

The lights of Arco do Cego: the portuguese enlightenment and knowledges in the 18th century

As luzes do Arco do Cego: o iluminismo português e os saberes no
século XVIII

*Ana Paula Barco da Silva*¹

*Christian Fausto Moraes dos Santos*²

*Gabrielle Legnaghi de Almeida*³

¹ Mestranda em História pela Universidade Estadual de Maringá. Programa de Pós-graduação em História. E-mail: apaulabarcosilva@gmail.com.

² Pós-Doutor em História das Ciências pelo Consejo Superior de Investigaciones Científicas de Barcelona (CSIC) e em História da Cultura pela Universidade Federal de Minas Gerais (UFMG). Professor no departamento de História na Universidade Estadual de Maringá. Email: cfmsantos@uem.br.

³ Doutoranda em História pela Universidade Estadual de Maringá. Programa de Pós-graduação em História. Email: glegnaghi@gmail.com.

RESUMO

Através das influências do movimento iluminista difundidas em Portugal, o presente artigo analisou a origem da Oficina Calcográfica Arco do Cego na passagem do século XVIII para o século XIX. Também foi considerado o contexto em que se deu início a Instituição, evidenciando a maneira com que a filosofia natural serviu de mecanismo para alavancar o potencial agrícola de Portugal e suas colônias. As estruturas do Antigo Regime sofreram grandes reformas nos aspectos políticos e áreas do conhecimento. Por meio dos manuais de técnicas na agronomia, medicina, náutica, engenharias e animais, a Casa Literária fomentou essas produções durante cerca de 28 meses, ampliando significativamente a construção e difusão do conhecimento

PALAVRAS-CHAVE: Iluminismo; filosofia natural; Arco do Cego; agricultura; Portugal.

ABSTRACT

Through the influences of the Enlightenment movement spread in Portugal, this article analyzed the origins of the Oficina Calcográfica Arco do Cego at the turn of the 18th century to the 19th century. The context in which the Institution began was also considered, highlighting the way in which Natural Philosophy served as a mechanism to leverage the agricultural potential of Portugal and its colonies. The structures of the Old Regime underwent major reforms in political aspects and areas of knowledge. Through manuals on techniques in agronomy, medicine, nautical, engineering and animals, Arco do Cego promoted these productions for around 28 months, significantly expanding the construction and dissemination of knowledge.

KEYWORDS: Enlightenment; natural philosophy; Arco do Cego; agriculture; Portugal.

The lights at the transition of centuries

During the 18th century, men of letters faced significant challenges in their attempts to boost the economy of the Portuguese metropolis. Through innovations in what is now conventionally considered agriculture, the development of production and technologies promoted technical and technological advances in European society during the Enlightenment period. In this context, the dissemination of Enlightenment ideas in Portugal and the consequent creation of the Casa Literária Arco do Cego will be analyzed through a bibliographical approach.

A place marked by the transition of knowledge, Portuguese identity was strongly influenced by the Aristotelian tradition. Portuguese chastity, based on the classics of Antiquity, gradually changed. With the increasing diffusion of Enlightenment ideals, Portuguese society witnessed the transition between the classical tradition and the reforming principles of the Enlightenment. During the 18th century, the dissemination of knowledge was transmitted through periodicals and pamphlets in foreign languages such as French and works from Venice, Milan, Genoa, France that circulated in Portugal (Denipoti, 2012, p. 163-168). In this context, natural history can be highlighted as one of the highlights of this change in perceptions. In previous centuries, Natural Philosophy had consolidated its space for understanding the universe, with mathematical laws, geometry, description of beings (Heynemann, 1999, p.102). The institution of Casa Literária Arco do Cego, created at the turn of the 18th to the 19th century, had the purpose of implementing knowledge about animals and plants in the Portuguese imagination, based on the enlightened influence. And, of course, use it, Natural History, for the economic development of the Kingdom.

To approach the theme, we sought to analyze the way in which the Portuguese Crown began to understand the relevance of agricultural development in the midst of a crisis in the monarchical regime, and the way in which it could boost the economy of the 18th century, based on the influence of the Enlightenment. Considering the distinctions of the emerging current of thought, there were divergences between the countries of Europe regarding their ideologies. For the present analysis, the implementation of such a current in a society marked by the Ancien Régime was considered, with emphasis on the enlightened movement.

Another highlight is related to Natural Philosophy, presented as a “solution” that would contribute to the promotion of “philosophical journeys”, organized by minister Martinho de Melo e Castro (1716-1795). With the aim of exploring new plants with economic potential, Natural Philosophy becomes motivated by economic interests. It should be noted that such a movement could already be observed in nations such as Spain, France and the Netherlands. The emergence of the Arco do Cego chalkographic workshop, its expenses, and its purpose of spreading illustrated knowledge to the metropolis and the colonies will also be highlighted. Considering the relevance of the topic, the dissemination of what is conventionally categorized as “science”, mainly based on the use of natural philosophical knowledge, can be indicated as a factor that was capable of driving the dynamics of the eighteenth century in Portugal.

Agricultural production in the Portuguese empire

During the first half of the 18th century, Portugal spent little investment in what could be understood as the "agricultural sector" of its colonies. This movement can be justified by the previous crisis in sugar exports, mainly due to market

competition in the Antilles and by the decline of gold production, significantly in the captaincy of Minas Gerais.

During this period, the Portuguese metropolis decided to adopt the “colonial pact” policy, a strategy already used for more than a century by neighboring competing countries, such as France and England. In general, colonial policy consisted of assigning the national market of a metropolis to its respective colonies and commercial exchanges to the navy under its flag (Prado Júnior, 2008, p. 79).

