



**Joining pleasure and
work in the making
of science: the
Jardim Botânico
do Rio de Janeiro -
1808 to 1860**

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The Jardim Botânico do Rio de Janeiro played an important role in the first half of the nineteenth century. Although the park will soon celebrate its two-hundredth anniversary, no systematized study of it has ever been undertaken. With the intent of contributing to discussions on the history of institutions and the natural sciences during the period in question, the article seeks to uncover what has lain behind this disinterest in the garden on the part of researchers from the history of the sciences and history of institutions. The article also analyzes major issues in the history of the garden from its creation in 1808 until becoming part of the Imperial Fluminense Institute of Agriculture in 1861.

KEYWORDS: Rio de Janeiro Botanical Garden; history of the sciences; history of institutions; history of botany; history of the natural sciences.

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The Lagoa Rodrigo de Freitas Botanical Garden continues to operate regularly, and work there is progressing, both in terms of what is useful and in terms of what is pleasurable.

Ministry of the Empire Report, 1836.

A stroll through the Jardim Botânico do Rio de Janeiro (Rio de Janeiro Botanical Garden) induces a sense of calm and well-being, a mood of tranquility and contemplation. This landscape shaped by human hands evokes pleasant feelings and thoughts, as it offers you the chance to observe plants and animals—like birds, monkeys, sloths—and to listen to the gurgling waters stream lightly down the mountain along canals and cascades built in harmony with the terrain.

For most visitors, a trip to the park brings back fond personal memories or reminds them of iconographic images that are an integral part of Rio de Janeiro's history. Works of art standing in the open air touch human sensibilities as well; they complement nature, working together to enhance the visitor's experience. At the end of the main lane, the old door of the Real Academia de Belas-Artes, designed by Grandjean de Montigny, delights the eyes. Bordered by royal palms, the lane itself makes you feel as if you are walking down the loveliest 'avenue' in town.

History can be felt as you meander down pathways of twisted old mango trees. Nature itself—especially the size of the trees—tells you how old this place is. The garden's main symbol is the imposing imperial palm (*Roystonea oleracea*). As legend has it, the first seedling was planted by no one less than Prince Regent Dom João, and thus the plant became one of the symbols of the monarchy.

It is not readily apparent that scientific research has been responsible for this arrangement of plant life for many years. The scientific name found on each small marker in the arboretum provides a key to knowledge of species within the plant kingdom—knowledge produced principally by the academic community. When a visitor learns a plant's scientific name, he or she gains a tool for obtaining precise information on the plant's uses, ecology, and geographic distribution, as well as other data that may have been amassed on that species. While visitors may not be aware of it, down through its history the institution has constantly endeavored to uncover information about Brazilian flora for use by the public.

Of course, the scientific research undertaken at the Jardim Botânico do Rio de Janeiro (JBRJ; Rio de Janeiro Botanical Garden) was not alone in bringing the arboretum to life. After all, the garden has served diverse purposes and uses. But in large part, the history of the institution finds representation in the myriad collections organized by scientists who introduced new species, collected

primarily on their excursions around Brazil. These collections, along with single examples of some species, often represent valuable contributions to science by research projects.

Hand in hand with research, public visitation has been part of the JBRJ throughout most of its history. Open to the public since 1819, the arboretum gradually developed into the landscape we appreciate today thanks to a combination of numerous initiatives.

As botanical gardens have almost always expressed the reconciliation of diverse purposes, their institutional histories are unique, meaning that our analyses of them must be distinct from those of other scientific establishments. This is true not only in terms of a garden's value in the realm of experiments and technical/scientific research but also in terms of the enjoyment it affords the public. Lending itself to interdisciplinarity, a garden's multifaceted character encourages projects in a gamut of areas: teaching, museography, landscape architecture, technical/scientific endeavors, and history.

The Jardim Botânico do Rio de Janeiro has played a singular role in the history of Brazil. It is the country's oldest active botanical garden and the only one to remain under the administration of the federal government since its inception. Furthermore, understanding the history of this institution, which has been dedicated to raising and studying plants in the tropics, can contribute to the study of the history of scientific institutions and the very history of the sciences. With much left to tell us, the trajectory of the JBRJ will help us understand what role the garden has played in the social history of Brazil and of Rio de Janeiro.

