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## The Paper Museum

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**Date:** Oct. 1999

**From:** Natural History (Vol. 108, Issue 8)

**Publisher:** Natural History Magazine, Inc.

**Document Type:** Article

**Length:** 2,436 words

**Content Level:** (Level 4)

Full Text:

Early in the seventeenth century, Cassiano dal Pozzo made an attempt to gather a comprehensive visual record of the natural world.

In 1985, in a cupboard in Windsor Castle, I found a cache of several hundred of the most beautiful natural history drawings I had ever seen. I was astonished by both their quality and their range. There were drawings of animals, birds, fishes, plants, fungi, fossils, gems, and minerals. They included drawings that magnified animal and plant parts, as well as representations of many unexpected species, from lowly grasses to puzzling mollusks and curious mushrooms. The drawings also showed a few recently discovered plants and animals from the New World. I seemed to be in the presence of a vast attempt to catalogue all of nature. But where had those drawings come from, who had made them, and why had they been done with such extraordinary intensity and closeness of observation?

What led me to that cupboard in the Royal Library at Windsor Castle was a book I was writing about a Jesuit priest by the name of Giovanni Battista Ferrari (1585-1653), who had roused my interest because of his unusual career--unusual even by the standards of many of the brilliant members of that enterprising and controversial religious order. At first a professor of Hebrew at the Jesuit College in Rome, Ferrari soon gave himself over to his chief passion: gardening. When Urban VIII became pope in 1623, Ferrari was taken on as chief horticultural adviser to the papal family, the Barberini. This was the same family that would soon form an alliance with the Jesuits against Galileo. Ferrari himself had been present on that famous occasion in 1611 when Galileo first explained his use of the telescope to the very Jesuits who, within a few years, became his fiercest opponents. No one had written in any detail about Ferrari's life or about his lovely books on horticulture and botany. I was particularly interested in his last book, the *Hesperides seu de malorum aureorum cultura* (*Hesperides, or On the Cultivation of the Golden Apples*), published in Rome in 1646. Its engravings depicted more than 150 varieties of citrus fruit, and I went searching for the original drawings. Eventually I found more than a hundred of them--watercolors of citrus fruit in every imaginable shape and form--at Windsor Castle. On that same serendipitous day, mixed in with those drawings I found an unexpected number of natural history watercolors.

My research on the documents relating to these works led me to archives and libraries in London, Paris, and Rome. It turned out that I had stumbled upon one part of the Museo Cartaceo (Paper Museum), a huge collection of drawings of everything under the sun, from ancient Roman artifacts to unusual mollusks and bizarre mushrooms, assembled by a contemporary of Ferrari's, Cassiano dal Pozzo. Made at the same time as Galileo's pioneering investigations into astronomy, mathematics, and physics, these watercolor drawings, which later made up a significant part of the Paper Museum, have remained unknown to the vast majority of historians of science and are absent from almost every account of the scientific revolution of the seventeenth century. The collection is encyclopedic in terms of size, comprehensiveness, and accuracy. Unlike the fantastic monsters, prodigies, and wonders that populated the pages of earlier natural history books by Conrad Gesner and by Cassiano dal Pozzo's contemporary Ulisse Aldrovandi, almost every specimen included in the Paper Museum actually occurred in nature.

But who was Cassiano dal Pozzo? Born in Turin in 1588, Cassiano (as he is known in the world of art history) was raised by his father's cousin, the archbishop of Pisa. He studied law and later moved to Rome and set up a household with his younger brother. He became part of a cultured and scholarly circle centered around Federico Cesi, the duke of Acquasparta and founder, in 1603, of the Academy of the Lynxes. This first modern scientific academy (described by Stephen Jay Gould in "This View of Life" May and June 1998) was named after the sharp-eyed animal that could then still be found in the forests of the Umbrian hills. Cesi and his companions, dissatisfied with the conventionality of the universities of their day, were intent on studying nature through direct observation and experiment. In 1611 the group welcomed Galileo, who was by that time challenging the old Ptolemaic views of the universe. Cassiano was elected to the academy in 1622, a year earlier than his benefactor, Cardinal Francesco Barberini, a powerful patron of the arts and sciences and the nephew of Pope Urban VIII. Cassiano, who served as the cardinal's secretary, played a very active role in the Academy of the Lynxes. In addition to collecting paintings, he conceived the extraordinary private initiative of employing artists to make a visual record of the antiquarian and natural worlds, calling the project his Paper Museum.

