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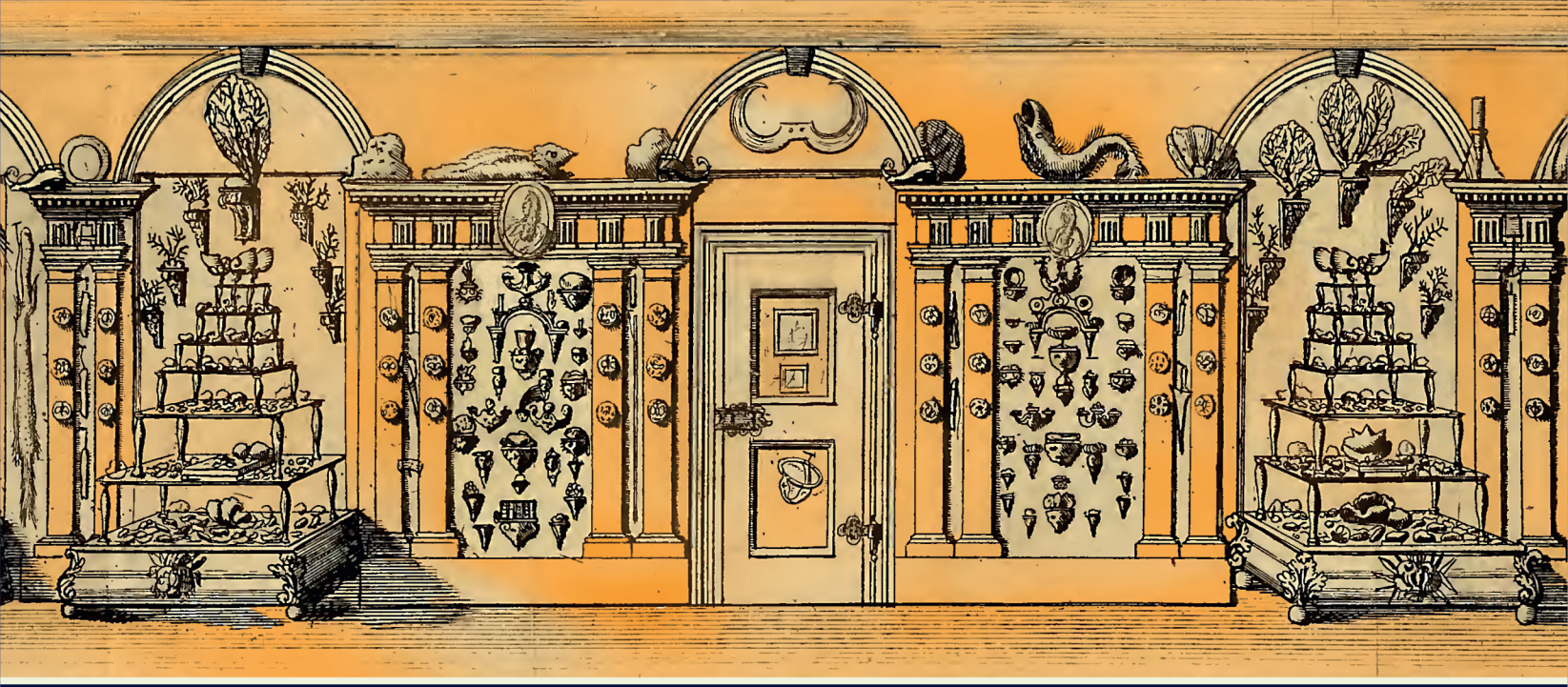

COLLECTION IN THE SPACE OF CULTURE

PROCEEDINGS OF THE INTERNATIONAL CONFERENCE

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COLLECTION IN THE SPACE OF CULTURE

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This book contains proceedings prepared by the participants of the international conference "Collection in the space of culture" which was held from 18 to 21 September 2017 at the Kaliningrad Regional Amber Museum.

The articles published here are devoted to topical questions in the history of collections and collecting. The established approaches to organisation and interpretation of the collections are considered; the resources of Russian and foreign museums which are generally unknown to the public are presented here.

This edition is intended for museum professionals, historians, cultural studies scholars, collectors, and educators.

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PORTUGUESE *MATERIA MEDICA* IN THE TÁVORA SEQUEIRA PINTO COLLECTION (PORTO)

Abstract

The taste for collecting, almost as old as man, takes passionate about art and antiques to rescue from oblivion masterpieces of the past. This is the case of the Portuguese art collector, Dr. Alvaro Sequeira Pinto. This article focuses on masterpieces of his Collection, the Távora Sequeira Pinto Collection (Porto), which bring us back to the splendour of the Age of Discoveries. Highly valued *materia medica*: unicorns, olifants, bezoar stones, Seychelles nuts, corals, pieces of amber, lacquer, mother-of-pearl, rock crystal, jade and meteorites, were selected, focusing their magic and symbolic meaning, and viewing them through their chemical and pharmacological effectiveness. Most substances were antidotes, energizers, all healing medicines also used as amulets, talismans, highly valued in a time when science began to disclose new insights and to shatter ancient myths.