Botanical gardens

Botanical gardens play a role in research, in the preservation of specimens, and in the exchange of plant material. There are about 1,800 such institutions around the world today, 30 of which in Brazil (including so-called *hortos botânicos*).¹

Botanical gardens were first created in the sixteenth century for the purpose of raising and studying medicinal plants. The goal was to identify plants with potential healing powers and to test their properties. The result was the world's first collections of dried plants for scientific ends.

The first such gardens were created in Pisa (1543), Padua (1545), and Montpellier (1598); the following century saw gardens established in Oxford (1621), Edinburgh (c.1670), and Paris (Jardin Royal des Plantes Médicales, 1640), to cite just a few examples. As Europeans explored the New World, their botanical gardens expanded to include plants from different corners of the planet. This meant that as naturalists progressed in their studies of plant

¹ The Conselho Nacional do Meio Ambiente (National Environmental Council) defines today's botanical gardens in these terms: "A botanical garden is a protected area, composed totally or in part of collections of scientifically recognized living plants that have been organized, documented, and identified for the purpose of study, research, and documentation of the country's flora heritage, open fully or in part to the public and used for education, culture, leisure, and conservation" (Brazil, Aug. 3, 2000).

structure, morphology, and physiology, they also developed new techniques for acclimatizing plants (Pyenson, Sheets-Pyenson, 1999).

In Brazil, the first botanical garden was created in Recife, Pernambuco, during the period of Dutch rule (1630-1654). There the naturalists Georg Marcgraf and Willem Piso gathered collections of regional fauna and flora, complemented by specimens found during their travels through Brazil's northeastern *sertão*. Their work formed the basis for *Historia Naturalis Brasiliae*, considered the most comprehensive, detailed study of Brazil's natural history through the early nineteenth century. This collection, which we know today through the paintings of Frans Post and Albert Eckhout, was used in comparative studies and the classification of species. Their illustrations of fauna and flora bear precious witness to species that have since disappeared or are now endangered, part of the remaining forests of a practically untouched *sertão*. Almost nothing remains of this botanical garden today. When the Dutch were driven out, they destroyed the most valuable collections, and when the Portuguese reconquered the territory, they made away with the last species raised there (Silva, 2004), possibly as their way of 'marking territory'.

In the eighteenth century, a number of colonial botanical gardens were created under the supervision of their counterparts in the metropolises. France, England, Spain, and Holland conducted experiments with native plants in their colonies. For the purposes of the present article and because of their influence on the conceptualization of the JBRJ, I will focus solely on those institutions that reflected the ideals of the Portuguese 'enlightenment'. In order to elucidate the context in Portugal and its repercussions in Brazil, I will also highlight the trajectories of the naturalist Domenico Vandelli and of Rodrigo de Sousa Coutinho.

The Jardim Botânico de Ajuda was created in 1768 to enforce the 'enlightened' policy advanced first and foremost by the Crown. It was a landmark in Portuguese intervention in the area of the sciences. Together with the 1772 reform of the Universidade de Coimbra and the 1779 founding of Portugal's Academia de Ciências, the Ajuda garden was part of a trio that allowed the 'enlightened' movement to refine its thought while simultaneously structuring and enforcing its policies. The 'scientific complex' organized around the Jardim Botânico de Ajuda in fact became an important center for receiving, describing, and growing the flora sent by the colonies to the Portuguese Empire.² The teaching reform at the Universidade de Coimbra was also part of the Portuguese enlightenment. The university's new role was to adapt itself to new demands and become an intellectual center of scientific

² The Ajuda complex included not only the botanical garden but also the Museu de História Natural, the Chemistry Laboratory, and the Casa de Risco, where illustrations were made (Sanjad, Nov. 2003).

production of the Enlightenment. Founded in 1779, Lisbon's Academia de Ciências was a government-sponsored catalyst of scientific and economic theories and practices. This period thus saw development of a centralized structure meant to guide 'enlightened' policies through scientific research of a utilitarian nature; in other words, the empire invested in research centered on products that could bring economic returns.

