E-Museum Teaching Guide

Materials




Mike Goode, Kate Holohan
Jeffrey Adams, Jeanelle Cho, Abigail Greenfield

Introduction

The Materials e-museum highlights objects in the Syracuse University Art Museum's collection that have been created out of ecologically interesting materials. All physical objects—including artworks—are created out of substances that have environmental histories and through processes that carry impacts for different places, species, and groups of people. The goal of this e-museum is to encourage a sideways analytical approach to objects by foregrounding their raw materials and the complex ecosystems and environmental histories bound up with these materials' extraction, harvesting, processing, and distribution.

With few exceptions, we have selected objects whose materials, time, and/or place of creation are certain, and whose ecological histories we think bear sustained examination. The objects come from a variety of times and places and belong to many different artistic media (photography, painting, printmaking, sculpture, textiles, decorative arts, and so forth).

In most cases, we have also tried to select objects that make other kinds of ecological references or representations in their form or content. Among the museum's contents, for example, are: a second-century Vicús terracotta wind instrument in the shape of a frog, a turn-of-the-nineteenth-century British tea caddy clad in sea tortoiseshell, a mid-nineteenth-century French photograph printed using salt, a late twentieth-century Yoruba sculpture of a monkey that is made partly out of monkey hair, and an early 21st-century Indian fish-print cloth that was bleached using dung from terrestrial animals. Here is a full list of the materials that comprise or were used to create the various artworks and objects in the e-museum:

- **Plant fibers and parts** (mahogany, black ash, teakwood, African blackwood, willow, sweetgrass, raffia, cotton, calabash, seeds, wood pulp/paper, plywood)
- **Plant extracts and blooms** (linseed or flax oil [oil paint], plant resin)
- **Animal parts** (bone, ivory, moose antler, tortoiseshell, cowrie shells, leather, feathers)
- **Animal products and by-products** (wool, silk, moose hair, monkey hair, cow dung, egg white [albumen print photograph], egg yolk [tempera paint], gelatin [gelatin silver print]
- **Metals, metal alloys, and metal derivatives** (silver, gold, copper and copper wire, tungsten [incandescent lightbulb], lead, aluminum, iron, pewter, bronze, silver nitrate [gelatin silver print photograph])
- **Stones and minerals** (marble, nephrite [jade], smoky quartz, feldspar [porcelain], quartz [porcelain], metallic oxides [favrile glass], iron oxide [terracotta], sodium oxide or "soda" [glass], calcium oxide or "lime" [glass], salt [salt print photograph])
- **Earth, sand, and soil** (mud, porous clay [ceramicware, terracotta], kaolin clay [porcelain], stoneware clay [stoneware], silica [glass], sand)
- **Synthetics** (plastic, fiberglass, lacquer/varnish, acrylic paint, plastic glitter, synthetic resin)
- **Electricity**

Keywords: *bone, ivory, shell, hair, wool, dung, gelatin, plant fibers, wood, mahogany, willow, plywood, paper, calabash, silk, cotton, plastic, resin, heavy metals, precious metals, stone*

Teaching Strategies: General Questions

In approaching this e-museum, we encourage you to prompt your students to take intellectual inspiration from Donna Haraway's pronouncement that "it matters what other matters we use to think other matters with" (*Staying with the Trouble: Making Kin in the Chthulucene*, Duke University Press, 2016, p.12). To get students contemplating how the matters used in creating an art object matter to the other matters the object prompts you to think about–that is, matter to the object's significance–you might ask questions like:

- What ecological and cultural histories were bound up with certain materials before they were used to create the artwork? What about since?
- Are any of the materials used to create the artwork valuable or scarce historically? Are any of them bound up with histories of colonialism, slavery, or labor exploitation? Do any of them carry cultural significance for the artist's own culture or for cultures associated with the places from which they were obtained? How exactly did the artist source these materials? How does contemplating any of these questions matter to assessing the work's significance?
- Animal matter features prominently in the works that are in this e-museum. Hair, hide, gelatin, ivory, tortoiseshell, and more are critical components of many of these pieces of art. Many of these animals were likely killed or harmed to make works in this collection. Given this, how does focusing on artworks' animal components allow us to think differently about a given artwork as something that can prompt ethical dilemmas?
- Minerals are seemingly inert and unliving but their extraction is done within specific environments under particular social conditions. What can different types of mineral materials (marble, copper, iron, clay, etc.) tell us about the different people and cultures who made these earthy items? And how do certain minerals connect works across cultures and time?
- To what extent does a given object call attention to the materials out of which it is composed or created? Does it call attention to all its materials equally? What interactions are there, if any, between the materials used in creating a given artwork and what the work represents, depicts, expresses, or symbolizes? How might this matter for thinking about the work's significance?
- All artworks take advantage of the representational and utilitarian affordances that their materials permit for them. Distinct materials allow for different types and forms of art to be made out of them, and different arrangements of materials invite different ways of interacting with them. In this e-museum, what works do you see as especially shaped by the materials used for their composition? Why?
- What are the different components of the total ecological footprint of a given artwork's materials? What about the materials used for its storage and display? Did the artist travel a significant distance to create the work? If so, how and why? If the work (for example, a painting) has a frame, out of what is the frame made, and how was it made? If it has internal supports or components, out of what are they made, and how were they made? How does contemplating any of these questions affect your assessment of a work's ecological significance?

