

HISTORICAL SURVEY OF THE INTERNAL USE OF UNPROCESSED AMBER

POVIJESNI PREGLED PERORALNE PRIMJENE NEOBRAĐENOG JANTARA

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SUMMARY

The organic mineraloid gemstone, amber, a fossilized resin collected from Eocene deposits laid down around 44 million years old on the Baltic coast, has been an important geopharmaceutical in the western materia medica since classical times. Once rendered into powdered form, it could be delivered into the body using a wide range of vehicles including lozenges, pills, tablets, troches, electuaries, solutions and lohochs (lick-pots), and with toast and poached eggs. Acting either alone or in combination with a wide range of botanical, zoological and other geological ingredients, it was employed in the treatment of a huge range of diseases. Most prominent among these were various vascular disorders (e.g. haemoptysis, haemorrhage, excessive menstrual bleeding), problems with the urogenital system (e.g. tendency towards miscarriage, impotence, venereal diseases, strangury, dysuria and bladder stones) and alimentary conditions, particularly dysentery. A variety of infectious diseases, including plague, gonorrhoea, measles and fevers could be targeted with amber-containing preparations, as could epilepsy, melancholy and the ravages of old age. Rather more unusual applications included its use in the treatment of impotence, halitosis, drunkenness and a weak back.

Key words: amber; materia medica; history of pharmacy; geopharmaceutical

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INTRODUCTION

The organic mineraloid, amber, is a fossilised plant resin produced by polymerisation of a wide range of isoprenoid compounds, mostly terpenoids, carboxylic (resin) acids and associated alcohols, which are secondary plant metabolites. Until the 20th century, most amber was collected from the Samland Peninsula on the Baltic coast of what is now Russia. Here, Baltic amber occurs in the *blau erde* or “Blue earth” that is exposed in the cliffs of the peninsula, but it also crops out in the floor of the Baltic Sea from which it is distributed by storm action both to Baltic littoral coasts and as far away as the east coast of Britain. K-Ar radiometric studies have indicated an age of 44.1 +/- 1.1 Ma, placing the amber within the Lutetian Stage of the Eocene¹. The most recent work on Baltic amber suggests it was produced by conifers belonging to the family Sciadopityaceae (the Umbrella pines)².

Baltic amber has been mined since prehistoric (Palaeolithic) times. Roman and medieval trade routes have been reconstructed using information from amber artefacts distributed throughout Europe³, and it has a long and varied folklore history. Distinctive because of its colour, low density, ability to hold a static charge and various thermal properties, amber has been a popular ornamental gemstone for millennia, being relatively easy to work and polish.

The romanticism of its properties and use were enhanced by colourful accounts of its origins; Ovid recorded a Greek myth that amber droplets were the tears of the Heliades (the daughters of Apollo mourning the death of their brother Phaeton), while Pliny recorded Sophocles’ opinion that certain birds in Africa shed amber beads in their faeces. Baltic legends state that an undersea amber palace was destroyed by Perkunas, the god of thunder, and that the debris is washed up on the circum-Baltic shoreline, particularly Latvia and Lithuania, during extreme storms. Roman and Greek mythology cited the golden apples of the Hesperides, covered in amber dew, while other European legends considered amber to be the congealed rays of the setting sun. As mentioned above, amber is actually a fossilised resin which, once buried, is matured by the liberation of various volatiles and subsequent

¹ Ritzkowski, S. K-Ar-Altersbestimmungen der bernsteinführenden Sedimente des Samlandes (Paläogen, Bezirk Kaliningrad). “Metalla”, 66; 1997: 19–23.

² Wolfe, A.P., Tappert, R., Muehlenbachs, K., Boudreau, M., McKellar, R.C., Basinger, J.F. & Garrett, A. A new proposal concerning the botanic origin of Baltic Amber. “Proceedings of the Royal Society, B”, 276; 2009: 3403-3412.

³ Spekke, A. The Ancient Amber Routes and the Geographical Discovery of the Eastern Baltic. Ares, Chicago, 1976.

complex polymerisation of residual hydrocarbons under conditions of increasing heat and pressure. Baltic amber is rich in succinic acid (up to 8%) and often referred to as Succinite. Perhaps the earliest image that depicts the formation of amber as a resin is that in the 1491 *Hortus Sanitatis* ('Garden of Health'; Fig. 1)⁴.

The use of amber as a therapeutic material was well established by classical times⁵ and it flourished through succeeding centuries to the present day⁶. Considering the dominance of the Samland or Sambian Peninsula (part of the Kaliningrad Oblast, an exclave of Russia), in terms of amber supply and trading it is likely that virtu-

ally all of the amber employed for medicinal purposes in Europe originally came from the Baltic coast although it should be noted that small pockets of amber deposits are also known from Sicily, Denmark, Germany, Sweden, Poland, Lithuania and Romania. In addition to its decorative nature, amber was worn as an amulet to counteract evil spiritual influences and to protect the head and throat against infection, to act as a prophylactic against the plague, to ensure unimpeded lactation in nursing mothers, to act as an antivenin, as a cure for ocular problems and to fasten loose teeth! Applied topically in plasters, salves, unguents, poultices, ointments, balsams and cataplasms, it was often combined with numerous aromatic gums and resins to give relief from a wide range of diseases. Burnt as a fumigant, the smoke produced by amber was inhaled to assist with childbirth and to treat epilepsy⁷.



Figure 1. The origin of amber as a tree resin (*Hortus Sanitatis*, de Lapidibus, Cap. lxx, 1491). From a copy held in the Boston Medical Library in the Francis A. Countway Library of Medicine, Boston, MA, USA.

⁴ Von Cuba, J. *Hortus Sanitatis*. De lapidibus, Cap. lxx. Mainz, Jacob Meydenbach, 1491.

⁵ Riddle, J.M. Amber in ancient Pharmacy. The Transmission of Information About a Single Drug. A Case Study. "Pharmacy in History" 15 (1); 1973: 3-17.

⁶ Duffin, C.J. Fossils as drugs : pharmaceutical palaeontology. "Ferrantia", 54; 2008: 1-83.

⁷ Duffin, C.J. History of the external pharmaceutical use of Amber. "Pharmaceutical Historian", 43 (3); 2013a: 46-53.



Figure 2. Amber (*Succinum Citrinum* and *Succinum Album*) from Drawer 15 of William Heberden's early 18th century *Materia Medica Cabinet*. By permission of the Master and Fellows of St John's College, Cambridge.

its common incorporation into a range of medicines⁸. Interestingly, within these cabinets, pieces of amber are invariably grouped together with geological materials (minerals, fossils, rocks and earths) rather than with gums and resins.

Geopharmaceuticals as elements of the *materia medica* have received relatively little attention in the literature compared to the published accounts of herbal and zoological simples. The last ten years have seen a significant rise in interest in geological materials, with attention being focused on the history of certain fossil, mineralogical and lithological items and their therapeutic uses. In this regard, amber has been the subject mostly of passing mention in broader works about the mineral itself or the general folklore of fossils; significant recent and 20th century publications are all referenced in the text. The present paper is part of an attempt to present the first detailed systematic review of the medicinal use of amber up until the 19th century. The history of many of the internal means of taking the organic gemstone will be considered here, with the exception of the products of amber distillation (tinctures, salts, oils and 'powers') which will be considered in a separate publication.

The incorporation of amber into various medicines, often mixed with a range of herbs, minerals, organic gems and 'waters', persisted from classical times right up to the nineteenth century. In addition to the written record of amber usage, the presence of the mineral in surviving medical cabinets, particularly those dating to the late 17th and early 18th century (Fig. 2), testifies to

⁸ Duffin, C.J. Some early Eighteenth Century geological *Materia Medica*. In Duffin, C.J., Moody, R.T.J. & Gardner-Thorpe, C. (eds.) *A History of Geology and Medicine*. Geological Society of London Special Publication, 375; 2013b: 209-233.

AMBER NOMENCLATURE

The various words used to designate amber are often the subject of some confusion and debate, so some brief background notes to their etymologies is relevant here.

The English word ‘amber’ is derived from the medieval Arabic *anbar*, and so related to very similar renderings in various southern european languages (e.g. French *ambre*; Italian *ambra*; Spanish *ambar* or *ambeur*; Portuguese *alambre*). The original Arabic name refers to the Sperm Whale (*Physeter macrocephalus* Linnaeus, 1758) and was also applied directly to ambergris, a solid accretionary faecal accumulate occasionally developed in both the Sperm Whale and the Pygmy Sperm Whale (*Kogia breviceps* Blainville, 1838)⁹; ambergris is classified as a cololite (faecal mass formed in the digestive tract), which may belong to either the intestinelite (preserved within the body cavity) or eviscerolite (preserved outside the body carcass) subgroup¹⁰. Employed historically as a medicine, condiment, aphrodisiac and perfume fixative, ambergris is usually denoted by the word *ambra* in latin texts although in some instances *ambra* has also been applied to the fossilized resin¹¹; the term *ambra citrinum* has sometimes been used to distinguish between amber and ambergris, the latter often being referred to as *ambra grysea* or (confusingly) *ambra terrestram*¹². *Ambra citrinum* translates to ‘yellow amber’ in English, indicating the fossilized resin.