Domenico Vandelli, an Italian from Padua, traveled to Portugal in 1764 at the invitation of the Marquis de Pombal to assist with the Universidade de Coimbra reform. Specifically, he was responsible for the courses of chemistry and natural history. Blending scientific skill and political leadership, he earned the admiration of governmental officials. His contributions far surpassed the original goals of his trip, as Munteal Filho explains (1993):

Vandelli devoted himself to the study of flora and fauna from Brazil and Portugal, introduced the Portuguese to new trades like that of illustrator and gardener, coordinated a number of the so-called philosophical voyages to the natural world of the colonies, and persuaded the Portuguese government to make botanical gardens scientific establishments. ... He eventually sculpted a vision of the world wherein the way to revive the Kingdom and remove Portugal from its cultural isolation was centered in the realm of Nature.

In a memoir on the utility of botanical gardens, Vandelli stressed the importance of creating these green spaces and concluded that the study of botany was vital to agriculture and to the exploration of natural resources. His publication prompted government authorities to assign the Ajuda garden, headed by Vandelli himself, as the main destination for plants from all over the Portuguese Empire, particularly species boasting economic potential.

At the close of the eighteenth century, still during the Enlightenment, Portugal began sponsoring "philosophical voyages" to acquire knowledge of the colonies' biodiversity and gather samples to send back to the metropolis. Vandelli, one of the leaders of this initiative, published *Viagens filosóficas ou dissertação sobre as importantes regras que o filósofo naturalista nas suas peregrinações deve principalmente observar* [Philosophical voyages or dissertation on the main important rules that shall be observed by the naturalist philosopher in his pilgrimages], in which he advised traveling naturalists about what to inventory and how to go about collecting, drying, and transporting material so that it might be used for scientific purposes.

The Ajuda garden acquired valuable collections thanks to these voyages, especially one into the Amazon region taken between 1783 and 1792 under the leadership of Alexandre Rodrigues Ferreira.

We can gather a notion of its importance from the order handed down by General Junot when the French invaded Portugal in 1808: the entire collection of the Ajuda garden should be sent to the Jardin des Plantes in Paris (Castel-Branco, 2000). This fact also shows that France's interest was not merely territorial but also to gain control of any 'riches' from the Portuguese Empire.

Another influential figure in the Portuguese court was Rodrigo de Sousa Coutinho. Minister of the Navy and Overseas Dominions and representative of the so-called English party, he was one of the members of the Portuguese political intellectuality who "foresaw the possibility of reviving the Kingdom by relying on the physical nature of the overseas dominions" (Munteal Filho, 2000). After removal from his post as minister in 1802, Sousa Coutinho maintained his prestige and still wielded influence as inspector general of the Royal Botanical Gardens and Museums, a post created especially for him (Sanjad, Nov. 2003). He later played a key role in transferring the court to Brazil and once again was named minister, this time of War and Foreign Affairs. The far-sighted Sousa Coutinho promoted knowledge of nature in the colonies: "Based on the unity of the Portuguese world and ensuing implications and advantages in the economic sphere, Dom Rodrigo took the idea of exchanging plants from the different territories and, especially, the project for acclimatizing Eastern spices in Brazil and made them an integral part of his policy to foster overseas trade" (Almeida, 1975, p. 401).

Domenico Vandelli and Rodrigo de Sousa Coutinho illustrate how Portuguese intellectuality and political power worked hand in hand to guarantee the economy of the Portuguese Empire by promoting a utilitarian scientific culture that sought to learn about natural assets and profit from them.

In Brazil, these changes actually made their repercussions felt starting in 1798, when the first botanical garden was created at the order of the metropolis and under Portuguese administration. There were a number of reasons why the city of Belém, in Grão-Pará, was chosen as the site. First was its proximity to the famous French botanical garden La Gabrielle in French Guiana. Featuring plants from a number of French colonies, this arboretum sparked envy and was the target of Portuguese 'piracy'. Second was the city's location at the entrance to the Amazon, a region that had been attracting explorers since Alexandre Rodrigues Ferreira's voyage. Lastly were the ties of kinship between the governor of Grão-Pará and Rio Negro, Francisco de Sousa Coutinho, and his brother Rodrigo de Sousa Coutinho. The Portuguese minister may have argued his case about the economic role of botanical gardens and advised his brother about the growing importance of these institutions within Portuguese policy, in addition to helping him actually set up the garden.