Teaching Strategies: Material History Assignment

Several of the questions on the previous page will not work in instructional contexts unless students have more knowledge to draw from than the questions themselves supply. One way to generate this knowledge is to have individual students select objects from the e-museum and research ecological and cultural histories of the material/s out which their chosen objects are constructed (histories that should cover a span of time beginning long before the object was created and extending all the way up to the present).

Only after students have completed this research should you have them then research their chosen object. At that point, you can use the general questions above as prompts to have students write or present about how researching the materiality of their chosen object has informed (or altered) their understanding of its significance.

Words that Come Before All Else - Thanksgiving Address, *Ronni-leigh Goeman and Stonehorse Goeman [Object 2022.0001]*

Supplying Material History Yourself

Another way to teach using this museum is to do a bit of research yourself to supply the students with ecological, cultural, and historical context for thinking about the materials used to create a given artwork. The "Further Reading" section at the end of this guide offers some research leads. Here are two examples designed to show how supplying even brief environmental and cultural histories of an object's materials can prompt potentially rich and provocative discussions about its ecological significance:

Example 1: A silk carpet [Carpet with Hunting Scene]; Iranian, Qom; circa 1960 [Object 1984.850]

[Carpet with hunting scene] [Object 1984.850]

The most straightforward way to begin a discussion of this ultrafine Persian carpet's ecological significance is to have students discuss what it depicts: a historical scene of Persian hunters mounted on horseback, using traditional weapons (bows and arrows, scimitars) to pursue their prey. The meanings of the scene change significantly, however, when one identifies the hunters' likely prey: urials, a type of wild sheep (identifiable in the carpet by their curved horns and relative size) and Asiatic cheetahs and/or Persian leopards (identifiable in the carpet from their spots and relative size). Targets of sport hunting for centuries in and around Iran's Qom province (where the rug was made), all three of these species are now endangered. Since the time this carpet was woven in the 1960s, urials have been officially declared a "vulnerable" species, and Asiatic cheetahs and Persian leopards have become critically endangered. Once present throughout wide swathes of Africa and Asia, only 12 Asiatic cheetahs still exist in 2023, a decline that has resulted from sport hunting, from trapping for zoos, and from urban development in historical habitats.

That said, in 1957, just a few years before this carpet was woven, Iran had gained international recognition as a leader in wildlife conservation and sanctuary creation for introducing measures to protect Asiatic cheetahs and Persian leopards, both of which are national symbols of Iran. These wildcat populations had already begun declining dramatically in the 1940s and early 1950s when Allied soldiers during WWII and, later, European and American tourists, began hunting them using modern rifles, floodlights, and jeeps. Kavir National Park, just 60 miles from where the rug was made, is among Iran's oldest wildlife preserves and home to several Asiatic cheetahs and Persian leopards.

Such information raises many questions: is this rug an object that glorifies hunting while ideologically deflecting attention from a developing ecological crisis (a bit like grocery store food packages using pastoral imagery that deflects attention from the industrial production conditions for the food)? Alternatively, how does the distance between the more sustainable historical hunting practices depicted in the rug and the modern hunting practices that necessitated conservation legislation potentially affect the rug's ecological significance? Might the rug be trafficking more self-consciously in nostalgia or elegy for a time before worries about extinction and biodiversity? What elements of the rug's imagery contribute to different interpretations of its ecological significance?

Supplying Material History Yourself cont.

