



## History of amber

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### Introduction

Amber is a cross-linked polymerized terpene, an oxygenated hydrocarbon, and a resin of pale yellowish or brown colour. It is brittle, translucent, and possesses a resinous luster. It is one of the most important and valuable fossil resins. Its mineralogical name is succinite, from *succinum*, the Latin name for amber. The term amber is of Arabic origin and was adopted by the Greeks after the Christian era. In approximately 600 BC, the Greek philosopher Thales first documented amber's ability to attract small seeds, dust, and pieces of cloth when rubbed against wool. The Greek word for amber (*elektron*) is the root of the modern word electricity relating back to this earlier discovery of static electricity.

When heated, amber begins to soften at about 150°C. It melts at 350°C to 375°C, giving off dense white fumes with a particular odour. It burns with a yellow flame, emitting considerable smoke, leaving a small amount of ash. It was once in viscous liquid form, which is illustrated by the remains of insects that are often found imbedded in some specimens (Fig. 1). Amber was exuded from pine trees which used to grow in the south of the Scandinavian Peninsula and in neighbouring regions approximately 50 million years ago, and now lies at the bottom of the Baltic Sea. The then sub-tropical climate grew warmer and coniferous trees started producing more resin, which flowed down the trees and onto the ground, hardening on the bark or on the trunk, and, due to various physical and chemical processes, gradually turned into amber. No variety of pine similar to the amber tree survives today.

Amber is found in the largest quantities on the Baltic coasts where it is sometimes washed up by the waves, however, generally, it is dug from a deposit of carbonized wood 15 m to 20 m

below the surface. It is usually found in small pieces, but occasionally it is found as lumps weighing 6 kg to 8 kg. The analysis of amber is 80% carbon, about 10% hydrogen, and 10% oxygen. Its chemical composition can be represented by the stoichiometry  $C_{10}H_{16}O$ . When distilled, an organic acid, named succinic acid, is obtained; its composition is  $HOOC.CH_2.CH_2.COOH$ . Its hardness is 2 to 2.5 and specific gravity 1.05 to 1.10.

Fig. 1. Specimen of amber showing embedded insects.



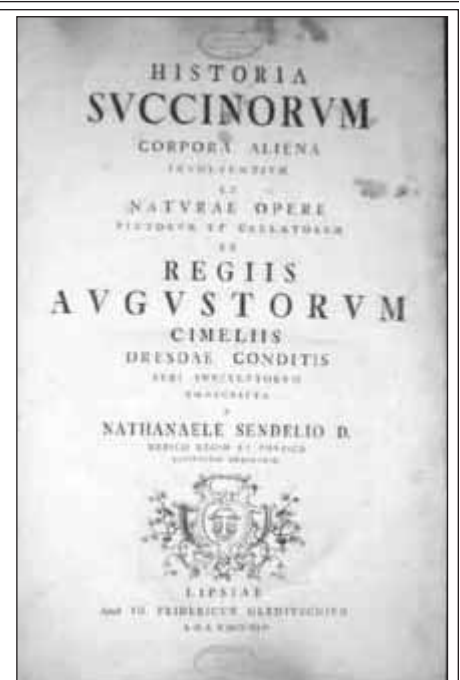
It is valued as an ornamental stone from which works of art can be carved (Fig. 2). While “diamonds are forever,” amber is not, as it forms a superficial crust over time.

The first book on amber was entitled *Succini Prussici*, i.e., “Prussian Amber,” written in Latin by Philipp Jacob Hartmann (1648-1707) and published in Frankfurt in 1677. This was followed by Nathanaele Sendelio's book *Historia Succinorum* published in 1762 (Fig. 3).

Fig. 2. An example of artwork made of amber.



Fig. 3. The front pages of the first two books on amber: a) Philipp Jacob Hartmann's book entitled *Succini Prussici* published in 1677; b) Nathanaele Sendelio's book entitled *Historia Succinorum* published in 1762.