‘White amber’ is referred to in some of the pharmaceutical recipes given below. Some authors¹³ refer to the Latin equivalent, *Ambra albidam*, linking it to spermaceti, a wax confined to the spermaceti sac and associated dorso-ventrally arranged blocks of tissue in the junk area of the snout in the Sperm Whale, and believed to be useful as a buoyancy aid and echolocation focusing agent and perhaps also providing physical protection for the head¹⁴. The question might legitimately be raised as to whether white amber and spermaceti, which was also used therapeutically, are identical. It is clear from

⁹ Clarke, R. The origin of ambergris. “The Latin American Journal of Aquatic Mammals”, 5 (1); 2006: 7-21.

¹⁰ Monaco, P., Baldanza, A., Bizzarri, R., Famiani, F., Lezzerini, M., & Sciuto, F. Ambergris cololites of Pleistocene sperm whales from central Italy and description of the new ichnogenus and ichnospecies *Ambregrisichnus alleronae*. “Palaeontologia Electronica”, 17 (2); 2014; ;29A: 1-20

¹¹ Klobius, J. F. *Historia Ambrae. Wittenbergae, Matthei Henckelii*; 1666.

¹² Baier, J.J. *Dissertatio Medica de Ambra*. Jena, Kristophorii Krebsii; 1698: 6.

¹³ Baier, J.J. 1698: 6.

¹⁴ Clarke, M.R. Structure and proportions of the spermaceti organ in the Sperm Whale. “Journal of the Marine Biological Association of the United Kingdom” 58; 1978: 1-17.

English pharmaceutical literature that the two are not synonymous since they have separate uses in individual works by authors including Nicolas Culpeper (1616-1654)¹⁵, and White amber is placed under *Succinum*, a second Latin term, this time reserved exclusively for amber, in Sir John Hill's *History of the Materia Medica* (1751)¹⁶.

The Arabic word *Kahruba*, which translates as 'straw-robber' (referring to the ability of amber to hold a static charge), is taken to indicate amber as are its variants (e.g. *carabe*, *cacabre*). The British physician and physicist, William Gilbert (1544-1603), pioneer of magnetism and electricity, considered that *carabe* was a synonym of *succinum* and *electron* in his famous treatise on magnetism, *De Magnete*, first published in 1600¹⁷. This view was supported by numerous other authorities^{18,19,20}.

Pedanius Dioscorides (circa 40-90), surgeon to the Roman army of Nero, refers in *De Materia Medica* to the tree *aigeiros*, which has usually been interpreted as the Black Poplar (*Populus nigra* Linnaeus, 1753)²¹, identified with the mythical Heliades cited above, although one translator suggests that the River Mangrove (*Aegiceras majus* Gaertner, 1788) is intended²². Dioscorides describes a resin produced by sap running down the bark of the tree that hardens to form amber which he commends as follows : 'Ground finely and taken as a drink it stops excessive discharges of the stomach and bowels'²³.

¹⁵ Culpeper, N. Culpeper's Complete Herbal & English Physician. London, Applewood Press; 2006: 276.

¹⁶ Hill, J. A History of the Materia Medica. London, Longman, T., Hitch, C. & Hawes, L.; 1751: 156.

¹⁷ Gilbert, W. On the Magnet, magnetick bodies also, and on the great magnet the earth; a new Physiology, demonstrated by many arguments and experiments. Translated by S.P. Thompson and the Gilbert Club. London, Chiswick Press; 1900: 47.

¹⁸ Martin, T. H. Du Succin, de ses noms divers et de ses variétés suivant les anciens. "Mémoires de l'Académie des Inscriptions et Belles-lettres de l'Institut de France", ser. 1, 6 (1); 1860: 297-329.

¹⁹ Morveaux, L.-B. G de. Mémoire sur l'acide Karabique. "Nouveaux mémoires de l'Académie de Dijon, pour la partie des sciences et des arts"; 1783 : 1-19.

²⁰ Williamson, G.C. The Book of Amber. London, Ernest Benn Ltd; 1932: 51.

²¹ Gunther, R.T. 1968. The Greek Herbal of Dioscorides illustrated by a Byzantine AD 512, Englished by John Goodyer AD 1655, Edited and first printed AD 1933. London, Hafner; 1968: 60.

²² Osbaldeston, T.A. & Wood, R.P. Dioscorides De Materia Medica. Being an herbal with many other medicinal materials written in Greek in the first century of the Common Era. Johannesburg, Ibdid Press; 2000: 113.

²³ Osbaldeston, T.A. & Wood, R.P.. 2000: 113.

This has led some commentators on Dioscorides to suggest that it was this resin that was indicated by *karabe*²⁴.

The Greek word *electron* is commonly applied to amber⁹ but the term was also used for a naturally occurring alloy of gold and silver. In situations like this, context becomes an important tool in determining the intended meaning of the use of the word^{25,26,27}. An additional term used occasionally for amber in Greek texts is *lyncurium* and its variants²⁸, although a strong case has been made for its application to fossil belemnites in renaissance medical literature²⁹.

LOZENGES

Lozenges are generally hard, flattened, round, oblong or diamond-shaped preparations designed to release their active ingredients quite slowly as they gradually melt in the mouth. The therapeutic components are added to a base which usually comprises a sugary substance (such as honey) combined with an edible gum (such as mastic, tragacanth or lac).

Pliny the Elder's (23-79 AD) *Historia Naturalis*, a huge compilation of Roman lore, including much medical folklore gathered from a wide range of sources, was produced in 37 volumes from around 77 AD³⁰. Pliny quotes an otherwise unknown Roman writer, Callistratus, as the authority for amber being used therapeutically³¹:

'trituated with honey and oil of roses, it is good for maladies of the ears. Beaten up with Attic honey, it is good for dimness of sight; and the powder of it, either taken by itself or with gum mastic in water, is remedial for diseases of the stomach'.

²⁴ Matthiolus, P.A. Commentaires de M. Pierre Andre Matthiole Medecin Senois, sur les six livres de Ped. Dioscor. Anazarbeen de la matiere Medecinale. Lyon, G. Rouille; 1579: 110.

²⁵ Riddle, J. R.. 1973: 4-5.

²⁶ Huld, M.E. Greek electron Amber. In Marler, J. (ed.) From the Realm of the Ancestors: An Anthology in Honor of Marija Gimbutas; 1997: 135-139.

²⁷ Deroy, L. & Halleux, R. A propos du grec electron "amber" et "or blanc". "Glotta", 52 (1/2); 1974: 36-52.

²⁸ Riddle, J.R.. 1973: 5.

²⁹ Duffin, C.J.. 2008: 22.

³⁰ Duffin, C.J. Lithotherapeutical research sources from antiquity to the mid-18th century. In Duffin, C.J., Moody, R.T.J. & Gardner-Thorpe, C. (eds.) A History of Geology and Medicine. Geological Society of London Special Publication, 375; 2013c: 7-43.

³¹ Pliny, *Historia Naturalis*, Book 37 Cap. 12, 51; Bostock, J. & Riley, H.T. *The Natural History of Pliny*, volume 6. Henry G. Bohn, London; 1857: 404.



Figure 3. Galen (circa 129-200), and an assistant with a pestle and mortar, plus a scribe in an apothecary's shop. Miniature (no. 37.181) from a 15th century manuscript in Dresden. Wellcome Library, London.

Callistratus further, according to Pliny, indicated that amber was 'good for any age, as a preventive of delirium and as a cure for strangury, either taken in drink or attached as an amulet to the body'.

Claudius Galenus, known as Galen of Pergamum (129-200 AD; Fig. 3) was a highly influential Greek physician practising in the Roman Empire as Court Physician to Marcus Aurelius³²; his voluminous writings were foundational to pharmaceutical philosophy and were revered without serious questioning well into renaissance times. One of the earliest authorities to present pharmaceutical recipes containing amber, the instructions for producing a lozenge (*Pastillus ex succino*) recommended as part of the treatment for a range of digestive and respiratory problems, especially 'hemoptysis, coughing both protracted and fresh, consumption, spitting up of humors, suppuration, suffering in the bowels, dysentery, and flatulency', was as follows^{33,34}:

³² Mattern, S.P. *The Prince of Medicine : Galen in the Roman Empire*. Oxford : Oxford University Press, Oxford; 2013.

³³ Kühn, C.G. *Claudii Galeni Opera Omnia*. Volume 13. Georg Olms, Hildesheim; 1965: 86.

³⁴ Riddle, J.M. 1973: 3-17.

Clean fleawort plant 45 drachmae, Illyrian iris, mastic, filings of amber, saffron, of separate ones, 30 drachmae, opium 15 drachmae. [Put] the beaten fleawort plant in warm water for soaking and when this is viscous and gluey, it shall be put in water [again]. Force out to a liquid. Prepare the medication with this. Shape this into a lozenge. Give three obols [0.7 g] when one is going to sleep.

Galen's closely related and textually immediately adjacent Neapolitan Lozenge (*Pastillus Neapolitae*) contained amber filings mixed with the same list of botanical ingredients, plus seeds of henbane, mandrake juice, curd and unspecified spices; he prescribed it in cases of haemoptysis (coughing or spitting blood), suppuration, consumption and rheumatism³⁵. Further prescriptions containing amber were given by him in cases of flatulency, consumption and oral infections³⁶. Galen's recipes for amber-containing lozenges proved popular; the Pergamum physician Oribasios (circa 320-403), personal physician to Roman Emperor Julian the Apostate³⁷, influenced heavily by his predecessor and countryman, also prescribed them in the treatment of haemoptysis, dysentery, stomach disorders, consumption, coughing, suppuration and running of the bladder³⁸.