Having discussed what the rug depicts, you might then ask students if and how its ecological significance has been altered for them by considering the material out of which it is created: silk. Silk, a fiber obtained through a process of extraction from animals, has been produced in Qom and other northern Iranian provinces for nearly 3,000 years (although it wasn't until the sixth century, when the Byzantine empire managed to smuggle silkworm eggs out of China and break what had been a Chinese monopoly on silk cultivation, or sericulture, that sericulture began there). Silk cultivation involves raising huge quantities of live silkworms (technically, caterpillars) from eggs until they spin cocoons, which are then harvested and sold to silk producers. Silk producers soak the cocoons in hot water to loosen the long silk fibers nested in the inner portion of the cocoon, which are then wound into thread and reeled onto spools.

Silk has been promoted historically as a "sustainable" natural fiber on account of several factors: first, the ease of annually replenishing the animal source—caterpillars—from which silk fibers are extracted; second, the relative ease of transforming the chief byproduct of silk production—boiled caterpillars—into animal feed; and, third, the carbon mitigation impact of the mulberry farms required to sustain sericulture (mulberry leaves being the food that sustains silk caterpillars). That said, silk caterpillars require controlled temperatures to cultivate, and their cocoons need to be boiled during the extraction process. The energy required for both processes ha been supplied for the past two centuries primarily by burning fossil fuels. Silk caterpillars also eat an astonishing quantity of mulberry leaves in their brief lifetime (more than 7 pounds per individual caterpillar!), which means that the mulberry farms required to sustain the silk industry are huge. In addition to removing arable land for use by other kinds of agriculture, these farms tax local freshwater supplies in many areas, including in the chief mulberry farming areas of Iran north and west of Qom province.

Several ecological watchdog groups have also questioned mulberry farms' supposed carbon mitigation effects on account of the kinds of fertilizer and manure the farms typically use to grow mulberry trees.

The level of animal slaughter involved in silk production also raises ethical questions for some, leading to a search for alternative extraction methods and silk supply sources (e.g., spiders). Roughly 10,000 caterpillars are killed just to produce a single silk shirt or dress. Roughly 50,000 silk caterpillars were killed to extract the amount of silk needed to make the roughly 20 square-foot, densely knotted carpet depicting the hunting scene. Ask your students what impact, if any, knowing about this more invisible scene of animal slaughter has on their earlier conversation about the rug's stance on game hunting. Does it alter their sense of the rug's ecological significance? What about its ideological significance?

Iran is the world's eighth largest silk producer today, and silk is a huge business globally, employing millions and sustaining many rural communities economically, including in Qom and its surrounding provinces. Silk rugs from Qom are prized as among the finest and most expensive rugs in the world. At the same time, in Iran and elsewhere where silk is produced, most of the profits go to the cultivators and traders of cocoons and not to the silk thread producers or the rug-knotters, many of whom live in modest conditions. It is worth discussing with students how the wealth disparity between the participants in the hunt depicted in the carpet and the laborers who produced and manufactured the materials for the carpet matters to the rug's environmental significance. If the rug is sending ecological messages, either through the images it depicts or the materials from which it is composed, from whom are those messages originating and to whom are they being sent?

