing the samples and providing a point of reference for historical lithology still valid today. Together with Corsi's work, Raniero Gnoli's *Marmora Romana*, published in 1971, is considered one of the fundamental works for studies on the classification and provenance of ancient Roman marbles.

The Pescetto and De Santis collections, on the other hand, differ in nature and function. Formed between the mid- and late 19th century, they were subsequently acquired by the Royal Geological Office. The De Santis collection, dating back to before Italian unification, reflects an enlightened and private sensibility, with a descriptive focus on marble used in ancient and modern times. The Pescetto collection, on the other hand, was created after Italian unification with a technical-documentary approach geared towards the study of stone in architecture. These collections are part of the reorganization of the ISPRA collections now underway at the MUCIV-Museum of Civilizations, where they are presented as representative stone libraries that illustrate the transition from descriptive collecting to a functional and territorial vision of stone in line with the educational and productive aims of the post-unification state.

The history of Italian stone collections also has a dual scientific and artistic tradition rooted in the Renaissance. Lorenzo de' Medici promoted the recovery of rare stones and ancient marbles from Rome, selecting them not only for their material value but also for their decorative potential. This would find expression in the Opificio delle Pietre Dure in Florence founded in 1588, where Florentine stoneworking skills rose to the highest technical and visual levels, and mineralogical knowledge was inseparable from pictorial and sculptural composition.

Originally established for scientific and technical purposes, the ISPRA Litho-Mineralogical Collections now renew the entwined study of materials, classificatory precision, and sense of form in contemporary vein, thus restoring stone to its role as a complex object amidst nature, culture, and history. The dual destiny of stone between man and nature assumes powerful symbolic synthesis in the Chamber of Honor at the Hall of Science in Rome's EUR district, where the ISPRA collections have been rearranged. At the center lies the monumental hard stone inlay floor laid by Mario Tozzi in 1943, a work that combines technical and artistic mastery with a visual allegory of scientific modernity. In ideal continuity with the tradition described above, the composition transforms stone into a vehicle for collective narration in which art, geology, and science commingle.

### **Contemporary perspectives: new models for Earth's collections**

Paleoart is an expressive and collaborative art form at the intersection of science and imagination in which artists and scientists reconstruct prehistoric animals through models, drawings, or three-dimensional representations. This dialogue between visual intuition and analytical rigor dates back to the 19th century and the pioneering work of Benjamin Waterhouse Hawkins. In 1852, Hawkins reconstructed the Paleozoic, Mesozoic, and Cenozoic eras in London's Crystal Palace Park using life-size models of extinct dinosaurs and mammals, a prototype of the paleontological diorama that anticipated many of the exhibition concepts later systematized in natural history museums in the following century.

In the 1930s, better informed debate on the effectiveness of museum displays and international models began emerging also in Italy. The idea of the museum as a space-time continuum for contemplation gradually developed into a more explicitly educational and communicative vision capable of guiding and engaging the public. New approaches to exhibition, such as dioramas, which were initially met with suspicion, soon came to be recognized for their educational and narrative value. With their hyper-realistic reconstruction of natural environments, ecological relationships, and scenes of animal life, dioramas became effective tools for conveying complex knowledge in visual form. This gave rise to reflections on exhibitions as a more dynamic and accessible form aimed not only at specialists but an increasingly wider audience as well.

In transiting to the 21st century, this horizon has expanded even further. Natural history collections—geological and paleontological collections in particular—have returned to the center of the museum debate no longer as repositories of scientific

knowledge but critical archives capable of questioning the relationships between nature and culture, history and technology. The focus has shifted from geological knowledge to a relational way of thinking in which stones and fossils are seen as active agents of ecological and eco-cultural processes, signs of once-living, now stratified geology. In this context, the issue of so-called “rare earths”—minerals essential to the production of electronic devices, solar panels, batteries, and contemporary digital technologies—demands new reflections on the responsibility of science museums. Geological materials, once studied for both their physical characteristics and their potential economic exploitation, have now become economic, environmental, and political indicators capable of reshaping national and international agendas even more than ever before.

In recent decades, new practices in art and curatorship capable of brightly illustrating the Earth sciences by pluralistic and interdisciplinary readings of the geological archive have arrived. Multispecies perspectives, decolonial approaches, and ecologies of knowledge open up alternative ways to interpret collections, the artifacts, and the thought structures that organized them. Museums now become epistemological laboratories in renegotiating the meaning of the materials on display and their accompanying narratives in order to make all the cultural, historical, and political implications that permit the consolidation of geological knowledge more and more visible.

The ISPRA collections at the MUCIV-Museum of Civilizations are being aligned to these concepts. Fossils, minerals, rock samples, instruments, geological surveys, works, specimens, and documents have been reorganized in a project that entwines museographic memory, critical vision, and imaginative perspective. The historic furnishings from the previous headquarters of the Italian Geological Survey have been restored and arranged in a display system that reflects on the historical stratification of geological knowledge and its forms of representation. The city of Rome can be imagined as one enormous archive consisting of many layers of historical and architectural periods. Objects, with all their personal and cultural value, are seen as interweaving with the urban fabric that comes to be enriched with the memories, experiences, and meanings of today's inhabitants. In this way, memories—individual and collective—are sedimented in a multiple memory that accompanies and sometimes questions the City's physical stratigraphy. Reorganizing the ISPRA geological heritage enables the reinterpretation of these collections as a more complete telling of the story of the relationships between human beings and materials, territories and institutions. Previously considered inert objects of study, stones now open links to eras, geographies, interpretations, and experiences. Stones are tools in comprehending past and future forms of coexistence between species, resource management, and environmental imagination that must be understood as a perspective from which to rethink the ways we inhabit this world. As artist Yto Barrada writes in *A Guide to*

*Fossils*, fossils are casts of vanished originals, mineral replicas married to living rock, traces that help us read otherwise inaccessible stories, and silent remains that document the Earth's deep past.

New types of fossil are emerging even as I write —petrified plastic bottles, cans, tools—reminding us that also our own traces will one day be only deposits found in the future, mysterious parts of the geological landscape we leave behind to the planet's coming inhabitants.

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