Art historians have long been familiar with Cassiano in his roles as a patron of Nicolas Poussin, an admirer of Diego Velazquez, and a passionate collector of antiquities. But even most specialists had no idea of the full extent of the collection of drawings that formed part of his Paper Museum, which was housed in the residence he shared, in the via dei Chiavari, with his brother Carlo Antonio and Carlo's family. Contemporary visitors described a huge library of some 9,000 items: manuscripts, printed books, drawings, and miscellaneous objects. The bound sets of drawings were kept with the relevant printed books on shelves labeled *ad naturalem historiam*. Cassiano greatly enhanced the Paper Museum when he bought the contents of Federico Cesi's library after the duke's untimely death in 1630--a library containing not only books and instruments but also specimen drawings commissioned by Cesi during the earliest days of the Academy of the Lynxes. When Cassiano himself died in 1657, he owned, in all, approximately 7,000 drawings relating to architecture, mosaics, ancient sculpture, and natural history. Although he had corresponded with scientists, antiquarians, poets, and scholars from all over Europe, only a tiny fraction of the letters were published, and Cassiano, once well known as a patron of the arts and sciences, eventually faded into obscurity.

Ornithology particularly fascinated Cassiano. Besides having established a laboratory and a collection of zoological, botanical, and fossil curiosities at his residence, he kept live exotic birds, including a flamingo and a bearded vulture. As proof of his scientific expertise, needed for election into the Academy of the Lynxes, Cassiano submitted a book about birds, the *Uccelliera*. Although the author's name is listed as Giovanni Pietro Olina, much of the material was written or assembled by Cassiano himself, who, whether for reasons of modesty or perhaps politics, wanted to minimize his role to the public. Cassiano had commissioned illustrations for the *Uccelliera* from the artist Vincenzo Leonardi, whose name I discovered in connection with my work on Ferrari's citrus fruit drawings. (Leonardi turned out to have been responsible for the finest drawings in Cassiano's collection.) Additional evidence of Cassiano's interest in ornithology are three small treatises he wrote--on the bearded vulture, a pair of hummingbirds sent to him by a Jesuit from Canada, and the European and Dalmatian pelicans. There is also an exchange of letters between Cassiano and the French polymath Nicolas-Claude Fabri de Peiresc, in which they discuss everything about the flamingo--from the distinction between males and females to the taste of flamingo tongue, evidently an exceptional culinary delicacy. Their descriptions cover details of the bird's flight, song, behavior, and habitat, as well as describing ways of sewing the skins for specimen preservation.

Cassiano's thirst for knowledge was such that from the early 1630s he enlisted the French painter Poussin not only to make illustrations of birds and to copy antiquities for his Paper Museum but also to prepare illustrations for an edition of Leonardo da Vinci's treatise on painting. At about the same time, Cassiano commissioned Vincenzo Leonardi to draw the wild animals in Cardinal Barberini's live menagerie. These included a gazelle, a porcupine, an oryx, and a civet cat. There is speculation that the civet cat was dissected in Cassiano's own laboratory, which presumably contributed to the unusual accuracy of the drawing.

Cassiano also had a passion for botany, and it may well have been through the cardinal, who subsidized Ferrari's 1633 book, *Flora, sive de Florum Cultura* (*Flora, or On the Cultivation of Flowers*), that Cassiano met the Jesuit priest. This volume contains the first published illustration of plant parts seen under a microscope: the seeds and seedpod of the hibiscus, or Chinese rose. Over the next decade, Cassiano helped Ferrari assemble and publish his *Hesperides*, with its 115 plates and 400 folio-sized pages documenting the exuberant biodiversity of citrus trees and fruits available to Europeans during the Renaissance. He gathered information from correspondents all over Italy and France, again commissioning Leonardi to produce the illustrations. These were the exquisite watercolors that I came upon in 1985 at Windsor Castle.

Perhaps Cassiano's greatest contribution to science lay in his persistence in continuing the work of Cesi and other academy members. Although Cassiano, Cesi, and three colleagues helped Galileo prepare his manuscript *Il Saggiatore* (*The Assayer*) for publication in 1623, for the most part they stayed away from cosmological and physical theory, focusing on firsthand observation and experiment and collecting plants, insects, fossils, fungi, mammals, birds, and fishes. When actual specimens could not be acquired, they sought out reliable reports and illustrations.

