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THE LEGACY OF MONASTIC APOTHECARIES: S. MARTINHO DE TIBÃES[1]

Abstract: After the definitive establishment of liberalism in Portugal in 1834, characterized by profound anti-clericalism, the religious orders became extinct, and their properties, which included valuable libraries and their assets, infirmaries and pharmacies, were confiscated or sold. Bibliographic collections were frequently dismembered throughout the change process, and many works were lost. The National Archive of Torre do Tombo and regional and local city libraries received many collections. However, most medical and pharmaceutical equipment was sold or lost. The infirmary and apothecary of the Monastery of S. Martinho de Tibães, in the outskirts of Braga (North of Portugal), the motherhouse of the Monastery of Saint Benedict in Portugal since 1579, were no exception. However, preserved medical and pharmaceutical books and manuscripts from the library ensured our knowledge of their operating standards of social and medical assistance. Monastic apothecaries were essential in assisting people experiencing poverty and largely contributed to the evolution of the scientific development of Pharmacy in Portugal. This essay will briefly survey the recovery of the history of the infirmary and apothecary of the Monastery of S. Martinho de Tibães and present mortars and jars housed at the Biscainhos Museum, which possibly belonged to the Monastery and among which, those referring to the treatment of syphilis are of particular relevance.

Keywords MeSH: History of pharmacy, syphilis, Portugal

Non MeSH: monastic apothecaries, pharmacy jars, history of syphilis, treatment of syphilis

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Introduction

The Revolution of August 24, 1820, opened a new era in Portugal, leading to the establishment of liberalism, which was characterized by profound anti-clericalism. In 1821, the Holy Tribunal of the Inquisition was abolished [1]. In 1834, under the "General Ecclesiastical Reform", the Minister and Secretary of State, Joaquim António de Aguiar (1792-1884), carried out the General Reform of the Clergy (1833–1837). By the Decree of May 30, all convents, monasteries, hospices, and houses of all religious orders became extinct. Friars and nuns were subject to their respective bishops until the death of the last nun and the definitive closure [2].

In 2016, Giurevitch and Leitão listed what survived from these libraries in the most complete survey of the catalogues and inventories of the libraries of Portuguese religious institutions. Five hundred libraries were irretrievably lost. The volume lists information on surviving manuscripts, incunabula, and printed books. Medical pharmaceutical books and manuscripts of recipes from each congregation and monastery are the most relevant for the study of monastic medical and pharmaceutical knowledge and healthcare and social assistance [3].

Medical and pharmaceutical equipment were frequently lost. When the inventory and appraisal of all the Monastery of S. Martinho de Tibães assets was carried out, the apothecary was valued at 18$000 réis by Pedro Manuel Araújo, a pharmacist from Braga. On August 17, 1834, the apothecary and the shelves were sold at public auction to José Moitinho de Carvalho, a pharmacist from Barcelos, for 26$000 réis [4]. In 1833–1834, the Monastery was closed and the building was sold. Disaffected from its initial assistance functions, the Monastery was handed over to the Church, functioning as a Parish. The Monastery was dilapidated, staying in ruin and abandoned until the seventies of the twentieth century. In 1986, it was purchased by the Portuguese Government. A restoration project soon started, recovering the building, fence and gardens. A Museum was created to recover and preserve the Monastery's history [5] Fig. 1. The Biscainhos Museum and the Archaeological Museum D. Diogo de Sousa in Braga received some of these assets as donations, presented at an exhibition in the Biscainhos Museum in 1992 [6].