It appears that in the eyes of the metropolis, the Belem botanical garden was so successful that subsequent initiatives bore great similarity. Not long after creation of this garden, the so-called Luso-Brazilian network of botanical gardens inaugurated its activities (Sanjad, Nov. 2003), with exchanges of products between the cities of Cayenne, Belem, Olinda, and Rio de Janeiro, like breadfruit, cinnamon, cloves, pepper, and many other plants deemed 'useful'. All indications are that the Olinda garden served primarily as a warehouse for the acclimatization of species from other provinces. Gardens were later established in Ouro Preto, São Paulo, São Luís, and Salvador as well. The network also disseminated information on how to acclimatize and improve species and, above all, how to encourage farmers and provide them with scientific literature or distribute free seeds and seedlings for new or improved crops.

In a pioneer study on the first botanical gardens in Portugal and Brazil, Jobim (1986) argues that these institutions were created in response to the "adoption of a systematic policy that valued agriculture through science and thus galvanized the colonial economy via diversification of agricultural products" (p. 69). Prior to the early nineteenth century, Portugal's economic policies did not stimulate the production of spices, perhaps because the Empire was leery of competition from the Eastern colonies. The establishment of botanical gardens indicates a shift in direction and a search for new crop alternatives.

The Acclimatization Garden

Notwithstanding the import of the JBRJ to the history of the sciences and the cultural history of Rio de Janeiro, research into its trajectory has only just begun and not much is to be found in present historiography. As sources, scholars rely mainly on the publications of João Barbosa Rodrigues, director of the garden from 1890 to 1909, including his noteworthy *Hortus Fluminensis* and *Centenário do Jardim Botânico* (Centennial of the Botanical Garden). Nor have there been enough critical studies of these sources, upon which reconstruction of the garden's history has been based.

In his master's thesis, Sanjad (2001, p.13) points up this deficiency:

The scant number of studies on these gardens does not puzzle us as much as what we have observed in the case of the Rio de Janeiro Botanical Garden, especially given that for decades this institution carried the epithets 'Royal' and 'Imperial'. From what we could glean from the bibliography, the historical texts by João Barbosa Rodrigues, director of the institution from 1890 to 1909, are still the main sources for the nineteenth-century history of the Rio de Janeiro garden.

The paucity of research on the JBRJ is owed in part to the possible loss of its pre-1930 archives (not located at present) and likewise to the lack of research tools with which to explore the other archival documents still in the hands of the institution. Some more devoted staff members stored away botanist records on the plants introduced into the arboretum, particularly in the twentieth century. Indications are that all efforts to preserve the institutional memory were concentrated on the Herbarium, one of Brazil's most important; with some 410,000 well-preserved dried specimens and documents dating from the eighteenth century, this source has not yet been explored by historians, despite its undeniable value.³

³ On this topic, see Pacheco, 2003.

I will thus begin with João Barbosa Rodrigues's information on the JBRJ (1908). According to the author, the institution was set up in 1808 in the area of the Gunpowder Plant, as an "Acclimatization Garden meant to introduce the growing of East Indies spices to Brazil" (p. 9). Prince Regent Dom João, "seduced by the beauty of that place," ordered the grounds to be readied for a botanical garden. In laudatory tones, the text goes on to recount the genesis of the institution and to make trenchant criticisms of the administrations before and after Frei Leandro do Sacramento (1824-1829). According to the author, the Jardim Botânico became "truly scientific" in 1890, that is, just after the Proclamation of the Republic and under the administration of Barbosa Rodrigues himself.

This version of the history of the JBRJ is consonant with the period in which it was written and with the interest in exalting the person of Barbosa Rodrigues, one of whose achievements was writing the first version of an institutional history. Yet the mere reproduction of his statements is questionable if we fail to take into account more recent historical interpretations of the context or to explore for new analyses.