Galen's contemporaries also esteemed amber as a therapeutic material. Aretaeus of Cappadocia in Asia Minor (2nd century AD), now part of southern Turkey, was a member of the pneumatic school of medicine, founded in the 1st century at Rome by Athenaeus of Cilicia. Members of this fraternity adhered to the doctrine of the *pneuma* or spirit as the active principle determining the body's state of health or disease. Several of Aretaeus's writings survive, first published in Venice in 1552, and are noteworthy for many 'firsts' or particularly accurate descriptions of various conditions including diabetes, coeliac disease, bipolar disorder and asthma. Aretaeus lists lozenges based on amber among his 'compound medicines of tried efficacy' against the bringing up of blood, being convinced that ingested medicines are far superior to plasters and other topical remedies since they 'come nearest the injured parts'³⁹. Similar applications were also proposed by the Roman physician Caelius Aurelianus (circa 430 AD), a champion of the methodic

³⁵ Kuhn, C.G., 1965: 86; Riddle, J.M., 1973: 7.

³⁶ Kuhn, C.G., 1965: 94, 138; Riddle, J.M., 1973: 7.

³⁷ Baldwin, B. The Career of Oribasios. "Acta Classica", 18; 1975: 85-97.

³⁸ Riddle, J.M., 1973: 9.

³⁹ Adams, F. The Extant Works of Aretaeus, the Cappadocian. The Sydenham Society, London, 1856: 424, 426; Riddle, J.M., 1973: 9.

school of medicine, in his Latin translation of the Greek works of Soranus of Ephesus (98-138 AD)⁴⁰.

The Mesopotamian physician and Court Physician to Byzantine Emperor Justinian I, Aëtius Amidenus or Aëtius of Amida (now the Turkish city of Diyarbakır) studied at the medical school in Alexandria; his dates are disputed but he is generally thought to have flourished during the 5th and 6th centuries. Probably the first Greek medical writer among the Christians, his *Sixteen Books on Medicine* was not printed until 1549. The work is a compilation of many medical insights from various writers, including a number of works, now otherwise lost, from the library of the Alexandrian School. Aëtius mentions amber in Book 2 of his work where several chapters are dedicated to mineral simples. He indicates that amber was taken to alleviate strangury (slow and painful discharge of urine) and stomach problems⁴¹.

Thomas Raynald, a Tudor printer who flourished circa 1539-1552, published an English translation (rather confusingly, probably carried out by a physician called Thomas Raynalde) of Eucharius Rösslin's midwifery manual, *Der Swangern Frauwen und Hebammen Rosegarten* ('Rosegarden for Pregnant Women and Midwives')⁴². Rösslin began his career by serving as an apothecary in Freiburg (1493) and then moved on to be elected City Physician, first at Frankfurt (1506) and later at Worms⁴³. Commissioned to oversee the city midwives, he found the profession to be in a parlous and dangerous state; his response was to produce a guidebook to midwifery in 1513. The English translation, under the title *The Byrth of Mankynde* (1552; Fig. 4), was the first book published in English to be illustrated with copper engravings. It cites the 'apothecaries trochiskes', lozenges of amber which should be taken with four or five spoonfuls of Plantain Water and used to treat excessive menstrual bleeding^{44,45}.

⁴⁰ Drabkin, I.E. Caelius Aurelianus. *On Acute Diseases and on Chronic Diseases*. Chicago : University of Chicago Press, 1950: 166; Riddle, J.M., 1973: 9.

⁴¹ 40 Drabkin, I.E. Caelius Aurelianus. *On Acute Diseases and on Chronic Diseases*. Chicago : University of Chicago Press, 1950: 166; Riddle, J.M., 1973: 9.

⁴² Rösslin, E. *Der Swangern Frauwen und Hebammen Rosegarten*. Strasbourg & Hagenau, 1513.

⁴³ Dunn, P. M. Eucharius Rösslin (c 1470–1526) of Germany and the rebirth of midwifery. "Archives of Disease in Childhood-Fetal and Neonatal Edition". 79; 1998: F77-F78.

⁴⁴ Hobby, E. (ed.) *The Birth of Mankind: Otherwise Named, The Woman's Book : Newly Set Forth, Corrected, and Augmented : Whose Contents Ye May Read in the Table of the Book, and Most Plainly in the Prologue*. Ashgate Publishing Ltd, Bath, 2009.

⁴⁵ Raynald, T. *The Byrth of mankind, otherwise named the womans Boke. Newly set forth, corrected and augmented, whole contentes ye may reade in thee Table of the Boke, and*

In 1652, the City Council of Ghent ordered the publication of a pharmacopoeia, the *Antidotarium Gandavense*, authored by a trio of city physicians – Franciscus Van den Vivere, Iohannes Stalins and Gislenus Rissoens⁴⁶. The publication includes a recipe for *Trochisci de Carabe* that differed from the amber troches of classical times in combining amber with hart’s horn, gum arabic, red coral, gum tragacanth, aca-cia, hypocistis (*Cytinus hypocistis* - an ant-pollinated holoparasitic member of the Rafflesiaceae from the Mediterranean area), ‘Balaustiorum’ (*Punica granatum*, the Pomegranate), mastic, ‘Laccae lotae’ (washed scarlet resinous exudation from lac insects – scale insects of the family Kerriidae), black poppy, ‘Thuris’ (frankincense or olibanum resin?), saffron, opium and *muscilaginis psyllii* (possibly *Plantago ovate*; the seed husks of this Asian desert plant are very high in soluble dietary fibre). The tablets were recommended to check bleeding in all parts of the body, as well as helping in cases of haemoptysis, dysentery and purulent discharge.

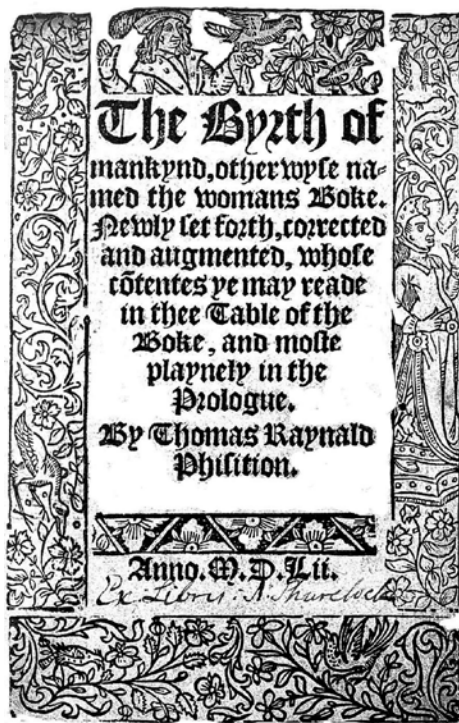


Figure 4. Title page of *The byrth of mankind* (London, 1552), translated by Thomas Raynald from an original work by Eucharius Roesslin the Elder. Wellcome Library, London.

POWDERS

Therapeutic powders were produced by grinding hard materials with a (usually brass) pestle and mortar (Fig. 3) or by using a stone ‘muller’ on a

moste playnely in the Prologue. Publisher and place not indicated, 1552: unpaginated, Boke 2, folio lxxix.

⁴⁶ *Antidotarium Gandavense sive medicamentorum componendorum a pharmacopeis Gandavensibus observanda methodus, Senatu mandante, a medicis lubenter obsequentibus, in commune patriae bonum compendiose concinnata. Gandavi, Baldvini Manilii, 1652: 134-135.*



ELIZABETH Grey
Countess of Kent.

A
Choice Manual,
OR
Rare and Select
SECRETS
IN
PHYSICK
AND
CHIRURGERY:
Collected, and practised
by the Right Honourable
the Countesse of Kent, late deceased.
Whereto are added several
Experiments of the Virtue of Cascoo
powder, and lapis contra Yarnam
by a Professor of Physick.
As also most exquisite ways
of Preserving, Conser-
ving, Candyng, &c.

The Sixteenth Edition.

LONDON, Printed by A. M.
for Margaret Shears at the
Sign of the Blew-Bible in
Bedford-Street in Covent-
Garden, 1671.

Figure 5. Title page of *A choice manual of rare and select secrets in physick and chirurgery* (London, 1671), and accompanying portrait of Elizabeth Grey, Countess of Kent (1581-1651). Wellcome Library, London.

marble or porphyry slab. Recipes often specified that the powder so produced should be ‘impalpable’ – that is, finely and evenly ground so that no gritty particles could be felt when the product was rubbed between the fingers.

Probably the most popular amber-containing confection of this type was the Countess of Kent’s Powder. The recipe was first proposed by the eponymous Elizabeth Grey, Countess of Kent (1581-1651; Fig. 5), second daughter of the 7th Earl of Shrewsbury. Elizabeth married Henry Grey (c.1583–1639), who later became the Earl of Kent (1628) in 1601. Active at Court, she served Anne of Denmark, James I’s Queen, as first lady of the bedchamber from 1617⁴⁷. Two years after her death, in 1653, a book was published entitled *A*

⁴⁷ Considine, J., Grey, Elizabeth, countess of Kent (1582–1651), *Oxford Dictionary of National Biography*. Oxford, Oxford University Press, 2004.

choice manual of rare and select secrets in physick and chirurgery. Although often identified as the author, Elizabeth contributed only one recipe to the volume (the powder that bears her name), which was otherwise collected together for her use by the publisher, W.I.Gent (possibly William Jervis)⁴⁸. The book, containing cures for common ailments and a wide range of cooking recipes, was extremely popular and went through at least 22 editions to 1726.