Key words: art collecting; Renaissance *Kunstkammern*, *materia medica,* toxicology, unicorns, bezoar stones, Seychelles nut.

Introduction

In the history of man, the compulsion to collect objects emerges as one of the oldest forms of expressing himself in some way, through the millennia, as a kind of self-realisation. This trend can be traced from pre-historic hunters who collected bones and stones to the aesthetic patterns which were introduced and developed by later civilisations. Ancient monarchs collected gems and treasures. A strong passion for collecting valuable objects emerges by the late Middle Ages in circum-Mediterranean countries. The first collections from the second half of the fourteenth century are indicated by inventories of the personal belongings of the ruling princes. By the late fourteenth and early fifteenth centuries the first *études*, *cabinets* and *studioli* were furnished in palaces, first in France and, shortly after, in Italy. Most were placed near the royal rooms, where the prince or monarch kept his valuable books and artworks for his own delight or for the entertainment of a small group of close friends.

Shortly after 1500, the Medici family unveiled an ancient universal collection, in Florence, for the first time. The exhibition was displayed according to the chapters of *Naturalis Historia* by the great Roman encyclopaedist, Pliny the Elder (23—79 AD). Members of the Medici family, who had married into the Valois and Habsburg families, took the idea of the exhibition over the Alps. In the sixteenth century, almost all the important princes from Austria, Germany and Scandinavia had their own *Kunstkammer* collections. These private collections soon became a remarkable sign of the fame and prestige of dynasties, attracting visitors, scientists and humanists, marking the first step of the development of collections into later public museums.

Kunstkammern conveyed an ancient concept of *Kunst* and *Wunderkammer* as sets of artworks combining jewels with curiosities of Nature, artifacts of semiprecious stones, complex scientific instruments, ingenious room clocks, armillary

spheres, terrestrial globes, music boxes and other machines for entertainment and scientific purposes. In the sixteenth century, the *Kunstkammer* took the place of honour of the well-guarded *Schatzkammer* (Treasure) which stored sacred pieces, family and crown jewels, and important documents in the Middle Ages. Portraits, paintings and maps were usually added. From 1560 to 1620, the most respectable collections within the boundaries of the Holy Roman Empire belonged to the Houses of Habsburg, Wittelsbach and Wettin (Von Habsburg, 1997, pp. 7—9).

Artworks were not intended merely for visual delight. In Italy, around the *studiolo* of Grand Duke Francesco I (1549—1587), the secret meaning of the items depicted in the pieces of artwork was to be found along with the wisdom of the artist. Intriguing topics about plants, animals, gems, metals, minerals, valuable antidotes, statues, medals, paintings and machines for different purposes, were discussed (Von Habsburg, 1997, p. 71). Gems, bezoars and rhino horns, charged with magical and apotropaic power, had a place of honour in these collections.

The Távora Sequeira Pinto Collection (Porto)

Álvaro Sequeira Pinto, a lawyer, university professor and businessman, is a fascinating personality, and one of the most outstanding Portuguese art collectors. In 2015, he was awarded the Collector Prize by the Portuguese Association of Museology. Álvaro Sequeira Pinto inherited his passion for India and the history of Portuguese expansion from his maternal grandparents. His collection includes Indo-Portuguese jewelry, furniture, Portuguese and Flemish paintings, and sculptures, but his most curious pieces are finely worked items of exotic *materia medica* (Fig. 1).

Fig. 1. Works of art of the Távora Sequeira Pinto Collection (Porto)

The ensemble conveys the contemporary taste for the exotic, luxury, magic, science, and curiosities of Nature and the decorative arts. Two apothecary jars indicate the concern about health (Fig. 2). The collection includes attractive objects which originally belonged to Portuguese, Dutch and German *Kunstkammern*. The art collector lives, as it were, in a small cabinet, surrounded by the most exotic and intriguing materials, such as a meteorite and a dried Japanese Puffer fish (Family Tetraodontidae) which contains a poison in its organs, especially the liver. The fish poison is a potent neurotoxin, tetrodotoxin, a sodium channel blocker that paralyses the muscles leading to asphyxiation (Bane et al., 2014, pp. 693—755) (Fig. 3).

