Pearl Diving Video

Pearl diving was the traditional means of gathering pearls over the last four millennia. However, with the advent of commercial pearl culturing in the 20th century, pearl diving is no longer widely practiced.

What are Pearls?

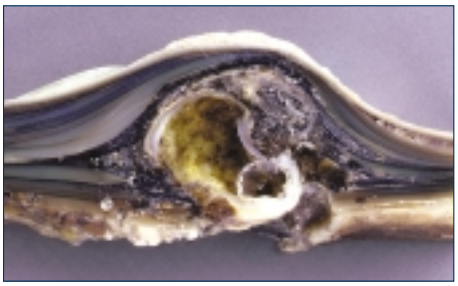
This section explores the great natural beauty and the associated cultural meanings of pearls through the ages and around the world. Using historical and modern pearl objects the physical, chemical, and optical properties of pearls are demonstrated. The unique iridescence of pearls will be exemplified by a number of objects, but particularly interesting is a 50-million–year-old lustrous fossil pearl and a 100-million-year-old nacreous and iridescent fossil ammonite.

Queen Conch shown with an array of the porcelain-like pink pearls it produces.

Shell: AMNH
Pearls: Susan Hendrickson
C. Chesek/AMNH Photo Studio

How Pearls Form

Students will learn what a mollusk is and the process by which a mollusk produces a pearl. Contrary to the popular belief that a pearl starts as a grain of sand, the process involves the mollusk continually coating an invasive foreign object (called a *nucleus* and usually is a parasite, not a grain of sand) with shell-forming tissue (called *the pearl sac*).

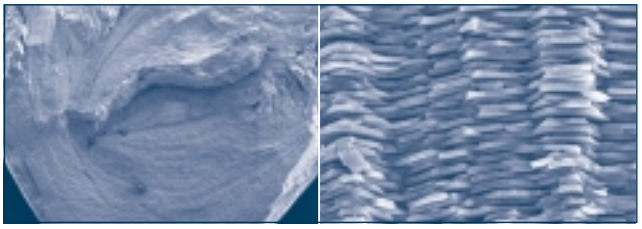


J. Beckett/AMNH Photo Studio

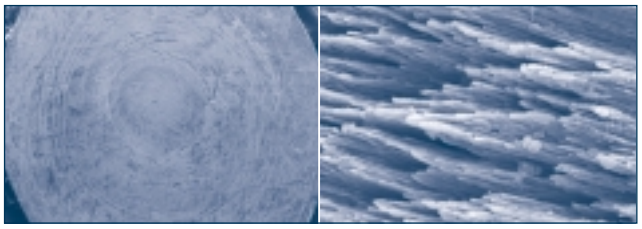
This cross-section demonstrates how a pearl forms in an oyster.

Pearl Structure

A series of scanning electron micrographs reveals the layered structure of a pearl at magnifications up to 50,000 times actual size. A pearl is composed of multiple layers of aragonite ("ah-RAG-ah-nite") and conchiolin ("KON-kee-oh-lin").



Abalone x 25 *Abalone x 4267*



Conch x 25 *Conch x 11861*

AMNH Interdepartmental LAB

Surface, Size, Shape, and Color

Students can study the rough surface and irregular size and shape of pearls in specimens and in jewelry. Pearls come in many colors, ranging from white to pink, gold, green, purple, and black. In the Black-lipped Pearl Oyster, the conchiolin, which determines the color of a pearl contains melanin-the same substance that determines the darkness of human skin. Sometimes chemicals in the water alter the color of the pearl or pearls may be dyed to change their color.

Luster and Iridescence

One of the most distinctive features of a nacreous pearl is the way it seems to glow from within. This property, known as "luster," gives pearls their unusual beauty. Luster results from the refraction of light rays not only off the surface of the pearl, but also off the concentric inner layers of nacre, like light bouncing off a convex mirror.

Imitation Pearls

Students can observe the different efforts over time to create imitation pearls. Cave pearls made from stalactites and stalagmites look like molluscean pearls, but are not.

Animation (see map for details)

Chrysanthemum brooch
Natural pearls, diamonds, gold, platinum
United States, 1904

Collection of Mr. and Mrs. R. Weatherly
Photo: Wartski, London

The Central Gallery

The Central Gallery contains a diverse array of spectacular elements that introduces students to the wonders featured in the other sections of the exhibition. The world's largest mollusk species, the giant clam (*Tridacna*), is show-cased alongside a reproduction from the Berlin Natural History Museum of the largest known pearl in the world, the Pearl of Allah (also known as the Pearl of Lao-Tsu, the Chinese sage). The pearl weighs 14.5 pounds and is about 10 inches long and was produced by a giant clam of the type displayed. Spectacular portraits of Queen Elizabeth I and Sir Walter Raleigh show the popularity of pearl-embroidered clothing during the European Renaissance. The long-standing relationship between royalty and pearls is also illustrated by stunning jewelry such as a pearl-and-diamond brooch given to Queen Victoria by her husband, Prince Albert, on their third wedding anniversary in 1843. Students can trace different species on a beautiful Evolutionary Tree. Actual shell specimens and pearls are represented on the diagram.