The natural history of the New World presented academy members with the dramatic possibility of breaking with the old paradigms of such ancient authorities on the plant world as Aristotle and Theophrastus. One of the academy's earliest projects was an effort to publish a manuscript of commentary and illustration on more than a thousand Mexican plants and animals previously unknown in the Old World. These were assembled in Mexico between 1571 and 1577 for Francisco Hernandez, Philip II's physician, and preserved in the Spanish royal collections in the Escorial. Cesi saw a partial copy of this compendium in Naples in 1610, and Cassiano, accompanying Cardinal Barberini on a diplomatic mission to Spain in 1626, had copies made of several more sections. The so-called Mexican Treasury (*Rerum medicarum novae Hispaniae thesaurus*) was not published in its entirety until 1649-51, after Cassiano had obtained funding from the Spanish ambassador to Rome.

Although the book is hugely informative in describing the flora and fauna of the Americas, its illustrations are rudimentary compared with the studies of animals, plants, shells, and fossils subsequently commissioned by Cassiano, Cesi, and their fellow academicians. It seems that nothing in nature was beyond their curiosity or ambition, and Cassiano, in acquiring Cesi's great library, preserved intact some of their finest efforts. The library included not only Cesi's collections of plant and flower drawings but also his great series of mushroom drawings, which he had hoped to publish as well. These illustrations were made with the aid of a microscope and show fungi and ferns growing in situ. Fungal growths especially interested Cesi because they so often seemed to teeter on the borderline between animal and vegetable. It was just this problem of the boundary between one natural kingdom and another--and the issue of hybrids in general--that for both Cesi and Cassiano seemed to hold the clue to some of nature's deepest secrets.

Another important interest of Cesi's was fossils. Were ammonites, for example, animal, mineral, or both? Seven years after his death, Cesi's devoted friend and fellow academy member Francesco Stelluti published a small treatise, with thirteen plates, on fossilized wood. Among the treasures at Windsor Castle were 199 fossil drawings and, in addition, a number of geological and mineralogical illustrations, many of which had been in Cesi's collection, while others came from artists working for Cassiano. These later illustrations depict an extraordinary variety of minerals, gems, corals, and semiprecious stones.

How did parts of Cassiano's Paper Museum end up in London and Paris? A century after his death, the entire contents of the Paper Museum entered the collections of the rich and powerful Albani family in Rome. When Cardinal Albani needed cash in the 1760s, he sold many of the folio volumes to George III of England. In the 1780s, some 200 folio volumes from Cassiano's Paper Museum were amalgamated into the Royal Collection, reordered, and rebound. Eventually the Royal Collection was stored at Windsor Castle. After World War I, a royal librarian, perhaps unaware of the importance of the natural history drawings from Cassiano's collection, sold many of them to a London secondhand bookseller. They were then dispersed and are only now being tracked down. The volumes in the Institut de France in Paris also originally came from the Albani family but were sequestered by the French forces in Rome at the very end of the eighteenth century. Publication of a multivolume catalog of Cassiano's collection is now in progress under the auspices of the Royal Library, the British Academy, the Institut de France, and the Academy of the Lynxes (the present-day successor to the original academy). The first volume, on citrus fruit, has already appeared, while one on fossils is imminent.

Cassiano's Paper Museum provides the visual evidence that Cesi and his fellow academicians were carrying out research in natural history. The watercolor drawings are remarkable for their range of subject matter and their precision, refinement, and analytic intensity. In 1664 Cassiano's biographer, Carlo Daft, wrote: "With the true eye of a lynx, Cassiano was not content with the simple description and history of nature, but went beyond, in order to study its very anatomy" Cassiano dal Pozzo has preserved the work of a pioneering group that was intent not only on recording every aspect of nature but also on looking into the interior of things that until then had been portrayed only from the outside.

David Freedberg ("The Paper Museum"), a professor of art history at Columbia University in New York City, is editor of the multivolume catalog of Cassiano dal Pozzo's natural history drawings being published by Harvey Miller Publishers under the auspices of the Royal Library at Windsor Castle. As a result of the fortunate accident described in his article, the author discovered that Cassiano was not only a patron of the visual arts but also a passionate investigator of the natural world. Freedberg's best-known book is *The Power of Images: Studies in the History and Theory of Response* (University of Chicago Press, 1989). *The Eye of the Lynx*, his forthcoming book from the same publisher, examines the role of Galileo and his associates (including Cassiano) in creating the modern field of natural history.

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**Source Citation** (MLA 8th Edition)

Freedberg, David. "The Paper Museum." *Natural History*, vol. 108, no. 8, Oct. 1999, p. 58. *Gale In Context: Biography*, <https://link.gale.com/apps/doc/A56183372/BIC?u=columbiau&sid=BIC&xid=5ad5d595>. Accessed 30 Nov. 2020.

**Gale Document Number:** GALE|A56183372