The Countess of Kent's Powder consisted of Magistery of Pearl and of white coral, crab's eyes (*oculi cancrorum*, or astacid crayfish gastroliths), 'black tops of the great claws of crabs' (*chelae cancrorum*), white amber and *lapis contrayerva*, beaten together to form a powder. *Lapis contrayerva* was an artificial stone based upon the rhizomes of *Dorstenia*, introduced into Europe from South America during the 1580s, established in apothecary shops from around 1602 and increasingly popular through the seventeenth century⁴⁹. In lump form, amber comes in a wide range of colours; white amber is generally characterised by a high succinic acid content. The powder was sieved, supplemented by powdered oriental bezoar and worked into troches after mixing with hart's horn jelly, ambergris and musk; saffron was added as a colouring agent. Having air-dried the troches, they could be broken down to give doses, each of 12 or 20 grains (0.78g - 0.3g), and administered in warm sack or hart's horn jelly during the treatment of 'all Malignant and Pestilential Diseases, French Pox, Small Pox, Measels, Plague, Pestilence, malignant or scarlet fevers' and Melancholy. The recipe, supported by case histories, was quickly incorporated into other volumes, and some of the ingredients omitted in favour of supposed alexipharmic ingredients including red coral, ivory, unicorn horn, the flesh of vipers and even antimony^{50,51,52}.

⁴⁸ Grey, E. *A choice manual of rare and select secrets in physick and chirurgery*. 19th edition. London, H. Mortlock, 1687.

⁴⁹ Duffin, C.J. & Pymm, R.J. A Survey of Pharmaceutical 'Stones' – Part 1. "Pharmaceutical Historian", 45 (1); 2015: 2-8.

⁵⁰ W. M. *The Queens closet opened*. Incomparable secrets in physick, chirurgery, preserving, candying, and cookery; as they were presented to the Queen by the most experienced persons of our times, many whereof they were honoured with her own practice, when she pleased to descend to these more private recreations. Never before published. Transcribed from the true copies of her Majesties own receipt books, by W.M. one of her late servants. London, Printed for Nathaniel Brook at the Angel in Cornhill, 1655: 274.

⁵¹ Wecker, J. *Eighteen Books of the Secrets of Art and Nature, being The Summe and Substance of Naturall Philosophy, Methodically Digested*. First designed by John Wecker Dr in Physick, and now much Augmented and Inlarged by Dr R. Read. [Translated by William Rowland]; a like work never before in the English tongue. London, Simon Miller, 1660.

⁵² Wellcome MS. 2990/110 Hyde, Bridget, 1690; Wellcome MS. 3724/71 – Sir Thomas Osborne, 1670-1695; Wellcome MS. 3448 – Saint John, Johanna, 1680.



Figure 6. Portrait of William Salmon (1644-1713). Line engraving by W. Sherwin, 1671. Wellcome Library, London.

The somewhat similar Powder of Crab's Claws involved adding pearls, red coral, amber, bezoar stone, crab's eyes and hart's horn to the claw tips, rendering the mixture to a powder and then binding it together with viper skin jelly; the resulting material was then fashioned into troches or tablets. White coral replaced the red variety, and hart's horn jelly replaced that produced from viper skin in the closely similar Gascon Powder⁵³.

In the same work, an amber-containing powder is recommended for the treatment of epilepsy ('falling sickness')⁵⁴. Six pennyweights each of pearl, coral and amber, one pennyweight of gold (where a pennyweight is 1,555 g), 8 grains (518.4 mg) of bezoar, half an ounce of peony seeds

were crushed and mixed together. The addition of dead man's skull depended on the sex of the patient – skull from a male was required to treat females and vice versa. Sufficient of the mixture to cover a two penny piece was taken, dissolved in Endive Water; endive is a form of chicory (*Cichorium* sp.) whose leaves are rich in minerals and vitamins.

Amber was also an active ingredient in *Pulvis partum provocans*, a powder seen as facilitating labour and easing childbirth, as recommended by the *Antidotarium Grawanense*⁵⁵. White amber was beaten together with cinnamon, 'Sabinae' (*Juniperus sabina* or Savin), saffron, 'Cassia lignae verae' (wood/bark of the Chinese Cinnamon, *Cinnamomum cassia*) and 'Foliorum Dyptami' (leaves of *Dictamnus albus*, or False Dittany). William Salmon (1644-1713; Fig. 6) sought similar results with his closely related 'Emmenagogick

⁵³ Grey, E., 1687: 185, 186.

⁵⁴ Grey, E., 1687: 3.

⁵⁵ *Antidotarium Gandavense*, 1652: 119.

Powder' which 'brings away the Child, whether alive or dead, as also the after Birth'⁵⁶; amber was added to cinnamon, saffron and borax (sodium tetraborate) and the whole mixture rendered to a powder. Salmon commented that the effects of the medicine could be strengthened with the addition of dried horse testicles, myrrh, bryony root, and long-established abortifacients such as birthwort (*Aristolochia* spp.), as noted by Dioscorides, and Savin. The powder could be administered either in Rhenish Wine or in Mugwort Water (derived from *Artemisia* sp., another acclaimed emmenagogue).

Salmon also recommended an amber-containing powder for the treatment of gonorrhoea, supporting his contention with a case history. In addition to prescribing such measures as drinking mint-infused ale, washing his feet with water from the forge of a local smithy and his back with Vinegar of Roses, Salmon asserted that taking a powder containing amber, oven-dried acorns, coriander, frankincense, mastic, *Agnus-castus* seed (*Vitex agnus-castus* or Monk's Pepper), mint and sugar of roses, dispersed in milk or red wine, caused all discharges to cease and the patient to recover his complexion⁵⁷.

Oswald Croll (1563-1609), alchemist, imperial physician to Rudolph II and formerly Professor of Medicine at Marburg University, incorporated amber into 'A Dysenterick Powder of admirable virtue' in his *Basilica Chymica* (1609) (Fig. 7). The powder also contained *sanguis draconis*, haematite, red coral, seeds (purslane, plantain and anthora [Healing Wolfsbane]), tormentil root, *terra srigensis*, nutmeg, cinnamon, *crocus martis*, and calcined talc,



Figure 7. Title page of *Basilica Chymica* (Frankfurt, 1609), by Oswald Croll (c. 1563-1609). Wellcome Library, London.

⁵⁶ Salmon, W. *Collectanea Medica. The Country Physician: Or, A Choice Collection of Physick: Fitted for Vulgar Use.* London: Printed for John Taylor at the Ship in St. Paul's-Church-Yard, 1703: 86.

⁵⁷ Salmon, W., 1703: 350.



Figure 8. Portrait of Nicolas Culpeper (1616-1654). Wellcome Library, London.

mother of pearl and 'Bones of Microcosme' (human bones?). Croll recommended its use in cases of dysentery, lientery (excretion of partly or wholly undigested food), nosebleeds, excessive menstrual flow and bleeding during pregnancy⁵⁸.

Nicolas Culpeper (1616-1654; Fig. 8), the English herbalist, physician and astrologer, recommended Cordial Magistral Pouder, or *Pulvis Cardiacus Magistralis*, as being 'excellent in al Venemous diseases.... helps fluxes, corrects a stinking breath, is good for the falling-sickness,

all Infirmities of the Brain and Heart ... cheers a Melanchollick spirit'. A complex recipe, it incorporated white amber with a wide range of other ingredients (including bezoar stones, bone of a stag's heart, white and red coral, Magisterium of Pearl, harts-horn, ivory, bole-armenick, earths of Germany, Samos and Lemnos, elk's claw [hoof of the right hind foot, possibly from the reindeer], tormentil roots, wood of aloes, citron peels, roots of angelica, and zedoary, plus gold leaf, ambergris, and musk). Many of the components were very expensive, making it 'too deer for a vulgar purse'. For those who could afford it, 'a scruple, half a dram or two scruples may be given in a little Borrage Water, or in sack to elderly persons not feverish'⁵⁹.

⁵⁸ Croll, O. *Bazilica chymica, & Praxis chymiatricae, or, Royal and practical chymistry in three treatises : wherein all those excellent medicines and chymical preparations are fully discovered, from whence all our modern chymists have drawn their choicest remedies : being a translation of Oswald Crollius, his Royal chymistry, augmented and enlarged by John Hartman : to which is added his Treatise of signatures of internal things, or, A true and lively anatomy of the greater and lesser world : as also, The practice of chymistry of John Hartman, M.D., augmented and enlarged by his son all faithfully Englished by a lover of chymistry.* London, John Starkey & Thomas Passinger, 1670: 149.

⁵⁹ Culpeper, N. *Pharmacopoeia Londinensis: or, the London dispensatory further adorned by the studies and collections of the Fellows, now living of the said colledg [sic] [...] In which is printed, I. The vertues, qualities, and properties of every simple [...] VI. The Latin names of every one of the compounds .* London, Peter and Edward Cole, 1661: 135.

ELECTUARIES

Electuaries are medicinal pastes produced by mixing various therapeutic ingredients in finely powdered form, and then binding them together, usually with honey or a sweet solution.