The Távora Sequeira Pinto collection artworks of primarily medicinal use and selected for consideration in this article are: bezoar stones, rhino horns, narwhal tusks and coconut shells. Amber, copal, coral, ivory, rock crystal, lacquer and nautilus shells, primarily, used in decorative artworks, also employed in medicine, were also selected. Rock crystal, jade and meteorites were the selected *mineralia*; amber, lacquer and Seychelles nuts, *vegetalia*; mother-of-pearl, bezoar stones, narwhal tusks, rhino horns and elephant tusks were the selected *animalia*. Many of these substances were studied and tested for the first time in their place of origin by the Portuguese physician, Garcia de Orta (1501—1558), latinised to Garcias ab Horto, who introduced them into European medicine (Orta, 1563).

Fig. 2. Portuguese apothecary jars in white earthenware and blue decoration with “Baroque cartouche” with the arms of the Saint Dominic Order
Late 17th century

Fig. 3. Dried Fugu,
Japanese Puffer fish from a Dutch *Kunstkammer*
17th century

MINERALIA

Rock crystal

Gems were highly appreciated by Christian authorities in the Middle Ages. Saint Hildegard of Bingen (1098—1179), a Benedictine abbess who was also a mystic, poet, visionary, philosopher and composer, valued them in religious terms, for their supposed property of being able to combat the devil (Throop, 1998, p. 137).

Rock crystal (quartz) was used as a magic and holy stone in all ancient cultures and is still respected by contemporary shamans. In ancient Ayurvedic medicine, gems were reduced to powder, dissolved in beverages and taken internally. When a true diamond was not available, it was replaced by rock crystal because it was similar to diamond in taste and properties. It was said to cure exhaustion, leprosy and poisoning (Garbe 1882, p. 89). In Antiquity, it was believed to be frozen ice. It was used in medicine in the healing of diseases and to drive out demons (Rätsh & Guhr, 1992, p. 44).

The purity of rock crystal was thought to be incompatible with poisons. Its touch would shatter darkness and wickedness. Relics of saints were kept in cylindrical crystal containers, considered to be the most suitable material in which they could be stored, protected yet still remaining visible, because, by that time, glass quality was poor, being smoky, greenish or blistered.

Rock crystal was the material of choice for Christian crosses, reliquaries, holy figurines and carvings (Menzhausen, 1977, p. 185). Rock crystal continued to be the material of choice for religious artworks in later periods. Rock crystal vessels, Christian crosses and other religious objects had a prominent place in *Kunstkammern* (Fig. 4).

Rock crystal is a silica mineral (SiO_2). It is credited as being a high energizer.

Fig. 4. Infant Christ, Saviour of the World
Ceylon, 2nd half of the 16th century
Carved rock crystal, gold, rubies, and sapphires

Jade

Jade is mostly found in China, but it also comes from Guatemala, Canada and New Zeland. It is a soft, ornamental rock, very suitable for carving. It is mainly green, but can also be yellow, grey, orange, white or reddish. The most highly appreciated variety is green jade, or Imperial jade. Jade is made up of two metamorphic silicate minerals: Jadeite ($NaAlSiO_6$), a sodium and aluminium rich pyroxene and nephrite ($Ca_2(Mg, Fe)_5$), a calcium, magnesium and iron rich amphibole.

In China, from ancient times, jade was a most prized and precious material. It was a symbol of masculinity and power (Chou and Chou, 1982, p. 16). According to an ancient legend, two Chinese sovereigns fought for power. After a tough fight, Zhurng, the good sovereign, was the winner. Gong-gong, the wicked, deluded and furious, threw himself against one of the four columns of heaven. By that time, the sky was believed to stand on four columns, like a big pavilion. The column crashed down, and a piece of heaven was destroyed. The new sovereign was so mournful about the destruction of heaven and the beauty of the world that he started to collect the best stone blocks. But he was never satisfied. The stones were never as beautiful as he wished. He took a long time to choose the stone that better resembled the colour of heaven. This stone became jade, the stone of heaven. Some stone blocks had remained unused. He spread them through the whole world, so that later generations could have fine and useful objects (Chou and Chou, 1982, p. 17).

Asia was designated as the place of terrestrial Paradise. Various rivers of the far and near East, such as the Indus, Ganges, Nile and Euphrates, were thought to have a common source in the Garden of Eden (Lach, 1965, p. 23). Jade was its most emblematic gem, standing as a bridge from earth to heaven (Figs 5, 6).

In China, jade objects date from Pre-History. They were used together with cowry shells as grave goods. They were put on the nostrils of the deceased to guard the soul from demons and on their mouth to prevent putrefaction. Jade was used as an all-healing medicine, associated with fertility.

