

TEARS OF THE GODS

“Language is the amber in which a thousand precious and subtle thoughts have been safely embedded and preserved.”

– Richard Chenevix Trench



Janna Semenova, 2020, *Burmite at Sunrise*, Multicolour.com

Phaeton's sisters grieved for four months, and the gods turned them into poplar trees and their tears into amber. Their tears still flow and hardened by the sun, fall as amber from the virgin branches, to be taken by the bright river and sent onwards to adorn Roman brides.

Amber has always been admired and esteemed, and the amulets and articles recovered from Stone Age excavations provide some insight into these earliest civilizations' arts and cultures.

The oldest discoveries date back thousands of years to Mesopotamian Greece and Northern Europe. Amber has long been used in folk medicine for its purported healing properties, and its extracts were recommended from the time of Hippocrates (460–370 BC) for a wide variety of treatments. Throughout the Middle Ages and up until the early twentieth-century, amber necklaces were a traditional European remedy for colic or teething pains.

In ancient China, it was customary to burn Amber during large festivities. Since the Han Dynasty 2200 years ago, Burmese Amber was highly sought by artisans. It was thought to contain the soul of a tiger and considered a symbol of courage and bravery. In traditional Chinese medicine, Amber is used to “tranquelize the mind.” Even Marco Polo wrote about Amber from his travels on the Silk Road between 1271 and 1295.

Most Amber has a hardness ranging between 2.0 and 2.5, a refractive index of 1.5–1.6, a specific gravity between 1.06 and 1.10, and a melting point of 250–300°C. By gemstone standards, it is very soft but, as a result, conveniently workable for necklaces or earrings.

It occurs in various colors, and some pieces are transparent, while others are cloudy or opaque. As well as the usual yellow-orange-brown colors, it can range from pale lemon yellow to brown to almost black. Uncommon colors include red, sometimes known as “cherry amber,” green, and even extremely rare blue amber.

Amber is produced from the resinous marrow discharged by the trunks and branches of pine, gum and cherry trees. Oozing as an ultra-sticky liquid, this prehistoric resin gradually hardened over millions of years. The small plants, animals and insects that became trapped within it give us a view of life at the time. It often emits a pine-like smell when rubbed or ignited and is known for this coniferous odor.



A perfume-pot made from amber and depicting cupids and a panther. Roman, Aquileia, 100–120 CE. British Museum, London.



Vintage inspired Contemporary Baltic Amber gold pendant.

Amber and Copal are easily confused. While Copal is also made from tree resin, it's not nearly as old as Amber. What makes Amber have the demand and value that it does is its age. Copal is softer and does not have the same properties as Amber because it hasn't had enough time to fossilize. Copal resin most often comes from the aromatic copal tree and can also be burned as incense.

The name "amber" is thought to be derived from the Arabic word *ambar*, meaning ambergris. Ambergris is the waxy aromatic substance created in the intestines of sperm whales used in making perfumes in both ancient and recent history.

Although burning Amber does give off a characteristic "pinewood" fragrance, modern products, such as perfume, rarely employ it because the scent is not strong enough. In perfumery, the scents referred to as "amber" are more often other concoctions created and patented to emulate that scent.

Amber is found in many places worldwide, but the largest and most exciting deposits are from the Baltic regions of Europe, the Dominican Republic, Lebanon, and Myanmar (Burma).

As each area represents a different era of Earth's geologic past, we can learn much from the fossilized plants, animals, and insects trapped inside.

Found along the Baltic Sea's southern shore, yellow Amber reached the Middle East and western Europe via trade. It was known to the Persians as *kah-ruba*, referring to its electrical properties. Indeed, rubbing Amber will produce a static charge, which is the easiest way to identify it.

The Kaliningrad region and specific areas of Lithuania, Poland, and Ukraine are home to Amber's largest industrial deposits. Over 98% of the material is classified as Baltic Amber or succinite. The largest deposits are located on the Baltic Sea coast – in Russia, Lithuania and Latvia. The Kaliningrad region in Russia is a unique area that holds 50 million-year-old amber deposits, and the local village of Yantarny is home to 90% of the world's amber deposits.

The most inexpensive European Amber comes from the Rivne Oblast and surrounding Ukraine and Belarus regions. Rovno amber, occasionally called

Ukrainian amber, is dated between Late Eocene and Early Miocene and suggested to be contemporary to Baltic Amber.