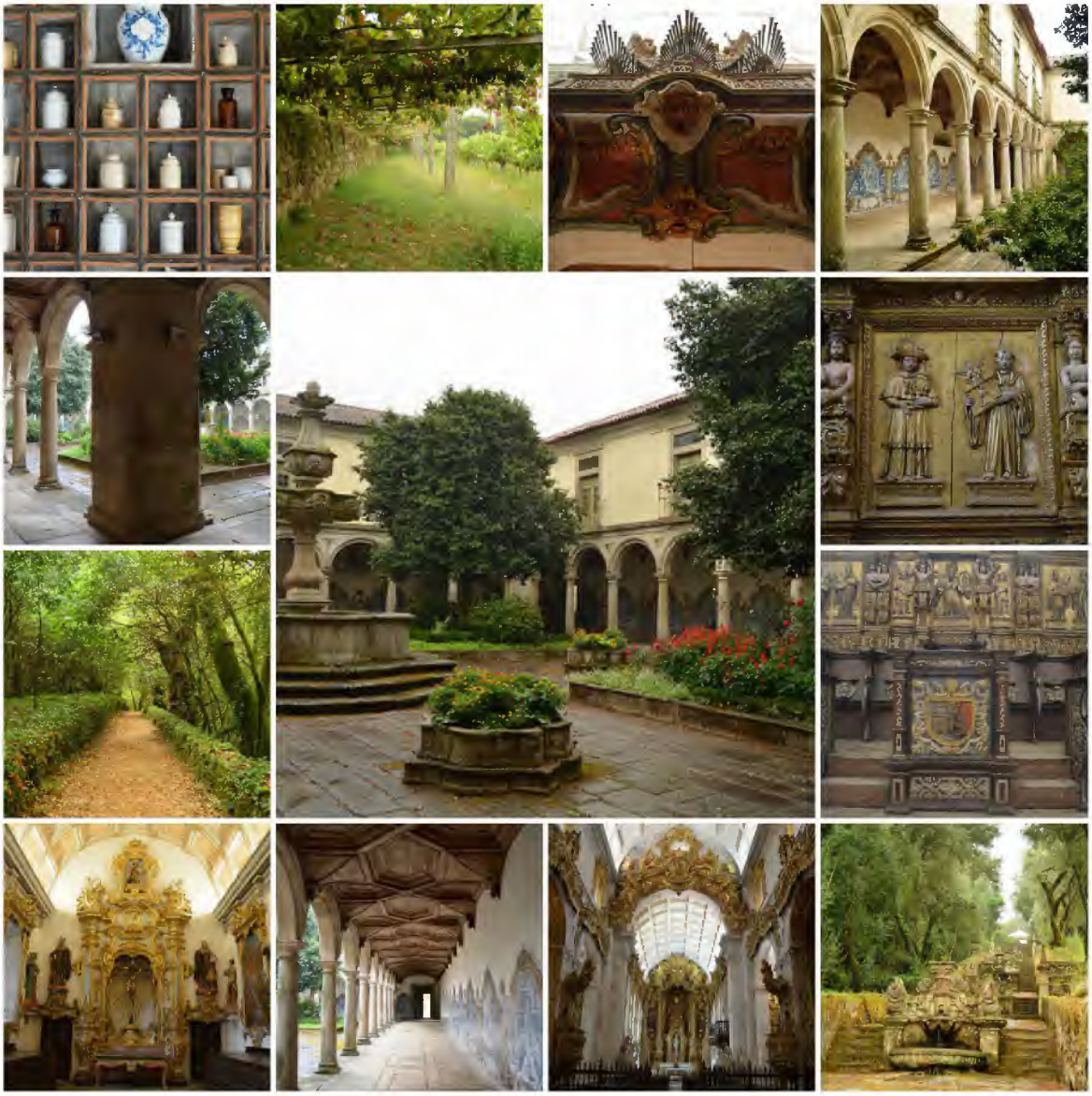

Fig. 1- Monastery of S. Martinho de Tibães. Public domain (Wikipedia Commons).

The Monastery of S. Martinho de Tibães

The Monastery of S. Martinho de Tibães was founded in the mid-eleventh century, possibly by D. Paio Guterres da Silva (1070–1129), a Portuguese nobleman from the lineage of the sovereigns of León in 1077. He adopted the Rule of the Christian Saint Benedict of Nursia (480–547 AD), who founded the Monastery of Montecassino in AD 529 [1]. The feudal rights were granted by Henry of Burgandy (1066-1112), Count of Portugal (Fig.2) and father of King Alphonse I, the first King of Portugal (reigned 1143–1185), in 1110 [7].

Fig. 2- Henry of Burgundy, Count of Portugal (c. 1312-c.1325). Biblioteca Digital Hispánica. Free download.

The study of medicine, especially the preparation of remedies, was regulated in article XXXVI of the Saint Benedict Order, accepted in Rome in 580. The monastic establishments should provide an appropriate place for this purpose. For Saint Benedict, the care of the sick was one of the primary concerns of the Order [8 p345]. Therefore, the monastic hospitals, infirmaries, and apothecaries (*boticas*) acquired a special place. The Portuguese and Spanish word for apothecary *botica* derives from the Greek word *apotheca,* a storehouse containing remedies for those who needed them, from the Latin *apotica* [8, p339]. The Latin word *botegarius,* referring to someone learned in the preparation of healing substances, appears for the first time in the *Privilege of the Twenty*, given to the city of Aragon By Alphonse I of Aragon (1073–1134) in 1118 [8, p343].

The Latin word *botegarius,* evolved from the Portuguese word *boticário* (apothecary or druggist). The first apothecaries emerged in Portugal from the spice trade, related to the presence of Arabic medicine in the Iberian Peninsula between 711 and 1249 in Portugal and 1492 in Spain. The Arabs created the first pharmacies in the eighth century AD. Both pharmacists and physicians prepared medicines. In 1461, King D. Afonso V (reigned 1438-1481) regulated the practice of medicine and pharmacy as separate professions [9 p94].