Fig. 5. Jade cup
China, 16th century. Portuguese silver mounts

Fig. 6. Carved jade cup
India, Mughal Empire, 16th century

The *Chinese lapidary*, published in Europe in the fourteenth century, indicated jade, reduced to rice sized grains, was used as a remedy for stomach ache, cough and thirst. It would reduce weight, fortify the lungs, heart, the vocal organs and extend life. Its medical effectiveness was enhanced if used together with gold, silver and a Japanese plant, *baku mon do* (*Ophiopogon japonicus*) (De Mély, 1896, p. 177). The *Lapidary* also gives indications for the preparation of liquid jade or jade liquor, known as *shin giyoko sho*, liquor of divine jade, a potent medicine that was used to heal the thousand diseases of the five viscera, fortify and soften the muscles, strengthen the bones, calm down the head and spirit, enrich the flesh and purify the blood. Those who took it for a long time were supposedly never tired, cold, hungry or thirsty. For those who drank five pounds of the liquor before dying, the corpse did not decay for three years. It was also recommended for the twelve abdominal diseases of women.

The beneficial effects of jade can be attributed to silica, the main chemical component of jade. In contrast to the toxic effects if inhaled (lung silicosis), when taken orally, silica seems to be beneficial to human metabolism. Silicon, a component, is the second most prevalent element after oxygen, on earth (Martin, 2007, pp. 94—97).

Meteorites

Meteorites, solid debris travelling through space and reaching the earth, are stones fallen from heaven. They are mainly composed of iron, stone or glass (tektite) (Lüschen, 1979, p. 275). Meteorites are still used in primitive cultures. Shaman healers of the African-Haitian culture carry a medicine bag with herbs, potions, rattles, sacred stones, quartz, meteorite, flint thunderstones, feathers, incense and other paraphernalia (Crosley, 2004, p. 5). They have been regarded as something sacred, magic, a wonder of God. The heavenly origin rendered them stones with a strong magical charge. In ancient Sumerian texts, they were called “Fire from Heaven.” The Egyptians called them “Heavenly thunderstone” and “Heavenly metal.” They originated in the light forces of the divine realms. The cult of iron meteorites can still be found in many places all around the world (Rätsch and Guhr, 1992, pp. 114—115).

In 1576, the Spaniards led an expedition to Campo del Cielo, a remarkable place of meteorite dispersion in the Provinces of Chaco and Santiago del Estero, in Argentina. The place, a former sedimentary plain covered with parks and subtropical savannas, was struck with the impact of a big metallic meteoroid, probably about 5800 years ago. The place was known by pre-Columbian inhabitants whose solar cult was associated with Méson de Fierro (one of the craters) because they believed that the iron mass was detached from the sun. They held pilgrimages to the place, which occupied an area of about two hundred square kilometers. They believed in the transfiguration of the meteorite into a radiant, brilliant and iridescent tree that chimed like a hundred bells at the dawn of a certain day of the year (Gimenez et al., 2000, pp. 357—363). Meteorites, regarded as highly energizing, have rarely been used medicinally (Fig. 7).

Fig. 7. Two meteorite iron blocks
Campo del Cielo, Argentina, 1576

VEGETALIA

Baltic amber and copal

Baltic amber is a natural fossilised resin from Eocene conifers. Its origin was unknown until the beginning of the nineteenth century. Several thousand-year-old amber amulets indicate that people have believed in its power since the earliest prehistoric times. It was a kind of foundation stone to ensure both health and good luck (Gierlowska, 2002). Its beauty, resinous scent, transparency, electrostatic properties and inclusions of trapped life raised a rich mythology in Baltic, Germanic and Roman cultures. In the Middle Ages, amber was used as an ornamental material or reduced to dust and burned as incense in rituals. It was one of the most respected of medicinal ingredients, being taken in elixirs and compound medicines.

Copal, a younger fossil resin, is very similar to Baltic amber and its oldest known substitute. It occurs in semi-fossilised forms ranging from 1000 to 100 years old. Copal is typically yellow or brown, and transparent or translucent. It is softer than amber, and contains insects, leaves and other botanic inclusions. When heated, both amber and copal emit a resinous odor and burn with a smoky flame (Rice, 1980, pp. 219—220). Amber and copal were used in religious cults. They were highly valued in the Christian religion (Rätsch and Guhr, 1989, pp. 46—47) and used in the manufacture of Christian rosaries, carvings and figurines (Figs 8, 9).

Baltic amber contains 3—8% succinic acid, a substance necessary to the Krebs' cycle, with antioxidant activity, enhancing immunity (Gierlowska, 2002). Succinate is an important metabolite of several metabolic pathways. It is involved in the formation and elimination of reactive oxygen, and it is becoming increasingly apparent that its action extends to epigenetics, tumorigenesis, signal transduction, endo-and paracrine modulation and inflammation (Tretter et al., 2016, pp. 1086—1101).