Everyone who the armed gangs will allow can benefit. The amber is close to the surface, so a shovel is often a sufficient tool for local people to make a fortune. Most mining areas are controlled by the mafia. The forest in the area where an amber deposit is anticipated is burned or chopped down, a dredger digs a channel, and water is pumped from the nearest water source. Groups of miners dig a pit up to 10 metres deep. The pits are flooded with water, the amber rises to the surface, and the miners look for it in the water. After exploiting the mining site, they leave.

Dominican Amber is the youngest, between 16 and 20 million years old. All Dominican Amber is fluorescent, and the rarest color is blue. It turns blue in natural sunlight or any other partially or wholly ultraviolet light source. In long-wave UV light, it reflects white. Only about 100 kg or 220 lbs is found per year, which makes it valuable and expensive.



Amber and amber inclusions are increasingly important for making discoveries and conclusions about the life that existed on Earth millions of years ago.

Scott Davies, 2018, The Micro World Embalmed in Burmese Amber

HOW OLD IS AMBER?

The vast majority of amber is younger than 90 million years old, but in 2009, researchers discovered a 320-million-year-old piece of amber in an Illinois coal mine, which unexpectedly was very similar to more modern resins. This discovery completely upended the entire early evolutionary history of plants and showed resins were much older than was previously thought.

The most common method of determining Amber's age is by looking at the insects contained within it. By determining when the insects became extinct, we can surmise that the Amber must be at least that old.

As technology has progressed, more technical methods of dating amber have been developed.

Another effective method for determining age is called exomethylene signature dating, which compares the decay of chemicals trapped inside. Spectroscopy and Differential Scanning calorimetry and uranium-lead dating can also be used to determine the age of Amber.

Many remarkable insects and spiders were also recently discovered in nearby Jordan, including the oldest zorapterans, clerid beetles, umenocoleid roaches and achiliid planthoppers. This Amber referred to as Lebanese Amber, is roughly 125–135 million years old. It is considered of high scientific value, providing evidence of some of the oldest sampled ecosystems. Recently, even more aged Jurassic Amber has been found.

The oldest Amber with compelling numbers of arthropod inclusions like crustaceans, insects, millipedes and centipedes comes from Lebanon. More than 450 outcroppings of Lower Cretaceous amber have been unearthed, and some have yielded biological inclusions comprising the oldest representatives of their species.

HOW DO WE KNOW IF AMBER IS AUTHENTIC?

Amber might be the most frequently faked fossil, and with the invention of plastics, it has become even easier. In some cases, holes are drilled in natural Amber, modern insects added, and the voids infilled in with resin. We should always be suspicious of large insects and other fossils preserved in Amber, as larger insects can usually struggle free.

For those interested in purchasing Amber, determining authenticity is essential. Buying from reputable sellers is ideal. To make sure, rub the Amber on a natural cloth and see if it builds a static charge. Small bits of paper or hair will be attracted and cling to it. If this occurs, the Amber is likely authentic. Amber will also warm quickly when held in hand.



Differentiating Amber and Copal: Using the appropriate scratch sticks (or a fingernail) to test hardness, one should be able to tell quickly if the material is Amber or Copal. Amber has a hardness of 2-3 on Moh's scale while Copal registers around 1.5. Therefore, the Copal can be scratched with just a fingernail while the Amber cannot.

Amber and Copal react differently to UV light. If the stone has no color change at all, it is Copal. If the stone changes to a pale shade of blue under the UV light, it is Amber.

The friction test is easy to do anywhere. Rub the mystery stone vigorously with a soft cloth, preferably made of wool. If it is true Amber, it will start to give off a resinous smell. If it is Copal, the friction created will cause the stone to become soft and sometimes even sticky to the touch.

Differences in density can be observed in a saline solution of table salt and lukewarm water. If the gem is Amber, it should float. If the material is Copal, it will sink.

If the gem starts to melt slightly where poked with a hot needle, it is Copal. If it does not melt as immediately and emits a sooty, piney scent, it is Amber. This destructive test should only be performed on a less obvious location on the gem, such as on the back of a set-piece.

Copal is a general name that describes the resinous substance exuded from a variety of tree genera.

The most important Amber from the Cretaceous era (145 million to 65 million years ago) is the Burmese Amber from the Hukawng Valley in the Kachin state of northern Myanmar. Burmese Amber, whose vertebrate diversity is unparalleled, is almost 100 million years old, and the hottest property in paleontology since it is stuffed full of incredible fossils, including even dinosaur and bird parts.