In the second half of the 18th century, the promotion of studies dedicated to nature and its phenomena began, related to the policy of an agricultural renaissance. Portugal showed a growing interest in increasing the production of raw materials to promote technological advances. In addition to the fall in the price of sugar, the motivation was due to fluctuations in the yield of the fifth, which corresponded to 20% of a gold bar that was attributed to the Portuguese Crown, as well as the adversities of an aggravated tax system. Both situations were linked to the collection of mineral resources, which required extensive policing by the State (Dias, 1968, p. 112).

During the mining process, the presence of agriculture was inevitable, as the survival of the population of Minas Gerais was not only linked to products that came from abroad, but also to domestic subsistence production. The Portuguese Crown noted the need for mineral exploitation linked to agricultural production, since there were episodes of famine due to the increase in the number of people in the mining regions (Guimarães, Reis, 1986, p. 15-26).

The importance of the economy, linked to the land, was emphasized in the economic movement of the period called physiocracy. This reflected the wealth in agricultural production of the period. Agriculture was, therefore, developed using the bases that comprised fields of knowledge originating from Natural Philosophy.

These bases later became known as belonging to "science" during the Modern Era (Ávila, 2014, p. 54).

In addition to physiocratic thinking, the men of letters considered knowledge of the natural environment as prosperity in the social sphere by making space for philanthropy. This behavior was esteemed by natural philosophers who disseminated knowledge as they traveled between the continents of America and Europe in an attempt to make agricultural productivity more efficient (Meneses, 2022, p. 220).

In the Age of Enlightenment, the attention given to nature and cabinets with items linked to natural history had already been incorporated into European society. The literature of the period was marked by the use of botany and zoology, often linked to human curiosity. The control of nature was seen as a fundamental element for the nation, in which power was associated with agricultural skills (Kury, 2001, p. 115). At the end of the eighteenth century, the natural environment was viewed with religious connotations, linked to God and with affection. The beauty of nature went through not only exaltation, but also a greater positive outlook, in which beneficial characteristics regarding privacy and reflections on the individuality of human beings were implemented (Thomas, 1988, p. 309).

The understandings surrounding the Colony were based, in most cases, on reports produced during the 16th and 17th centuries, and focused on themes that involved nature in its broad spectrum, such as fauna, flora, minerals, climate, geographical aspects and cartography (Domingues, 2006, p. 155). The expeditions carried out aimed at commercial profit regarding the colonial territory, in which many travelers of the nineteenth century were guided by references written in the eighteenth century (Silva, 2015, p.35-36).

The interest in studies on marketable products in Portuguese America was demanded by the then Secretary of State of Portugal, Sebastião José de Carvalho e

Melo (1699-1782), popularly known as the Marquis of Pombal, to the governors and captains general of the Captaincies. Resulting in the encouragement of studies on the Natural Philosophy of the period. The relevance of the Luso-Brazilian flora, until then interpreted as an unknown, began to gain prominence due to the difficulties that the Portuguese faced in their commercial domains in the East, caused by the demand for products that became more accessible and opportune, such as sugar in the Luso-Brazilian northeast and gold in the Minas Gerais region. In the tropics, the need to investigate nature was perceived based on the search for little-explored riches with commercial potential (Dias, 1968, p. 113).

The enlightenment of the Portuguese metropolis

The idea of a financing program, put into practice by the Marquis of Pombal, was focused on the intention of modernizing agricultural State activities, leading to the maximization of the exploitation of natural products from the colony of America, in addition to other possessions in Asia and Africa. Educational reforms illustrated in the metropolis were associated with this financing project during the reign of D. Maria I (1777-1816), with the adherence of more pragmatic approaches in institutions that had a natural-philosophical character (Costa, Leitão, 2009, p. 46; Varela, 2006, p. 62-65).

During the middle of the 18th century, the idea that a revolution could take place in the knowledge that made up natural philosophy was recurrent, initially concerning knowledge related to mathematics and astronomy. The words “reason” and “nature” became inseparable, the connection between these ideas coming from 17th century England with its domains of natural theology, which during the Middle Ages was recognized for understanding the domain of truth through reason. In the Enlightenment context, the transformations in the fields of knowledge

about natural phenomena culminated in the reconfiguration of the understanding and analysis of nature, a process which, now called science, was then referred to as natural philosophy (Hankins, 2002, p. 1-11).

In the political context of the Enlightenment, new concepts of government emerged centered on rationality and individual rights. The definition of freedom underwent variations and equality could have limited application in practice. Intellectuals sought to redefine the role of man in the Ancien Régime, pushing for gradual reforms. In this context, the Enlightenment introduced a system of innovative values, especially when the Crown carried out pedagogical reforms, which were implemented in Portuguese academic institutions (Silva, 2006, p. 30-35).

In the period from 1794 to 1804, the Natural Philosophy course began to be more attended, with 84 students compared to Mathematics, which had 75 students, 10 of whom were in medicine. The Crown offered, through incentives in 1799, scholarships for portuguese-brazilians to train two doctors, two topographical engineers, one accountant and two hydraulic engineers (Dias, 1968, p. 116). The intention of the Portuguese monarchy was to strengthen relations with the portuguese-brazilian elites. One of the incentives to expand social interactions was the arrival of the sons of the Colony's wealthy to the University of Coimbra. In the captaincy of Minas Gerais, there was constant access to higher education for the children of the "mineiras" elites. They dedicated their lives to seeking status through clerical careers, or through university studies, such as the poet and lawyer Cláudio Manoel da Costa (1729-1789), who, upon returning to the colony later, was inserted into Portuguese political and administrative life (Ferreira, 2012, p. 438; Pereira, 2018, p. 59). Furthermore, maintaining diplomatic relations with the portuguese-brazilian nobility contributed to the modernization of the portuguese colony. The Crown aimed, with the insertion of Natural Philosophy in education, to train colonial agents who could generate modernization and consequent benefits in

the agricultural economy, but this process didn't go as planned; some of the works produced by the Arco do Cego calcographic workshop ended up incomplete and were sold by weight due to the end of the institution (Leme, 1999, p. 84-85; Cruz, Pereira, 2009, p. 206).