Monastic hospitals were the basis of medieval healthcare. However, their importance declined in the fourteenth century, losing their influence due to the concurrence of lay hospitals. Therefore, the Order improved the assistance in their infirmaries and shelters [8 p349]. In the sixteenth century, through the bulls 'In Eminenti' of April 30, 1566, and the 'Regimini Universalis Ecclesiae' of August 13, 1567, Pope Pius V (papacy 1566-1572) instituted the Congregation of all monasteries of the Order of Saint Benedict. In 1570, Tibães became the "Motherhouse" of the Congregation [1]. According to the Benedictine Monastic Constitutions of 1628, the *Regra Monacorum*, each monastery should be equipped with an infirmary and a nurse monk, providing the sick with everything needed:

> In each house [monastery], we command by obedience that some apothecary shop (botica) should exist, supplied with waters, olive oils, canafistola, and syrups that some apothecary can prepare in houses assisting small towns with little assistance. An apothecary shop should be supplied with such things, including sugar, almonds, raisins, and everything else necessary, and all houses should hire a trained physician. [10 p 133].

> Each monastery should assist the religious community and the surrounding population in providing bread, medicines, and spiritual assistance to the poor and needy [11]. Library catalogues from 1743 provide insights into the medical practice at the Monastery. The library, built between 1701 and 1704, was recovered from the books and manuscripts kept in the Library of Oporto and District Archive of Braga. In the eighteenth century, the library at the Tibães Monastery was well-equipped and the best in Entre-Douro and Minho. [12 p 74]. As in other monasteries and Religious Orders in which the friars prepared their own medicines, manuscripts of recipes and other medical topics are extant, such as a *Collection of Remedies for various ailments and illnesses, taken from many modern and ancient authors and other curiosities about medicine* (*Pecúlio de alguns remédios para diversos achaques e enfermidades tirados de muitos autores modernos e antigos e de outras curiosidades*

pertencentes à medicina) from July 21, 1665, containing an empirical collection, recipes of a professional pharmacist, a treaty of physiology and two medical treaties as those from the Faculty of Medicine of the University of Coimbra of 1665 [11 p 110].

Four manuscript codices from the eighteenth century provide information about the infirmary's location, functioning and equipment. The *Book of the Infirmary* (*Livro da Enfermaria*), encompassing 1725–1750 and 1751–1801, accounts for hospital expenses. The *Book of Implements* (*Livro das Alfayas*) (1750–1801), *Books of the Deposit* (*Livros do Depósito*) (1626–1629) and *Book of Works* (*Livros de Obras*) (1758) account for the hospital's working, equipment and contracts with external personnel and monasteries. A twelve-bed infirmary was located on the first floor, next to the cemetery cloister, close to the chapel, attended by a nursing monk who also took care of the preparation and administration of medicines before the creation of the apothecary. Physicians, pharmacists, surgeons, barbers, barber-surgeons, chiropractors, plaster applicators and tooth-pullers were called when required. There was a close relationship with the apothecary of the Society of Jesus from SantoTirso, near Braga and Tibães, whose priest came to observe the infirmary patients when required. Until 1759, the apothecary of the Society of Jesus was the usual supplier of medicines for the Monastery. From 1759, the apothecary of the Carmelite Monastery became the regular supplier since, in that year, the Society of Jesus was expelled from the Portuguese Empire by The Marquis of Pombal (1699-1782), chief minister of King Joseph I (reigned 1750- 1777) for political and economic reasons. A list of infirmary equipment included, among other tools and utensils, suction cups, a lancet kit, bleeding plates, brass syringes, a small ivory syringe and dental pliers for minor surgical procedures; and bathtubs, a wheelchair and other objects for the patients' support and hygiene. A hostel provided social assistance [13].

