From settlements to the botanical garden: the appropriation of plants used by indigenous peoples in the captaincy of Guayases, 1772-1806

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Received on 27 June 2019.
Approved on 8 Jan. 2020.

Translated by Naomi Sutcliffe de Moraes.

http://dx.doi.org/10.1590/S0104-59702021000100002

DIAS, Thiago Cancelier; MORAES, Cristina de Cássia. From settlements to the botanical garden: the appropriation of plants used by indigenous peoples in the captaincy of Guayases, 1772-1806. *História, Ciências, Saúde – Manguinhos*, Rio de Janeiro, v.28, n.1, jan.-mar. 2021. Available at: <http://www.scielo.br/hcsm>.

Abstract

The article intends to contribute to the history of science, indigenous history and the history of Portuguese America. We begin with the methodological assumptions of Dominique Pestre and the historiography on Portuguese America to investigate a network of indigenous settlements, the work of civil servants with naturalist knowledge, the shipment of botanical species for analysis in Portugal and, finally, the foundation of a botanical garden in the captaincy of Guayases (Goiás) from 1772 to 1806. We describe the indigenous contribution to the construction of natural history knowledge, and discuss the influence of Enlightenment concepts on the reform of the Portuguese colonial system in the captaincy based on Portuguese administrative documentation, letters and study of the application of laws and instructions.

Keywords: indigenous history; Portuguese America; captaincy of Goiás; drugs from the sertão; natural history.

This article investigates the Portuguese scientific and governmental practices in the captaincy of Guayases that resulted in appropriation of the local plants used by the indigenous people for food, medicine, ropes and dyes and their shipment to Portugal. The governors implemented colonial policies based on pragmatic laws and instructions that included the native people and natural resources in the region of the sertões (hinterlands) in a single occupation and exploitation plan. As part of this policy, colonial botanical gardens were established in Portuguese territories, and we discuss the garden located in the capital, Vila Boa de Guayases. We analyze this process in terms of the existence of natural history practices in the captaincy, the indigenous contribution to the creation of scientific knowledge and the history of science based on historical documents that are little-known to the historiography of the state of Goiás, of science, and of indigenous people. We begin the discussion with a preliminary deconstruction of what is historically treated as science, and then address the specific case of the captaincy.

The hegemonic understanding of science is a neutral, impartial and rational area of knowledge, independent of production contexts, and which seeks truth and human progress. In this understanding, science is perceived as an investigator of the real and, as reality is supposedly unique, its assumptions and conclusions are universal and applicable anywhere (Pereira, 2013). This understanding was questioned by historians of the history of science in the mid-twentieth century when investigating science in the colonial world. Initially, they studied overseas territories in an attempt to understand the extent of European social and intellectual history, especially the presence of ideals, intellectuals and social movements. The studies focused on the Enlightenment model of truth and rationality and the scientific society, with ethnic, mestizo, popular and non-Western knowledge thought to lack rationality. Changes in the area started to occur when, influenced by English historiography, the historians of science also began to examine the past of subordinated, invisible populations (Pestre, 1996).

Dominique Pestre suggests a methodological approach based on the assumption that the social relationship is unequal and asymmetric, and that the analysis of subjects and scientific practices should take this into account. He also notes the importance of contextualization, which allows us to go beyond a narrow analysis of the evidence of scientific discoveries, or the recurring conclusion that some populations have a "pathological impediment: social, psychological or epistemological"[1] (Pestre, 1996, p.7.), that makes collective rational construction of the natural world unfeasible. In addition to contextualization, there is the study of social subjects, their experiences and the different positions they occupy in the historical process of the constitution of scientific knowledge, which allows us to recognize the multicultural contribution that formed it. The contributions and benefits of scientific practices must be understood, but it is also critical that their perverse effects and consequences be analyzed and narrated (Santos, Meneses, Nunes, 2005).

Therefore, one must separate the understanding of what science is beyond the "epistemological exclusivism" that claims it to be the only valid knowledge, rationally able to interpret and act on the world in an efficient manner. Understanding that not only disqualifies other ways of comprehending the world, but also discredits the historical contexts and processes involved in constituting knowledge, relegating to obscurity the

contributions of other ways of thinking, marginalizing them and repudiating them, ignoring the historical processes of appropriation of ethnic and popular knowledge, plus that of subordinated groups, in scientific practices (Santos, Meneses, Nunes, 2005).

Palmira Fontes da Costa and Henrique Leitão (2008), when reading the historiography on science in the Portuguese Empire, highlight three different approaches: the first focused on the science and technology of navigation, the second on Jesuit contributions to mathematics and the natural sciences, and finally a third on the changes in Portuguese science caused by the introduction of Enlightenment assumptions in government practices, education and science from the mid-seventeenth century. They observed that historiography at first favored the analysis of chronicles, travel literature and letters in order to understand scientific practices in conquest and catechization efforts, in the mechanisms of information exchange and medical and natural history practices in the European kingdoms and, finally, the establishment of charity hospitals throughout the kingdom.

They also highlighted that, in the late twentieth century, historians of Portuguese science focused their efforts on understanding overseas scientific expeditions and the monarchy's plans to inventory the natural resources, populations and commercial possibilities of its overseas possessions in Asia, Africa and America. They drew attention to the existence of research on educational and economic reforms that took place from the mid-eighteenth century onwards, the influence of the naturalist Domenico Vandelli on scientific expeditions and on the establishment of the Ajuda museum and botanical garden, the existence of the Lisbon Academy of Sciences and other academies in the Americas, the establishment of an information network and the shipment of specimens to Portugal for analysis (Costa, Leitão, 2008).

The studies of José Aguiar (2011) indicate that the Portuguese monarchy, starting with the reigns of José I (1750-1777) and Maria I (1777-1815), employed scientific knowledge in administrative practices and in the means used to dominate and control the land and people conquered. Reformist administrators influenced by the Enlightenment, such as government officials like the Marquis of Pombal (1750-1777), Martinho de Mello e Castro (1770-1795) and Dom Rodrigo de Souza Coutinho (1795-1801), promoted mineralogical, botanical and zoological research in the Americas. The author Lorelai Kury (2004) demonstrates that viceroys and governors were strongly influenced by reading French and English Enlightenment authors, overlooking their libertarian political nature and concentrating on practical thinking. Together with governors and military officers, naturalist civil servants were central to the dissemination of scientific practices in the Portuguese administration, as some participated in the European scientific circuit, wrote in Latin and adopted the Linnaeus system, and had, for the most part, studied in Coimbra or in France. Many were born in Brazil, some were affiliated with the Lisbon Academy of Sciences, and some participated in exploratory or philosophical voyages (Kury, 2004).

The reform implemented by the monarchy consisted of a reorganization of territorial occupation by the Enlightenment-driven administration, with the objective of obtaining geographic, political, commercial and military control of the demographic resources, with agricultural and commercial plans and military organization, based on the production and control of information. The intent was to make the collection of fees and taxes more

effective and control the land, colonists and conquered indigenous people in a more rational, profitable way (Domingues, 2012). There was also an attempt to secularize and centralize administrative practices, recognize and catalogue natural resources through "urbanization, navigation and the incorporation of indigenous peoples into colonial society as labor and military reserves" (Sanjad, 2012, p.225).

The purpose of this text is to focus the analysis on the specific features of the captaincy of Guayases (Goiás) and discuss the indigenous contribution to the foundation of modern Portuguese science. In the captaincy, a network of Portuguese settlements was established for the indigenous peoples in indigenous territories because the regions were of interest to the Portuguese government due to the presence of gold. The settlements were strategically distributed throughout the territory to defend gold camps, farms, trails and rivers against attacks by indigenous nations and quilombolas (escaped slaves and their descendants), and prevent gold smuggling. The settlements were also intended to convert the indigenous people to Catholicism, train artisans in trades and build a labor reserve (Dias, 2017). Our hypothesis is that the existence and variety of indigenous people in the settlements, the fact that the Portuguese government sent employees, military officials and governors with naturalist knowledge to work in the captaincy, and the implementation of laws and instructions with the objective of administrative, scientific and colonial reform resulted in a process of mestizaje (miscegenation) between European and indigenous scientific knowledge and practices. This mestizaje is understood in a manner similar to that of Serge Gruzinski (2001, p.62), namely as cross-pollination in America "between people, ideas and ways of life coming from America, Europe, Africa and Asia."