Some Portuguese institutions of the period demonstrated the impact obtained with the dissemination of studies in the fields of nature, arts and literature. In areas considered strategic, such as engineering, studies were developed in nautical sciences and fortifications. The Royal Navy Academy was also founded, occupying some rooms in the Colégio dos Nobres in Lisbon, in 1779. Other complexes created were the Royal Academy of Fortification, Artillery and Design in 1790, the São Carlos theater in 1793 and the Royal Public Library of the Court in 1796, which occurred together with the reforms of the censorship institutions of the time (Curto, 1999, p. 38).

In this scenario of expansion of academic competences, the enlightened movement also spread, seen as a precursor to the independence of the United States, the French Revolution and the subsequent Napoleonic invasions, which would affect the stability of the kingdom of Portugal (Curto, 1999, p. 15). In France, the difficulties faced by subsistence production on rural properties were the subject of frequent debates. Among the contested privileges, royal taxes were the focus of discussions led by illustrious figures and farmers. Simultaneously with these questions, the State administration tried to introduce new planting and livestock farming techniques (Kury, 2001, p. 119). In England, the philosophical-natural principles were related to the very idea of the extinction of the monarchy. Revolutionary ideals, amidst traumatic events, brought the perception of equality, mainly influenced by France. In the Iberian Peninsula, the Portuguese elite reflected a particular perception of the enlightened movement, by carrying out significant development in relation to the arts and crafts, but being reticent towards

innovations in the political context. Referring to the dissemination of the Enlightenment movement, Portugal managed to separate the threat of its monarchical regime from the development of knowledge linked to Natural Philosophy (Santos, Campos, Moraes, 2010, p. 98).

Although the Enlightenment movement originated in Paris, it spread to many other European places, including Lisbon, Italian cities such as Naples and Milan, Amsterdam, and even Philadelphia in the North American region. The whole illustrated dynamic had communication chains of men of letters who exchanged their knowledge (Darnton, 2005, p. 20). Thus, although French philosophers had a great influence on other nations that adopted the Enlightenment, they were also influenced by the English ideals developed by thinkers such as Bacon (1561-1626), Locke (1632-1704) and Newton (1643-1727) (Carvalho, 2007, p. 15).

The enlightened movement was disseminated in different ways. These forms could cause either the dissolution of empires, or their preservation. The Portuguese experience with the intellectuality of the period can be considered more as a practice of continuation of the Old Regime than a rupture with it (Harden, 2011, p. 307-308). The spread of the Enlightenment, in many parts of Europe, inspired revolutionary movements associated with the bourgeoisie and against national monarchies, with modern democratic tendencies that included liberal practices. The Portuguese Crown took the opportunity to promote the sponsorship of illustrations, since in the midst of the extreme currents there could be the possibility of reform. This occasion, within classical political history, is usually called “enlightened despotism”,⁴ which presents the union of absolutist power with Enlightenment

⁴ To maintain the structures of the Old Regime and introduce enlightened reforms, monarchs from different countries such as Russia, Prussia, Austria and Spain decided to introduce “enlightened despotism” in the second half of the 18th century. The action aimed to concentrate

principles. The occurrence of this fact was more common in countries with a Catholic presence, where the Ancien Régime and the nobility had strong dominance, especially in Iberian, Mediterranean, Eastern and Central Europe. Monarchical power was not only subject to the king, but had a strong philosophical influence from the notion of progress linked to social happiness. In this way, the monarch was in charge of being a servant of his country, in which he dedicated his duties to illustrated conceptions (Ávila, 2014, p. 43; Silva, 2006, p. 33-34).

With the death of D. José I (1714-1777), the direction of the Marquis of Pombal ended. This administration was marked by the growth of trade and technical and technological advances, also supporting the areas of arts and literature. Later, when D. Maria (1734-1816) took over, she was the first woman to conquer the Portuguese throne. The beginning of his reign was marked by the release of many political prisoners and the reconstruction of the memories of former nobles who took part in the king's administration. These changes demonstrated the existence of a Monarchy with great absolutist power and repression against revolutionary movements (Elias, Martins, Moreira, 2017, p. 166).

The dissemination of natural philosophy through “Philosophical Journeys”

Invited by the Marquis of Pombal to teach at the Royal College of Nobles in Lisbon, institution that did not make the expected progress and, subsequently, at the University of Coimbra, the Italian natural philosopher Domenico Vandelli (1735-1819) was one of the main disseminators of Portuguese Philosophy and Natural History during the 18th century. Appointed as director of the Real Jardim Botânico, Vandelli focused his studies on research into exotic plants with economic potential

the powers of the crowns in the new contemporary perspectives of revolutionary society (Cardoso, Cunha, 2011, p. 68-70).

for the Metropolis (Santos, 2008, p. 209). The production of a natural history would be centralized in the so-called Philosophical Journeys. In this case, coordinated by the Italian natural philosopher. The objective of such trips was to discover species that could contribute to the development of the various fields of knowledge considered strategic at the time. Among these objectives, the aim was to carry out observations on the soil, air and water, seeking to understand the way in which effective agricultural production could function. The movement of seedlings or parts of plants would not only be from Portuguese America to the Metropolis, but they could also be taken to other African and Asian colonies under the control of Portugal (Figueirôa, Silva, Pataca, 2004, p. 717).