Monastic apothecaries have been essential in medical care, especially those far from big cities where lay apothecaries abounded. The Holy House of Mercy was founded in Braga in 1513. It was constituted as a Brotherhood by Archbishop D. Diogo de Sousa (c. 1461-1532) in 1558 and assisted the poor and needy population [14]. In 1754, the Congregation of Saint Benedict created the first apothecary in the Monastery of Refojos de Basto. The apothecary (botica) was run by a specially trained monk. The nurse friar would do that job in small monasteries and isolated places [15]. Since Tibães was close to Braga, where medical assistance and trained apothecaries were available, the apothecary was built in 1797, commissioned by the Abbott Bernardo da Esperança Tello. It was located on the second floor, at the south end of the west wing, in a narrow place belonging to the barbershop at the rear of the building, comprising a laboratory where the apothecary monks concocted their medicines from raw materials using professional utensils, often inventing their own medications. The *Book of Implements* provides information on the furniture, implements and containers. An inventory lists the apothecary tools: pots, pans, bottles, glass jars, earthenware jars, mortars, alembics, funnels, sieves, spatulas, strainers, scales, weights and the purchase of pharmaceutical ingredients. The inventory from May 26, 1834, by Pedro Manuel de Araújo, an apothecary from Braga, before being sold on August 17, 1834, to José Moitinho de Carvalho, an apothecary from Barcelos, is the last extant record of the apothecary. No

vegetable or botanical garden to cultivate medicinal plants was ever mentioned [16, pp. 44–62].

The apothecary of the Monastery of S. Martinho de Tibães was built and equipped according to the instructions of Friar José Maria, an outstanding mentor of the pharmacies of the Benedictine Monasteries [17 p29–30]. His instructions figure in the *Pharmacopeia dogmatica medico-chemica, e theorico-pratica,* of his authorship [16]. Monastic apothecaries frequently authored pharmacopoeias and recipe books containing recipes with the names of their inventors or the monastery. The Jesuits kept the manuscript from 1766, including all the recipes from their monasteries in India and Brazil, in the Jesuit Archives of Rome [18]. This collection is a valuable contribution to the knowledge of materia medica in modern times since the Jesuits learned medicine and healing arts from the native peoples and introduced new drugs to European medicine.

Mortars and jars from the Biscainhos Museum

Mortars and pestles have been used since early civilizations to grind and reduce powder substances for pharmaceutical use. They were conformed containers with wide feet to ensure stability and maximum height. The most ancient were of marble, stone, agate, or granite. Occasionally, they were of ivory, earthenware and wood. In the Gothic period (twelfth century AD), they were made of bronze [8 p350]. Later, bronze mortars predominated. They could also be made of gold, iron, tin, brass, wood, ivory, and glass. In the seventeenth and eighteenth centuries, apothecaries had several types of mortars. A large one assumed an ornamental function, placed on a large wooden trunk. Fourteen bronze mortars of different shapes and sizes, three of ivory and one of wood, dating between the sixteenth/seventeenth and eighteenth centuries, were displayed for the first time in the Biscainhos Museum. Dr. José Maria da Costa Júnior bequeathed them. The provenance and the manufacturing place are primarily unknown [19].

For this essay, we selected four mortars. The oldest is a set of mortar and pestle manufactured in the Iberian Peninsula, possibly from the Middle Ages. The mortar is a truncated cone with six buttresses, cut on the outside in an undulating pattern and widening from bottom to top. Two of the buttresses are symmetrical and slightly larger, functioning as handles. The pestle widens towards one end with rings in relief at the centre and top of the shaft (Fig. 3).

The oldest is a bronze alloy mortar and pestle set, possibly from the sixteenth/seventeenth century. The mortar has two lateral wings of circular shape. The cylindrical part is decorated with eight triangular fins, four on each side. The pestle has a biscuit end, a central relief ring and a rounded flare at the lower end (Fig. 3a). Two mortars from the fifteenth/sixteenth century from the National Museum of Ancient Art in Lisbon are parallels for this item [20 p13 fig. 16].

Fig. 3 – Mortal and pestle from the Middle Ages (?). Bronze. Provenance: Iberian Peninsula. Dimensions: Height: 9.0 cm. Biscainhos Museum. Inventory Nr. 482MB.

Fig. 3a – Bonze mortar and pestle. Bronze alloy. Bronze alloy. Dimensions: Mortar: Height: 8.8cm; Width: 15.2cm; Diameter: 4.5cm. Pestle: Length: 17.5cm. 15th (?) /16th century (?). Biscainhos Museum Inv. Nr. 4182 (a, b) MB. Photo credit: MADDS/Manuel Santos.

Two sets of horn or ivory mortars, possibly from the seventeenth/ eighteenth century, manufactured in India, are similar. They present frame decoration on the edge, a double beam of three incised concentric fillets, flanking a frieze of small punched circles centred by a hole, base with relief and narrowing fluting. The pestles are of wood, double-ended with a central relief ring and the same type of decoration as the mortars. These pieces, like some pharmacy jars, are part of the Portuguese medical and pharmacological legacy of Portuguese India (Fig. 4 Fig. 4a). See parallels on ivory mortars from the sixteenth/seventeenth century of a private collection [20 p24 fig. 27].