Juciene Apolinário (2013) discusses the cultural exchange of botanical knowledge and practices between colonial Portuguese and indigenous people, highlighting interethnic relationships and the importance of the shaman and elders, and classifies indigenous knowledge, in the spirit of Lévi-Strauss, as the "science of the concrete." She and Rodrigo Osório Pereira (2013) identified scientific practices employed in settlements by Infantry Captain Domingo Alves Branco Muniz Barreto in Bahia. In works on other captaincies (Dean, 1991; Domingues, 2012; Pataca, 2016; Marques, 2005; Raminelli, 2008, 2012; Sanjad, 2001; Sevcenko, jun.-ago. 1996; Varela, 2007; Walker, 2009), we see that discussion of the indigenous contribution in the history of science, when it is mentioned, focuses on the use of labor and the indigenous origin of the plants sent to Portugal, with less emphasis on the contexts and on the indigenous individuals involved in the scientific practices.

The captaincy of Guayases, indigenous peoples and the colonial settlement policy

The indigenous people were the foundation of Portuguese colonial plans for the sertão where, without the "heathens," they would have been unable in the first centuries to cultivate the land and produce staples essential to the survival of the colonists, extract riches and defend themselves from indigenous nations and hostile European nations (Perrone-Moisés, 1992). From 1591 to 1725, expeditions (for slaves and gold) and traders coming from São Vicente and Belém, in addition to the Jesuit missions primarily from Belém, entered the indigenous lands in the valley of the Araguaia and Tocantins rivers,

in the Central-West of Brazil (Karasch, 1998). Beginning in 1725, a year in which more than 29kg of gold was mined, the colonial practice of sending military incursions into indigenous lands to obtain labor, either through alliances or war, shifted to occupation of indigenous lands with gold encampments (Taunay, 1923).

The discovery of gold led the Portuguese monarchy to authorize the occupation of indigenous lands through encampments and farms, in addition to routes followed by a heterogeneous group of Portuguese subjects who migrated, often seeking "promises of easy riches, or avoidance of justice or debts" (Vidal, 2009, p.249). The first settlement was founded in 1726 and called Arraial de Sant'Ana. It was the basis for the foundation of Vila Boa de Guayases in 1739, which was later reclassified as a capital when the captaincy of Guayeses was founded in 1749 (Lemes, 2012a).

The captaincy, one of the largest in Brazil, was organized around its sole town, and its council consisted of two ordinary (second instance) judges, three city councilmen and a prosecutor (Vidal, 2009). More that fifty settlements were founded in Guayases in the eighteenth century, most lasting only a short time (Boaventura, 2007), established "by setting up an 'itinerant troop' in an encampment for gold mining activity" (Vidal, 2009, p.249-250). The encampments were not an administrative unit, as they had no administrative autonomy, and civil organization was provided through religious orders and troops organized by the heads of families (Vidal, 2009).

Figure 1 shows the territory demarcated as the captaincy of Guayases in the eighteenth century is shown in the center (Goiás). The regions with hachures correspond to borders disputed with other captaincies. The map, constructed by reading administrative documents and demographic maps from the 1780s, indicates the existence of about 55,000 free, freed and enslaved people.

The captaincy was the second greatest gold producer in Brazil, second only to Minas Gerais. Its gold production indicates the importance of the captaincy to the economy of the Empire. According to Moraes (2011), from 1726 to 1735, its gold production accounted for about 16% of the total in Portuguese America. Between 1736 and 1751, it reached 20%, followed by a progressive decline: 16% between 1752 and 1778 and 14% between 1799 and 1822.

The rudimentary techniques used for gold mining and the brief existence of the encampments, however, meant that production depended on expansion into regions populated by indigenous nations. There were two methods employed to obtain access to new territories. The first was war, with the slaughter and enslavement of the indigenous people. The second was forced or negotiated migration through alliances of indigenous villages to Portuguese settlements.

The map in Figure 2, based on an original prepared by government secretary Ângelo dos Santos Cardoso in 1753, has been modified based on historical documents and historiographic research, but is not intended to be a snapshot of the occupation of Guayases. Rather, it is an outline of what we could call Portuguese America and Indigenous America from the Portuguese point of view. The central area was under the control of the colonizers and was the location where gold was mined. Two years later, Ângelo dos Santos Cardoso indicated that, over a period of about 30 years, the area conquered covered more than

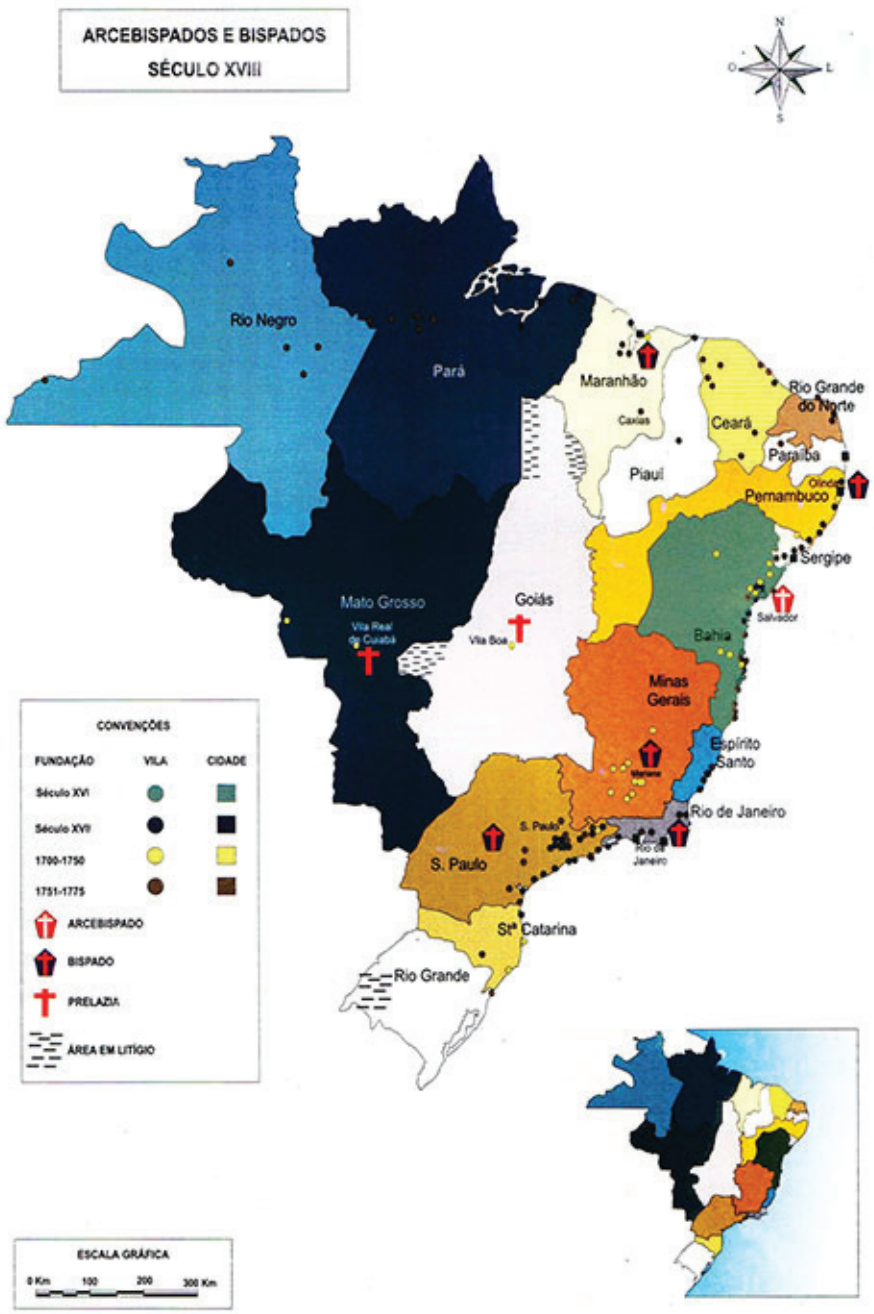

Figure 1: Map of Portuguese America (Rocha, Moraes, 2001, p.61)

Figure 2: Modified map of original probably authored by Ângelo Santos Cardoso (1753)

300 leagues (about 1,800km) in latitude and 200 leagues (1,200km) in longitude in a straight line (cited in Lemes, 2012b).

The settlements were an important tool in this process of occupation. The map shows the locations of indigenous lands and which indigenous nations occupied them. To the north were the indigenous lands inhabited by three different peoples pertaining to the Akwén sociocultural group (Akroâ, Xacriabá and Xavante). To the northwest were the Iny (Karajá, Javaé and Xambioá). On the border with the Cuiabá captaincy were the Boé (Bororo), who also occupied settlements along the royal road leading to the São Paulo captaincy. The Paraniá (Kayapó do Sul) were to the south. It is important to stress that, under law, the settlements were established in indigenous regions, as close as possible to gold camps, farms, roads and the capital.