Fig. 8. Amber rosary
Goa, 17th century. Indo-Portuguese silver filigree mounts
Saint John
North of Europe, 17th century. Baltic amber and ivory

Fig. 9. Infant Jesus
Goa? Ceylon?, 16—17th century
Copal, Indo-Portuguese silver mounts

Lacquer

Lacquer is a resinous secretion from an Asiatic tree, *Toxicodendron vernicifluum*, called *urushi* in Japanese, and utilised as a varnish or for painting. Lacquer ware has been recovered from Neolithic archaeological sites in Japan and China (Suzuki et al., 2014, p. 70). Lacquer is directly extracted from the tree. A similar substance, lac, is extracted from resinous trees by an insect, the lac bug, which produces Shellac. Lacquer and Shellac were highly appreciated materials used in the decorative arts (Fig. 10).

Lacquer tinctures figured as astringents, diuretics, in the treatment of scurvy and to fortify teeth and gums in European pharmacopeia as late as the nineteenth century. In the *Pharmacopeia Universalis*, Boerhave (1668—1738), the father of clinical medicine, recommended it dissolved in Spanish wine, in the treatment of gout, rheumatism and scurvy (Pharmacopoea Universalis, 1830, Vol. II, p. 48). In Korea, *Toxicodendron vernicifluum* has been used to treat inflammatory diseases and cancers for centuries. Recently, cytotoxic and anti-inflammatory constituents have been identified in its bark (Ki Hyun Kim et al., 2015, pp. 231—237).

Seychelles nut

Coco de Mer (*Lodoicea maldivica*) is the fruit of a palm tree from the Seychelles. Its origin was unknown outside the islands. Nut shells appeared in the Maldives where their palm trees did not grow. The Coco de Mer was believed to grow on a mythical tree at the bottom of the sea. Coconuts fell from the trees and floated on the seas carried by prevailing sea currents. The nuts could only float when they were hollow, after the germination process had taken place. European nobles would have the shells of these nuts cleaned and decorated as valuable jewels for their private collections. They were also valued as a medicine. The source of the nut was only discovered in 1768 (Zemanek, 2010, p. 22) (Fig. 11).

The Coco de Mer is known as the double coconut, or love coconut because it resembles a woman's hips. In the sixteenth century, the king of the Maldives offered them to visiting European dignitaries. Due to its mythical properties as an aphrodisiac in local folklore, the nuts were taken to the king when they were found lying on the shore. According to a popular myth, male and female plants whose reproductive organs resemble those of humans, meet during a stormy night and produce a sound as they rub against each other, which the natives interpret as double coconut trees mating. The edible endosperm was highly valued in the Chinese pharmacopeia as a treatment for coughs.

Fig. 10. Black and gold lacquered wooden tray with mother-of-pearl inlays. 16th century
Pair of wooden cups, red (probably Shellac) and gold paints. Late 16th — early 17th century

Fig. 11. Seychelles nut shell case
17th—18th century
Indo-Portuguese silver filigree mounts

The seeds were also highly prized because they were rarely found. In India and Southeast Asian countries, the kernel is still used as a tonic, aphrodisiac and antidote for poisons (Damania, 2013, pp. 299—309). The chemical composition of the internal and external pulp of the fruit kernel, were studied for the first time in 2015 to assess its alimental, medicinal properties and potential toxicity (Falcinelli et al., 2015, pp. 308—323).

As the origin of the Seychelles nut was long unknown and very few fruits came to Europe because they were just occasionally found washed ashore, their value was incredibly high. Just a few silver decorated Seychelles nut shells from around 1600 remain extant. They were the pride of King Gustav of Sweden's *Kunstkammer*. One of them is kept in Vienna and has Portuguese silver mounts (Menzhausen, 1977, p. 141) (Fig. 12).

Fig. 12. From left to right:
Nut bowl. 17th century. Silver filigree mounts
Hair adornment. 16th century. Carved Seychelles nut, woman figure, floral motifs and diamond inlay
Nut cup with lid and Indo-Portuguese silver mounts. 17th century
Carved Indo-Portuguese nut bowl. 17th century. Silver filigree mounts with coat of arms

Coral

Red and white corals, skeletons secreted by small marine cnidarian animals known as polyps, have been appreciated since Antiquity. Coral, especially red coral, was a highly valued talisman and a medicine (Riddle, 1977, p. 59). Marbode, Bishop of Rennes (1035—1023) described how coral was believed to be a green marine plant which hardened on contact with the air, becoming a beautiful ornament with its bright red branches. Since the origin of coral was not well known, they were surrounded by a rich mythology. Christianity saw the cross of Christ in the shape of the coral and created beautiful coral artworks during the Renaissance (Fig. 13).