Specific recipes requiring grinding ingredients and, sometimes, the addition of liquids were prepared in ivory or stone mortars, as indicated in the Jesuitic manuscript collection. Three of these medicines were antimalarial preparations containing quinine powder, a potent antimalarial obtained from chinchona bark from Peru [19 p35-6; 39; 264; on this subject see 22, 18 p35-6; 39; 264; on this subject see 21].

Fig. 4 – Mortar and pestle. Horn or ivory. 18/19 century. India. Dimensions: Mortar: Height: 9,4cm; Diameter: 8.6cm; Pestle: Length: 17,1cm; Diameter: 3,3cm. Biscainhos Museum Inventory Nr. 495 (a, b) MB.

Fig. 4a- Mortar and pestle. Horn or ivory. 17th/18th century. India. Dimensions. Mortar: Height: 11cm; Diameter: 8.5cm; Pestle: 18cm; Biscainhos Museum Inventory Nr. 496 (a, b) MB. Photo credit: MADDS/Manuel Santos.

The collection of apothecary jars from the Biscainhos Museum includes twenty-five items, mainly albarellos dating from the seventeenth, eighteenth and nineteenth centuries, bequeathed by Dr. José Maria da Costa Júnior [19]. The pieces selected for this essay are of glazed earthenware with blue decorations on white backgrounds. The provenance and place of manufacture are primarily unknown.

The Arabs were probably the first to create pottery and pharmaceutical ceramics in Europe, especially Spain. They introduced glazed ceramic to prevent porous material from absorbing the products [8 p355, 358]. In the fifteenth century, containers with cylindrical bodies appeared in Italy. They probably originated in the Arab and Persian potteries, which were widely disseminated in the sixteenth and seventeenth centuries (9 p365). The word albarello comes from the Persian*al-Barani*, meaning jar for spices. Albarellos were standard apothecary jars with a cylindrical shape and a wide neck. They also preserved fruits, jams and aromatic herbs [8 p350].

Songe decorations were applied with a sponge or cloth to get an irregular spiked effect on the entire piece surface and appeared during the sixteenth and seventeenth centuries [8 p364]. Such is a pair of albarellos of this collection (Fig. 5).

Fig. 5 – Pair of glazed earthenware albarellos with blue sponge decoration on a white background. Dimensions: Height: 28.6 to 29.3cm; Diameter: mouth: 9.2 cm. 18th century (?) Biscainhos Museum Inv. Nr. 728 (a, b). MB. Photo credit: MADDS/Manuel Santos.

Sponge decoration of Spanish albarellos in hospitals from Madrid and Alcala de Henares, ruled by Benedictine, Augustinian, Franciscan and Carmelite Orders and Monastic Orders in Spain, also appeared from the end of the 18th century [8 p350].

Heraldic decoration appeared in pharmaceutical jars and albarellos during the seventeenth and eighteenth centuries, frequently depicting the shiels of monastic orders [8 p365]. The Biscainhos Museum houses items bearing shields of Portuguese and Spanish religious Orders. A pair of white albarellos with blue decoration from the Benedictine Order and a similar piece from the eighteenth century decorated with the shield of the Benedictine Order formed by a cross inscribed in a circle, topped by a crown, surrounded by foliage and scrolls (Fig. 6 Fig. 6a), possibly belonged to the apothecaries of Tibães and Refojos de Basto.

Fig. 6 – Pair of glazed earthenware albarellos with the shield of the Benedictine Order. 17th century. Biscainhos Museum. Inv. Nr. 2118 (a, b) MB.

Fig. 6a – Glazed earthenware albarello with the shield of the Benedictine Order. Dimensions Height: 26.3cm; Diameter: mouth: 12.3cm;18th century. Inv. Nr. 678 MB. MB. Photo credit: MADDS/Manuel Santos.

Pharmacy jars with oriental decorations appear frequently in Portuguese monastic apothecaries. Three items of this collection highlight the exchange of cultures in the Portuguese Age of Discovery. They were manufactured in Portugal in the seventeenth century. One is related to India, depicting an elephant with its trunk and a castle with a flag raised in the middle tower behind him (Fig. 7). The figures are surrounded by stylized flowers and vegetal motifs.

The others allude to relations between Portugal and China. The Portuguese explorer Jorge Alvaro (?-1521) was the first to arrive at Ling-Ting Island in 1513 [22]. Tomé Pires (c. 1468 — c. 1524/1540), a Portuguese apothecary and diplomat, arrived in China in 1516. In his book *Suma Oriental*, sent to King Manuel I (reigned 1495–1521), he was the first to report on Eastern drugs and their place of origin [23 Appendix I, p446–458].