There were three settlement policy phases. The first was from 1731 to 1751, when four settlements were founded for the Bororo to fight the Kayapó to the south and three in the north to settle the Akroâ and the Xacriabá. The settlements were also intended to protect the principal roads, such as that connecting the São Paulo captaincy and the capital of the captaincy of Guayases, or that connecting the capital and leading west towards Cuiabá, or the third road north towards Bahia and Belém do Pará. The map also shows two areas where cattle were raised to the northeast, probably initially occupied during this period by cattle ranchers from the São Francisco River region.

The second settlement policy phase was when Governor João Manoel de Melo declared a "just war" against the Akroâ, Xacriabá, Xavante and Kayapó in 1762 (Dias, 2017). In our discussion, we are interested in the third phase, during which Governor José de A.V. de Soveral e Carvalho (1772-1778), commonly known as Mossâmedes, renegotiated peace with the Akroâ and Xacriabá, and settled the Xacriabá in the recently restructured Santa Anna do Rio das Velhas settlement (1775-?) and the Akroâ in the São José de Mossâmedes settlement (1775-1832). Both of the settlements were organized to defend against attacks by the Kayapó (Dias, 2017).

On Bananal Island, he founded the Nova Beira settlement (1776-1781?) for the Karajá, Javaé and Xacriabá, who signed an allegiance treaty and became allies. Mossâmedes inaugurated the transition from a policy of exterminating the indigenous peoples to assimilating them. Later, Governor Luis da Cunha Meneses (1778-1783) enlarged the Mossâmedes settlement and established another two: one called Maria I (1781-1813) for the Kayapó, and the other named Salinas (1781-?) for the Karajá and Javaé who migrated from the Nova Beira settlement. His brother, and also governor, Tristão da Cunha Meneses (1783-1800) founded the Carretão settlement (1788-?) for the Xavante (Dias, 2017).

The São José de Mossâmedes settlement supported colonial expansion because it provided supplies and labor. It was also connected by rivers to another four Pombaline settlements and was only a few leagues from Vila Boa de Guayases (Figure 2). From it one could reach the Araguaia River and then the Tocantins River, leading to Belém do Pará. Named after its founder, Mossâmedes, it was designed to assimilate the indigenous people through work. During the first year after the settlement was established, he stated that "it

seems to be indispensable in the neighborhood of this Vila to have an establishment that serves as a model for all, and encourages industry, as it is also a Seminary for Craftsmen" (Carvalho, 20 set. 1776). In another letter to State Secretary Martinho de Melo Castro, he clarifies that the objective was to found "a normal, permanent establishment that would be the envy of all the wild natives, who would visit the village, and serve as a university for those who wished to settle in it" (Carvalho, 2 jan. 1779).

In 1780, when its population was at a peak, it had 814 Karajá and Javaé. Second Lieutenant Izidoro Roiz da Silva stated that 384 were learning mechanical skills: 80 "boys" in the school, 70 "girls" were sewing, another 70 were spinning cotton, eight carpenters, four shoemakers, two tailors, seven cowboys, eight weavers of cotton cloth, six cart drivers, four shepherds, ten makers of roof tiles, 100 in the fields, eight women in the mill making corn and cassava flour. In that year, the total indigenous population of the settlement was: Akroá (41 men and 40 women), Kayapó (11 men and 12 women), Xavante (4 men and 2 women), Karijó (14 men and 22 women), Karajá (213 men and 121 women) and Javaé (200 men and 130 women) (Menezes, mar. 1780). Note that, in the Mossâmedes settlement, six different indigenous nations coexisted, with at least four languages that were mutually incomprehensible. In general, it was common for there to be different cultures in the settlements, which were spaces for cultural hybridization.

One of the objectives of Portuguese colonial policy was to eliminate what they referred to as "paganism" (the indigenous sociocultural system), and the means to that end was catechesis and work. The institutions developed to carry this out were the settlements. The unexpected result was the *mestizage* of indigenous knowledge and practices with those of the colonizers, in both directions.

This colonial policy is evident in the structuring and organization of the São José de Mossâmedes settlement. A stream diverted from the Serra Dourada and also fed by the Fartura River supplied the settlement (Mattos, 1874), crossed plantations with 2,000 banana trees, irrigated a vegetable garden, provided water for residents and livestock, and powered the cassava and corn flour mill and yarn spinning house (1780). Our attention was drawn to the existence of a special structure on this diverted stream, for washing, called a bathing house – probably intended to allow the women to bathe far from the eyes of the men (Dias, 2017).

There must have been two schools, but their location can only be inferred. There was a church, a sacristy and an area for old objects that might be reused, houses for soldiers and for the governor, 32 "barracks" serving as single-family homes for indigenous families, and also a barn, cattle ranch and corral. The cattle was used for food, leather production and animal traction. They raised horses, pigs, chickens, ducks and probably hunting dogs. All of these animals, except the ducks (*Cairina moschata momelanotus*) – from North America – were introduced by the colonizers. Near the Fartura River they planted corn, squash, beans, peanuts, papaya and cotton (Dias, 2017). These structures are shown on the map in Figure 3.

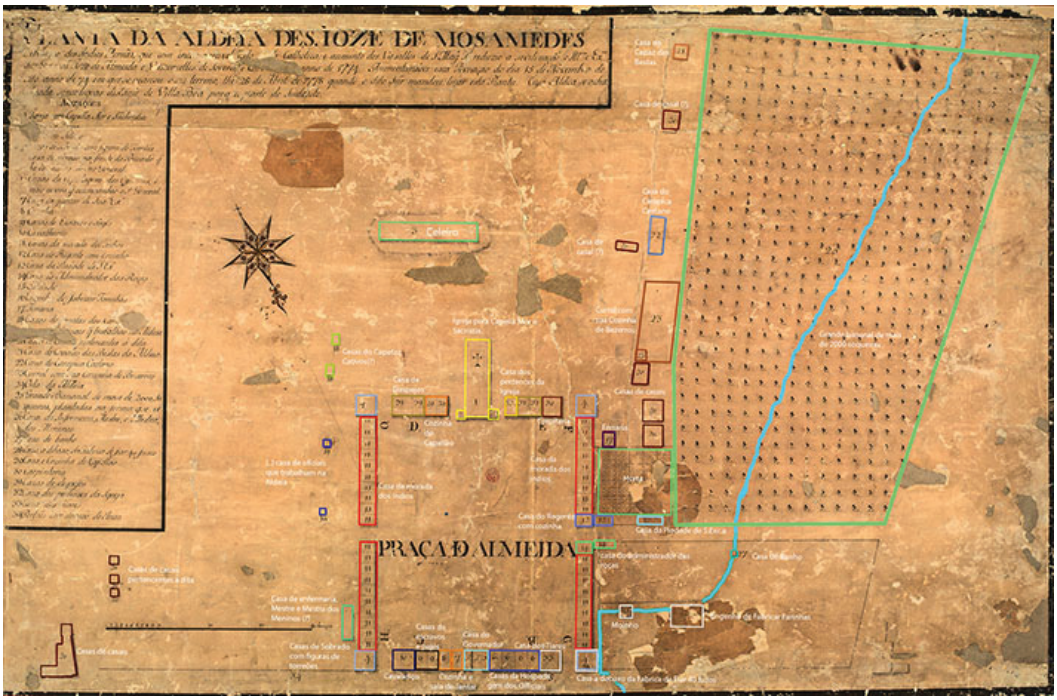

Figure 3: Modified map of the São José de Mossâmedes settlement, based on original dated 1774 (Dias, 2017, p.64)

The Diretório dos Índios (a law in force from 1758 to 1798) encouraged the presence of whites in the settlements, but any person of any type or condition could reside there and "achieve all honors and privileges granted to residents by the Monarchy" (Furtado, 1757, section 80). Africans also resided there, as seen by the existence of slave quarters consisting of two houses. Governors were also present in Mossâmedes. Mestizage, in today's terms, was part of the colonial plan to civilize the indigenous people through work and catechesis, but it also had a third aspect: the appropriation of native drugs known and used by the natives, based on the precepts of natural history.

From extraction to cultivation

The understanding of what was meant by "drug" during that period is similar to the etymology of the word in Dutch, namely "dry product," and could mean food, dye, medicine, poison, ropes and pleasurable products (Carneiro, 1999). The Diretório dos Índios standardized the settlements as locations for extracting drugs from the sertão, leading to later interest in the cultivation of native plants used by the indigenous people for commercial purposes (Furtado, 1757, section 36). The Diretório dos Índios governed partition of the profits from the extraction and sale of drugs. It determined what portion should be given to the indigenous people, with the percentage based on how much they had worked, and they could only obtain profits if they finished the fields (section 49). Payment was made by the general treasurer, who paid them with cloth (fabrics). Thus, the settled indigenous workers had no access to the profits of their work in currency, and the

justification for this was based on their supposed inability to deal with money (section 58), a colonial assumption. The indigenous leaders, the captains and sergeants could send four to six natives to extract drugs from the sertão for themselves (section 50), but one third of the natives should serve the inhabitants when extracting drugs from the sertão or from the crops planted (section 63).