The existence of the Philosophical Journeys occurred during the leadership of the minister Martinho de Melo e Castro (1716-1795), who provided services during the reign of D. José I, continued with D. Maria I and lasted during the regency of D. João VI (1767-1826). With his death in 1796, the succession of his title as Minister of the Navy and Overseas was given to the baptismal godson of the Marquis of Pombal, D. Rodrigo de Souza Coutinho (1755-1812). The new representative's trajectory was marked by his studies at the Colégio dos Nobres, the law course at the University of Coimbra at the time when the Pombaline reforms of 1772 were implemented, where he met many Portuguese-Brazilians (Pereira, 2014, p. 499).

The Philosophical Journeys in Portuguese America took place mainly in the Captaincy of Grão Pará and Maranhão. Also noteworthy is the captaincy of Rio de Janeiro, which was explored by the Portuguese-Brazilian natural philosopher Friar José Mariano da Conceição Veloso (1742-1811) during the viceroyalty of Luís Vasconcelos e Sousa (1742-1809). Friar Veloso also acted as an intermediary between the sending of correspondence and European natural collections. The friar, unlike many natural philosophers of the period, did not acquire his education at university and was considered self-taught. His apprenticeship with herbariums

took place during his stay at the convent of São Boaventura de Macacu, was extended at the convent of Santo Antônio in Rio de Janeiro and at the Franciscan convent in São Paulo, where he had the opportunity to teach. The routine of the travels required a great deal of knowledge of techniques to systematize the collections made, organize them and be able to send the natural articles. The contributions of the voyage records were not only testimonies of knowledge from an enlightened Europe, but of indigenous knowledge about native nature (Nunes, Brigola, 1999, p. 51-56; Pataca, 2019, p. 156-160).

The structuring of technological, technical and natural-philosophical knowledge as part of the Portuguese empire was achieved with the formation of important members of the colonial aristocracy, made up of men of letters and administrative collaborators. The governors and captains general were the individuals who had authority in the colony of Portuguese America. Sometimes, they played the role of general commissioners in defining territorial limits, activities carried out by astronomers and cartographic engineers, who obtained information from naturalist travelers (Domingues, 2001, p. 826-827).

As a result of his work in natural philosophy, Veloso led the production of *Florae Fluminensis* (1827), structured with descriptions, classifications and nomenclatures using the method of Linneus (1707-1778). Identifying, in the case of Frei Veloso, the flora of the captaincy of Rio de Janeiro, and describing it, led to the production of *Florae Fluminensis* (1827), structured with descriptions, classifications and nomenclatures using Linnaeus' method (1707-1778). Widely used by scholars at that time, the Linnaean classification system served as a mechanism to standardize procedures and generalize botanical language around the world. Botany had a direct connection with God's creations, in which his kingdoms were studied in an attempt to attribute logic to the world through natural history (Kury, 2015, p. 248). In what makes up the *Florae Fluminensis*, Linnaeus' techniques would

be related to a survey of inventoried species from a given region, as in the case of “Valeriana Scadens” and “V. Alpina” which make up the flora in the Fluminense region (Velooso, 1827, p. 6). The descriptions of these plants were made according to rules ordered based on the Genus and reconciled in class groupings, which could be accompanied by brief analyses. The observations could include the vernacular name and the habitat described in Latin (Bediaga, Lima, 2015, p. 88).

In 1796, Friar José Mariano, working for the Portuguese crown, produced publications and translated works considered national novelties on the agricultural theme in Portugal. The religious man performed multiple functions as compiler, coordinator and translator of his works, in which he aimed to persuade typographers to disseminate his literary and editorial efforts with enlightened tendencies to the portuguese Metropolis and colonial America (Nunes, Brigola, 1999, p. 62-63). In 1797, the *Florae Fluminensis* was printed. Works like this had been produced in only a few regions of the European continent, so a team had to be formed to produce it. This initiative can be seen as a stimulus for the formation of the structure of what would later become the Arco do Cego Literary House. It was also an innovation in that it disseminated in the Portuguese language the acquired knowledge represented as conquests of the empire (Faria, 1999, p. 110-111). Physiocracy and philanthropy contradicted the dynamics of the Jansenists⁵, as they were associated with attributes that came from the human being and his relationship with his neighbor through divine love.

The existence of the Arco do Cego typographic workshop (1799-1801)

⁵ Jansenism was a religious doctrine that emerged in the 17th century, which included reflections on divine grace. For more information on the subject: SANTOS, Cândido dos. **O Jansenismo em Portugal**. Faculdade de Letras da Universidade do Porto. Porto. 2007.

During the management of Martinho de Mello e Castro, greater attention was given to the colonies, with emphasis on the survey of animal and plant species transferred to the Botanical Garden or the Natural History Office of Ajuda. During the management of D. Rodrigo de Souza Coutinho, in the Navy and Overseas, some significant changes occurred, in which the collections of natural varieties continued. However, instead of planning philosophical journeys, Minister Coutinho opted for collaborators with specific skills and occupations in the field of Natural Philosophy. The greatest transformation occurred during the production of works with a philosophical-natural nature and an activity that had great power for D. Rodrigo: printing (DeNipoti, Pereira, 2013, p. 258). It is worth noting that no documents were found that prove the constitution of the Arco do Cego Calcographic Workshop, however, there were links to its creation at the will of Minister Sousa Coutinho (Leme, 1999, p. 77).

The Casa Literária do Arco do Cego had great prominence as a component of the Portuguese Enlightenment, due to its encyclopedic character. His works were based on the dissemination of knowledge related to various fields of knowledge, these linked to the technological innovations of the period, experimented by men of letters. The themes could present agricultural, botanical, linguistic and mineralogical techniques. These themes were often accompanied by iconographies of the objects studied (Santos, Campos, Moraes, 2010, p. 97). The wide-ranging collection of productions edited by Friar Veloso demonstrated his fascination with topics ranging from cinchona with the antimalarial healing properties of its bark called quina, used for individuals suffering from fevers, typhus and gout, to practical drawing guides and illustrations (Nunes, Brigola, 1999, p. 69; Semedo, Pereira, Pita, 2023, p. 506).