One definition of 'Philonium' is "a kind of somniferous anodyne opiate"⁶⁰. The two most popular opiates were *Philonium persicum* (Persian philonium) and *Philonium romanum* (Roman philonium); only the former incorporated amber as an ingredient. The name of the opiate is derived from its inventor, Philon of Tarsus, a Cilician, whose recipe is preserved in a Greek poem cited by Galen⁶¹. Originally proposed as an antidote, the medicine was cited by numerous authors of classical medicine, including Galen, Paulus Aegineta, Oribasius, Aëtius, Joannes Actuarius, Marcellus, Alexander Trallianus, Nicolaus Myrepsus, Avicenna, and perhaps also Celsus⁶². The recipe survived virtually unchanged into the 17th century, when Nicolas Culpeper began warning that it belonged to a group of medicines that should be used only 'with abundance of skill and discretion, and never but in cases of necessity, when the pain is so vehement that Nature is not able to bear it'⁶³. In addition to amber, the ingredients included other geological materials (*terra lemnia* and haematite) as well as botanical (pepper, henbane, opium, saffron, spikenard, pyrethrum, zedoary, doricum, camphor and honey of roses) and zoological ingredients (pearls, castoreum - the secretion from the castor sacs of the beaver, *Castor fiber*). Specialist drug jars were produced for its storage (Fig. 9), and it was esteemed for stopping haemorrhages, fluxes, and a means of preventing abortions⁶⁴. Culpeper concurs with this opinion and explains that it 'stops blood flowing from any part of the Body, the immoderate flowing of the Terms in Women, the Hemorrhoids spitting of blood, bloody fluxes, and is profitable for such women as are subject to miscarry'⁶⁵.

Culpeper also introduces the Queen of Colen's Electuary (*Electuarium Reginae Coloniens*) – 'commended as a jewel' because it supposedly 'opens all obstructions and moves the Courses for which probably the good Queen

⁶⁰ Anonymous. *A New and Complete Dictionary of Arts and Sciences*. Volume 3. London, W. Owen, 1764: 2461.

⁶¹ Galen, C. *De compositione medicamentorum secundum locos*, ix, 4, vol. xiii, 267.

⁶² Smith, W. *A Dictionary of Greek and Roman biography and mythology*. London, John Murray, 1873: 313.

⁶³ Culpeper, N. *Pharmacopœia Londinensis, or, The London dispensatory further adorned by the studies and collections of the Fellows, now living of the said colledg*. London, Peter Cole, 1653: 152.

⁶⁴ Anonymous, 1764: 2461.

⁶⁵ Culpeper, N. 1661: 146.



Figure 9. Tin-glazed earthenware drug jar for storage of Persian philonium (Italian, Faenza, about 1520 – 1530). The Getty Museum.

might use it, as well as for Wine and Stone Colick, and to make her blithe and buxome, when she was to club with the king her husband in the great business of making Princes and Princesses'. Administered in three ounces of white wine with a spoonful or two of 'Syrupe of Marsh-mallows',

the electuary was prepared as follows⁶⁶:

Take of the Seeds of Saxifrage and Gromwel, Juyce of Liquoris, of each half an ounce. Seeds of Caraway, Anniseed, Smallege, Fennel, Parsly of Macedonia, Broom, Carrots, Bruscus, Sparagus, Lovage, Cummin, Juniper, Rue, Siler mountain, Seeds of Acorus, Penyroyal, Cinkfoyl, Bay-berries, of each two drams. Indian spicknard, Schaenanth, Amber, Valerian, Hogs Fennel, Lapis Lyncis, of each a dram and an half. Galanga, Ginger, Turbith, of each two drams. Senna, an ounce. Goats blood prepared, half an ounce. Mix them together: first beat them into powder, then make them into an Electuary according to Art, with three times their weight in Sugar dissolved in white Wine.

Culpeper further surmises that the eponymous queen might be ‘Wife to one of those three Kings of Colen that the Legend tells us came to visit Christ in the Manger at Bethlehem’.

The Swiss physician, Johann Jakob Wecker (1528-1586; Fig. 10) suggests an electuary ‘against dangerous and pestilent diseases of children’, composed of ‘a little of the bone of the heart of a Stag, and of Unicorn’s Horn, red Corall, white Amber, Pearls, Pouders of Gold and Elk’s Claw’. Beaten to a powder, they were then delivered in either Rose Water or Lavender Water⁶⁷.



Figure 10. Title page of *Secrets of art and nature* (1600) with portrait of Johann Wecker (1528-1586). Wellcome Library, London.

⁶⁶ Culpeper, N. 1661: 163.

⁶⁷ Wecker, J. *Eighteen Books of the Secrets of Art and Nature, being The Summe and Substance of Naturall Philosophy, Methodically Digested. First designed by John Wecker Dr in Physick, and now much Augmented and Inlarged by Dr R. Read.* [Translated by William Rowland]; a like work never before in the English tongue. London, Simon Miller, 1660: 42.

Possibly the most famous amber-containing electuary is the Gem Electuary whose recipe was first proposed by Mesuë the Younger (Pseudo-Mesuë, Maswijah al-Marindi or Johannes Mesuë of Damascus; died 1015). Finely comminuted sapphires, chalcedony emeralds, garnets and amber were bound together with pearls, red coral, ivory and musk along with a range of herbal ingredients in a honey or sugar base⁶⁸. A very expensive mixture, it was used both as an individual medicine and in combination with additional preparations, right through to the mid-eighteenth century. Most popular during the sixteenth and seventeenth centuries, it was prescribed for the treatment of melancholia, nightmares, plague, syphilis, palsy, cramp, breast cancer, headache, erysipelas, fevers, tuberculous adenitis (scrofula) and a range of gynaecological conditions, as well as being employed as an alexipharmic and cardiac tonic⁶⁹.

TABLETS, PILLS AND TROCHES

Troches are small, often circular medical lozenges that are usually designed to dissolve in the mouth. William Bullein's (c.1515–1576⁷⁰) recipe for 'Trochisci di Ambra' (Bullein 1562: part 3, fol. xxxiii) contained powdered amber mixed with powdered hart's horn and coral, gum arabic, tragacanth, mastic, gum of laudanum, acacia, 'hypoquistis' (probably *Cytinus hypocistis*), powdered black poppy, and pomegranate flowers, all mixed together in the 'slimie iuce of fleworte'. It was used to treat unspecified sicknesses⁷¹.

Culpeper combined amber with bdellium (an aromatic gum), pearls, flakes of iron, burnt coral and other items, in order to produce pills that could be administered in cases of haemorrhoidal bleeding and ulceration, excessive menstrual bleeding and 'the whites in Women'⁷². His recipe for Trochisks of Winter Cherries, a preparation used in the treatment of dropsy,

⁶⁸ Mesuë, J. the Younger (Pseudo-Mesuë or John of Damascus). *Opera medicinalia. Canones universalis. De simplicibus. Grabadin. Practica*. Publisher unknown, Florence, 1471.

⁶⁹ Duffin, C.J. The Gem Electuary. In Duffin, C.J., Moody, R.T.J. & Gardner-Thorpe, C. (eds.) *A History of Geology and Medicine*. Geological Society of London Special Publication, 375; 2013c: 81-111.

⁷⁰ Duffin, C.J. 2013c: 81-111.

⁷¹ Bullein, W. *Bulleins bulwarke of defence againste all sicknes, sornes, and woundes, that dooe daily assaulte mankinde, whiche bulwarke is kepte with Hillarius the gardiner, Health the phisician, with their Chyrurgian, to helpe the wounded soldiors (Here after insueth a litle dialogue, betwene twoo men, the one called Sorenes, and the other Chyrurgj: concerning apostumacions, etc.--The booke of compoundes--The booke of the use of sicke men, and medicens)*. 4 parts, London, Jhon [sic] Kyngston 1562: unpaginated, Book 4, folio xxxiii.

⁷² Culpeper, N. 1661: 162.

dysuria and bladder stones (as well as providing a means to ‘prevent and cure drunkenness’), incorporated amber, together with⁷³:

Earth of Lemnos, Bole-Armenick, Hypocistis, Gum Arabick toasted, Dragons blood, White Starch, Red Roses, Rose seeds, Bloodstone, Red Coral, Balaustines, Spodium, Purslain seeds a little toasted, Olibanum, Harts-horn burnt, Cypress Nuts, saffron of each two drams. Blak Poppy seeds, Gum Tragacanth, Pearls of each one dram and an half. Opium prepared one dram. With juyce of Plantane, make it into troches.

Wecker formulated some pills that were supposedly ‘excellent for a weak brain, especially for old men, and such as are cold of constitution’. Ambergris and amber were combined with Lignum Aloes, cubebs and the best wine to make 25 pills, two of which were to be taken before supper⁷⁴.

The English cleric, physician and compiler, Thomas Fuller’s (1654-1734) ‘Alexiterial Stones’ – pills used to ward off contagions – contained both amber and antimony⁷⁵:

Take Amber, red Coral each half a dram; diaphoretic Antimony, Contrayerva root, Crabseyes, each 1 dram; Crabs-claws half an ounce; levigate all upon a Marble, till it be an exquisitely fine, and impalpable Powder; which make up into little Balls, with gelly of Harts-horn; to these may be added Amber-grise 12 grains.

William Salmon recommends using amber troches, powdered together with acorns, Armenian bole and sugar, and administered by the spoonful with goat’s milk as a treatment for urinary incontinence (enuresis). He also gives the case history of a seven-year old boy who showed blood in his urine following a bad fall. Part of Salmon’s supposedly successful treatment involved giving a mixture of powdered amber troches and mummy suspended in whey. In a further application, he mixed amber troches with Syrup of Poppies and Plantain Water in order to treat a rather intransigent case of dysentery⁷⁶.