Two jars depict a Chinese and a European male figure in Chinese backgrounds: a Chinese figure holding a parasol next to a building, possibly a pagoda (Fig. 7a), and a European in a baroque costume holding something like a cane among vegetation close to two cylindrical towers (Fig. 7b). The names of the ingredients, which frequently figure on the labels of pharmacy jars, include Oriental ingredients like *Corallin algae* (sea moss) and China root, also surrounded by Orient-inspired decorations.

Fig. 7- Albarello with Oriental decoration. Elephant. Dimensions (cm): Height: 24.3cm; Diameter: 12cm. 17th century. Biscainhos Museum Inventory Nr. 3795 MB. Incorporation from the Archaeological Museum D. Diogo de Sousa.
Fig. 7a- Albarello with Oriental decoration. Chinese male figure. Manufacturing place: Portugal(?). 17th century. Dimensions: Height: 28cm; Diameter: 10.4cm. Biscainhos Museum Inventory Nr. 512 MB. MB. Photo credit: MADDS/Manuel Santos.
Fig. 7b- Albarello with Oriental decoration. Female European figure. Manufactured in Portugal. 17th century. Dimensions: Height: 27.8 cm; Diameter: 10.9cm; Inventory Nr. 513 MB Biscainhos Museum. Photo credit: MADDS/Manuel Santos.

An albarello with floral decoration and a diagonal strip labelled *S. PEONIAE* (Fig. 8) corresponds to the *Paeonia officinalis*- Petals, roots, and seeds were used. The plant was appreciated for its minor sedative and antispasmodic effect [24 p209]. Peony seeds, also used as spices, were a folk medicine for convulsions and a wide range of other ailments [25 p336]. An albarello with the lettering *BANHA D F L* (Fig. 8a) corresponds to *BANHO (A) DE FLOR DE LARANJEIRA (ORANGE BLOSSOM WATER),* listed among hot waters. It figures as an ingredient in an ointment for uterine pain from the Jesuitic manuscript [18 p200; p134]. A jar labelled with the lettering *CORALLIN* surrounded by Orient-inspired decorations and volutes identifies corallin, *Corallin algae* (sea moss), a calcareous alga growing in corals and shells with astringent properties, figures in recipes against ascariasis [18 p250] (Fig. 8b).

Fig. 8 - Albarello with stylized floral decoration and a diagonal strip labelled S. PEONIAE. Dimensions: Height: 27 cm; Diameter: 12 cm; 18th century. Inv. Nr. 422. Fig. 8a- Albarello with diagonal script labelled as BANHA. D F L., outlined by internally cut windings, alternately, with stylized and floral mot.fs. Dimensions. Height: 22.5; Diameter mouth: 11.5. Late 17th century/early 18th century (?). Inv. Nr. 517MB. Fig. 8b- Jar with a diagonal strip with the lettering CORALLIN. Dimensions:Height: 22,5 cm; Diameter mouth: 14,1 cm; Base: 12,2 cm. 17th century (?), Inv. Nr. 51 (a)MB. Photo credit: MADDS/Manuel Santos.

An albarello with the lettering *V. MERCV. R. (UNGUENT OF MERCURY)* surrounded by volutes and oriental-inspired elements (Fig. 9) brings up a drug listed in the purchasing expenses of the Books of the Infirmary (1725 to 1750 and 1751 and 1801) of the Monastery of S. Martinho de Tibães [16 p88].

Fig. 9- Albarello with a diagonal script almost the entire piece's height, with the lettering V. MERCV. R. Dimensions :Height: 21 cm; Diameter: 11 cm; 17th/18th century (?), Inv. Nr. 426 Mb. Fig. 9a- Albarello labelled R. DA CHINA, framed by scrolls and plant motifs. Dimensions. Height: 25 cm; Diameter mouth: 11.5 cm. 17th/18th centuries, Inv. Nr. 730 MB.Photo credit: MADDS/ Manuel Santos.

The Swiss physician Theophrastus von Hohenheim (Paracelsus) (1493-1541) searched for more effective remedies in inorganic salts, metals and minerals as part of his interest in alchemy, an ancient tradition dating back to Chinese and Arabic cultures [26] advising mercury formulated as an ointment in the treatment of syphilis [27]. Mercury was employed in Western medicine to treat skin diseases since the Middle Ages. However, although efficacious in controlling the cutaneous manifestations of the condition, physicians were aware of its toxicity [28].

The microorganism that causes syphilis, the Treponema pallidum, was microscopically identified by the German zoologist Fritz Schaudinn (1871-1906) and the Polish-German dermatologist Erich Hoffmann (1868-1959), who published their discovery in 1905 [29].