In the 18th century, the use of images as a teaching tool gained prominence in Europe. The production of scientific materials expanded perceptions about the

elements (Figure 1). Books that did not feature images and had a natural philosophy theme were the target of criticism in the scientific community. Casa Literária Arco do Cego had positive aspects in relation to this informative instrument. The use of illustrative language, which provided easy understanding of what was presented, was seen as an enrichment in the works published (Faria, 1999, p. 107-120).

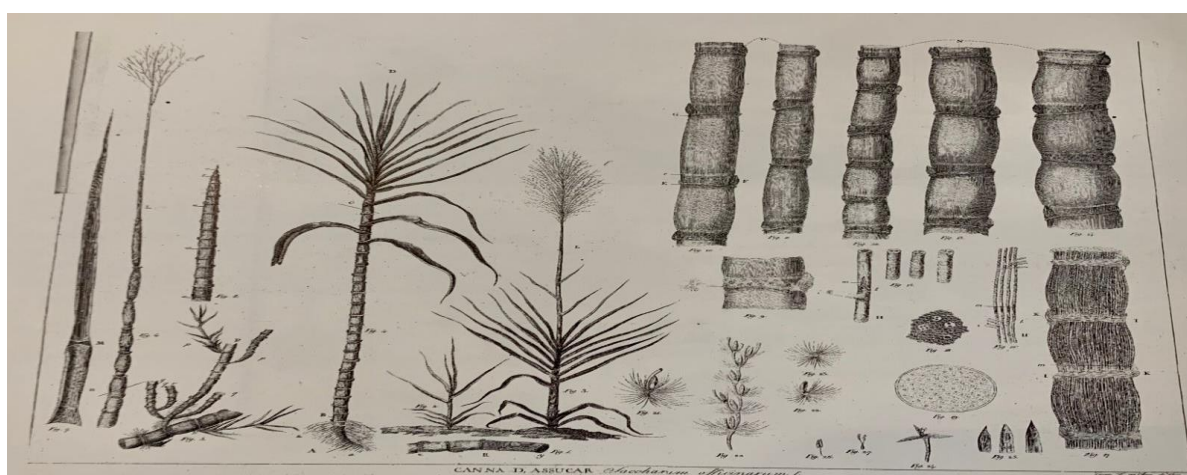


Figure 1- Canna de Assucar (1801).

The typographic workshop was developed on the outskirts of Lisbon, on the farm of the intendant of Arco do Cego. After a few months of installation, it started operating. It soon began to rely on a calcography, made up of autonomous engravers, and achieved the title of "typoplastic", as it produced its own printing characters. Its name changed, over the few years of its existence, being initially in 1799-1800 *Officina da Casa Litteraria do Arco do Cego*, during 1800-1801 it was *Typographia Chalcographica e Litteraria do Arco do Cego* and in February 1801 *Typographia Chalcographica, Typoplastica and Litteraria do Arco do Cego* (Leme, 1999, p. 80-81).

Among the functions implemented was translation, which meant that Casa Literária Arco do Cego was the first translation agency financed by the Portuguese Crown. Many of the literary productions were the result of foreign works, which

could be seen as threatening to Portuguese customs, mainly due to the Enlightenment influence. The translators attributed paratexts to their works that guaranteed knowledge without risks to the society of the period (Harden, 2011, p. 304-306). Another aspect involved in the translations was linked to the addition of comments by the translator. There was no obvious difference between the original text and the translated one, and several translated texts could be added to the same topic. In these translations, only the compiler's name was described, but the original references did not appear (Ávila, 2014, p. 51).

The works that made up the Casa Literária Arco do Cego were composed of dedications. These had a tribute directed to the body that financed the literary institution. In dedications, rhetoric was used as the predominant style, in which the person being honored received the category of co-author. The honors of the work were also shared with the patron, with the Portuguese Crown and the client corresponding with the author of the dedication. The characteristics of these texts contributed to the maintenance of the Ancien Régime in the enlightened period (DeNipoti, Pereira, 2013, p. 262).

SENHOR, tantas vezes honrado por sua magestade, seria criminoso da mais punivel ingratitude, se huma vez nao fosse ao pé do Throno, desde esta distancia, em que existo, confessar a minha divida, para o que me aproveito desta pequena memoria, que será de maior utilidade para o Paiz em que nasci, em que habito e para a V. ALTEZA REAL olha, não como Senhor mas como Pai (Pereira, 1797, p. 3).⁶

There was a significant degree of subjectivity in the texts of the dedications; the works with translations had figures of speech used in their preface. In the

⁶ LORD, so often honored by your majesty, I would be a criminal of the most punishable ingratitude, if I were not once at the foot of the Throne, from this distance, in which I exist, to confess my debt, for which I take advantage of this small memory, which will be of greater use to the Country in which I was born, in which I live and to His ROYAL HIGHNESS he looks upon, not as Lord but as Father (Pereira, 1797, p. 3). (Our translation).

original compositions, men of letters used the language according to social standards and cultured norms of the period, using reason and objectivity. The translators, on the other hand, used a standard of eloquence originating from scholastic rhetoric. This characteristic was criticized by the Enlightenment thinkers of the period, due to its dependence on royal authority and the use of pretentious language (Harden, 2011, p. 307).

Frei Veloso sought to form the Casa Literária Arco do Cego with people from his homeland to collaborate on the publications. Most Portuguese-Brazilians were translators and some were authors of works. The books from Casa do Cego were sold in an exclusive store, in the Rossio neighborhood, under the care of the merchant João Nunes Esteves (?-?). Most of the works were sent to Portuguese America, where they could be sold or made available to the public. In the Metropolis, some were sent to the nearest regions to be sold. Regarding productions, 83 titles have been located to date, of which 36 were written by Portuguese or Portuguese-Brazilians, 41 books are translations and 6 publications are written in Latin (Leme, 1999, p. 82).