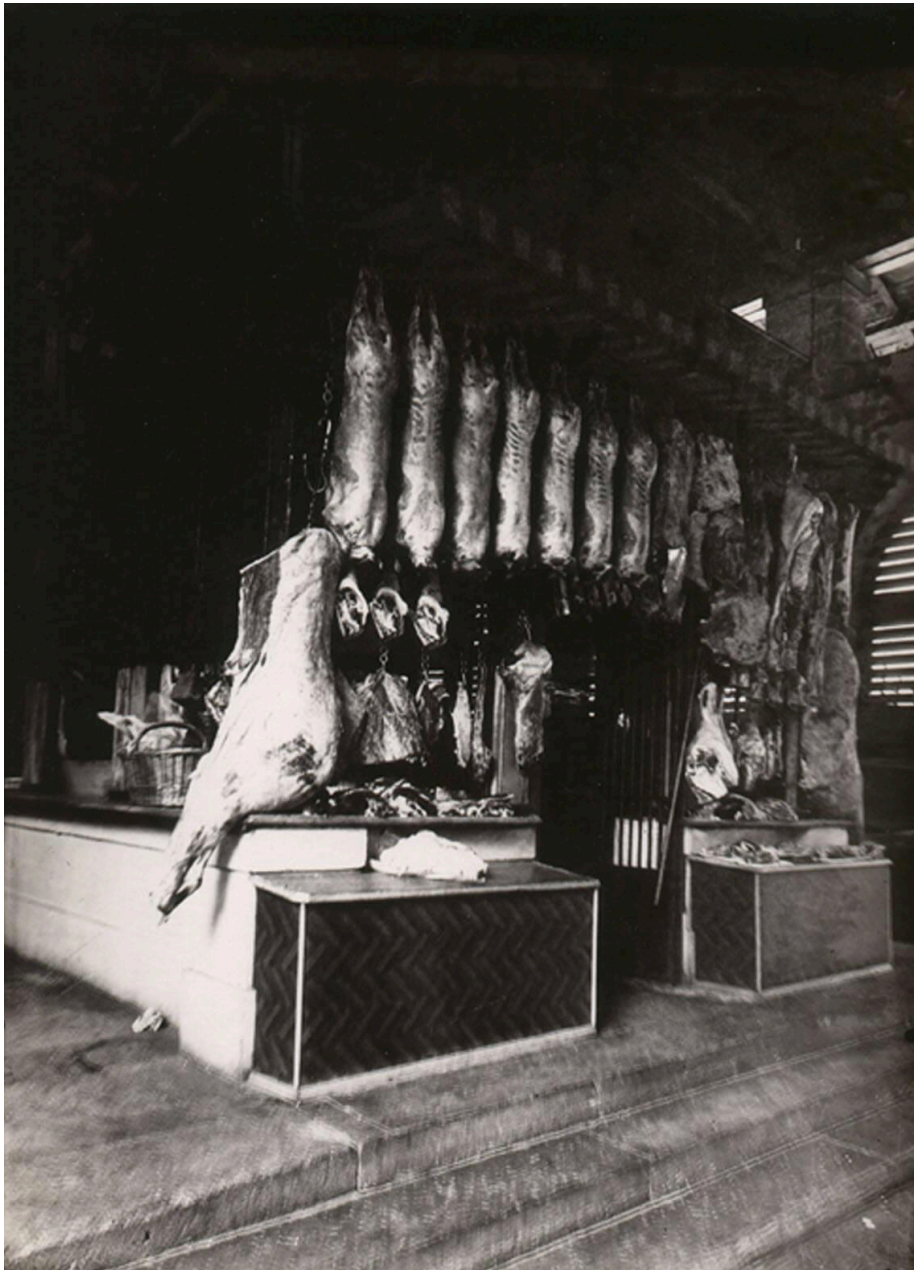
Supplying Material History Yourself cont.

Example 2: A gelatin silver print photograph (Eugène Atget, *[Butcher's shop]*; France; circa 1923; [Object 1984.116])

Eugène Atget, a pioneer of documentary photography, documented the streets of Paris in the early decades of the twentieth century, at a time when modern commercial, building, and advertising practices were rapidly changing the city's architecture, population, and atmosphere. His early 1920s photograph of slaughtered pigs and sides of beef hanging in a French butcher shop located in a covered market is part of this urban documentary project. Viewed as part of this project, it reads as elegiac or nostalgic, given that French beef and pork production and distribution were becoming more industrialized and grocery stores less specialized.

One of the consumer practices helping to drive the industrialization of French meat production in the 1920s, however, was photography itself, and Atget's photo of the butcher shop is thus implicated in the urban changes it documents. Early photographs were usually printed on paper that had been sensitized to light with salt water and silver solution (salt prints and calotypes) or that had been treated with egg whites sensitized to light with silver salts (albumen prints). In the 1870s, however, the gelatin silver print took over as the most common photographic development process, and it remains so today for analog photography. The process uses gelatin instead of egg whites as the vehicle for dispersing light-sensitive silver salts over paper. Gelatin, an animal by-product, comes from animal collagen. For the past 150 years, the gelatin used for photography– including for Atget's silver gelatin print photo–has been derived primarily from bovine bone and hide remnants.

On the one hand, the explosion of photography as a medium in the late nineteenth and early twentieth century would have been impossible without gelatin, which became essential to the development of the commercial photography industry, to documentary photography and photojournalism, and to the film processing technologies that made possible early portable cameras, such as those made by Rochester, New



[Butcher's shop], Eugène Atget [Object 1984.116]

Supplying Material History Yourself cont.

York's Eastman Kodak company. On the other hand, gelatin processing became such a significant industrial sector in the nineteenth century, especially in Britain, France, Germany, and the United States, that many gelatin factories began opening their own slaughterhouses just to source the skin and bones needed for gelatin production. The importance of gelatin to the photography industry was such that, by the 1930s, Eastman Kodak opened its own gelatin factory and raised its own cattle herds for slaughter.