In the captaincy of Guayases, one can also identify the policy established by governors and military officials to prospect the drugs used by the indigenous peoples. A first sign is the words of the Head of the Royal Treasury and Intendant of Gold (1775), Joaquim José Freire de Andrade, who was appointed Director-General of the Indians the following year. Andrade (26 jul. 1774, p.154) praised the military troops sent by Mossâmedes that traveled down the Tocantins River to Belém do Pará, commenting on the usefulness of the new commercial route to the government: "one can extract leather and medicinal drugs, which are so abundant in our sertão, via that river." Another sign is seen in the words of second lieutenant José Pinto da Fonseca, who commanded a expedition to Bananal Island (Araguaia River) in 1775. He affirmed, in a letter to Governor Mossâmedes about the Karajá and Javaé, who would be settled the following year in the Nova Beira settlement, that "these Indians know of many medicinal plants on that continent, which they use for healing, that look like miracles" (Souza, [1777?], p.129). The extraction of drugs used by the indigenous nations at the Mossâmedes settlement occurred in the 1780s, when colonial policy began to implement knowledge of natural history in the administration of the kingdom. This can be seen in a letter written by Governor Luís da Cunha Meneses to his brother, Tristão da Cunha Meneses, who later followed him as governor. The letter describes the practices, customs, beliefs and rituals of the indigenous peoples in the settlements: Iny (Karajá and Javaé) and Kayapó do Sul (Paraniá) (Aparício, 1998). Apparently it was written to be read at the Lisbon Academy of Sciences, because it was written following the methodological format called *Breves instruções aos correspondentes da Academia das Ciências de Lisboa* (Brief instructions to Lisbon Academy of Sciences Correspondents) (1781).

The *Brief instructions* described how to gather material to develop an inventory on the economic possibilities to be exploited in Portuguese possessions. The members of the Academy wished to collect animals, plants and minerals in order to write a compendium and establish a national museum, and with this collection "advance the arts, commerce, manufacturing and all other branches of the economy" (Breves instruções..., 1781, p.3). The *Brief instructions* included methods for selecting, preparing and packing animal, plant and mineral specimens for shipment to Portugal. In addition to descriptions of nature, they suggested examining aspects "related to the morals of the people," based on "religion, politics, economics, arts, traditions, etc." (Breves instruções..., 1781, p.44).

The Portuguese interest in obtaining drugs from the sertão was clear. Researchers were asked to send details about the plants, animals and minerals consumed and used by the indigenous people, their artifacts and their arts, understood in the eighteenth century as ways of doing things. In terms of agriculture, interest focused on the "uses of and defects in farming tools," which included knowledge of the plants used for "sustenance, clothing, medicine, dyes, etc." As for animals, they wished to know "how to hunt and fish," but also "the animals they used for work and other domestic services." Regarding minerals,

investigation concerned which minerals the indigenous peoples obtained from the land, their uses and "how to subjugate them for these uses." The term "subjugate" (*reduzir*) recurs in the documentation and, in the context analyzed, means to use the natives to carry out the activities that they already performed, but for the benefit of the Portuguese. This subjugation also encompassed the techniques and manners of making "the perfection and imperfection of the arts, manufacturing, and all types of industry, and commerce existing in the country" (Breves instruções..., 1781, p.45).

The governors had access to the management of the indigenous world when they spent days at the São José de Mossâmedes and Maria I settlements, near the capital. They talked to their officers and spoke to the indigenous leaders appointed to fulfill the orders of the Crown (*índios principais*) and the leaders of indigenous villages (*maiorais*), generally through an indigenous military interpreter. At one point, Governor Luís da Cunha de Meneses stated that the indigenous people did not know or were not afflicted by "the effects of so many diseases that we suffer," and additionally "since they know the diseases that affect them, they have the experience needed to cure them ... through knowledge of many plants with healing effects" (cited in Aparício, 1998, p.371). Further on, he specifically mentioned a plant used by the Iny (Karajá and Javaé), "a tuber called Paraguaia and here in Nova Beira [Bananal Island], when used directly or as tea, has proven to be better than quinine for the constant fevers, which it cures easily" (p.371). Drugs like the tuber described above were strategic in Portuguese expansion into regions with tropical diseases, as Europeans had difficulty withstanding pathogens like dengue, yellow fever, malaria, Chagas disease and, probably, leishmaniasis (Diamond, 2013).

Later in the letter, the governor described the use of uruku (*Bixa orellana*) for body painting: "to protect against bites from mosquitoes, flies and other insects that abound on the margins of most of the rivers where they live" (cited in Aparício, 1998, p.372). The historian Sérgio Buarque de Holanda (1994) arrived at the same conclusion when stating that paint made of uruku and jenipapo (*Genipa americana*) protected against mosquitoes.

According to the governor, the use of uruku was also related to the ability to move between venomous animals and predators: "the smell from the same fruit protects them from being attacked by other animals, such as caimans, anacondas and boa constrictors ... as seen repeatedly by the daring with which they enter the water, among all of these animals, fearlessly" (cited in Aparício, 1998, p.170). Sérgio Buarque mentioned the use of both uruku and jenipapo by indigenous hunters: "this can also be linked to the easy observation that certain colors exert a real power of attraction or repulsion over animals. Red attracts deer, while black does not scare prey, while the white-lipped peccary becomes furious when it seems bright colors" (Holanda, 1994, p.61).

In a letter written by the Director-General of the Indians, Ignácio Joaquim Leme (10 set. 1783), to State Secretary Martinho de Melo e Castro, there is a description of the scientific experiments conducted on *erva-andorinha* (probably *Euphorbia hyssopifolia*) and the use of tucum fibers (*Bactris setosa*) in the settlements. He mentions that Captain João Goudieley confirmed that he had used *erva-andorinha* "repeatedly and experienced this admirable effect in his domestic [slaves]." To test the efficacy of *erva-andorinha*, he noted its use to treat punctured eyes and

> told his Aide-de-camp José Pinto da Fonseca that, in order to test it, he had pierced the eye of a duck and, after five days, brought the healed animal to his Excellency General Luís da Cunha, with no more than a small scratch in the eye that had been injured. His Excellency punctured both of the duck's eyes and repeated the cure every day for five days, at which point the duck appeared to be completely healed except for signs of the two blows to the duck's eyes (Leme, 10 set. 1783).

They proved that the duck's eyes were cured when it found its way to the corn. A package of *erva-andorinha* was sent to Portugal for analysis and the shipment of a larger quantity, plus seeds, was proposed, "so that Your Excellency may plant it to see if it grows in Europe" (Leme, 10 set. 1783). In the first shipment, a small quantity was sent, and due to the fact that it would arrive dry, Ignácio Taques recommended: "I believe that its powder will have the same effect, three times as fast, and perhaps distilled, by chemistry precepts, its solution will have the same effectiveness." In another letter, he promised to send another batch, including seedlings, but he feared that if the plant was not watered during the sea voyage, it would certainly dry up" (Leme, 12 maio 1784).

The plants used by the indigenous nations were compared to "similar" plants used in Europe and described based on their applications. In Europe, there was a plant called greater celandine (*Chelidonium majus*) [*andorinha* in Portuguese] that was used similarly. The Bluteau (1712, p.270) dictionary described it thus: "*Andorinha*. The plant is called this because swallows [*andorinhas* in Portuguese] carry the plant to their nests and it is believed that they feed it to their chicks, who are born blind, to allow them to see."

The common practice was to give the same common name to different plants that had similar qualities in terms of their characteristics: healing, food, dyes, poison and production of objects. In practice, the name designated a quality common to very distinct species, rather than a particular plant. In general, the assessment of the plant was based on characteristics like taste, smell, edibility, shape and colors (Marques, 1999). The names used included generic terms such as "tuber called Paraguaia," those used in the general Nheengatu language, such as uruku and jenipapo, or Portuguese names, such as the plant called *andorinha*. The innovation was the evaluations based on natural sciences.

In addition to the *erva-andorinha,* a skein of tucum rope and the leaves of the tucum palm were sent to Portugal from the São José de Mossâmedes settlement. The rope was compared to linen in its capacity and water resistance, probably via tests carried out in the settlement itself:

> This is the strongest there is with such substance, and to sustain a heavy weight a rope of linen 100 inches thick was needed, but for one ... of tucum a thickness of only 10 inches was needed. They are preserved well in water, and this circumstance reminds me that they were examined, and proof of their strength, they will be very useful for tying. There is an abundance of these palm trees in the Americas, but they are so fertile in Pará and Maranhão that I feel that just these two states could supply ties for the ships of His Majesty (Leme, 12 maio 1784).