Salmon’s recipe for amber pills is surprisingly complex: pearl, amber and coral, together with oak bark, nutmeg and cinnamon were powdered together with sugar and added to boiled turpentine. Two or three doses were

⁷³ Culpeper, N. 1661: 196.

⁷⁴ Wecker, J., 1660: 49.

⁷⁵ Fuller, T. *Pharmacopoeia extemporanea: or, a body of prescripts. In which forms of select remedies, accommodated to most intentions of cure, are propos’d.* London, B. Walford, London, 1710: 403.

⁷⁶ Salmon, W., 1703: 353, 354, 355.

supposedly sufficient to 'stop all Fluxes of the Bowels and Fluxes of Humours to any part; strengthen the Stomach, Liver and Spleen' as well as preventing miscarriages and fortifying 'the Body against violent Distempers'⁷⁷.

In a bid to cure consumption and epilepsy, he recommended dried and powdered kingfisher flesh mixed with amber and man's skull. He further thought that epilepsy could be eased by means of a closely related anti-epileptic oil derived from pulverized amber and 'the Shavings of a dead Man's Skull, that died a violent Death'⁷⁸. As a general tonic 'to restore the Tone of the Blood' and to revitalize those who had been suffering from sickness, Salmon suggested mixing powdered viper, amber, antimony, sugar and starch into a paste with Spirit of Wine, and then shaping the mixture into small 'cakes'⁷⁹.

SOLUTIONS

Marcellus Empiricus (Marcellus Burdigalensis or 'Marcellus of Bordeaux'; dates unknown, but flourished at the turn of the 4th and 5th century AD), a Latin author from the Roman region of Gaul, wrote his *Liber de Medicamentis* ('Book of Drugs') some time in the period 395-410 AD⁸⁰. Drawing heavily from earlier writings and the folklore traditions of common folk, he presents an impressive array of medical recipes, some of whose magico-medicinal roots were betrayed by suggestions of strengthening the simples with a variety of incantations and charms. Pulverised amber was included in several of his recipes. He suggested treating colic with a three-day course of powdered amber draughts in lukewarm water. His treatment for 'the stone' (various renal calculi) involved mixing amber with Italian Catnip, seselis, pepper, saxifrage, rock-parsley, cyperos (Galinal) and ginger; drinking this mixture supposedly caused the stone to break down and be voided harmlessly in the urine. 'True amber' (*succinum verum*) could be placed in a pot, boiled and reduced it to half its original volume. The residue was then burnt and the ashes were used to treat goitre. Alternatively, the boiling water in which true

⁷⁷ Salmon, W. *The Family-Dictionary: or, Houshold Companion*. London, H. Rhodes, 1705: 8.

⁷⁸ Salmon, W., 1705: 149, 204.

⁷⁹ Salmon, W., 1705: 366.

⁸⁰ Stannard, J. Marcellus of Bordeaux and the Beginnings of Medieval Materia Medica. "Pharmacy in History" 15 (2); 1973: 47-53.

amber had been steeped could be drunk over a period of three days in order to treat palpitations of the heart^{81,82,83}.

The Byzantine Greek physician, Paul of Aegina (Paulus Aegineta; c. 625 – c. 690), born on one of the Saronic Islands of Greece, produced the *De Re Medica Libri Septem* ('Medical Compendium in Seven Books'), summarising medical knowledge to that point in history. In a brief entry for amber (*electron*) he cites that when 'pulverised and drunk, [it] stops defluxions of the stomach and bowels, and discharges of blood'⁸⁴.

Georgius Agricola (Georg Bauer; 1494-1555), the famous German scientist who served as apothecary and physician to the mining town of Joachimstahl (now Jáchymov in the Czech Republic), claimed numerous therapeutic benefits to taking amber in various drinks^{85,86}:

In medicine it has the property of coating and having been drunk stops bleeding no matter where it occurs. It will stop vomiting, flux of the womb, discharge from ulcers, head discharges, and cure tonsillitis and throat irritations. It strengthens the viscera and other parts of the body.

The English Elizabethan physician, author, clergyman and inventor of modern shorthand, Timothie Bright (circa 1551-1615), included amber with numerous other ingredients in a 'strengthening simple' that supposedly prepared and purged 'both in respect of the fancy, of the brayne, and affection of the hearte, and the complexion of both, put out of frame by the humour'. The cordial comprised the following⁸⁷:

⁸¹ Riddle, J.M. 1973: 9.

⁸² Niedermann, M. Marcellus über Heilmittel. 2 volumes. Berlin, Akademie-Verlag, 1968: 377, 430, 450, 512.

⁸³ Marcellus Empiricus. Liber de Medicamentis, Books 21, 15; 21, 17; 26, 114; 29, 32.

⁸⁴ Adams, F. The Seven Books of Paulus Aegineta. Translated from the Greek, with a Commentary Embracing a Complete View of the Knowledge possessed by the Greeks, Romans and Arabians on all subjects connected with Medicine and Surgery. Volume 3. London, Sydenham Society, 1847: 129.

⁸⁵ Bandy, M.C. & Bandy, J.A. De Natura Fossilium (Textbook of Mineralogy) by Georgius Agricola. The Geological Society of America, Special Paper 63; 1955: 7. [Dover reprint 2004].

⁸⁶ Agricola, G. Georgii Agricolae De ortu et causis subterraneorum, lib. V. De natura eorum quæ effluunt ex terra, lib. IV. De natura fossilium, lib. X. De ueteribus et nouis metallis, lib. II. Bermannus, siue de re metallica dialogus. Interpretatio germanica uocum rei metallica, addito indice fœcundissimo. Basileae, Per Hieronymvm Frobenivm et Nic. Bischoff, 1546.

⁸⁷ Bright, T. A Treatise of Melancholie. Containing the causes thereof, & reasons of the strange effects it worketh in our minds and bodies: with the phisicke cure, and spirituall consolation for such as have thereto adioyned an afflicted conscience. The difference betwixt it, and melancholie with diverse philosophicall discourses touching actions,

... borrage, buglosse, the juice of pippins and parmains, balme, *Carduus benedictus*, scabions, basill seede, vincois horad, beasar stone, yuorie, pearle saphyre, iacint, corall, amber, limon and citron pile, cinnamon, cloves, wine, suffran, angellica, marygooldes, with a number of like nature, the great providence of God being such that this noble part of the hearte hath more helps and comforts peculiar thereunto then any parte of our body besides.

Salmon recommends that a fasting patient should take half a drachm of finely powdered amber in a quarter of a pint of winter wine daily for a week in order to combat epilepsy⁸⁸, while Johann Wecker commended the same approach in order to treat stomach pains and renew the appetite⁸⁹.

Richard Brookes (flourished 1721-1763), a well-travelled physician and author who had a rural practice in Surrey, proposed a rather extreme remedy, dissolving amber by boiling it in a mixture of nitre (potassium nitrate) and regulus of antimony (virtually pure antimony). The amber was supposed to ameliorate the otherwise burning taste so that the solution could be tolerated during consumption by the patient. Not surprisingly, considering the strongly emetic, cathartic and diaphoretic properties of antimony, the medicine was esteemed as 'opening the obstructions of the bowels, and promoting all sorts of excretions'⁹⁰.

Felice Passera (1610-1702), a Capuchin monk from the Brescia Infirmary, in his concise but exhaustive summary of the contemporary medicinal uses of amber in the late seventeenth century, notes in his *Il nuovo tesoro degl'arcani farmacologici galenici, e chimici, ò spargirici* (1688; Fig. 11) that pulverised or distilled amber, mixed with wine or other alcoholic drink, was used to treat the plague, poisons, hydropism, worms, 'white flux of the uterus' ('flusso bianco dell'Utero'; leucorrhea, a white, yellow or green viscid vaginal discharge) and all contagious diseases⁹¹. He also comments that it was effective against 'morbid humours of the head' expressed as catarrh, epilepsy, apoplexy, dizziness, and lethargy could also be treated in this way, as could breathing problems, asthma, 'swelling of the stomach', all cardiac pains and illnesses, renal calculi

and affections of soule spirit and body: the particulars whereof are to be seene before the booke. London, Thomas Vautrolier, 1586: 279.

⁸⁸ Salmon, W., 1705: 88.

⁸⁹ Wecker, J., 1660: 59

⁹⁰ 90 Brookes, R. *A New and Accurate System of Natural History*. Volume 5 : The Natural history of Waters, earths, Stones, Fossils and Minerals, with their Virtues, Properties, and Medicinal Uses, to which is added, the Method in which Linnaeus has treated these subjects. London, J. Newbery, 1763: 94.

⁹¹ Passera, F.F. *Il nuovo tesoro degl'arcani farmacologici galenici, e chimici, ò spargirici*. Divisa in tre libri. Venezia, Giovanni Parè, 1688, 494.



Figure 11. Title page of *Il nuovo tesoro degli arcani farmacologici galenici, e chimici, ò spargirici* (Venice, 1688) by Felice Passera (1610-1702).

and other urinogenital problems (when taken in ‘Water of Saxifrage’), stomach ache, coughs, toothache and earache^{92,93,94,95}. It accomplished all of these effects by strengthening the ‘natural faculties’ of the body.

The Countess of Kent recommends an amber-containing broth to be taken in the morning⁹⁶, followed by sleep, in cases of consumption. The

⁹² Ragazzi, E. Ambra: mito e realtà. Studi e Ricerche. Associazione Amici del Museo – Museo Civico “G. Zannato” Montecchio Maggiore (VI); 1998: 13.

