

The Development of Scientific Inquiry and the Cabinet of Curiosity

The cabinet of curiosity, or *Wunderkammer*, as it was originally called, was a collection of natural and man-made objects of interest. The items comprising these collections often possessed rare or unique qualities, intended to awe both the collector and the audience. When creating a cabinet, there was often a mix of science and religion, in which one was used to justify the other as will be demonstrated later. In some cases, it was “rapturous admiration at the handiwork of God,” rather than a pure investigation of the material world.¹

In order to recognize the role of the cabinet of curiosity in history, it is important to understand the circumstances and atmosphere in which these collections developed and existed. Like with all cultural movements, there are many factors leading to their evolution. As it will be described below, many of these collections were also intended for scientific study and research.

A description of the historical climate, focusing on the progression of scientific inquiry during the renaissance and enlightenment, will be followed by a description of cabinets and their uses. The cabinets, starting small but taking many forms, were precursors to modern museums. The dual position of museum and

¹ Alexander Marr, *Introduction*. In R. J.W. Evans and Alexander Marr, eds. *Curiosity and Wonder from the Renaissance to the Enlightenment*. (Burlington: Ashgate Publishing Limited, 2006) 6.

research center still exists in the American Museum of Natural History in New York and the Exploratorium in San Francisco.

Ages of Science: Renaissance and Enlightenment

In Europe, when the middle ages were coming to an end, western culture was coming out of the “dark ages” and re-embracing the classical thought that flourished in the Greco-Roman world. During the middle ages, the writings of classical western philosophers such as Aristotle, Archimedes, and Plato were both stored in monasteries in the west and translated into Arabic in the East.

Pliny the Elder’s *Natural History*, comprised of 37 volumes from the first century CE, is the earliest surviving encyclopedia to survive from the Roman Era:

An exhaustive survey of the phenomena of nature, this encyclopedia is also an unparalleled guide to the cultural systems, which the ancient Romans used to understand their world... It immerses the reader as no other book can in the traditions, fantasies, and prejudices through which the ancients observed the world.²

Trevor Murphy’s book, *Pliny the Elder’s Natural History*, which is quoted above, attempts to position the encyclopedia as a political move in addition to its relevant observations. There may be credence in the concept, however *Natural History* presents early observations of the natural world as separate from the supernatural.

² Murphy, Trevor. *Pliny the Elder’s Natural History*. (Oxford: Oxford University Press, 2004) 2.

His texts also described the man-made wonders of his time.³ Writings such as this would later influence the scholars of the Renaissance. These writings re-emerged in the late middle ages and became widely available to increasingly literate cultures. They were slowly translated into Latin and became accessible to scholars at the monasteries and new universities most notably in Italy. The Renaissance, or rebirth, spread across Europe, and lasted from about the mid-fourteenth century into the mid-seventeenth century. As with all cultural movements, the Renaissance is hard to define, being composed of a variety of personages, events, inventions, and observations. It stretches across such a broad amount of time and subject matters including art, science, politics, and technology that it was ripe for scientific thoughts and observations to develop at a considerable pace.

The invention and development of the printing press by Johannes Gutenberg in 1439 is considered to be the device that spurred the Renaissance.⁴ Of course, as Jocelyn Hunt says in her book *The Renaissance*, “developments are seldom as sudden, or as radical, as at first appears, and changes can be seen as emerging from and merging into one another.”⁵ While the printing press and European development of movable type was a strong catalyst for the surge of the classical revival, it was certainly not the sole stimulus.

³ Mirollo, James V. “The Aesthetics of the Marvelous: The Wondrous Work of Art in a Wondrous World.” In *Wonders, Marvels, and Monsters in Early Modern Culture*. Platt, Peter G. ed. (Newark: University of Delaware Press, 1999) 31.

⁴ Bryan Bunch and Alexander Hellemans. *History of Science and Technology*. (Wilmington: Houghton Mifflin Harcourt, 2004) 97.

⁵ Jocelyn Hunt. *The Renaissance*. (London: Routledge, 1999) 5.