Collection and Mining

In ancient times, amber was easily found and collected on the shores of the Baltic Sea (Fig. 4), especially after heavy storms. It was also easily excavated by simple tools in cliff outcrops and on the dune ridges. The amber-bearing stratum lies partly below sea level, and the amber washed up by the waves was picked up on the seashore by fishermen (Fig. 5) or recovered by dredging. At present, Baltic amber is obtained by sinking shafts through a superficial stratum of marl and sand, a bed of lignite with clays, and finally a layer of green sand 25 m to 30 m thick. In the lower portion of the green sand layer, there is a stratum 1 m to 2 m thick of "blue earth" in which amber nodules occur in abundance. Amber was mentioned by Georgius Agricola in his book *De Natura Fossilium* published in 1546 in which he used the Latin term *succinum*.

Amber Trade

Amber trade started in the Stone Age from the Baltic countries and spread to Central and Eastern Europe reaching as far as Egypt. Beads of amber were discovered in the tombs of pharaohs (3400 BC to 2400 BC) and in other Mediterranean countries. It was intensively traded with the Roman Empire and its colonies over

the so-called "Amber Route." References to amber in Greek literature are abundant. Homer's work *The Odyssey* also contains numerous references. It was the Celts who opened the amber routes leading to the Baltic. The Celts' interest in amber is reflected in the ornaments made of this material and found in a number of rich princes' graves.

During the reign of the Emperor Nero, a Roman expedition was dispatched to the far North to locate the source of the so-called "northern gold." This was quite a feat as, at the time, unknown territories inhabited by Germanic tribes had to be traversed. The expedition returned with about six tonnes of amber. Pliny the Elder (23-79AD) wrote about this adventure which was later recognized as a major event in Rome's history as this daring act opened up many northern trade routes which, up until that time, had not been exploited. In his *Natural History*, he detailed the various myths and legends regarding amber's origin and stated that "Amber is formed by the pith which flows from trees of the pine species, as a gum flows from cherry trees and resin from pines." He also stated that the geographic origin of amber was "in the islands of the north of the Northern ocean that is called Glessum by the Germans, and that for this reason when Germanicus Caesar was commanding a fleet in those regions, the Romans gave the name of Glessaria to one of these islands." Pliny also

stated that amber was found in India; the specific entry reads:

*"That amber is found in India too, is a fact well ascertained. Archelaus, who reigned over Cappadocia says that it is brought from that country in the rough state, and with the fine bark still adhering to it, it being the custom there to polish it by boiling it in the grease of a sucking-pig. One great proof that amber must have been originally in a liquid state is the fact that, owing to its transparency, certain objects are to be seen within — ants, for example, gnats and lizards. These, no doubt, must first have adhered to it while liquid, and then, upon its hardening, have remained enclosed within."*

The peak of amber popularity in Roman time was between the first century BC and second century AD. Later, the resin went out of fashion and the amber route shifted eastwards starting new trade relations with the Middle East and northern African countries. By the end of the third century, trading routes to the east along the Dnepr, the Dnestr, and the Prut rivers flourished, and relations were established with Slavic settlements and Roman colonies on the coast of the Black Sea and later with the Byzantine Empire and Arab countries. Between the eighth and ninth centuries, new amber excavation and processing centres emerged along the southern coast of the Baltic Sea. Amber craft

Fig. 4. Map showing Königsberg (now Kaliningrad), Danzig (now Gdansk), and the Samland Peninsula on the Baltic Sea where large deposits of amber have been exploited since ancient times.



Fig. 5. Fishermen picking up amber (from a book published in 1677).



Fig. 6. The Amber Chamber (Berstein Zimmer) at Catherine Palace in Czarskoe Selo, a suburb of St. Petersburg.