⁹³ Ragazzi, E. L’ambra nella medicina del passato. 47-52. In Pontin, C. & Celi, M. (eds.), Ambra: scrigno del tempo. Roma, Cierre edizioni, 2000: 49.

⁹⁴ Ragazzi, E. 2005. L’Ambra Farmaco Solare. Padova, Zielo Edizioni, Padova, 2005: 70.

⁹⁵ Passera, F.F. 1688: 494ff.

⁹⁶ Grey, E. 1687: 25-26.

body cavity of a pullet was stuffed with conserves of red roses, bugloss, pine kernels, pistachios and the amber. The bird was then boiled in water containing agrimony, endive, succory (archaism for chicory) ‘Sparrow-Grass’ (asparagus), fennel, caper (*Capparis spinosa*, a Mediterranean bush rich in flavonoids, including quercetin) and raisins. Removed periodically and beaten before bringing to the boil again, the mixture was strained and added to a little rose water and half a pint of white wine.

In a bid to ‘comfort the Stomack, and help windiness and Rheum’ the Countess also recommended that amber be pulverized with a wide range of spices (ginger, cloves, mace, nutmeg, cinnamon, galingal and ‘cubebes’ or peppers), coral and seeds (dill, fennel, caraway, liquorice, aniseed). The resulting powder was added to one and a half pounds of melted sugar and mixed with red rose water. When needed, a dose about the size of a hazelnut was given with a glass of red wine both morning and evening.

Oswald Croll refers to an arcanum (a secret, powerful remedy) of ‘Theophrastus’ (by which he means Philippus Aureolus Theophrastus Bombastus von Hohenheim, 1493 –1541, better known as Paracelsus) that was supposedly ‘excellente against every kind of venome’ amongst which are specifically included ‘Mercury, Arsenick, Wolf-bane, Powder of the Adamant, Spiders and Toads, Thora, the Brains of a Cat, Menstrues’. ‘Thora’ possibly refers to Leopard’s bane, *Doronicum orientale*. This rather unlikely concoction is based on the processed blood of a fully exsanguinated stork, to which was added amber, red coral, black berries of *uva versa* and root of anthora (both Wolf’s bane), essence of mummy, bezoar stone and the best treacle (theriac). After being mixed with pine nut oil in a stoppered vessel, it was allowed to ferment in the sun. Prescribed in water, wine or warm milk, it caused the patient to vomit the offending poison when other alexipharmic remedies (such as unicorn’s horn and various treacles) had proven unsuccessful. Croll cites its use as a last resort in the attempted treatment of the poisoning of Louis of Nassau (1538-1574)⁹⁷.

This same author recommends an amber-containing remedy for impotency; *Diatrion-pipereon*, an elixir based upon long pepper (*Piper longum*), white and black pepper (both *Piper nigrum*) had amber and Oil of Cinnamon added to it⁹⁸.

⁹⁷ Croll, O., 1670: 159.

⁹⁸ Croll, O., 1670: 72.

In order to combat ‘all Diseases and Infirmities of the Matrix’, William Salmon (1705:129) proposed an ‘Hysterick Elixir’ that contained pennyroyal, ‘Featherfew’, rue, amber, sugar and tinctures of castor and saffron, plus distilled Oil of Wormwood⁹⁹.

The *Diacubearum* ascribed to Paracelsus was recommended by Croll for the condition known as ‘Timpany’ or ‘Windy Dropsy’, in which the distended abdomen (due, perhaps, to the accumulation of digestive gases because of an obstruction) has tightly stretched walls; tympani is the sound when the taut, gas-filled abdomen is percussed. The recipe given by Croll uses a variety of seeds and berries (myrtle, basil, clove, endive, purslane and lettuce) mixed with spodium (ash from the inside of a furnace) and sugar, dissolved in Chicory Water to which Syrup of Pomegranate has been added. Other recipes are far simpler, depending on cubebs (seeds of the Java pepper, *Piper cubebum*), cardamom seeds, and shavings of ivory – all include the use of amber¹⁰⁰.

The *Confectio Liberans* was a complex medicinal powder administered in a suitable liquid medium. It consisted of a wide range of botanical simples plus emeralds, jacinth, ‘granate’ (garnet), white amber and, rather unusually ‘Raw silk toasted’¹⁰¹. Although somewhat bewailing the cost, Culpeper judged it to be ‘a gallant cool Cordial’, and ‘exceeding good in pestilential Feavers, and preserveth from ill airs, and keepeth the humours in the body from corruption, it cools the heart and blood, strengtheneth such as are oppressed by heat’.

LOHOCHS

Lohochs, Eclegmata or ‘lick pots’ refer to preparations that were thicker than syrups but less viscous than electuaries. The name comes originally from the Arabic, *la’ûg*, via the Middle French *loog*. As medicinal recipes, they were originally designed to treat respiratory problems, and could therefore be referred to as linctuses. Once mixed, the bruised end of a liquorice stick was dipped into the paste which was then allowed to melt gently in the mouth using body heat. Culpeper’s recipe for *Lohoch portulaca* or Lick-pot of Purslane included amber troches as follows:

⁹⁹ Salmon, W., 1705: 129.

¹⁰⁰ Croll, O., 1670: 108.

¹⁰¹ Culpeper, N. 1661: 138.

'Take of the strained juyce of Purslain two pound. Troches of Terra Lemnia two drams. Troches of Amber, Gum Arabick, Dragons blood of each one dram. Blood-stone [haematite], The wool of a Hare toasted, of each two scruples. White Sugar one pound. Mix them together that so you may make a Lohoch of them'.

Effective at halting 'spitting of blood' and heavy menstrual bleeding, it nevertheless had to be taken with due care and attention as 'the medicine is so terrible binding that it is better to let alone than taken', unless it is given in very small doses¹⁰².

TOASTS

Leavened bread, a dietary staple, stales within a few days. One means of reducing waste by reviving the bread was to make it into a toast¹⁰³. The bread was often soaked in water or wine (often claret or sack), and had butter or oil added to it before being fried or toasted in a gridiron. Sugar, orange juice, spices and scented waters (e.g. rosewater) were often added both for taste and for therapeutic value. While the usual breads of medieval and Tudor times were made with flour from a mixture of grains (maslin breads), the bread of choice for making medicinal toasts was the more expensive Manchet Bread or Pandemain (from *panis dominis* – the Lord's Bread). This was made from a pure wheat flour that had been sieved twice (double bouted). Ground medicinal spices and other ingredients could be powdered and added to the toast. Wecker recommends the following medicinal toast for those suffering from a weak back¹⁰⁴:

'Take Amber, Nutmegs, and Corrall, of each of them alike, beat them into very fine powder, put thereto a little grated Cinamon, and mingle them all well together, and straine the same powder upon a fine toast of Manchet, being first sprinkled over with very good Muscadine, being toasted brown on both sides: let the Patient eat the same fasting, and use it five or six daies together, and doubtless by Gods help this will cure him'.

¹⁰² Culpeper, N. 1661: 131.

¹⁰³ May, R. *The accomplisht cook, or, The art and mystery of cookery wherein the whole art is revealed in a more easie and perfect method than hath been publisht in any Language.* London, Nath. Brooke at the Sign of the Angel in Cornhill, 1660: 161-162.

¹⁰⁴ Wecker, J., 1660: 65.

POACHED EGG

Although, perhaps, a slightly unusual means of medicinal administration, poached eggs seem to have been relatively popular in this regard, particularly in 18th century England. Various therapeutic doses of oils or powdered materials were administered in this way. Thomas Lupton (flourished 1597), for example, recommends a poached egg as an appropriate way for a patient to take a dose of dried and powdered eyebright (*Euphrasia* spp.) in order to restore weak sight¹⁰⁵. Thomas Short (c. 1690-1772), a Sheffield physician and expert in the analysis of mineral waters, suggested poached eggs as a suitable means of administering plantain seeds, dockweed powder or powdered nutmeg, all for the treatment of diarrhoea¹⁰⁶, while Robert James (circa 1703-1776) used them to give doses of ambergris, oil of cinnamon and powder of kermes (to prevent miscarriage)¹⁰⁷.

Richard Brookes administered amber in this way in order to treat 'cold disorders of the brain' such as 'pains of the head, sleepy and convulsive diseases, as well as in hysterick and hypochondriack fits and gonorrhoeas'¹⁰⁸. James Wolveridge, a late 18th century English surgeon and self-proclaimed man midwife living in Cork, prescribed powdered amber (together with kermes berries, and red and white coral), in poached egg, in order to strengthen early pregnancy and prevent miscarriage¹⁰⁹. Probably the greatest diversity of application is indicated by Robert James, however, who administered powdered amber in poached egg for 'cold states of the brain', catarrhs, headache, sleepy and convulsive disorders, suppression of the menses, 'hysterical and hypochondriacal Affections', gonorrhoea, fluor albus (leucorrhoea) and haemorrhage¹¹⁰.

¹⁰⁵ Lupton, T. *A Thousand Notable Things on Various Subjects; disclosed from Nature and Art; Practicable, Profitable and of great Advantage*. Manchester, Hopper & Co., 1800: 43.

¹⁰⁶ Short, T. *Medina Britannica: or a Treatise on such Physical Plants, as are Generally to be found in the Fields or Gardens in Great Britain*. London, B. Franklin, 1751: 228-230.