Scientific investigations were carried out at the settlement following natural science principals, such as comparison and measurement of the capacity of the tucum rope, pointing out practical conclusions. During the same period, similar experiments were

carried out to produce rope using hemp in the northeast, the bush *jecum* [tucum?] in Bahia and *guaxima* in Santa Catarina. The final tests were performed at the Rope Factory of the Court in Lisbon (Domingues, 2012).

During the term of João Manuel de Meneses (1800-1804) he shipped to Portugal "seven boxes with the numbers and products of Nature pertaining to the Animal, Mineral and Vegetable Kingdoms." According to Meneses (26 jul. 1800), there was interest in acquiring from the locations the "medicinal plants and roots ... of which I have news that produce an even better effect in this country that those that come from other countries, especially cinchona [*Strychnos pseudoquina*] and *calumba* [*Simaba ferruginea A. St.-Hil*], which work wonderfully."

In these boxes there was also, together with the natural products, a description of the tests carried out, which took into account the appearance, taste, color, the smell and color when burned and the quality of the extracts made. Two of these boxes contained "cinchona" [from the Cerrado savannah] and the analysis contains evidence of reading and references to Linnaeus when they state that it is not the same as the Peruvian *Chinchona officinalis* found in their writings. In another box there was a container of jelly made with a mixture of chicken, turkey and "cow's feet," mixed with cinchona salt, forming an extract. The conclusion was that the cinchona found was not the same as the Peruvian plant, but had the same effects. According to the document, it cures intermittent and noxious fevers, treats the putrefaction of humors and closes skin ulcers (Meneses, 26 jul. 1800).

In the analysis, a comparison is made between the plants found in the captaincy and those from different places but with the same name. This is the case of another plant in the Cerrado known as "Jalapa" (*Mandevilla ilustris*) which, based on the description of its appearance, is found to be different from the plant from Mexico, but has a similar purgative effect. Another was called "contra cria," a plant to promote miscarriage, but no experience is described, it is just compared with those from Mexico, Peru and the Island of São Vicente, stating that it works better than the others (Meneses, 26 jul. 1800).

Another plant from the Cerrado, generically named "calumba" (*Simaba ferruginea*), which according to the report "is very different from that from Asia and was named *Calumba Goynense*" was also sent, citing that "the inhabitants use it for all types of fevers, with amazing effects ... when they are bit by a venomous snake, they grate a bit in warm water and apply the mixture to the bite." Another fever-reducing plant sent was "*cinco folhas*" [five leaves] which, as with the others, is "used by the inhabitants of the country." The term "inhabitants of Brazil" indicates that the plants were originally used by the indigenous peoples, but the knowledge of colonial residents was probably relied on also. And lastly, one of the boxes contained a portion of saltpeter taken from the salt pan, along with another mineral called "Glauber salt" (sodium sulfate) (Meneses, 26 jul. 1800).

Another study on indigenous use focused on a type of yam (batata cará). This was seen in the letter from Chief Surgeon José Manuel Antunes da Frota to State Secretary Viscount de Anadia that research on medicinal and food plants was a government priority. According to the surgeon, at the behest of Governor João Manoel de Meneses, a variety of natural products were sent to Portugal to be analyzed. One of the boxes contained a yam "that the natives called cará [probably *Dioscorea triloba*]," another contained flour of the

same yam, which was indicated, according to the specialist, as an ingredient of crackers "appropriate for consumption by laborers" (Frota, 7 mar. 1802). In the sixteenth century, Gabriel Soares de Sousa (1851, p.171) had already mentioned knowledge of cará yams among the indigenous people in Bahia: "they eat them cooked and baked, like yams, but they taste better: most of them are white, others purple, others white inside and purple outside near the peel, which are the best, the tastiest; others are all black." Thus, there was a large variety of species called "batata cará" in Brazil, and most were probably of American origin.

Governor Francisco de Assis Mascarenhas also sent cinchona. Dalisia Doles states that a shipment was sent from Guayases to Belém via Araguaia-Tocantins in 1806. A troop made up of five pedestrians, 14 Xerente, 48 Kayapó and 27 oarsmen carried "1,640 arrobas [24,600kg] of a variety of items: sugar, cotton, cinchona, tobacco and other articles" (Doles, 1969, p.257). Indigenous workers were involved in all stages of appropriation, from the knowledge involved in extraction, cultivation and treatment of the plants to transport.

Governors in different captaincies sent drugs to Portugal, sometimes together with reports from physicians and practitioners to be tested at the Royal Military Hospital in Lisbon, "in the form of syrups, baths, decoctions, reductions or poultices" (Domingues, 2012, p.141), at the Rope Factory of the Court when intended for producing ropes, and at the Royal Army Arsenal for the production of ships and architectural structures, while drugs for dyeing were sent to the Chemistry Laboratory of the Ajuda Botanical Garden for tests (Domingues, 2012). This process of appropriation of indigenous drugs based on the precepts of natural history arose from the reorganization of the colonial system and the publication of the Diretório dos Índios.

The Enlightenment premises on which Luso-Brazilian scientific knowledge was based beginning in the mid-eighteenth century were inter-weaved with a pragmatic scientific and philosophical understanding of the study of nature. The question was how to control nature, how to make it serve man, understanding it as providence, whether divine or natural, that, as the creation of God, would provide the solutions for human problems, with science only needing to uncover them (Kury, 2004, p.110).

The parameters of the colonial system reform were the experiences of other countries, principally the "Franco-English hegemonic model, in which scientific practices became an integral part of the administrative routine of the empires" (Kury, 2004, p.115). The instructions received by Mossâmedes in 1771 forcefully stated that French and English methods – considered gentler and milder that those of the Portuguese and Spanish – should be followed. He developed policies related to the indigenous people based on "books, studying North America, the means used by the French and English, and that we should have adopted, and corrected through practice" (Carvalho, 2 jan. 1779).

Governor Luís da Cunha Meneses clearly noted the reading he had done to implement the plan to expand the indigenous settlement system based on French and English experiences, but without discarding Spanish and Portuguese efforts. He wrote that he leaned about Portuguese colonial expansion in Africa, Asia and America by reading Father Zafito, of the Society of Jesus [Jesuits], and that he had studied the history of colonization of North America and the description "of the customs of the inhabitants of all of that part of Canada by Mr. d'Bacquille de La Potheire." He also read about the conquest of Mexico and

Peru by the Spanish in the "History of the Incas, by Marmontel," as well as the "Natural, Civil and Geographic History of the Orinoco ... by Father José Gumilha [*sic*] of the Society of Jesus ... which discusses in greater detail the customs of the Tribes ... which differ little from those found here" (cited in Aparício, 1998, p.365). He mentioned that he sent these books to his brother, who replaced him as governor. And that he should read another two important works: "The voyages of Condamine and Mr. Bouguer along the large Paraguay, Prata and Amazon rivers; when they completed the astronomical observations that the Academy of Sciences of Paris had asked them to make, in the large d'Yaruque valley near Cuenca, in Quito Province, in 1745" (cited in Aparício, 1998, p.376).

The movement towards incorporating French and English administrative practices with regard to knowledge was undertaken "according to a logic based on networks between centers of knowledge production and of preparation and redistribution of scientific products" (Kury, 2004, p.110). In the captaincy of Guayases, the governors wanted the settlements to fulfill the role of research and production centers, while redistribution was the responsibility of the botanical garden established in the capital.

The establishment of a network of botanical gardens and the garden in Vila Boa de Guayases

The desire to identify and classify plants and acclimatize them in botanical gardens for medicinal studies arose in Pisa (1543) and Padua (1545). The objective was to improve the studies undertaken in ancient Greece by thinkers such as Dioscorides, Theophrastus, Galeno and Pliny. This type of garden multiplied throughout Europe, in general linked to universities, such as the "Italian gardens and those in Montpellier (1598), Oxford (1621) and Edinburgh (1670), or as royal establishments, such as the Royal Garden of Medicinal Plants in Paris (1640)" (Sanjad, 2001, p.23). In the Portuguese Empire, the first botanical gardens were private and appeared in the sixteenth century. Garcia d'Orta had one in Goa and the German physician Gabriel Grisley had a garden in Lisbon in the late seventeenth century. These gardens emerged directly linked to physical philosophy (medicine) and the theory of humors.

In the eighteenth century, the idea of gardens as a place for medical research began to compete with the concept of gardens as institutions to "collect, preserve and distribute plants hitherto unknown to Europeans" for use as food, medicine and manufacturing (Sanjad, 2001, p.26). The changes in the Portuguese scientific system reached a turning point in 1759 when the Jesuits were expelled and there was a break with the knowledge consolidated by them, such as the Hippocratic, Galenic, and Scholastic schools, with a consequent harmonization of the ideas from the medical and natural sciences. The Jesuits were the professors at the University of Coimbra, training medical philosophers and some of the aristocratic elite that filled government positions.