According to Arco do Cego's finances, the gains obtained did not come from the sale of books, but from the illustrated content that would be disseminated, which can be pointed out as one of the reasons for the high loss in Arco do Cego's economy. The idea of profit would be linked to the dissemination of new knowledge among the subjects of Portugal, with the consequent enrichment of the Metropolis through the implementation of this knowledge. The Crown was unable to maintain the calcographic workshop and it was an arduous task to convince the population that new techniques and technologies in agriculture could boost production and improve the Portuguese economy (Santos, Moraes, Campos, 2010, p. 101).

A large part of the expenses of Casa Literária Arco do Cego were attributed to its production of illustrations, which had pedagogical functions placed on the books. The issuance of expenses for the production of works was linked to the salaries to be paid to engravers, as well as printing and illustration materials that accounted for around 33% of total revenue (Faria, 1999, p. 125).

The duties of the Arco do Cego calcography required large funds from the Royal Treasury, which had the function of a royal institution to control the accounts of administrative management. The requirement to control the costs of the literary house's productions was a preponderant factor in its closure as an autonomous press. To continue publishing books considered useful by the Portuguese Crown, D. João incorporated the Arco do Cego workshop into the reforms of the Royal Printing Office, in which administrative changes were made. Friar José Mariano was moved as director of the Literary Board of the Royal Printing Office, accompanied by the Greek language teacher Custódio José de Oliveira (?-?), by the royal professor of Latin grammar Joaquim José da Costa e Sá (1740-1803) and by the diplomat Hipólito José da Costa Pereira Furtado de Mendonça (1773-1824). These, in turn, had the function of choosing the works, translating them and reviewing the prints to be made from that period onwards (Azevedo, 2018, p. 97).

The scientific propagation

The spread of the Enlightenment occurred in various ways in European countries with its diffusion in various regions of the European continent, with its French origins influenced by English ideas. The threat of the fall of the monarchy was highlighted in France and England, and the ideals of freedom and independence were propagated in the North American colonies that would come to be called the United States. In Iberian countries such as Portugal, the illustrated

movement was used in a different way. Due to the strong presence of the Ancien Régime, the illustrated current was absorbed by their monarchs in order to maintain their hold on power in the form of investments in land and philosophical-natural dissemination through the press. To understand the creation of the Oficina calcográfica Arco do Cego, we need to look at the contexts of the illustrated reforms in Europe. The importance of agriculture as a profitable sector for the Portuguese Crown, which predated mining, was gaining prominence and becoming widespread in the country once again. In this context, the use of the knowledge that made up natural philosophy was linked to nature, and the 18th century was characterized by its close relationship with natural philosophy.

The incentives of the Portuguese Crown, which changed over the course of the administrations, influenced the departure of Portuguese-Brazilians to the European continent and the growing demand from literate groups for courses at the University of Coimbra. The illustrated reforms were based on the formation of institutions focused on Natural Philosophy, navigation and agricultural techniques and technologies, which ended up contributing to the continuation of a regime that ended up becoming obsolete.

Through the use of agricultural techniques in the colonies, enjoying the territories was an advantage that was applied by the Philosophical Journeys coordinated by the Italian Vandelli. These expeditions contributed to a system of collection communications that made use of the combined knowledge of Europeans and indigenous people. Despite being associated with these movements, the Portuguese-Brazilian Friar Veloso built his understanding of nature in Portuguese America and was considered an autodidact. His work *Florae fluminensis* contributed to the creation of a team that would print it and take part in the future Oficina Calcográfica Arco do Cego. Consequently, through the influence of a new minister, D. Rodrigo, the practice of printing gained its due prominence. The priest Veloso

then took over the leadership of the Arco do Cego Literary House, which acquired new members over the course of its approximately 28 months. Its themes were related to the technologies of the period that could contribute to agriculture, medicine, nautical, engineering and animal production.

The target audience was focused on rural individuals such as the grantees. The use of images contributed to the dissemination of works published by Calcografia do Arco do Cego, as it was a didactic way of understanding for the population of the period. Clientelism was one of its characteristics that shared what aristocratic society was, mainly with the exaltation of the monarchy. The spread of knowledge that represented the latest innovations in various fields of knowledge contributed to what is currently understood as the Portuguese Enlightenment. This represented an innovation for the period, being one of the first presses with an intellectual character that had an understanding of the universe of nature along religious lines. Due to the high cost of producing images and ornaments for books, unfortunately its duration was short, being incorporated by the Portuguese Crown into the Royal Press.

Although no documents were found that constituted the creation of the Arco do Cego calcographic workshop, its importance in this research was given due to the production of many works of a philosophical-natural nature that left a vast legacy for the history of Portuguese and Luso-Brazilian science. A reflection of the Enlightenment phenomenon of that period. Its existence represented some of the Crown's attempts to boost the economy through agricultural production, a system that has always been seen as the foundation for the construction of Portuguese America and which today still serves as the basis of wealth for the Brazilian economy.

ILLUSTRATION

Figure 1- Sugar Cane (1801).

DOCUMENTAL SOURCE

LA COUTURE, Jacques François Dutrone. **Compendio sobre a canna, e sobre os meios de se lhe extrahir o sal essencial, ao qual se ajuntão muitas memorias ao mesmo respeito, dedicado à colonia de S. Domingos.** Typographia Chalcographica Typoplastica, e Litteraria do Arco do Cego. Lisboa. 1801.