Tarantula Brooch
Natural pearl, white and brown diamonds, ruby, brown sapphires, gold
Germany 1998

Stefan Hemmerle, Munich

The Evolutionary Tree

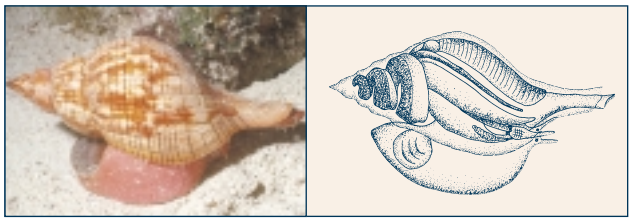
Any mollusk that can make a shell can in theory also make a pearl. On this tree, each branch represents a lineage of mollusks related through a common ancestor, ending in one or more mollusks from which pearls are known. Notice how pearl-producing mollusks are scattered across the tree rather than concentrated in one lineage. The tree also shows that groups with shells lined by nacre (mother-of-pearl) are likewise widespread.

Marine Pearls

The best-known sources of pearls are marine mollusks—pearl oysters as well as conchs and abalone. This section explains that while nearly all mollusks including snails are capable of producing pearls, only a few produce pearls of gem quality. Each display case is devoted to one type of marine mollusk, its pearls, and examples of cultural objects made from them. For example, the La Paz pearl oyster (*Pictada mazatlanica*) from the Gulf of California and Gulf of Panama is displayed next to a 17th-century Spanish pendant brooch made with La Paz pearls. Humans have long harvested various species of saltwater mollusks for their mother-of-pearl shells as well. Marine supply sites include Japan, Ceylon, the Persian Gulf, Caribbean region, South Pacific, and Tahiti, which produces black pearls. Most pearls come from bivalves, the two-shelled mollusks, rather than single-shelled gastropods.

Jane Burton/Coleman, Inc. Illustration/AMNH

Flame Scallops lend themselves to intrusion by particles.



Chesher/Photo Researchers, Inc. Illustration/AMNH

Tulip Snails tend to keep particles from entering their bodies.

Students can explore why this is so by contrasting the anatomy and way of life of single-shelled gastropods with two-shelled mollusks.

Atlantic Pearls

AMNH Rare Book Collection

Illustration of pearl fishing at Cubagua and Margarita Islands

In 1492, when Christopher Columbus sought a new route to the Orient, pearls headed the list of goods that the Spanish monarchs desired. Though he never reached Asia, in 1498 Columbus discovered the pearl-rich islands of Margarita and Cubagua off the Venezuelan coast. Over the next century, millions of natural pearls were shipped to Europe, bringing the Atlantic Pearl Oyster close to extinction.

Freshwater Pearls

Freshwater pearl mussels living in lakes, rivers and streams produce pearls that rival those of saltwater mollusks in luster and diverse color. As locally obtainable "jewels," these pearls were long prized in Europe, Asia, and North America. The central display in this section is a necklace of Scottish freshwater half-pearls set in gold that belongs to the present Duke of Norfolk in England. It is said to have been a betrothal gift to his ancestor in the 16th century from the ill-fated Mary Queen of Scots, cousin to Queen Elizabeth I. Due to her beheading, the wedding never took place.

Biwa Pearl Mussel with cultured blister pearls

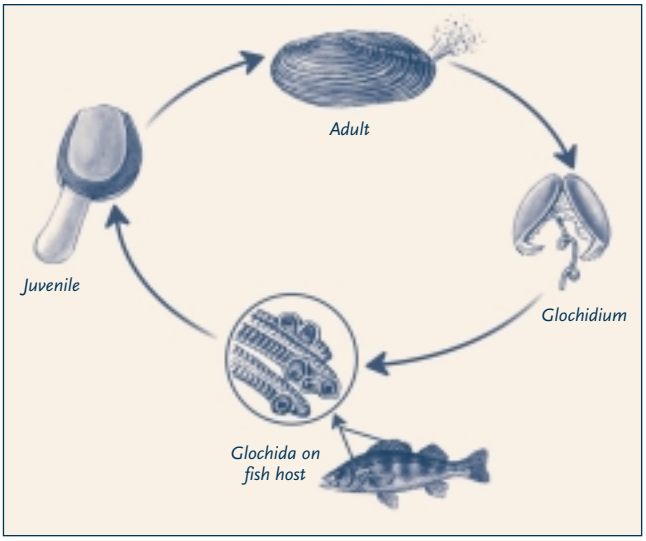
J. Beckett/AMNH Photo Studio

Earrings
Natural and imitation pearls, gold, copper alloy metals, kingfisher feathers China 1800s.