Gelatin production is also a water-intensive industry, requiring many gallons of water to produce a single pint of gelatin, with the leftover water needing to be treated as wastewater. The wastewater left over from gelatin production typically contains lime (long used within industry to speed the process of deriving gelatin) and, often, chemicals that were present in the tannery waste (scraps of animal hide) used as a source for gelatin. Gelatin factories thus have been responsible for significant land pollution historically (including in New York State, where the site of a gelatin factory south of Buffalo, in Gowanda, NY, is now a Superfund site).

With the advent of digital film in the twenty-first century, beef gelatin demand has dropped enough that its supply now can be filled by using what would otherwise be waste materials from animals slaughtered for food. That said, the demand for analog film has been climbing slowly but steadily in recent years. Raising beef cattle carries the highest carbon footprint of any food industry, and the gelatin industry in the past and present has supported the beef industry by buying its waste, thereby deflating the price of beef and keeping beef demand artificially high. The process of bovine gelatin production by itself also has a carbon emissions footprint that is 19 times its weight (i.e., 1 lb. of bovine gelatin has a carbon footprint of 19 lbs. of CO_2 emissions), and that ratio was worse in silver gelatin photography's heyday, due to the use of coal to power gelatin factories. While the carbon footprint and pollution cost of a single silver gelatin photograph are negligible, the popularity of this technique among art photographers, commercial photographers, and amateur photographs historically carried major environmental costs.

As a commercial photographer and devotee of gelatin silver printing when the process first became mainstream, Atget could not have been ignorant that his photograph of a butcher's shop was also a photograph, in a sense, of the raw materials required to create his photo. Whatever facility these animals were slaughtered in likely also produced gelatin. How does this information alter the ecological significance of the photo for you? What about its ideological significance? Does the photograph obscure or call attention to its own materiality? Does it affect your answer to know that gelatin was much more commonly used by home cooks in the early twentieth century than it is today, and that this gelatin, when not rendered at home by boiling bones, was typically purchased from butcher shops? While not clearly visible in Atget's photograph, a 1920s butcher's stall would almost certainly have been selling gelatin.

[Butcher's shop], Eugène Atget (detail) [Object 1984.116]

Further Resources

Available under the Art, Ecology, and Climate Project webpage on the Syracuse University Art Museum website are in-depth teaching guides to the following individual artworks in the "Materials" e-museum:

- Ronni-leigh and Stonehorse Goeman, *Words That Come Before All Else – Thanksgiving Address* (woven basket; black ash, sweetgrass, moose antler, moose hair; Haudenosaunee; 2021)
- [Tortoiseshell tea caddy] (wood and tortoiseshell; British; ca. 1800)
- [Hunger figure] (African blackwood sculpture; Makonde people, Africa; ca. 1990)
- Robert Rauschenberg, *Goat Chow* (screenprint and collage on paper, with plastic twine; American; 1977)

Additional context for a few other artworks in this e-museum can be found in the teaching guides for other e-museums in the Art, Ecology, and Climate Project. For the following works, consult the relevant teaching guide on the Project's webpage. The relevant guide is listed in parentheses after the work:

- Chinese jade carving of Buddhist monks within a mountainous landscape (Environmentalisms)
- Mark Boyle, *Liverpool #2* (Bewilderment)

More artworks that are made out of ecologically interesting materials and/or that engage self-reflexively with their materiality can be found throughout the Art, Ecology, and Climate Galleries.

Tortoiseshell tea caddy [Object 1969.1651]

Materials
Selected Recent Texts

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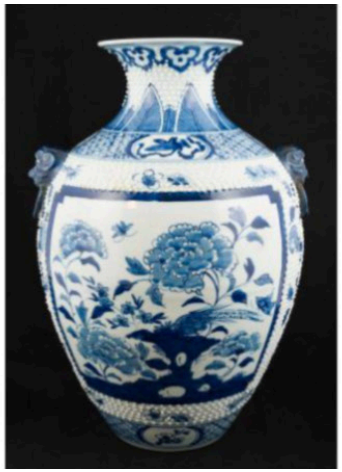


Project Team and Sponsors

Professor Mike Goode

Professor of English and WIlliam P. Tolley Distinguished Professor in the Humanities

Kate Holohan

Curator of Education and Academic Outreach, Syracuse University Art Museum

Jeffrey Adams

Ph.D Student in English

Jeanelle Cho

'24 (Architecture)

Abigail Greenfield

'25 (History and Political Philosophy)

William P. Tolley
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