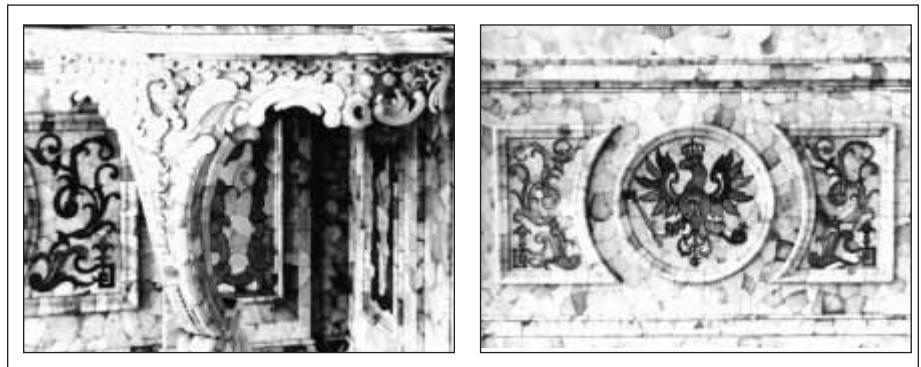
was at its peak from the late tenth to mid-eleventh century at Danzig.

In 1283, the Teutonic Knights became absolute rulers of Prussia and also created a monopoly on amber production within the Samland Peninsula. The major product became *Pater Noster* beads, a particular religious article. The Teutonic Knights ruled the amber industry with an iron fist. By the end of the fourteenth century, the sale and gathering of amber was completely controlled by them. Königsberg (now Kaliningrad) was an important mining site. Gradually, however, the Teutonic monopoly was transformed over the years into a series of monopolistic guilds. In 1480, the Danzig Amber Guild was formed. The Teutonic rule had collapsed when more guilds and craft organizations were formed. With the incorporation of the Vistula Pomerania into the Polish state, amber craft rapidly developed. The sixteenth and seventeenth centuries were the city's golden age. Significant development and growth in northern Europe has been attributed to the amber trade. Amber became a media for contact between cultures from ancient times. The mid-eighteenth century marked the beginning of the decline in the craft.

#### The Bernstein Zimmer

The masterpiece that crowned the era of flourishing amber art was the Amber Chamber known by its German name "Bernstein Zimmer" produced in 1713 for Frederick I by craftsmen in Danzig (now Gdansk in Poland). Its beauty became famous and it was visited by Tsar Peter who was greatly taken by its splendour. The room, part of the Catherine Palace at Czarskoe Selo, i.e., Czar's village, a suburb of St. Petersburg (Figs. 6 and 7), was presented to him in 1717 as a gift to cement a peace treaty. During World War II, when the Nazi troops occupied the palace dur-

Fig. 7. Details of the Amber Chamber.



ing the siege of Leningrad (St. Petersburg) in 1941, the room was dismantled, and an estimated six tonnes of amber panelling were shipped to Germany. They were never seen again. However, the Russians have restored the room to its original form using synthetic resins.

#### Amber's Myth

Amber was acclaimed to possess the power of healing. Worn as a necklace or charm, or carried around in small bags, amber was believed to be a remedy against such ailments as gout, rheumatism, sore throats, toothache and stomach-ache. It was also believed that it was a good remedy against snake bites. To guard against the swapping of a new born baby, the infant was often given an

amber necklace to wear. Amber was believed to contain magical powers, which is why heart shaped amber charms were carried to offer protection against evil forces and help against witchcraft.

#### Suggested Readings

- GRIMALD, D.A., 1996. Amber. Window to the Past. American Museum of National History.
- SPEKKE, A.S., 1975. The Ancient Amber Routes and the Geographical Discovery of the Eastern Baltic. M. Goppers, Stockholm, 120 p.
- DAHLSTRÖM, A. and BROST, L., 1997. The Amber Book. Geoscience Press, 144 p.
- GANZELEWSKI, M. and SLOTTA, R. (editors), 1996. Bernstein. Verlag Glückauf, Essen, 594 p.

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