Syphilis was a dreadful sexually transmitted new disease which appeared in Europe brought by the Spaniards from the Hispaniola Island in Central America; it was endemic by the end of the fifteenth century, as stated by Gonzalo Fernández de Oviedo y Valdez (1478-1557), nominated by Emperor Charles V as the first chronicler of the new discovered Indies by Emperor Charles V (Emperor of the Holy Roman Empire and Archduke of Austria from 1519 to 1556, King of Spain from 1516 to 1556).

Valdez recounts how the Spaniards arrived on Hispaniola Island (currently Haiti) in 1493 and how the disease was as natural as the Indian women from whom they had gotten it. He knew the disease was contagious and that the Spaniards who returned to Spain passed it to Italy and other European countries. The Indians treated the *mal de las boubas (syphilis)* with gaiacum wood; Valdez described its properties and gave instructions for its preparation [30 p32, p50, p389–390]. *Gaiacum officinalis*, also called *palo santo (pau santo* in Portuguese), the "woof of life" from the West Indies and Americas, was the source of gaiac resin or gum gaiac, used in the form of raspings. It was a gastric stimulant and mild purgative, also employed for chronic rheumatism [24 p153].

Paracelsus deemed guaiacum ineffective in a writing published in 1529 [31]. Therefore, mercury started to be the standard treatment for syphilis.

The Jesuitic collection provides numerous recipes with mercury against gonorrhoea [18 p122, 123] and other conditions, mainly skin diseases like pruritus (itchy skin) or scabies. Some recipes refer to the appearance of sialorrhea as a sign of mercury toxicity if taken for a long time [18 p96–97].

China root, the rhizome of *Smilax china*, has diaphoretic and diuretic properties and was employed in skin and venereal disorders [24 p107]. It was a less dangerous therapeutic agent than mercury in the treatment of syphilis. It figures in an albarello as *R. DA CHINA (CHINA ROOT)* (Fig. 9a). Andreas Vesalius (1514-1564), the great anatomist of the Renaissance, dedicated an essay to this plant, *Epistle to the China Root*, in which he studied the effectiveness of the drug on those who had taken it. Among them was Emperor Charles V, who took the medicine at his initiative [32].

Two other containers bear dittany labels. The first is a pear-shaped jar with the lettering *DICTAMUS (DITTANY)* (Fig. 10).

Fig. 10 –Pear-shaped apothecary jar decorated on the front with a rectangular diagonal caption with the lettering DICTAM surmounted by a winged head and surrounded by profuse decorations of phytomorphic elements. Dimensions: Height: 24 cm; Diameter mouth: 12.4 cm; Base: 8.6 cm. 17th century. Inv. Nr. 77MB.
Fig. 10a – Albarello with the label DICT. REGIS outlined by scrolls and plant motifs. Dimensions: Height: 26.9 cm; Diameter mouth:9.9 cm. Late 17th /early 18th century (?). Inv. Nr. 521 MB. Photo credit: MADDS/Manuel Santos.

It refers to a medicinal plant originally from Crete, used since ancient times to help women in labour. The winged female figure certainly alludes to the easing effect attributed to *Dictamus*. During the Middle Ages, dittany was an essential ingredient to produce Benedictine liquor [33 p133]. An albarello bears the inscription *DICT. REGIS* outlined by scrolls and plant motifs. *Dictamus regis* was the white dittany [18 p51] (Fig. 10a).

Conclusion

What has been recovered from the infirmary and apothecary from the Monastery of S. Martinho de Tibães and the mortars and jars from the Biscainhos Museu, we can get insights into the outstanding role of Portuguese monastic apothecaries. Their most significant contribution to the development of pharmacological science in Portugal was the publication of the first pharmacopea in Portugal in 1704, the *Pharmacopea Lusitana* by D. Caetano de Santo António (d. 1730), a Canon of the Augustine Order of the Monastery of Santa Cruz in Coimbra who later became the apothecary friar of the Monastery of S. Vicente de Fora in Lisbon [34]. It was written as a practical guide for preparing and compounding medicines, showcasing the most common recipes. A poem by the Priest D. Antonio da Costa, figuring in the Pharmacopoeia, praises the author's work at the Monastery of Santa Cruz in Coimbra:

QUẽ não paſma, ò Caietano,
Quando vè q̃ a voſſa idea
Fa neſta Pharmacopeia
Divino o remedio humano:
Invento foi ſoberano
De ideia tão advertida,
Pois quis, neſte livro lida,
Se viſſe, ſahindo a lux,
Que era proprio em Santa Cruz
Acharſe o livro da vida.

Who will not wonder, oh Caietano,
When one can see your idea
Turning, in this pharmacopoeia,
The human into divine medicine:
The invention of such a cautionary
Idea was sovereign,
In this book, it was succeeded
To watch the light coming out,
As it was expected at Santa Cruz
To be found in the Book of Life [34].