As a result of their expulsion and as part of the effort to move towards Enlightenment ideals, the monarchy invested in scientific institutions in accordance with parameters derived from the physical and natural sciences, including the foundation of the Royal Natural History Office and the Ajuda Botanical Garden (1768), the reform of the University

of Coimbra (1770-1777), which included the establishment of a botanical garden, and the foundation of the Academy of Sciences of Lisbon (1779) (Marques, 1999). The gardens in Portugal came to have an organized, scientific character, with analyses based on the theory of Linnaeus and educational practices. A scientific academy was established in Rio de Janeiro, and it was home to a garden in the 1770s (Marques, 2005). There were also private initiatives, such as that of Antônio José de Araújo Braga, who established a garden in Barcelos in the 1780s, and that of Antônio José Landi, "who, until his death in 1791, owned a botanical garden and a zoo in Belém" (Sanjad, 2001, p.85).

To meet the demands of institutions in Portugal, the monarchy hired researchers and professors of physics, astronomy, chemistry, mathematics and natural history in Bologna, Genoa and Padua (Domingues, 2012). This investment in natural history expertise was intended to modernize and diversify agricultural production, but also to entertain and instruct the aristocracy by exhibiting the grandeur of the overseas territories in museums and gardens (Raminelli, 2008).

Domenico Vandelli (1735-1816) was one of the foreigners hired. He worked at the Royal Natural History Office and at the Ajuda Botanical Garden from 1768 to 1810. He was a chemistry and natural history professor at the University of Coimbra from 1772 to 1791, and his students, mostly Brazilians, were sent for professional preparation as naturalist scientists from the Ajuda Botanical Garden in order to carry out overseas natural history research missions (Brigola, 2009).

He participated in the development of an information and research network made up of natural scientists, engineers, physicians, colonists and civil servants. The information network sought to recognize the physical limits of the overseas possessions, their commercial potential, and renew and expand Portuguese knowledge by identifying and describing the use of resources by the indigenous populations. The production of chorologies, maps, chronicles and official documents was encouraged, with the aim of diversifying and expanding Portuguese trade in products derived from nature (Domingues, 2012). In addition to commercial objectives, Vandelli proposed the preparation of a natural history of the colonies. Therefore, the naturalists sent overseas would describe, sketch, collect, store and send plants, animals and minerals discovered based on natural philosophy (Pataca, 2016).

In the instructions written by Vandelli for the philosophical trip organized by Alexandre Ferreira, the following statements stand out: "the natives, since they are the most intelligent experts on that continent, are also the best to teach us the names of the plants and their uses, principally those from which colors can be extracted and those that can be used for the diseases specific to the America where they live" (cited in Pataca, 2016, p.92).

In the report written for Queen Maria I, he described what would be agricultural science: "the knowledge of plants, their nature, the climate, and the land where they grow" (Vandelli, 1788, p.1). For knowledge about plants there was botanical knowledge, arising from "physical experiments and reflections" (Vandelli, 1788, p.1), whereas climate and the land were studied in the botanical gardens.

The process of appropriation of the native plants used by the indigenous peoples was part of a broader movement to cosmopolitanize the flora and land fauna in America. This research was

based on humoral theories for centuries, with the Jesuits as the principal researchers in Portugal (Walker, 2009), and then began to be conducted in a learned, scientific manner through the use of two new species exchange instruments: the herbarium and the colonial botanical garden (Dean, 1991). With the botanical garden, "the possibility of generating information on the new plants to support transfers with tested cultural techniques considerably increased the ability to disseminate this information among potential farmers" (p.220).

The government passed a law in 1798 establishing a network of colonial botanical gardens in Portuguese America. This plan became effective with the establishment of the Belém do Pará Botanical Garden. Other captaincies, such as the captaincy of Guayases, would receive similar orders. The purpose of creating botanical gardens was to "bring together the natural products of the colonies and carry out tests for large-scale cultivation, as well as acclimatize commercially interesting species from other regions" (Sanjad, 2001, p.78). Agricultural diversification in overseas possessions was sought through the search for new native species with commercial potential and the introduction of exotic species in local production. Additional reasons to provide new species to the European botanical gardens included scientific research, collection and the enjoyment of the aristocracy.

The Belém Garden was thought of as a model for others and was the key to organizing a future network of botanical gardens. It was located on the coast of the Amazon, where it was to support the gathering, domestication and distribution of plants of commercial interest based on indigenous uses, as well as promote the acclimatization of exotic plants. In addition to these objectives, there was yet another: "to provide support for the introduction in Portuguese lands of species smuggled from French Guiana, mainly from the La Gabriele [botanical garden]" (Sanjad, 2001, p.61). This smuggling reached a peak with the invasion of French Guiana by troops from Grão-Pará and Pernambuco in 1809 and was characterized by the shipment of plants collected by the French to Portuguese possessions in America, which continued until 1817 (Sanjad, 2001).

The governor of Grão-Pará and Maranhão, Francisco Maurício de Sousa Coutinho, was one of the main designers of the botanical garden system. He built the first in response to a royal letter in 1796. He ordered nurseries to be built in the Belém garden to acclimatize exotic plants so that, in his words "at the same time we can grow indigenous plants that are not yet being cultivated, but whose products are sought after in the forests" (cited in Sanjad, 2001, p.78) As the governor said to his brother and Secretary of the Navy and of Overseas Domains, Rodrigo de Souza Coutinho (1796-1801), "I hope that your excellency makes this garden serve as a model for all the others, which should be established in other captaincies in Brazil, and that they are so extensive that the exotic and indigenous plants you have cultivated can be sent to other captaincies" (cited in Sanjad, 2001, p.79). The Belém do Pará garden was to serve as the head garden in the beginning, for initial acclimatization, and then supply the gardens in other captaincies with seeds and seedlings, and this did in fact occur.

Secretary Rodrigo de Souza Coutinho "sent letters ordering the creation of gardens similar to that in Pará in São Paulo, Salvador, Goiás, Olinda, São Luís and Vila Rica" (Sanjad, 2001, p.84). These "Notices" were accompanied by copies of catalogs of plants from the garden in Pará. Knowledge of the plants available at the Pará garden allowed the governors to request surplus plants. Some governors requested plants even though they did not have

a garden in their captaincies. The network of botanical gardens was designed to circulate plant species not only within Portuguese America, or between it and Portugal, but also in possessions in Africa (Sanjad, 2001).

Governor João Manuel de Meneses (1800-1804) was responsible for construction of the Botanical Garden in Guayases. The sick governor bought chief surgeon José Manoel A. da Frota with him, who assisted him on the journey along the rivers to Vila Boa. Frota took on other roles in the government, such as carrying out the plan that included exploitation of saltpeter in the salt flats and the establishment of a botanical garden, for which he had to undertake the "harvesting of seeds from all trees and plants and ... make inquiries about natural products" (Marinho, 7 maio 1804).

A letter from the governor to State Secretary Viscount de Anadia states that the garden was originally the property of José Francisco Hutim and was chosen because it was "convenient and had land ... for the foundation of the Botanical Garden" in the capital. In order to establish the garden, "the houses and farms mentioned should be finished before initiating sowing and planting according to the Plan provided in the Royal Notice" (Meneses, 4 abr. 1803). It is not certain whether the garden was started in 1801, as ordered, or later, but by 1803 it had "many plants, which depend on care to be maintained." Nelson Sanjad (2001, p.86) argues that the botanical garden in "Goiás, founded in 1801, does not appear to have prospered, and those in São Paulo, Ouro Preto, São Luís and Salvador were only founded after Brazilian independence."

Next to the garden was a coffee plantation, with crops sent for sale in Belém do Pará. The coffee farm belonged to Manoel José Leite and bordered that of José Francisco Hutim. The governor wrote that he ordered him to "take care of a farm ... and plant coffee there, then when transported to the city of Pará, the proceeds will significantly offset the expenses of the Garden" (Meneses, 4 abr. 1803). The difficulty in founding the garden was to convince the Royal Treasury Council that the orders came from the government and that it should provide gold to carry it out.