Coral figures in all ancient lapidaries. Its magical and medicinal indications are summarised by Ahmad al-Tīfāšī (1184—1253), a Tunisian scholar who wrote a book on minerals and gems. Coral necklaces were believed to heal epilepsy, gout and to protect children against the evil eye and against human evil. When burnt, it was used as a tooth paste, making the teeth white and shiny, eliminating tartar and fortifying the gums. Used as an eye collyrium, it would clean skin ulcerations and facilitate wound healing, was good against eye opacity, cataracts, and dried watery purges from ocular suppurations. Reduced to a powder and drunk, it was esteemed against palpitations and was used in electuaries designed to fluidify the blood, help those with a feeble heart, relieve haemoptysis, heal

Fig. 13. Works of art from a German *Kunstkammer*. From left to right:
Gilded angel topped by a coral branch. 17th century
Red coral branch
Silver pineapple topped by a coral branch. 17th century, Augsburg

excoriations promptly, help against urinary retention, relieve stomach aches and block haemorrhages from every part of the body (Zilio-Grandi, 1999, pp. 131—132).

Calcium carbonate, the main chemical component of corals, is currently used in tooth pastes, highlighting its beneficial use in the past (Hanslik, 1960, p. 49): it acts as an antacid, is an important co-factor in blood clotting and is used in the treatment of osteoporosis.

ANIMALIA

Mother-of-pearl

Pearl and Mother-of-pearl from sea shells and conches are charged with magical symbolism, credited with promoting longevity and devoted to the gods. In Hindu mythology pearl was considered to be a manifestation of the *Soma/amrit*a, and acted as a life elixir which could drive away poison and

demons, old age and disease. Pearl and Mother-of-pearl were endowed with the same symbolic powers. They are chemically similar, composed of aragonite (calcium carbonate) and conchiolin, a protein (Schlüter and Rätsch, 1999, p. 23, 139). An Indian sea conch, *shank* in Sanskrit, *Turbinella pyrum*, was venerated as a sacred snail in religious rites and used during meditation. It was also used as an adornment and as a medicine (Schlüter and Rätsch, 1999, p. 149).

Nautilus belongs to the cephalopods, a fascinating group of highly developed and specialised molluscs. They belong to the Order Nautiloidea which ranges from Cambrian to the present day. During the Renaissance, the Nautilus was respected as a wonder of Nature and as a scientific object. Mathematicians had discovered its shell was constructed according to a logarithmic spiral. Its rich symbolism encompassed the sea and protection in sea-faring, maternity and sexuality. It was a highly respected antidote and the best medicine against melancholy (Mette, 1995, pp. 44—74). Nautilus shells were artistically worked in cups that recreated marine and mythological scenes. They were regarded as the most wonderful beings that kept their natural beauty in life and death (Mette, 1995, p. 163) (Fig. 14).

Bezoar stones

Bezoars, animal gastric concretions of indigestible material in mammals, especially wild ruminants, porcupines and monkeys, were highly appreciated. The name comes from the Persian *pad-zahr*, meaning 'against poison' (Rätsch & Guhr, 1989, p. 47). Bezoars, loaded with strong symbolic charge were surrounded by myths. They were part of the medical tradition of shamanic rituals together with sea shells, animal blood and other organic materials (Müller-Ebeling and Rätsch, 2011, p. 121). They played an important role in Malayan magic.

Fig. 14. From left to the right:
Gunpowder container. 16th—17th century
Mother-of-pearl powder-gun. India, 17th century
Bowl. 17th century. Mother-of-pearl and silver mounts
Nautilus cup with Indo-Portuguese gilded silver mounts. Augsburg, 17th century
Turbinella pyrum with Indo-Portuguese silver mounts. 17th century
Turbinella pyrum with mother-of-pearl lid. 17th century

They were called *batu guliga* and said to have originated in rhinoceros, serpents, large spiders, sea whelks and dragons. They were also supposed to originate in coconuts, jackfruit and bamboos. The Malay people believed that the stone had its own life and that it was nourished with rice. It was credited as being effective against all kinds of poisons and diseases. The stone was carried as an amulet against ailments and bad spirits. Bezoar stones were also said to be the best aphrodisiacs. As antidotes, bezoars were reduced to a powder, dissolved in water and taken, while uttering a prayer (Rätsch and Guhr, 1989, p. 49).

Bezoars are amongst the most revered alexipharmics, poisoning being a constant concern of European kings and nobles. They were frequently associated with other substances used as antidotes such as corals (Fig. 15).

Bezoars from goats were introduced into European medicine by Arabic physicians around the twelfth century. They were brought from India and traded by the Portuguese during the Age of Discovery, together with bezoars from porcupines and monkeys. They stand among the most valued medicines of the European Renaissance (Barroso, 2014, pp. 77—98). The pharmacological effectiveness cannot be denied due to their high concentration of phosphates (Warth, 1974, p. 35). Phosphates acted as poison adsorbents, as did calcium carbonate and keratin. These are the main components of goat bezoars. Their effectiveness as poison antidotes has recently been proven by Malcom (1998).