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Rezime

Nakon definitivnog uspostavljanja liberalizma u Portugalu 1834. godine, koji je bio karakterisan dubokim antiklerikalizmom, verski redovi bili su ukinuti, a njihova imovina, uključujući vredne biblioteke, ambulante i apoteke, konfiskovana je ili prodata. Bibliografske zbirke su često bile rasparčane tokom procesa promene, a mnoga dela su izgubljena. Nacionalni arhiv Tore do Tombo, kao i regionalne i lokalne gradske

biblioteke dobile su mnoge zbirke. Međutim, većina medicinske i farmaceutske opreme je prodata ili izgubljena. Ambulanta i apoteka manastira Sv. Martinjo de Tibaeš, u predgrađu Brage (severni Portugal), nisu bili izuzetak. Međutim, sačuvane medicinske i farmaceutske knjige i rukopisi iz biblioteke omogućili su nam uvid u njihove operativne standarde socijalne i medicinske pomoći. Monaški apotekari bili su od suštinskog značaja u pomaganju siromašnim ljudima i u velikoj meri su doprineli evoluciji naučnog razvoja farmacije u Portugalu. Njihov najznačajniji doprinos razvoju farmakološke nauke bilo je objavljivanje prve farmakopeje u Portugalu 1704. godine, Pharmacopea Lusitana, koju je napisao D. Kaetano de Santo Antonio (um. 1730), kanonik Avgustinskog reda manastira Sv. Santa Kruz u Koimbri, koji je kasnije postao apotekar manastira S. Visente de Fora u Lisabonu. Napisana je kao praktični vodič za pripremu i mešanje lekova, sa prikazom najčešćih recepata. Na osnovu sačuvanih manastirskih predmeta, kao i avana i tučaka koji se nalaze u muzeju Biskainjoš, a koji su verovatno pripadali manastiru, može se sagledati istorijat ambulante i apoteke manastira de Tibaeš.

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vegetable or botanical garden to cultivate medicinal plants was ever mentioned [16, pp. 44–62].

The apothecary of the Monastery of S. Martinho de Tibães was built and equipped according to the instructions of Friar José Maria, an outstanding mentor of the pharmacies of the Benedictine Monasteries [17 p29–30]. His instructions figure in the *Pharmacopeia dogmatica medico-chemica, e theorico-pratica,* of his authorship [16]. Monastic apothecaries frequently authored pharmacopoeias and recipe books containing recipes with the names of their inventors or the monastery. The Jesuits kept the manuscript from 1766, including all the recipes from their monasteries in India and Brazil, in the Jesuit Archives of Rome [18]. This collection is a valuable contribution to the knowledge of materia medica in modern times since the Jesuits learned medicine and healing arts from the native peoples and introduced new drugs to European medicine.

Mortars and jars from the Biscainhos Museum

Mortars and pestles have been used since early civilizations to grind and reduce powder substances for pharmaceutical use. They were conformed containers with wide feet to ensure stability and maximum height. The most ancient were of marble, stone, agate, or granite. Occasionally, they were of ivory, earthenware and wood. In the Gothic period (twelfth century AD), they were made of bronze [8 p350]. Later, bronze mortars predominated. They could also be made of gold, iron, tin, brass, wood, ivory, and glass. In the seventeenth and eighteenth centuries, apothecaries had several types of mortars. A large one assumed an ornamental function, placed on a large wooden trunk. Fourteen bronze mortars of different shapes and sizes, three of ivory and one of wood, dating between the sixteenth/seventeenth and eighteenth centuries, were displayed for the first time in the Biscainhos Museum. Dr. José Maria da Costa Júnior bequeathed them. The provenance and the manufacturing place are primarily unknown [19].

For this essay, we selected four mortars. The oldest is a set of mortar and pestle manufactured in the Iberian Peninsula, possibly from the Middle Ages. The mortar is a truncated cone with six buttresses, cut on the outside in an undulating pattern and widening from bottom to top. Two of the buttresses are symmetrical and slightly larger, functioning as handles. The pestle widens towards one end with rings in relief at the centre and top of the shaft (Fig. 3).

The other is a bronze alloy mortar and pestle set, possibly from the sixteenth/seventeenth century. The mortar has two lateral wings of circular shape. The cylindrical part is decorated with eight triangular fins, four on each side. The pestle has a biscuit end, a central relief ring and a rounded flare at the lower end (Fig. 3a). Two mortars from the fifteenth/sixteenth century from the National Museum of Ancient Art in Lisbon are parallels for this item [20 p13 fig. 16].

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