According to Governor João Manuel de Meneses (4 abr. 1803), the plan "was seen in this capital as heresy, and fought by the members of the Royal Treasury Council as a superfluous expense," especially the Gold Intendant, Manoel Souto Coelho. A group of local "good men" declared their discontent with the governance of João Manoel Meneses. It was decided that 1,319 *oitavas* of gold (4.73kg) would be earmarked for the project, but apparently was never paid, since the council in charge of the Royal Treasury of the captaincy alleged it was unaware of the 1798 notice, an act against Governor João Manuel de Meneses. The governor, in an attempt to prove that the king had ordered construction of the garden, showed the representatives of the Royal Treasury Council the notice dated December 19, 1798, whose contents were as follows:

> the Governor and Captain General of the Captaincy of Pará have established a Botanical Garden in that city, in which the plants listed in the enclosed catalog are already to be found, and which can be expected to expand gradually. But His Majesty recommends that Your Excellency establish in this Captaincy, at the lowest cost possible, a Botanical Garden similar to that in Pará, in which all indigenous plants are cultivated, and to learn how to plant and store the seeds of trees that are good for wood for building, to later plant in the Royal Forests (Meneses, 4 abr. 1803).

Governor João Manuel de Meneses accused the Gold Intendant and Treasury attorney, Manoel Souto Coelho, of being the main obstacle to the expenditures proposed for the garden, which the latter classified as a garden of "cabbage and lettuce." The Gold Intendant Manoel Souto Coelho was responsible for releasing Royal Treasury gold to meet the needs of the government. In a letter to the Overseas Council, he claimed that the large expenditures for the São José de Mossâmedes settlement and for the garden were the reason for the collapse of the Royal Treasury:

> The farm of José Francisco Hutim, confiscated for the Botanical Garden, without even hearing from the owner who was in prison, spending an extraordinary amount of gold [one thousand cruzados = 2.24kg of gold after paying tax] for new walls, and slaves acquired from those who owed money to the government, and all this without examining the quality and fertility of the land for planting coffee, which can be seen because the plants are poor and dry, like those of Manoel José Leite's farm, or the land is overrun with ants and is incapable of producing anything; but on this same land houses have been built and gardens planted, which are used by some people who live off him (Marinho, 7 maio 1804).

A document dated June 1804 finally indicates that the land used for the garden was up for sale and the price should include the expenses of the improvements and planting performed. If it were not sold, it would be leased, and the lessee should "maintain on a site on these lands the trees and other plants recommended in the Notice [1798]" (Souza, 21 jun. 1804). The reason for the sale was the expense and poor quality of the land.

Final considerations

Historiography recognizes the fact that the administration in Portuguese America emphasized the inventory and appropriation of the natural products investigated by civil servants with knowledge of natural history in order to make them commercially viable. These civil servants' main informants regarding new species and their use were the natives. Thus, the study of the indigenous contribution regarding knowledge of botanical species do justice to these social subjects who, with their cultures, experiences, know-how and practices had ancient understanding of the natural world. When duly recognized, this knowledge makes the indigenous peoples protagonists in the formation of Western scientific knowledge.

As for the Portuguese overseas Empire, the conclusions of Warren Dean, reiterated by Kury (2004) are valid. They found that the monarchy's efforts to replace income from gold with income from diversified, rationalized agriculture in alignment with the nascent natural sciences was unsuccessful in transforming the economic model based on monoculture. Competitions from other countries and the French invasion of Portugal disrupted the colonial system, plus coffee production became the main source of income in rural areas. In the captaincy, the sought-after replacement of income from gold with income from a variety of agricultural undertakings, based on indigenous labor, was also not as successful as expected. The sale of new, native plants and the acclimatization of foreign plants required, in addition to economic and political support, technical ability to extract and cultivate them, control of trade routes, the existence of a consumer market and a continuous incentive policy, factors that did not coalesce in the captaincy.

ACKNOWLEDGMENTS

We wish to thank the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (Capes) for its financial support in the form of a PhD scholarship (No. 1224367) and a PhD grant to study abroad (PDSE 99999.003297/2015-02) provided for the researcher Thiago Cancelier Dias from 2013 through 2017, which allowed him to focus exclusively on research, dialog with researchers and find historical documents in Brazilian and Portuguese archives. We are also grateful to the referees and the team involved for their contributions.

NOTE

[1] In this and other citations of texts from non-English languages, a free translation has been provided.

REFERENCES

AGUIAR, José Otávio. A botânica como missão pedagógica: Manuel Arruda da Câmara e a peculiaridade de suas interpretações sobre as espécies brasileiras (1752-1811). *Clio*, v.29, n.1, p.180-205, 2011.

ANDRADE, Joaquim J.F. de. Falas ao general em congresso festivo... In: Souza, Thomaz de. *Coleção de notícias da capitania de Goiás*. Loc. 07, 4, 070, p.154 (Biblioteca Nacional, Rio de Janeiro). 26 jul. 1774.

APARÍCIO, João Paulo da S. *Governar no Brasil colonial: a administração de Luís da Cunha de Meneses nas capitanias de Goiás (1778-1783) e de Minas Gerais (1783-1788)*. Dissertação (Mestrado em História e Cultura do Brasil) – Universidade de Lisboa, Lisboa, 1998.

APOLINÁRIO, Juciene. Plantas nativas, indígenas coloniais: usos e apropriações da flora da América portuguesa. In: Kury, Lorelai (org.). *Usos e circulação de plantas no Brasil: séculos XVI a XIX*. Rio de Janeiro: Andrea Jakobsson, 2013. p.181-227.

BLUTEAU, Raphael. *Vocabulário português e latino: áulico, anatômico, arquitetônico*... Coimbra: Colégio das Artes da Companhia de Jesus, 1712. 8v.

BOAVENTURA, Deusa Maria. *Urbanização em Goiás no século XVIII*. Tese (Doutorado em Arquitetura e Urbanismo) – Universidade de São Paulo, São Paulo, 2007.

BREVES INSTRUÇÕES aos correspondentes da Academia das Ciências de Lisboa sobre as remessas dos produtos e notícias pertencentes à história da natureza para formar um museu nacional. Lisboa: Régia Oficina Tipográfica, 1781. Disponível em: <http://purl.pt/720>. Acesso em: 20 jan. 2015.

BRIGOLA, João. *Coleccionismo no século XVIII: textos e documentos*. Porto: Porto Editora, 2009.

CARDOSO, Ângelo dos Santos. *Mapa geral da Capitania de Goiás*. CARTm 008, D.867 (Arquivo Histórico Ultramarino, Lisboa). 1753.

CARNEIRO, Henrique. As drogas no Brasil Colonial: o saber indígena e os naturalistas europeus. In: Simpósio Nacional da Anpuh, 20., 1999, Florianópolis. *Atas*... Florianópolis: Anpuh, 1999. p.1007-1016.

CARVALHO, José de A.V. de Soveral e. Ofício do ex-governador de Goiás, [barão de Mossâmedes], José de Almeida Vasconcelos de [Soveral e Carvalho], ao [secretário de estado da Marinha e Ultramar], Martinho de Melo e Castro... ACL CU 008, cx.31, D.1959 (Arquivo Histórico Ultramarino, Lisboa). 2 jan. 1779.

CARVALHO, José de A.V. de Soveral e. Ao mesmo Ex.mo Sr., dando S. Ex.a conta da construção do Edifício da Aldeia de São José de Mossâmedes. *Livro de Ofícios dirigidos a Corte de Lisboa*... [1771-1777]. AHU_ACL_CU - Cod. 1655, p.70v-71. (Arquivo Histórico Ultramarino, Lisboa). 20 set. 1776.

COSTA, Palmira F. da; LEITÃO, Henrique. Portuguese imperial science: a historiographical review. In: Bleichmar, Daniela; De Vos, Paula; Huffine, Kristin (coord.). *Science, power and the order of nature in the Spanish and Portuguese empires*. Stanford: Stanford University Press, 2008. p.35-52.

DEAN, Warren. A botânica e a política imperial: a introdução e a domesticação de plantas no Brasil. *Estudos Históricos*, v.4, n.8, p.216- 228, 1991.

DIAMOND, Jared M. *Armas, germes e aço: os destinos das sociedades*. Rio de Janeiro: Record, 2013.

DIAS, Thiago C. *O língua e as línguas: aldeamentos e mestiçagens entre manejos de mundo indígenas em Goiás*. Tese (Doutorado em História) – Universidade Federal de Goiás, Goiânia, 2017.

DOLES, Dalisia. A ligação Centro-Norte pela via Araguaia-Tocantins no período colonial. In: Simpósio Nacional dos Professores Universitários de História, 5., 1969, Campinas. *Anais*... Campinas: Anpuh, 1969.

DOMINGUES, Angela. *Monarcas, ministros e cientistas: mecanismos de poder, governação e informação no Brasil Colonial*. Lisboa: Cham, 2012.

FROTA, José M.A. da. Ofício do... ACL CU 008, cx. 44, D. 2606 (Arquivo Histórico Ultramarino, Lisboa). 7 mar. 1802.

FURTADO, Francisco Xavier de Mendonça. *Diretório, que se deve observar nas povoações das Índias do Pará, e Maranhão em quanto Sua Majestade não mandar o contrário*. Lisboa: Oficina de Miguel Rodrigues, 1757.