¹⁰⁷ James, R. *Pharmacopoeia Universalis: or, a new universal English Dispensatory*. London, T. Osborne, W. Strahan, J. Rivington, R. Baldwin, L. Hawes, W. Clarke, and R. Collins, W. Johnston, T. Caslon, S. Crowder, B. Law, Z. Stuart and B. Collins, 1764: 149, 280, 266, 323.

¹⁰⁸ Brookes, R. 1763: 94.

¹⁰⁹ Wolveridge, J. *Speculum matricis: or, The expert midwives handmaid catechistically composed by James Wolveridge*. London: Printed by E. Okes, to be sold by Rowland Reynolds, 1671: 130.

¹¹⁰ James, R., 1764: 323.

USE OF AMBER IN COMPARISON TO OTHER FOSSIL MATERIAL

As stated above, surviving materia medica cabinets from the early 18th century invariably group amber with geopharmaceuticals rather than with gums and resins. This pharmaceutical classification also holds in most publications from the 15th through to the 19th century. For these reasons, amber will be discussed in relation to other geological material here, rather than in relation to exudates of extant plants; a consideration of the full range of geopharmaceutical simples is beyond the scope of the present paper and so amber will be considered in relation to items of clearly palaeontological origin.

The use of fossils, other than amber, as therapeutic materials has been practised since Antiquity. In this regard, the five main fossils to be considered are *lapis judaicus* (Jews' Stones – spines of fossil echinoids, usually Jurassic in age), *lapis lincis* (Lynx Stone – fossil belemnites, Jurassic and Cretaceous in age), *Bufo nites* (Toad stones – fossil fish teeth belonging to the Mesozoic bony fishes *Lepidotus* and *Scheenstia*), *Glossopetrae* (Tongue Stones – fossil shark's teeth, often, but not exclusively, *Carcharocles megalodon* from the Miocene and Pliocene) and jet (*Gagates* – a mineraloid, like amber, but a form of lignite). There are several other simples for which a fossil identity is likely in some cases (e.g. *unicornum verum* or mammoth tusk, and *lapis chelidoniumis* – the Swallow Stone, some instances of which were the fossil teeth of pycnodont fishes). These are omitted from the present comparison, however, because they are not exclusively fossil in nature (unicorn horn included narwhal tusks, rhino horn and a variety of other mammal horns, and *lapis chelidoniumis* probably included gastropod operculae, crayfish gastroliths, fossil orbitoline protozoans and sedimentary agate grains¹¹¹).

It would be reasonable to assume that all fossil materials, being mineralised and obtained from the earth and therefore having many similar properties, would be prepared and delivered to the patient in similar ways. Table 1 summarises the means by which these fossil materials were administered medicinally. It is clear that the administration of amber was far more varied than that of any other fossilised material. This may be because amber is softer (2 to 2.5 on Moh's scale of mineral hardness) than the calcite that makes up fossil echinoid spines (hardness 3), or the apatite (calcium phosphate) that comprises fossil fish teeth (hardness 5), making it easier to work into a fine powder for incorporation into a range of delivery media. The hardness of jet varies from around 2.5 to 4, so one would expect these two mineraloids to

¹¹¹ Duffin, C.J. *Chelidoniumis* : The Swallow Stone. "Folklore", 124; 2013d : 81-103.

have been administered in similar ways. Jet, however, was delivered either as powders in a suitable draught, or the water in which it had been steeped was drunk by the patient. This rather limited means of application may well be a function of the rarity of jet in comparison to the relatively high abundance of amber.

Table 1. Table to compare the means by which different unprocessed (other than being crushed and powdered) fossil materials were administered internally. Data compiled from Duffin (2008) and references therein, and Duffin (unpublished).

Fossil Material	Means of application										
	Swallowed whole	Lozenges	Powders	Electuaries	Syrup	Tablets, Pills and Troches	Solutions	Lohochs	Toasts	Poached Egg	Steeped
Amber		X	X	X		X	X	X	X	X	
Lapis Judaicus				X			X				
Bufo nites	X										
Jet							X				X
Glossopetrae							X				
Lapis lincis			X		X		X				X

In terms of the perceived therapeutic value of unprocessed amber, either alone or in combination with other ingredients, when administered internally, compared to that of other fossil materials, a glance at Table 2 confirms that amber was deemed to be the most versatile of these geopharmaceutical simples. There is no reason to doubt that the bulk of the applications listed and the medical preparations quoted above, many of which are taken from authoritative manuals and formularies written by the experts of the day, were actually prescribed by the medical community, made up by apothecaries, and taken by patients.

Table 2. Table to compare the supposed therapeutic values of different unprocessed (other than being crushed and powdered) fossil materials that were administered internally. Data compiled from Duffin (2008) and references therein, and Duffin (unpublished).

Ailment	Fossil material					
	Lapis lincis	Lapis judaicus	Bufo nites	Glossopetrae	Jet	Amber
Abscesses			X			
Apoplexy						X

Fossil material

Ailment	Lapis lincis	Lapis judaicus	Bufonites	Glossopetrae	Jet	Amber
Asthma						X
Biliousness			X			
Bladder stone	X	X				
Cancer						X
Cardiac problems					X	X
Consumption						X
Cramp						X
Dropsy					X	X
Dysentery	X					X
Dysurea	X	X				
Epilepsy			X			X
Erisipelas			X			X
Eye problems	X					
Fastens loose teeth					X	
Fever			X			X
Flatulence						X
French Pox						X
Gonorrhoea						X
Gout	X					
Haemoptysis						X
Haemorrhage	X				X	X
Headache						X
Impotence						X
Infections						X
Jaundice	X					
King's Evil	X		X			
Labour pains			X		X	X
Leucorrhoea						X
Lientery						X
Malaria	X		X			
Malignant tumours			X			
Measles						X
Miscarriage and stillbirth	X					
Oral infections						X

Ailment	Fossil material					
	Lapis lincis	Lapis judaicus	Bufonites	Glossopetrae	Jet	Amber
Palsy						X
Plague			X			X
Poisoning			X	X		X
Promotes menstruation					X	
Rheumatism						X
Scarlet Fever						X
Smallpox						X
Stomach problems	X	X	X		X	X
Strangury						X
Strengthen liver and spleen						X
Suppuration						X
Suppuration						X
Tonsillitis						X
Tympani						X
Ulcers						X
Vomiting						X
Weak back						X
Worms						X
Wounds	X					

CONCLUSIONS

Of the range of geopharmaceuticals available in the *materia medica*, amber shows one of the greatest diversities of application in terms of the range of processing the raw material, means of delivery and variety of therapies included. Simple processing of amber by pulverising it to a powder, usually against porphyry or marble slabs, allowed it to be mixed with a huge range of botanical, zoological and other geological ingredients and incorporated into a wide range of media for internal delivery. Some of these were standard therapeutic delivery systems such as lozenges, troches, pills, tablets, electuaries, powders and solutions, while others were rather more unusual – lo-hochs, toasts and with poached eggs.

Amber was utilised as the active ingredient or supporting supplement in a wide variety of treatments for a bewildering array of conditions. Foremost among these were problems associated with the vascular system (haemoptysis, menstrual problems, haemorrhage, cardiac weakness, pre-partum bleeding, nosebleeds etc.) and various types of suppuration and discharge. Problems of the urogenital system that could be treated using amber-containing medicines included the danger of miscarriage, gonorrhoea and other venereal diseases, impotence, strangury, enuresis and bladder stones. Abdominal disorders including dysentery, flatulence, lientery (passage of undigested food in the faeces) and tympani could be treated, as well as contagious diseases including plague, measles, and fevers. Amber was often employed to strengthen the brain and could be utilised more specifically to address epilepsy, goitre, poor vision and melancholy. Rather more surprising associations are represented by the use of amber in treating halitosis and a weak back.

Acknowledgements

I am very grateful to the staff of the Wellcome Library for the History and Understanding of Medicine and the British Library for access to the many volumes consulted in the preparation of this paper. Rachael Pymm and Christopher Gardner-Thorpe critically appraised the manuscript, and I am grateful to the reviewers for their comments.

SAŽETAK

Dragi kamen, mineraloid organskog porijekla, jantar, fosilizirani ostatak 44 milijuna godina starih eocenskih naslaga s baltičke obale, bio je važan lijek mineralnog porijekla u zapadnjačkoj materii medicini još od antike. U jednom trenutku pretvoren u prašak, mogao je biti unesen u tijelo koristeći široku lepezu sredstava uključujući pastile, pilule, tablete, dražeje, tekućine i lizalice, s prepečenjem i prženim jajima. Djelujući zasebno ili u kombinaciji sa širokim spektrom botaničkih, zooloških i drugih mineralnih sastojaka, korišten je u liječenju velikog broja bolesti. Najistaknutije među njima bile su vaskularne bolesti (npr. hemoptiza, hemoragija, ekscesivno vaskularno krvarenje), problemi urogenitalnog sustava (npr. sklonost pobačaju, impotencija, spolne bolesti, strangurije, dizurije i kamenci u mokraćnom mjehuru) i probavne smetnje, osobito dizenterija. Raznolike zarazne bolesti uključujući kugu, gonoreju, ospice i vrućice, mogu biti tretirane preparatima koji sadrže jantar kao što to može biti i padavica, melankolija i staračka iscrpljenost. Nešto neuobičajenija primjena bila je pri liječenju impotencije, neugodnog zadaha, pijanosti i križoboljama.

Ključne riječi: jantar; materia medica; povijest farmacije; lijekovi mineralnog porijekla