That the works of art, relics and other remains preserved in churches and sanctuaries heralded the collections of works of art and wonders amassed by the humanists. That in their form and in the nature and rarity of the treasures they contained the *Schatzkammern* (treasure chambers) of medieval royal residencies anticipated the collections of the sixteenth century.⁶

Access to writings from Greek, Roman, and Islamic sciences were limited to Europeans in the middle ages, but “by the ninth century, growing intellectual activity in western Europe, particularly in parts of France and the rich Italian city-states, began to support new inquiries.”⁷ The arts and sciences invigorated one another and all of this would provide the fertile ground for cabinets of curiosity to develop.

The zeniths of scientific developments occur when cultures or societies “separate the natural world from the supernatural world.”⁸ During the middle ages, literacy was reserved occasionally for the royal elite, but principally for the church or clergy who were responsible for the religious texts. Although the church held this knowledge and shared it with a privileged few, the defeat of the Moors in Spain, the European Crusades to Jerusalem, and the development of the Silk Road led to a “renewed contact with the wider world” and the increased sharing of goods and ideas.⁹ The church, being responsible for the writings, also maintained

⁶ Patrick Mauries. *Cabinets of Curiosities*. (London: Thames & Hudson Ltd., 2002), 51.

⁷ Andrew Ede and Lesley B. Cormack. *A History of Science in Society: From Philosophy to Utility*. (Toronto: Broadview Press Ltd., 2004) 77.

⁸ *Ibid*, 14

⁹ *Ibid*, 82.

intellectual control through the possession of relics, items holding intrinsic religious meaning such as body parts or items related to or touched by saints.

The twelfth century and early thirteenth century also saw the first European universities and a surge of Arabic to Latin translations of many texts from antiquity. Aristotle and his theories on natural philosophy were in especially high demand. In essence, the Renaissance was the result of many social and scientific developments occurring around Europe towards the end of the middle ages.

Thomas Aquinas, influenced by the writings of Aristotle, is one personage credited with attempting to merge the natural with the supernatural. He believed in divine revelations and claimed God bestowed knowledge and the capacity for wisdom upon those considered worthy. He also claimed an understanding of the universe can be discerned by the physical senses. However, the church still had a firm grasp on the many aspects of society and the pope condemned such views in 1277.¹⁰

Italy was in a prime spot for Mediterranean trade into Europe from the Middle East. All throughout the Renaissance, astronomers and cartographers became increasingly active, resulting in what is now considered the ‘age of exploration.’¹¹ These sciences assisted explorers on voyages of discovery and early trade. Like the European Crusades and the establishment of the Silk Road in the late Middle Ages, increased travel and trade aided in the development and sharing

¹⁰ Bunch and Hellemans, 95-96.

¹¹ Hunt, 75.

of knowledge. Economic arrangements came about quickly and were a catalyst for the growth of the merchant class.

The chronicles of exploration seem uncertain in their bearings, disorganized, fragmentary. Their strength lies not in a vision of the Holy Spirit's gradual expansion through the world, but in the shock of the unfamiliar, the provocation of an intense curiosity, the local excitement of discontinuous wonders.¹²

This becomes more relevant in the objects comprising the cabinets of curiosity.

Another change, which took place during these early years, was the shift of power from the clergy to the royal courts. "Rather than syllogistic logic and theological subtleties, princes wanted spectacle, power, and wealth. Therefore, natural philosophers who were practical (or claimed to be) were valued."¹³ Courtly patronage, especially in Italy, of the arts and sciences also encouraged cartography and economy. Artisans began working with new materials in new ways, and natural philosophers and physicians began experimenting with alchemy.

Alchemy was the predecessor to modern chemistry and concerned itself with "employing the material world for useful purposes."¹⁴ While much of the work was rooted in incorrect theories, distorted observations, and continued to involve the supernatural, these studies set the foundation for later scientific inquiry.

Towards the end of the Renaissance, and into the Age of Enlightenment, scientific studies took a more methodical approach. As elements were discovered

¹² Stephen Greenblatt. "Introduction to *Marvelous Possessions.*" In *Wonders, Marvels, and Monsters in Early Modern Culture.* Platt, Peter G. ed. (Newark: University of Delaware Press, 1999) 106.