The Field Museum, Chicago

Pearl Mussels: A Unique Life Cycle

Unlike the larvae of saltwater pearl oysters, the specialized larvae of freshwater pearl mussels must attach to a fish for survival. Their tiny hooks cling to the fish's fins or gills until the larvae grow enough to drop off and settle on a lake bottom or streambed. The attached larvae feed on particles from the fish's food supply, and the fish carries them to a new habitat. Because the environment must sustain both the larvae and the fish to which they attach, the presence or absence of pearl mussels may indicate the health of a river or lake.



H. Friedman, illustrator/AMNH

Life cycle of freshwater pearl mussel, including fish, glochidial and larva

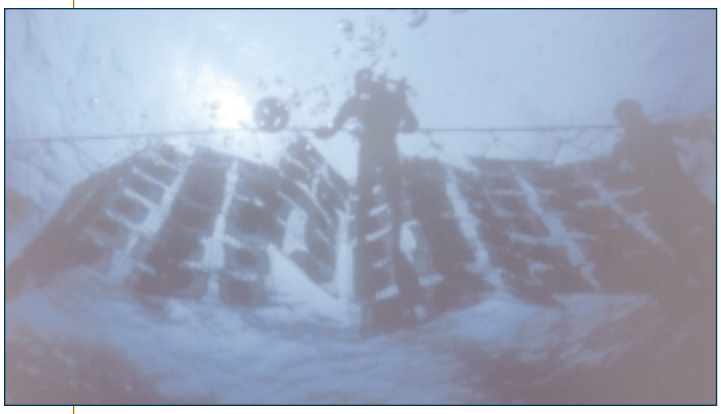
Freshwater Mussels Video (see map for details)

Pearls Mussels in Peril

An important display for students is the case with North American pearl mussels, particularly those from the Mississippi watershed–an area containing the most diverse population of pearl mussels in the world. Of some 300 species of pearl mussels native to American freshwater, two-thirds may be at risk. It is now the source of nearly every bead nucleus used in the production of cultured pearls throughout the world. The threat of extinction to these freshwater species from habitat destruction is explored in depth.

Of historical interest is the section that tells the story of Muscatine, Iowa, the largest producer of pearl buttons in the world from the late 19th century to the mid-20th century.

Gathering and Culturing Pearls



Tahiti Pearl, a Robert Wan Company

Few pearl oysters live in shallow waters, so gathering them in any quantity has always relied upon diving, sometimes to great depths. Because of the risks to a diver's survival–including dangerous marine creatures, diver's sickness ("the bends"), and pure exhaustion–many cultures forced impoverished laborers or slaves into service. Gathering and culturing Pearls presents the story of how pearls have been gathered, farmed, and cultured. The history of perliculture—the art and science of producing pearls by intentionally implanting an object within a mollusk's body and nurturing it in controlled conditions—is traced from its beginnings in China some 800 years ago to the 20th century, when modern farming and grafting techniques were developed and the modern cultured pearl industry was founded.

Students will find interesting the first physical evidence of successful pearl production by the Chinese, who inserted shapes such as tiny Buddhas between the shell and mantle of freshwater pearl mussels, producing pearlized Buddhas. More recent examples include pearly Chairman Mao. Students can also make a timeline with names and countries of innovators in the techniques of culturing pearls.

The image of Chairman Mao was inserted into the mantle of an oyster and became pearlized

The Field Museum, Chicago
J. Beckett, AMNH Photo Studio

Culturing Pearls in Japan Video (see map for details)

The upper body of this Renaissance style pendant is a large baroque pearl.

J. Beckett, AMNH Photo Studio

Pearls in Human History

Humans have long been fascinated by pearls and the shells of the mollusks that produce them. Pearls were highly valued by some cultures while others preferred the more easily obtained mother-of-pearl, or pearl shell. Pearl artifacts date to 7,000 to 8,000 years ago but are more abundant in the last 3,000 to 2,500 years, concomitant with the rise of sophisticated civilizations and the development of trade routes. Over time, pearls have symbolized wealth, power, religion, and influence.

Mummy portrait from the second century A.D. of a woman named Isadora includes fashionable jewelry featuring pearls, gold and emeralds

J. Paul Getty Museum, Malibu, CA

Hoop earring
Natural pearls and gold
Roman Empire, a.d. 100–200

The British Museum, London

The exhibition concludes with an impressive array of historically and culturally significant pieces of pearl jewelry and decorative objects from around the world. The shifting popularity of pearls in the 18th, 19th, and early 20th centuries is traced from the royal court of Louis XVI in France to the cresting of the natural pearl market during the Gilded Age of the early 1900s. As cultured pearls began to come onto the market, pearls became affordable not only to the rich and royal, but to almost everyone. A simple strand of pearls became a standard part of every woman's wardrobe.