China borders the Kachin State to the north and east (Tibet and Yunnan), the Shan State to the south, and India to the west. It is a wild and mountainous region forming the tip of the Himalayas. Its highest mountain, Hkakabo Razi (5,889 meters (19,321 ft)), constitutes the southern tip of the Himalayas.

The area has off and on been autonomous since independence from Britain in 1948. The Kachin conflict or Kachin War is one of the multiple conflicts collectively referred to as the internal conflict in Myanmar.

The story of both Burmese jade and Amber is inextricably tied to the turbulent history of Kachin. The Kachin Independence Army (KIA) fought a long and bloody war against the Burmese government, with an official ceasefire in 1994. Still, tensions and outbreaks of violence persist, with security services asserting a heavy presence in the area.

While the roadblocks and curfews may help keep an uneasy peace, the area is still dangerous. The amber market is in Myitkyina, but the actual mining occurs closer to Danai. Foreigners were until recently allowed in Myitkyina, but Danai is off-limits. Most buyers are from nearby China, and they pay the highest prices for the best specimens.

Burma Amber and Burmese Amber are all different names for the same thing, but Burmite remains the most common name for Burmese Amber.

Burmese Amber was formed during the Late Cretaceous, approximately 99 million years ago, when dinosaurs still roamed the Earth. Over 1300 species have been described, with over 300 in 2019 alone. The Amber from this region is by far the most interesting for its fossils' breadth and diversity.

In part because of their proximity to the deposit, Chinese collectors and scientists have been rigorous in collecting and identifying everything inside. Burmese Amber is by far the best source of Cenomanian insect fossils and full of surprises.

It has been commercially exploited since the first century AD and has been known to science since the mid-nineteenth century. The Amber is of significant paleontological interest due to the diversity of flora and fauna contained as inclusions, especially arthropods including birds, lizards, snakes, spiders, scorpions, beetles, ants, nematodes, gastropods, frogs, snakes, lizards and geckos.

In 2015, even a part of a dinosaur's tail was identified. Well over 1000 species of invertebrates have been uncovered from this deposit.

The Amber is referred to in ancient Chinese sources as originating from Yunnan Province as early as the first century AD, but trade with China had been ongoing for centuries. The amber locality itself was known to European explorers since the 1800s. At the time, the valley's mines' principal products were salt, gold and Amber. The early mines were marked with numerous abandoned pits, up to 15ft or 4.6m in depth.

Mining was being performed manually at the time by sharpened bamboo rods and small wooden shovels. Better pieces were supposedly recovered from the deeper pits, with transparent yellow retrieved from depths of 40 ft (12 m). The recovered Amber was bought with silver or often exchanged for jackets, hats, copper pots, or opium, among other goods. Women of the valley wore amber earrings as part of their jewelry.

Even today, the working conditions at these mines are extremely unsafe. Deep pits and tunnels down to 100 m (330 ft) barely wide enough to crawl through are the norms. Deposits of Amber from other regions in Myanmar exist but have yet to produce considerable quantities.

Most Amber is smuggled into China for jewelry, and estimates of up to 100 tonnes reportedly passed through to the primary market of Tenchong, Yunnan in 2015. With the recent military coup and the coronavirus, Myanmar is shut off to air traffic, and even the internet is down.

IS AMBER STILL POPULAR?

The amber market has always been subject to fluctuations. Its popularity reached a pinnacle in the 1990s with the Jurassic Park movie about dinosaurs recreated from DNA in Amber.

When Russia opened the Amber market at Kaliningrad, prices crashed. The demise of the monopoly led to prices falling by up to 70%.

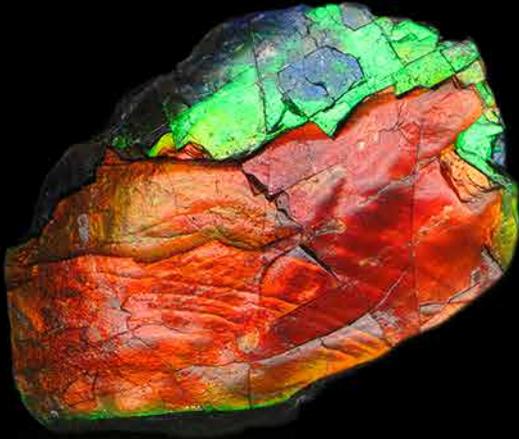
But in the late 90s came the Chinese phenomenon. The most highly prized Amber is transparent, but it is more commonly cloudy or opaque and many pieces contain minute bubbles. Chinese traditionally favor the deep cherry colored Amber known as "mi lah," and the white Amber, "baimi".