¹³ Ede and Cormack, 103.

¹⁴ Ibid, 120.

alchemy turned into chemistry. Concepts formerly considered facts were routinely proven false and avenues for sharing knowledge were growing.

Some, such as Alexander Marr, envision a broader context: the culmination of curiosity and wonder that manifested during these years, with the cabinet developing as only one component of a cultural trend. Quoting Krzysztof Pomian, Alexander Marr describes this trend as a “ ‘culture of curiosity’ amongst collectors, natural historians, alchemists and the like, claiming that collections and collecting practices are the principle manifestation of an ‘age of curiosity.’ ”¹⁵ This age of curiosity is essentially the bridge between the Renaissance and the Enlightenment, where people explored, observed, studied, and made conclusions about the world around them. It is in the above atmosphere that the cabinets evolved.

Cabinets of Curiosities

The move from the religious to the secular influenced not only the economy and the merchant class but also the arts and sciences and ultimately the collectors.

Collections of ruling kings and lords, secular and religious; collections belonging to scholars, universities, other institutions; and finally the private collections amassed by members of the aristocracy and bourgeoisie, including most notably, apothecaries and physicians.¹⁶

¹⁵ Marr in Evans Marr, eds. “Introduction.” 9.

¹⁶ Mauries, 24.

Some cabinets were used as a display of wealth and power. ‘Princely collections’ or *studiolo* such as that of Cosimo de Medici, composed of items from the “new world” and natural objects such as fish skeletons or the jaw of an elephant.¹⁷

“Wonder cabinets had supplanted reliquaries as objects of admiration and pilgrimage, though access was conventionally limited to an elite group of tourists.”¹⁸ The development of *Wunderkammern*, translated as ‘cabinets of wonder’ or cabinets of curiosities, demonstrate the rekindling of interest in the natural world. Also developing in conjunction with *Wunderkammern* were *Kunstammern*, ‘cabinets of art.’ The growth of these collections has roots in the Renaissance, matured during sixteenth century and developed substantially into the seventeenth century. “Accumulation, definition, classification: such was the threefold aim of the earliest cabinets of curiosities.”¹⁹ The early *studiolo* were literally cabinets and intended for private enjoyment.²⁰ These later developed into more extravagant displays such as the princely collections or laboratories. These collections bridge the gap between the Renaissance and the Enlightenment in western philosophy, although they were most dominant during the early Enlightenment, also termed Age of Reason.

¹⁷ Adriana Turpin. “The New World Collections of Duke Cosimo I de’Medici and their role in the creation of a *Kunst-* and *Wunderkammer* in the Palazzo Vecchio.” In R. J.W. Evans and Alexander Marr, eds. *Curiosity and Wonder from the Renaissance to the Enlightenment*. (Burlington: Ashgate Publishing Limited, 2006) 72-73.

¹⁸ Dennis Kay. “Who Says ‘Miracles Are Past’?: Some Jacobean Marvels and the Margins of the Known.” In *Wonders, Marvels, and Monsters in Early Modern Culture*. Platt, Peter G. ed. (Newark: University of Delaware Press, 1999) 181.

¹⁹ Mauries, 25.

²⁰ *Ibid*, 52.

The very term ‘cabinet of art and curiosities’ came into use only gradually. It was used to designate an enclosed space, often rather cramped and sometimes hidden away, characterized by the singular use it made of the space available and its scholarly array of objects which were brought together primarily to be studied rather than to be put on display.²¹

The collections were first defined by Samuel Quiccheberg as an assortment of objects from nature, or *naturalia*, and man-made objects, or *artificialia*.²² The objects ranged from seashells to taxidermy animals to paintings. Early scientists could not always distinguish between fact and fiction and this helped give rise to many mythologies. The objects in the cabinets “possessed something of the unique, the rare or the unassimilable”²³ and were collected to elicit more questions than they resolved. Applied in retrospect, Maurice Rheims calls the collectors of these objects “curio-collectors”:

Besides the collectors and the dilettantes, there are curio-hunters. They are a hybrid and diverting set of people, on the lookout for the rare and unexpected rather than beautiful things, exercising a choice that seems all the more delicate because it sly and perverse.²⁴

Such a collector was more inspired and awed by existence of these items, rather than by any inherent beauty. “The personality of each collection depended above all on that of its founder or creator.”²⁵ In many ways the items speak for

²¹ Ibid, 50.