Fig. 15. Oriental bezoar from a German *Kunstkammer*, topped by a coral branch
18th century. German gilded mounts

Unicorns
(rhino horns, narwhal and elephant tusks)

Other animal products were particularly appreciated in the Renaissance as they were believed to act as antidotes or detectors of poison. Chief among them was the unicorn's horn. Small pieces were set in jewels. Larger pieces were mounted on valuable pieces of gold and silver (Scarisbrick, 1994, p. 108).

The first representations of unicorns, legendary creatures, appeared in ancient China in 5000 BC (Thuja, 1988, pp. 8—9). The unicorn is referred to by Ctesias, the Greek physician (fifth century BC) who described it as a wild ass with a horn in its forehead, possessing medicinal properties against poisonings and seizures, in his book *Indika* (Nichols, 2008, p. 115). It is not clear what animal Ctesias was describing. He did not see the beast. According to Odell Shepard, the Indian rhinoceros was certainly the main ingredient of the compound of different animals that he described (Shepard, 1982, p. 28). Unicorn horns, usually from the Indian rhinoceros (*Rhinoceros unicornis*), were assiduously collected, and worked in beautiful silver or gold mounts (Figs 16, 17).

The myth lasted until the Danish physician and natural historian Ole Worm (1588—1654) identified the narwhal tusk as being the unicorn horn and said that unicorns did not exist at all. But he did not deny the alexipharmic properties of the horn (Worm, 1655, pp. 282—288). When the 'horn' was identified as the canine of the Arctic whale, *Monodon monoceros*, science replaced myth.

Fig. 16. Carved rhino horn cup with silver filigree holder
South China, 17th century

Fig. 17. Carved rhino horn cup
China, late 16th century. Goan filigree holder with vegetal decoration

The unicorn was believed to detect poisons, to purify waters, and to prevent poisonings. It was one of the most powerful symbols of preventative health. In the sixteenth century, a walking stick of spiraling ivory, representing a unicorn horn, was believed to protect the bearer from perils when walking, and preserve him from pestilence, poisoners, epilepsy and several less dignifying illnesses. It acted as an amulet, a talisman, a weapon and a medicine chest. It was sold for twenty times its weight in gold. These walking sticks were found in the treasure-chambers of popes, emperors and kings. According to the most learned contemporary opinions, they were not cut from an elephant or mammoth tusk, but grew from a glorious, virtuous and beautiful beast, the unicorn (Shepard, 1982, p. 20) (Fig. 18).

Ivory from different animals has attracted men for artworks and rituals. Ivory from mammoths and walrus was highly valued by peoples from Siberia and Alaska. Artworks from 3000 BC were part of the Saint Petersburg Kunstkammer. They were everyday life objects, and ritual and votive objects used by shamans in their religious and medical practices (Dinger, 1996, pp. 15—17).

Ivory from African and Asian elephant tusks has been the most frequently used. Olifants, ivory hunting horns made from carved elephant tusks were very appreciated in the Middle Ages. One of the oldest artworks belonging to the Habsburg family was a beautiful carved Moorish olifant with an inscription of Duke Albert III von Habsburg, filled with relics, and donated to the monastery Muri in Switzerland in 1199 (Von Habsburg, 1997, p. 85).

Ivory has been important in Chinese medicine since ancient times. Emperors believed that ivory chopsticks would change colour upon contact with poison. Tusk powder was said to have detoxifying properties, giving a luminous skin, and was used to treat convulsions, epilepsy, sore throat, anal fistula and consumptive fever (Wei, 2015). Decorated ivory cups were also used in Europe to test for

poisoned beverages (Fig. 19). In the Renaissance, it was used in jewels, portrait miniatures, religious and mythological carvings and figurines, decorative objects and world globes, clocks and scientific machines (Menzhausen, 1977, pp. 101—110). Richly decorated oliphants abounded in *Kunst-* and *Wunderkammern* (Fig. 20).

Ivory, a white and hard substance consisting mainly of dentine, is the main component of teeth and tusks of mammals, regardless of the origin of the species (mammoth, walrus, narwhal and elephant tusks). It is composed of inorganic substances such as calcium and phosphates ($Ca_{10}(PO_4)_6(CO_3)\cdot H_2O$) (Espinoza & Mann, 1999, p. 4).