The main buyers of specimen amber are scientists, collectors and museums, but the ancient insects and their accidental encapsulation fascinate all. Even young children will marvel at the critters inside.

How cool, a 100-million-year-old ant preserved in pine goo? As they first ponder the enormity of geological time, perhaps that little bug will inspire the next generations of fossickers or entomologists.

LIFE'S GEMS

Although most gemstones are minerals, many relatively rare and visually appealing materials with an organic origin are also considered jewels. Some, like Amber and pearl, have been revered for millennia, but some are relatively unknown to the public.



AMMOLITE

MOST RARE

Ammolite is a magnificent gemstone cut from the fossilized shells of extinct sea creatures known as ammonites. It is perhaps the most colorful fossil and unlike any other gem. Every piece of ammolite has a unique color, pattern, and personality.

Gem quality ammolite can only be found in the Korite International Mine or Aurora Ammolite Mine in Alberta, Canada. It was recognized as an organic gemstone in 1981 by the Coloured Stones Commission of the World Jewellery Confederation (CIBJO).



PEARL

MOST VALUABLE

For something so rare and precious, natural pearls' prices never followed an ascendency to the clouds like investment grade rubies, emeralds and diamonds. Unlike gemstones, which formed from geological processes millions or billions of years ago, pearls' formation is a biological response initiated by the host organism to protect itself from irritants.

The colors, sizes and varieties of pearls provide a palate of opportunities that designers, retailers and consumers are always ready to embrace.



MOTHER-OF-PEARL

MOST AFFORDABLE

The inner shell of a pearl-bearing mollusk comes in an array of exciting colors and variations. The nacre's color can be white, yellow, green, blue, pink or purple, depending on the mollusk species and the temperature of the water. Its abundance, low cost, and availability in large pieces make it ideal for beads, cabochons, inlays, cameos and carvings. The primary sources are South Sea and Tahitian oysters used for pearl culturing.



DINOSAUR BONE

MOST UNDERRATED

What we today call dinosaur bone is more correctly and descriptively known as silicified fossils of dinosaur bone. Fossils are the remains of prehistoric animals or plants. Silicified means the fossil is quartz (a form of silica). A more common name for this form of quartz is agate.

The patterns revealed through cutting and polishing vary with the type of bone and the cut's orientation to the bone. Some pieces are transparent when thin enough. Although fossilized dinosaur bones are found in many places worldwide, from Argentina to Mongolia to Madagascar, the highly silicified and beautifully colored dinosaur bone is almost exclusively found in a relatively small part of the United States on the Colorado Plateau.

RELICS & RARITIES

Assessing sapphires' padparadscha color, the deep pink petals with a yellow pistil of the Sacred lotus, isn't a straightforward process. Unlike any other gemstone colors, the definition of Padparadscha proves elusive. These three orangey sapphires from East Africa might be suspected of being beryllium treated, but these colors do occur naturally in Tunduru, Tanzania, and Illakaka, Madagascar.

Testing at GIA's laboratory in Bangkok returned only the marquise as "padparadscha" color, which shows just how narrow the standards are.

Interestingly, their initial determination of a Sri Lankan origin was incorrect. In the past, only untreated Sri Lankan stones could be considered Padparadscha, but nowadays, they're rightfully accepting African and Madagascan sapphires as Pads when they're the right color.



Vanutsaporn Treemok, 2020,
African Padparadscha Sapphires, Multicolour.com

PROSPECTOR'S CORNER

This extra fine Vayrynenite specimen measures 7.80 x 4.70 x 2.2mm, weighs 0.710-carat and comes from the Shengus district north of the road between Gilgit and Skardu in Northern Pakistan.

Named after Heikki Allen Väyrynen (1888–1956), a professor of mineralogy at the Technical High School, Helsinki (Finland), Vayrynenite typically found as striated and elongated monoclinic crystals. The pinkish-orange color is common for manganese-bearing minerals.

Rare collector's gemstone, Vayrynenite is typically translucent to transparent with a vitreous luster and irregular fracturing. Very few gem grade specimens are known to exist, while most of material typically small and heavily included.



PAKISTAN

Vanutsaporn Treemok, 2020,
0.710-carat Vayrynenite Crystal, Pakistan, Multicolour.com

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