GRUZINSKI, Serge. *O pensamento mestiço*. São Paulo: Companhia das Letras, 2001

HOLANDA, Sérgio Buarque de. *Caminhos e fronteiras*. São Paulo: Companhia das Letras, 1994.

KARASCH, Mary. Catequese e cativeiro: política indigenista em Goiás, 1780-1889. In: Cunha, Manuela Carneiro (org.). *História dos índios do Brasil*. São Paulo: Companhia das Letras, 1998. p.397-412.

KURY, Lorelay. Homens de ciência no Brasil: impérios coloniais e circulação de informações (1780-1810). *História, Ciências, Saúde – Manguinhos*, v.11, supl.1, p.109-129, 2004.

LEME, Inácio J.T. de A. Pais. Ofício de Inácio Joaquim Taques de Almeida Pais Leme, ao [secretário de Estado da Marinha e Ultramar], Martinho de Melo e Castro, sobre ter remetido a "erva de andorinha"... ACL CU 008, cx.35, D.2142 (Arquivo Histórico Ultramarino, Lisboa). 12 maio 1784.

LEME, Inácio J.T. de A. Pais. Ofício de Inácio Joaquim Taques de Almeida Pais Leme, ao [secretário de Estado da Marinha e Ultramar], Martinho de Melo e Castro, remetendo os seguintes produtos para a corte... ACL CU 008, cx.34, D.2121 (Arquivo Histórico Ultramarino, Lisboa). 10 set. 1783.

LEMES, Fernando Lobo. Espera, morte e incerteza: a instalação dos julgados nas minas de Goiás: leituras sobre a criação de Vila Boa. *História Revista*, v.17, n.2, p.189-213, 2012a.

LEMES, Fernando Lobo. Os tempos da história: ritmo, temporalidade e projetos coloniais nas minas de Goiás. *Dimensões*, v.28, n.1, p.247-269, 2012b.

MARINHO, José J.P. Ofício do contador-geral, José Joaquim Pereira Marinho, ao [secretário de Estado da Fazenda Real e presidente do Erário Régio, D. Rodrigo de Sousa Coutinho], sobre a carta do ex-intendente do Ouro da Casa de Fundição de Vila Boa... ACL CU 008, cx.47, D.2720 (Arquivo Histórico Ultramarino, Lisboa). 7 maio 1804.

MARQUES, Vera Regina B. Escola de homens de ciências: a Academia Científica do Rio de Janeiro, 1772-1779. *Educar*, v.21, n.25, p.39-57, 2005.

MARQUES, Vera Regina B. *Natureza em boiões*: *medicinas e boticários no Brasil setecentista*. São Paulo: Unicamp, 1999.

MATTOS, Raymundo Cunha. Corografia histórica da província de Goiás. *Revista do Instituto Histórico e Geográfico Brasileiro*, t.37, parte 1, p.213-394, 1874.

MENESES, João Manoel de. Ofício do [governador e capitão-general de Goiás], D. João Manuel de Menezes, ao [secretário de Estado da Marinha e Ultramar], visconde de Anadia [João Rodrigues de Sá e Melo], sobre a arrematação das casas do ex-tesoureiro, Francisco José Hutim... ACL CU 008, cx.45, D.2659 (Arquivo Histórico Ultramarino, Lisboa). 4 abr. 1803.

MENESES, João Manoel de. Ofício do [governador e capitão-general de Goiás], D. João Manuel de Menezes, ao [secretário de Estado da Marinha e Ultramar], D. Rodrigo de Sousa Coutinho, remetendo sete caixotes... ACL CU 008, cx.41, D.2528 (Arquivo Histórico Ultramarino, Lisboa). 26 jul. 1800.

MENESES, Luís da Cunha. Ofício do [governador e capitão-general de Goiás], Luís da Cunha Meneses, ao [secretário de estado da Marinha e Ultramar], Martinho de Melo e Castro, sobre o aldeamento da Nova Beira... ACL CU 008, cx.32, D.1996 (Arquivo Histórico Ultramarino, Lisboa). mar. 1780.

MORAES, Cristina de C.P. Em terra de cego, caolho tem vida de rei: as migrações no setecentos para o sertão dos Guayazes. *Revista UFG*, ano 13, n.10, p.68-92, 2011.

PATACA, Ermelinda Moutinho. Coleta, transporte e aclimatação de plantas no Império luso-brasileiro (1777-1822). *Museologia e Interdisciplinaridade*, v.9, n.5, p.88-108, 2016.

PEREIRA, Rodrigo Osório. *O império botânico*: *as políticas portuguesas para a flora da Bahia atlântica colonial (1768-1808)*. Tese (Doutorado em História) – Universidade Federal de Minas Gerais, Belo Horizonte, 2013.

PERRONE-MOISÉS, Beatriz. Índios livres e índios escravos: os princípios da legislação indigenista do período colonial (sécs. XVI a XVIII). In: Cunha, Manuela Carneiro da (org.). *História dos índios no Brasil*. São Paulo: Companhia das Letras, 1992. p.115-132.

PESTRE, Dominique. Por uma nova história social e cultural das ciências: novas definições, novos objetos, novas abordagens. *Cadernos IG-Unicamp*, v.6, n.1, p.3-56, 1996.

RAMINELLI, Ronald. Ilustração e império colonial. *História*, v.31, n.2, p.36-67, 2012.

RAMINELLI, Ronald. *Viagens ultramarinas*: monarcas, vassalos e governo a distância. São Paulo: Alameda, 2008.

ROCHA, Leandro Mendes; MORAES, Cristina de Cassia Pereira (org.). *Atlas histórico: Goiás pré-colonial e colonial*. Goiânia: Editora do Cecab. 2001.

SANJAD, Nelson. Ciência e poder imperial no Grão-Pará: da expansão à desconstrução. In: Kury, Lorelai; Gesteira, Heloisa (org.). *Ensaios de história das ciências no Brasil*. Rio de Janeiro: Eduerj, 2012. p.225-238.

SANJAD, Nelson Rodrigues. *Nos Jardins de São José: uma história do Jardim Botânico do Grão Pará, 1796-1873*. Dissertação (Mestrado em Geociências) – Universidade Estadual de Campinas, Campinas, 2001.

SANTOS, Boaventura de Sousa; MENESES, Maria Paula G.; NUNES, João Arriscado. Para ampliar o cânone da ciência: a diversidade epistemológica do mundo. In: Santos, Boaventura de Souza (org.). *Semear outras soluções: os caminhos da biodiversidade e dos conhecimentos rivais*. Rio de Janeiro: Civilização Brasileira, 2005.

SEVCENKO, Nicolau. O front brasileiro na guerra verde: colonialismo e cultura. *Revista USP*, n.30, p.108-119, jun.-ago. 1996.

SOUSA, Gabriel Soares de. *Tratado descritivo do Brasil em 1587*. Rio de Janeiro: Tipografia Universal de Laemmert, 1851.

SOUZA, Luis de Vasconcelos e. Arrendamento do horto botânico. Documentos avulsos, fl.124 (Museu das Bandeiras, Cidade de Goiás). 21 jun. 1804.

SOUZA, Thomaz de. Resumo de mais duas cartas particulares do alferes de dragões comandante da conquista da ilha Nova Beira, datadas na capital de Goiás a 22 de Novembro, e 18 de setembro de 1775. In: Souza, Thomaz de. *Coleção de notícias da Capitania de Goiás... (1772-1777)*. Vila Boa de Goiás: [s.n.]. p.127-133. Loc. 07, 4, 070 (Biblioteca Nacional, Rio de Janeiro). [1777?]

TAUNAY, Affonso de E. *Um grande bandeirante: Bartholomeu Paes de Abreu (1674-1738)*. São Paulo: Oficinas do Diário Oficial, 1923.

VANDELLI, Domenico. Memória sobre a utilidade dos jardins botânicos a respeito da agricultura e principalmente cultivação das charnecas. Coimbra: Real Oficina da Universidade, 1788.

VARELA, Alex. As viagens científicas realizadas pelo naturalista Martim Francisco Ribeiro de Andrada na capitania de São Paulo (1800-1805). *Topoi*, v.8, n.14, p.172-205, 2007.

VIDAL, Laurent. Sob a máscara do colonial: nascimento e 'decadência' de uma vila no Brasil moderno: Vila Boa de Goiás no século XVIII. *História,* v.28, n.1, p.243-288, 2009.

WALKER, Timothy. Acquisition and circulation of medical knowledge within the Early Modern Portuguese Colonial Empire. In: Bleichmar, Daniela et al. *Science in the Spanish and Portuguese empires, 1500-1800*. California: Stanford University Press, 2009.