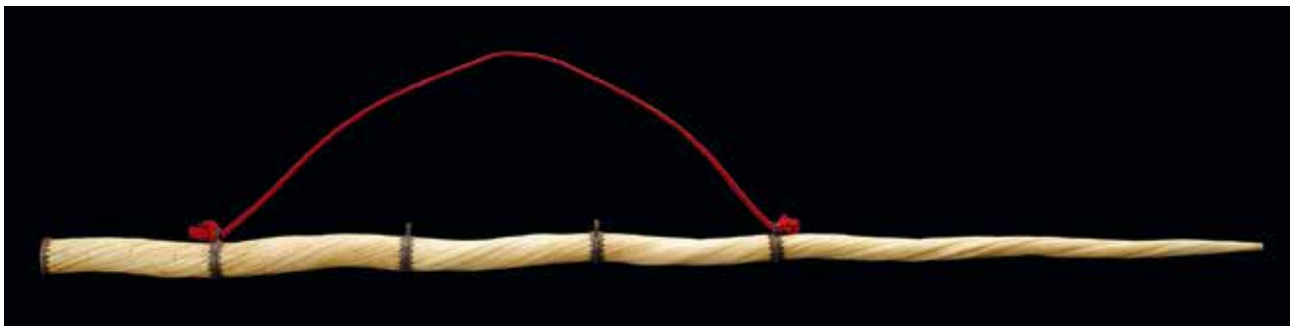

Fig. 18. Narwhal tusk of an Arctic cetacean (Monodon monoceros), 16th—17th century. European silver mounts

Fig. 19. From left to right:
Indian rhino horn and silver bowl and cup. 17th century
Rhino horn and ivory cup. 17th century

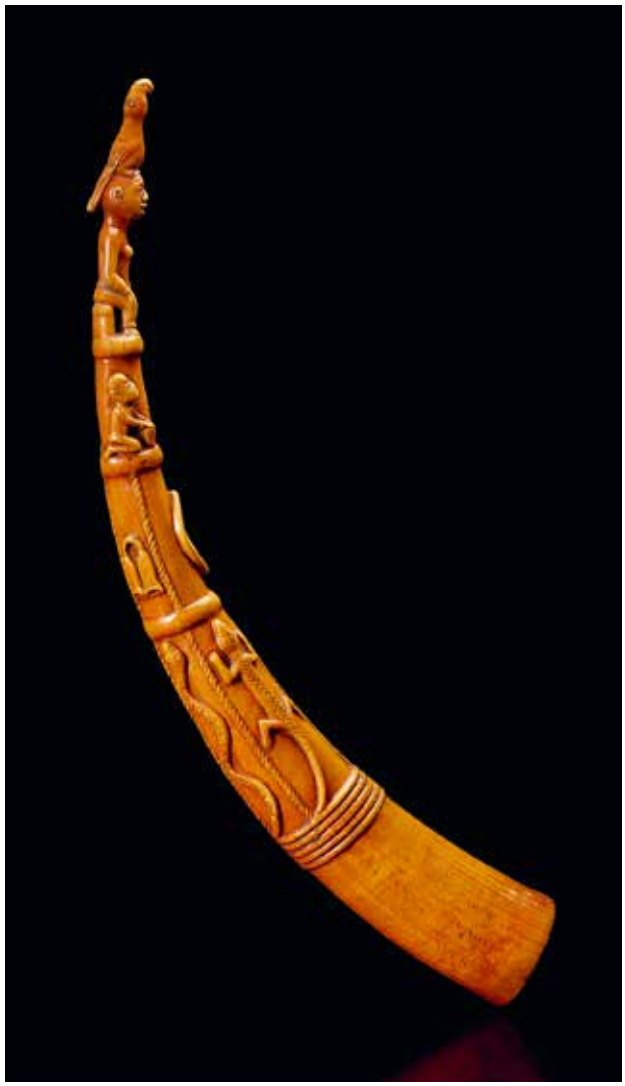

Fig. 20. Elephant tusk
Probably from Sierra Leone or Congo, 16th century

Polypharmacy abounded in pre-scientific medicine. In the light of current science, many different materials used as antidotes are chemically the same. Regarding the mythical unicorn, we should note that the animal was fanciful, but two different materials were used in artworks and medicine: tusks and horns. The base element of animal horns (rhino horns), is keratin.

Bezoar stones from Eastern wild goats are also basically composed of calcium, phosphates and keratin from undigested animal hair, which means that rhino horns and bezoar stones have essentially the same chemical composition. The therapeutic effectiveness of bezoars as poison adsorbents has been recently demonstrated. These substances were used empirically, with no effective dosage control. Scientific advances set them aside. They stand as marks of pre-scientific toxicology.

Conclusion

The Távora Sequeira Pinto Collection (Porto) brings together some of the most prized goods traded and manufactured by the Portuguese, and introduced into European medicine by Portuguese physicians during the Renaissance. The artworks take us back to a marvelous time when exotic and mysterious materials were highly esteemed in the protection of popes, kings and nobles from poisonings, evil and diseases. These pieces stand as the most important hallmarks of magic and empirical in a time when scientific medicine was still not fully established, as well they are the living memories of the glory and splendour of the Portuguese discoveries. These therapeutic *mirabilia* were replaced by more effective therapies from the eighteenth century onwards. However, biochemical assessment along with recent studies on these substances has proved some real pharmacological effectiveness.

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