²² Ibid, 23.

²³ Ibid, 25.

²⁴ Rheims, Maurice. *The Strange Life of Objects*. David Pryce-Jones, trans. (New York: Atheneum Publishers, 1961) 5.

²⁵ Mauries, 51

themselves, but they also speak volumes about the collector. Such as if the types of objects: *naturalia*, *artificialia*, or mix; their relationships to one another: duplicates, opposites, origins, etc.; and if the collector opted to display them publicly or privately.

The foundation for cabinets arose around the age of exploration. Explorers brought back to Europe evidence of what they considered the exotic and unique; these were artifacts of unknown worlds that sparked the imagination. Peter Platt argues against Aristotle's proposal that wonder is a temporary sensation, generated by curiosity but ceases once the related question has been answered. Platt proposes "the power of wonder [is] and elemental factor in pushing forward the frontiers of intellectual and aesthetic experience."²⁶

The apothecaries, the part scientists and part pharmacists, were also avid collectors for the most part. Collections were discussed and described on an increasing basis, but the first pictorial example came from Ferrente Imperato, an Italian apothecary in Naples. Imperato, like other apothecaries, utilized the collection for research and medicines. In his catalog manuscript, *Dell'istoria Naturale*, printed in 1599, the frontispiece depicts:

Books, botanical and zoological specimens and jars are crowded together in carefully arranged profusion. Shells and marine creatures, including an enormous stuffed crocodile, are suspended from the ceiling. ... 'One of the most observable places in the city, [sic] a repository of incomparable knowledge...' ²⁷

²⁶ Peter G. Platt, ed. "Introduction." *Wonders, Marvels, and Monsters in Early Modern Culture*. (Newark: University of Delaware Press, 1999) 15.

²⁷ Mauries, 10.

These cabinets also owe their development to the growth of mercantilism during the Renaissance years, as mentioned above. The decline of the feudalism and the growth of commerce encouraged people to trade and collect materials of interest, not just those from abroad. Art objects were highly prized as well and increasingly so as cabinets developed, since these items were more likely to be rare.

The existence of an item is a fact but it is not evidence until it is given context. Lorraine Daston posits “Nature’s facts are above suspicion” as they are presumed free of human intention.²⁸ Gradually, the collectors began to turn away from the curious and engage more with the aesthetic qualities of objects. Art objects increasingly valued as cabinets developed, since these items were more likely to be rare. Queries into the origins of curious objects were answered over time, abolishing the mystique of the object.

There should be in addition ‘pure’ history of science, the concern of those wishing to discover what was seen as ‘science’ at different times in the past, what problems scientists faced, and how they tackled them.²⁹

The fields of science are now numerous and nearly impossible to count. Many of these fields are intertwined, where a development in one field sparks a new avenue for discovery in another field.

²⁸ Lorraine Daston. “Marvelous Facts and Miraculous Evidence in Early Modern Europe.” In *Wonders, Marvels, and Monsters in Early Modern Culture*. Platt, Peter G. ed. (Newark: University of Delaware Press, 1999) 76.

²⁹ David Knight. *Sources for the History of Science*. (Ithaca: Cornell University Press, 1975) 13.

Cabinets of Curiosities, existing as both scientific labs and exhibition spaces, inspired new ways of looking and studying objects: as both an art object and a specimen. Although the separation is more apparent now, both are utilized in tracing a history or understanding artistic cultures and intellectual pursuits. For example, specimens were often “brought back to be identified and properly described by experts at the great museums or botanical gardens.”³⁰ Access to these early written observations are crucial to understanding how a specimen may have changed over the years or how it is related to similar specimens. Cabinets were also supplied with the machinery used for studying.