PEREIRA, J.M. **Memoria sobre a reforma dos alambiques ou de hum próprio para a destillação.** Lisboa: J. P. Correa da Silva, 1797.

VELOSO, José da Conceição. **Florae Fluminensis.** Off. Lithog. Senefelder. Vol. 1. Paris. 1827.

BIBLIOGRAPHIC REFERENCES

ÁVILA, Gabriel da Costa. **Um império no prelo. História Natural e administração colonial na Casa Literária do Arco do Cego (1799-1801).** Temporalidades. Belo Horizonte. V.6, n.2. p.41-60. Maio/ago. 2014.

AZEVEDO, Dannylo de. **O fazendeiro do Brasil: Manuais agrícolas no Brasil colonial em finais do século XVIII.** USP. São Paulo. 2018.

BEDIAGA, Begonha; LIMA, Haroldo Cavalcante de. **A “Flora Fluminensis” de frei Vellozo: uma abordagem interdisciplinar.** Boletim do Museu Paraense Emílio Goeldi. Ciências Humanas, v. 10, n. 1, p. 85-107, jan.-abr. 2015. DOI: 10.1590/1981-81222015000100005.

CARDOSO, J. L.; CUNHA, A. M. **Discurso econômico e política colonial no império Luso-Brasileiro (1750-1808).** Tempo, v. 17, n. 31, p. 65–88, 2011.

CARVALHO, Flávio Rey de. **Um iluminismo português? A reforma da universidade de Coimbra de 1772.** Universidade de Brasília. Brasília. 2007.

CRUZ, Ana Lúcia Rocha Barbalho; PEREIRA, Magnus Roberto de Mello. **Ciência, identidade e cotidiano. Alguns aspectos da presença de estudantes brasileiros na Universidade de Coimbra, na conjuntura final do período colonial.** In: Revista de História da Sociedade e da Cultura, v. 9, p. 205-228, 2009. Disponível em: https://www.academia.edu/download/35749583/rhsc9_205-228_abc-mml.pdf. Acesso: 05 de agosto de 2024.

CURTO, Diogo Ramada. **D. Rodrigo de Sousa Coutinho e a Casa Literária do Arco do Cego.** In: A Casa Literária do Arco do Cego (1799-1801). Sem livros não há instrução. Org: CAMPOS, F. M. G; LEME, M.O.R.P; FARIA, M.F; CUNHA, M; DOMINGOS, M.D. Biblioteca Nacional e Imprensa Nacional-Casa da Moeda. p.15-49. Lisboa. 1999.

DARNTON, Robert. **Os dentes falsos de George Washington: um guia não convencional para o século XVIII.** São Paulo: Companhia das letras, 2005.

DENIPOTI, Cláudio. **Rotas do comércio de livros para Portugal no final do Antigo Regime.** In: Rodrigues, José Damião. O Atlântico Revolucionário: circulação de ideias e de elites no final do Antigo Regime, Ponta Delgada: Centro de História de Além-Mar - CHAM, 2012.

DENIPOTI, Claudio; PEREIRA, Magnos Roberto de Mello. **Sobre livros e dedicatórias: D. João e Casa Literária do Arco do Cego (1799-1801).** Unisinos: Vol. 17 Nº 3 - setembro/dezembro de 2013.

DIAS, Maria Odila Leite da Silva. **Aspectos da ilustração no Brasil.** Revista do Instituto Histórico e Geográfico Brasileiro. V. 278. Departamento da Imprensa Nacional. Rio de Janeiro. Jan/ Mar. 1968.

DOMINGUES, Ângela. **Notícias do Brasil colonial: a imprensa científica e política a serviço das elites (Portugal, Brasil e Inglaterra).** Varia História. V.22, n.35, p. 150-174. Belo Horizonte. Jan/Jun. 2006.

DOMINGUES, Ângela. **Para um melhor conhecimento dos domínios coloniais: a constituição de redes de informação no Império português em finais do Setecentos.** História, Ciências, Saúde. Vol. VIII, p.823-838. Manguinhos. 2001.

DURELL, Gerald. **O naturalista amador: um guia prático ao mundo da natureza.** Ed: Martins Fontes. 2ª reimpr. São Paulo. 1996.

ELIAS, S. S. R; MARTINS, D. R; MOREIRA, I. C. **A ciência luso-brasileira na Europa iluminista do século XVIII**. Trama Interdisciplinar. V.8, n.3, p.160-184. São Paulo. Set/ dez. 2017.

FARIA, Miguel F. **Da facilitação e da ornamentação: A imagem nas Edições do Arco do Cego**. In: A Casa Literária do Arco do Cego (1799-1801). Sem livros não há instrução. Org: CAMPOS, F. M. G; LEME, M.O.R.P; FARIA, M.F; CUNHA, M; DOMINGOS, M.D. Biblioteca Nacional e Imprensa Nacional-Casa da Moeda. p.107-137. Lisboa. 1999.

FERREIRA, Cristina. **Souza, Laura de Mello e Cláudio Manoel da Costa: o letrado dividido**. Revista Brasileira de História. V. 32, nº 63, p. 437-440. São Paulo. 2012.

FIGUERÔA, S. M. F; SILVA, C. P; PATACA E. M. **Aspectos mineralógicos das “Viagens Filosóficas” pelo território brasileiro na transição do século XVIII para o século XIX**. História, Ciências, Saúde. vol. 11(3): 713-29. Manguinhos. Set.-dez. 2004.

GUIMARÃES, Carlos Magno; REIS, Liana Maria. **Agricultura e escravidão em Minas Gerais (1700/1750)**. Revista do Departamento de História. V. 1, n. 2, p. 7-36. Junho. 1986.

HARDEN, Alessandra Ramos de Oliveira. **Os tradutores da Casa do Arco do Cego e a ciência iluminista: a conciliação pelas palavras. Trabalhos em Linguística Aplicada**, v. 50, p. 301-320. 2011.Disponível em: <https://doi.org/10.1590/S0103-18132011000200005>. Acesso em: 18 de julho de 2024.

HEYNEMANN, Cláudia B. **História Natural na América Portuguesa: 2º metade do século XVIII**. Vária História. N.20, p.97-117. Belo horizonte. 1999.

PRADO JÚNIOR, Caio. **História econômica do Brasil**. Ed. Brasiliense. 49ª reimpressão. São Paulo, 2008.

KURY, Lorelai B. **Entre utopia e pragmatismo: a história natural do iluminismo tardio**. In: Da revolução científica à big (business) science: Cinco Ensaios de História da Ciência e da Tecnologia. Org: SOARES, Luiz Carlos. Hucitec-EdUFF. São Paulo-Niterói. 2001.

KURY, Lorelai B. **O naturalista Veloso**. Rev. Hist. N.172, p.243-277. São Paulo. Jan-jun. 2015. Disponível em: <http://dx.doi.org/10.11606/issn.2316-9141.rh.2015.98752>. Acesso em: 18 de julho de 2024.

LEME, Margarida Ortigão Ramos Paes. **Um breve Itinerário Editorial: Do Arco do Cego à Impressão Régia**. In: A Casa Literária do Arco do Cego (1799-1801). Sem livros não há instrução. Org: CAMPOS, F. M. G; LEME, M.O.R.P; FARIA, M.F; CUNHA, M; DOMINGOS, M.D. Biblioteca Nacional e Imprensa Nacional-Casa da Moeda. p.77-106. Lisboa. 1999.

MENESES, J.N.C. 2022. **Os caminhos da riqueza: “Nova Agricultura”, Fisiocracia e Filantropia – uma economia agrária para o Brasil. História Econômica & História de Empresas**. 25, 1 (maio 2022), 196–231.

DOI: <https://doi.org/10.29182/hehe.v25i1.869>.

NUNES, Maria de Fátima; BRIGOLA, João Carlos. **José Mariano da Conceição Veloso (1742-1811) - Um frade no Universo da Natureza**. In: A Casa Literária do Arco do Cego (1799-1801). Sem livros não há instrução. Org: CAMPOS, F. M. G; LEME, M.O.R.P; FARIA, M.F; CUNHA, M; DOMINGOS, M.D. Biblioteca Nacional e Imprensa Nacional-Casa da Moeda. p.51-75. Lisboa. 1999.

PATACA, Ermelinda Moutinho. **Frei Veloso viajante**. In: Frei Veloso e a tipografia do arco do cego. Tradução. São Paulo: Edusp, 2019. Disponível em: <https://repositorio.usp.br/directbitstream/c9bbf74f-c011-4f26-aa4f-b43f15b8e55b/Frei%20Veloso%20viajante%20%282019%29.pdf>. Acesso em: 18 jul. 2024.

PEREIRA, Magnus Roberto de Mello. **D. Rodrigo e frei Mariano: A política portuguesa de produção de salitre na virada do século XVIII para o XIX**. Topoi. V.15, n.29, p.498-526. Rio de Janeiro. Jul/dez. 2014.

PEREIRA, Márcio Mota. **Saber e honra: a trajetória do naturalista luso-brasileiro Joaquim Veloso de Miranda e as pesquisas em história natural na capitania de minas gerais (1746-1816)**. UFMG. Minas Gerais. 2018.

SANTOS, Cândido dos. **O Jansenismo em Portugal**. Faculdade de Letras da Universidade do Porto. Porto. 2007.

SANTOS, Christian Fausto Moraes dos. **Das memórias do Arco do Cego: divulgação científica na América Portuguesa do século XVIII**. Diálogos. Vol.12, n.1, p.207-225. Maringá. 2008.

SANTOS, Christian Fausto Moraes dos; CAMPOS, Rafael Dias da Silva; MORAES, Eulalia Maria Aparecida de. **Da calcografia do Arco do Cego: divulgação e uso das**

ciências no século XVIII. In: História das ideias: viajantes, naturalistas e ciências na modernidade. Eduem. p.101-117. Maringá. 2010.

SANTOS, Christian Fausto Moraes dos; FIORI, Marlon Marcel; CAMPOS, Rafael Dias da Silva. **A Calcografia do Arco do Cego e a disseminação de saberes no Império português no final do século XVIII e início do século XIX.** CONFLUENZE; Vol. 6, No. 1, 2014, pp. 48-60, ISSN 2036-0967, Dipartimento di Lingue, Letterature e Culture Moderne, Università di Bologna.

SANTOS, Nívia Pombo Cirne dos. **O palácio de queluz e o mundo ultramarino: circuitos ilustrados (Portugal, Brasil e Angola, 1796-1803).** Universidade Federal fluminense. Niterói. 2013.

SEMEDO, Maria Guilherme; PEREIRA, Ana Leonor; PITA, João Rui. **Investigação científica e uso clínico da quina em Portugal na transição do século XVIII para o século XIX.** Dynamis: Acta Hispanica ad Medicinæ Scientiarumque Historiam Illustrandam, v. 43, n. 2, p. 505-531, 2023.

SILVA, Ana Rosa Coclet da. **Inventando a nação: Intelectuais Ilustrados e Estadistas Luso-Brasileiros na Crise do Antigo Regime Português (1750-1822).** Editora Hucitec. São Paulo. 2006.

SILVA, Elis Pacífico. **A construção de uma identidade nacional brasileira em visões estrangeiras (1808-1822).** Universidade de São Paulo. São Paulo. 2015.

THOMAS, Keith. **O homem e o mundo natural: mudanças de atitude em relação às plantas e aos animais (1500-1800).** Companhia das Letras. São Paulo. 1988.