The seventeenth century saw a rise in communication among the collectors and scientists and the development of scientific societies and the scientific journal. These acted as a type of cabinet of curiosity, but with information rather than objects. Instead of displaying items of interest, the items and ideas were discussed and published for dispersal.

Prior to 1830, the term ‘science’ only meant “an organized body of knowledge” and scientists were called “ ‘physiologists’, ‘naturalists’, or ‘natural philosophers’, or often indeed simply a ‘philosophers’.”³¹ It was not until the mid-nineteenth century that science was considered a professional pursuit and around this development the cabinet of curiosity began to give way to the pursuit of scientific knowledge: “doubtless the pre-eminent status accorded to observation, to new methodologies, and to the accumulation of data reduced the cult of

³⁰ Ibid 195.

³¹ Ibid, 17.

curiosities to the status of an imperfect science.”³² A sense of wonder was no longer enough: society needed scientific proof in order to accept the existence of the fantastical monsters and exotic specimens.

This evolution falls particularly in line with the developing systems for biological classifications during the 18th century. In 1799 there existed over 50 systems of identification and classification of the natural order.³³ Ultimately, botanist Carl Linnaeus’ tiered classification system and two-part Latin name, or binomial nomenclature, would be the most widely accepted. The system is still in use today, albeit still contentious with some scientists.

“The concept of the cabinet of curiosities began to change when differences became more important than correspondences.”³⁴ Over the years, the objects, once housed in the cabinets of curiosity, were divided by topic or theme: the *naturalia* is separated from the *artificialia*, the science from the art. In an increasing breakdown of content, the cabinets “became fragmented into a series of private cabinets, each devoted to a particular specialty.”³⁵ The rooms themselves also became more ornamental and inclined to aesthetics.

Different forms of art and science museums thrive today, all with different missions and collections. Some are dedicated solely to astronomy, chemistry,

³² Mauries, 193.

³³ Patricia Fara. *Sex, Botany, and Empire*. (Cambridge: Totem Books, 2003) 20.

³⁴ Mauries, 185.

³⁵ Mauries, 189.

natural history, etc. The scientific societies and journals became specialized as well, creating forums for these more specific topics.³⁶

Contrary to the separation of arts and science or of the scientific disciplines, some collectors or museum curators stressed the importance of linking science to the humanities. For example, there was Christian Jürgensen Thomsen: (1788-1865) director of the Royal Museum of Nordic Antiquities and also an avid collector. He is credited for establishing the concept of the three ages of development in civilization: Stone, Bronze, and Iron Ages. Throughout his career he also pointed out arbitrary divide between the ‘two cultures’ of the sciences and the humanities.³⁷ Around this time in Denmark it was considered unscholarly to study history without written records, which means there had to be written documentation of a time period otherwise that time period ‘didn’t exist.’ Thomsen claimed the study of artifacts as documentation as a way to study history, not just written records. Using artifacts to study history and culture is a very definite reflection of the cabinets of curiosity being utilized to study the natural world.

Wonder persists and knowledge is cumulative. Science museums are still around and active, inviting scientists and artists in to study and develop new ideas. These museums still embrace the concept of an environment for learning and research, originally founded by the early cabinets and collectors.

³⁶ Knight, 15.

³⁷ Kasper Risbjerg Eskildsen. “The Language of Objects: Christian Jürgensen Thomsen's Science of the Past.” *Isis*, Vol. 103, No. 1 (March 2012), pp. 24-53

American Museum of Natural History

The museum and library were founded in 1869 and have since grown into one of the largest natural history museum, libraries, research centers in the world. According to their mission statement the “museum has advanced its global mission to discover, interpret and disseminate information about human cultures, the natural world and the universe through a wide-ranging program of scientific research, education and exhibition.”³⁸

The AMNH does not limit itself to any single scientific discipline. The museum has approximately six divisions of natural science: anthropology, paleontology, vertebrate zoology, invertebrate zoology and the physical sciences: earth and planetary science, and astrophysics. Researchers are invited to visit the museum to study and collaborate with others in their field. If they are unable to attend in person, the research center will ship a specimen to the researcher.

The museum is substantial in space and scope. The divisions operate individually from one another, but the opportunity for collaboration still exists.

Exploratorium

Conceived of by Frank Oppenheimer and established in 1969 in the San Francisco Bay area, the Exploratorium is a museum and “library of experiments” where visitors can “explore scientific phenomena at their own pace, following their

³⁸ “About.” *The American Museum of Natural History*. Accessed May 2, 2012. <http://www.amnh.org/about/>.

own curiosity.”³⁹ The Exploratorium is intended more for observational study than natural history like the AMNH. As Hilda Hein says in her book on the

Exploratorium:

Artists and scientists seek out patterns in the natural world and sensitize others to them. Scientists, like artists, validate their work aesthetically, and both make intellectual choices... the belief that they are dissonant and incompatible distorts and misrepresents them both.⁴⁰

The Exploratorium is conceivably the modern epitome of a cabinet of curiosities, one which will cover about nine acres when it moves to its new location in 2013. Visiting the museum is less about the artifacts and more about the experience. The members of the audience are invited to become engaged in science and art. In the museum, scientists and artists work together to “support a culture of experimentation and collaboration, inspire curiosity and understanding, and stimulate fresh ideas and directions.”⁴¹

In 1968, Oppenheimer published an article in *The Museum Journal* titled “Rationale for a Science Museum.”

The fruits of science and the products of technology continue to shape the nature of our society and influence events which have a world-wide significance. Yet the gulf between the daily lives and experience of most people and the complexity of science and technology is widening.

³⁹ “Our Story.” *Exploratorium*. (2011). Accessed May 2, 2012.
http://www.exploratorium.edu/about/our_story/.

⁴⁰ Hein, Hilda. *The Exploratorium: The Museum as Laboratory*. Washington: Smithsonian Institution Press, 1990. 147

⁴¹ “Our Story.” http://www.exploratorium.edu/about/our_story/.

Thus is a growing need for an environment in which people can become familiar with the details of science and technology and begin to gain some understanding by controlling and watching the behavior of laboratory apparatus and machinery; such a place can arouse their latent curiosity and can provide at least partial answers. The laboratory atmosphere of such an “Exploratorium” could then be supplemented with historical displays showing the development of both science and technology and its roots in the past.⁴²

Curiosities of Today

Cabinets of curiosity helped establish the practices still used today in science and natural history museums around the world. These practices have shaped scientific thought, research methods, and encouraged the sharing of ideas among scholars and researchers. “The marvelous cannot easily be quenched.”⁴³ Platt’s argument that a sense of wonder or of the marvelous as a driving force for inquiry is relevant even today.

Such specimens of curiosity and uniqueness are still being unearthed and preserved. For example, since 2008 the International Institute for Species Exploration at Arizona State University publishes a list online of the top ten newly discovered species every year. The list includes mammals, insects, reptiles, and bacteria, some of which are discovered in populated areas,

Another example, receiving more publicity than the above, is a calico lobster taken from the coast of Maine, and discovered at a seafood restaurant in Cambridge, Massachusetts. The lobster was saved from “being cooked and served

⁴² Frank Oppenheimer. “Appendix 1: A Rationale for a Science Museum.” In Hein, Hilda. *The Exploratorium: The Museum as Laboratory*. Washington: Smithsonian Institution Press, 1990. 217.

⁴³ Mirollo, in Platt, Peter G. ed., 39.

to a customer.”⁴⁴ The calico lobster, considered to be 1 in 30 million, will soon head to its new home at the Biomes Marine Biology center in Rhode Island. Although we have become immune to the curiosities, which fascinated and captivated the early collectors and scientists in the Renaissance and Enlightenment, we continue to be intrigued by the rare, unique, and exotic, even if its original destination was dinner.

⁴⁴ Young, Colin. “Calico Lobster Escapes Fate as Dinner.” *The Boston Globe*. May 8, 2012. http://www.boston.com/news/local/massachusetts/articles/2012/05/08/rare_calico_lobster_found_at_summer_shack_headed_for_new_england_aquarium/

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