If we are to understand the context in which the JBRJ was created, we must bear in mind the strategic role played by botanical gardens in Portugal and around the world starting in the latter half of the eighteenth century, as mentioned earlier. Still, it seems paradoxical to create an acclimatization garden in 1808 to 'benefit from the beauty of the place', independent of any larger project to invest in native, exotic natural riches that might prove of commercial value—all the more so since the Portuguese kingdom was then undergoing a crisis, to which it responded by striving to boost economic growth. It was also endeavoring to guarantee the permanence of the court and the Portuguese administrative machine that had disembarked in Brazil along with the royal family. Furthermore, the wane of gold mining in Minas Gerais as of 1750 left fertile ground for enforcing the ideas espoused by those economic interests that defended agriculture as the road to development and the true wealth of Brazil.⁴

⁴ On this topic, see Wehling, 1977; Jobim, 1986; and Dias, 1968.

The Gunpowder Plant on whose premises the JBRJ was established had been erected that same year (1808). With Napoleon's troops invading Portugal and the royal family and part of the Portuguese court fleeing to Brazil, it was a time of conflict. Since the colonial territory would have to be defended against a possible attack by the French Empire, orders were handed down to immediately build a Gunpowder Plant and Artillery Foundry (Decree, May 13, 1808).

Likewise in 1808 (Oct. 12), the post of Superintendent of the Rodrigo de Freitas Lagoon was created under a decree which further stipulated that a "type of crop which would be of greater interest and benefit to the Real Fazenda" should be planted in the tenantless area of the Fazenda and "in any other plantation as so determined by higher order." The Crown had acquired the Fazenda through 'voluntary' subscription by residents of the city, businessmen, ranchers, and so on (Malerba 2000, p. 231), and it had to be occupied in order to collect rent money from the old tenants. The Administrator was also charged with ensuring that area residents neither rerouted the waterways essential to the manufacture of gunpowder nor destroyed forests.

Today it is difficult to ascertain the precise boundaries of the Fazenda da Lagoa Rodrigo de Freitas. Based on iconography and the accounts of voyagers and naturalists, it is estimated to have encompassed the entire area of the lagoon, with its borders defined by the foot of Corcovado and the neighborhoods of Gávea, Leblon, Ipanema, and part of Copacabana. The lagoon covered a larger surface area back then, with its waters reaching almost to the current Jardim Botânico Street during high tide.

The rationale behind building the Gunpowder Plant in that particular region seems self-evident: an abundant water supply and, considering the danger of accidental explosions, the distance separating the facility from downtown and from the neighborhood of São Cristóvão, home to the royal family's palace. Another consideration was ease of defense in case of an attack or attempts to enter the court clandestinely.⁵ After all, the city was preparing for the arrival of a sizeable court (some 10,000 strong) and would be sheltering a royal family taking flight from a nation at war; this undoubtedly increased concern over security and the protection of urban borders.

And what about the decision to establish a botanical garden so far from the royal residence and the downtown area, unlike the Jardim Botânico da Ajuda, which stood beside the Royal Palace, or the Coimbra garden, focused on teaching and located next to the university? Moreover, why place it on the grounds of a gunpowder factory and under the jurisdiction of the Ministry of Foreign Affairs and War?

⁵ This concern is made evident in the document in which Count Linhares, in name of the Prince Regent, orders Napion to prohibit anyone without a passport from crossing the lagoon; recalcitrant individuals should be sent to the Lagoon's detachment (Coutinho, Apr. 1810).

Here we must weigh in the influence of the Minister of Foreign Affairs and War, Rodrigo de Sousa Coutinho. We must remember that he had been a key figure in the transfer of the court, had then gone on to become one of Dom João's most esteemed ministers, and had played a notable role in creation of the botanical gardens in Portugal and Belem do Pará. As the Gunpowder Plant was under his jurisdiction, he may have ordered experiments to be conducted on exotic plants from the botanical gardens of Belem and Cayenne, according to all indications. As a result, something quite singular and perhaps unique in the world occurred in Brazil: at the same time and in the same place where a gunpowder plant was built, a botanical garden came to life under the command of no less than the Minister of Foreign Affairs and War.

Early nineteenth-century iconography shows the surrounds of the Palácio de São Cristóvão as practically rural and large enough to have room for a botanical garden. However, in preferring the uninhabited outskirts of the city over São Cristóvão, it is reasonable to presume that the Portuguese wished to maintain secrecy about what was transpiring there. Remember that in January 1809, months after the royal family had fled to Rio de Janeiro, French Guiana was invaded by Luso-Brazilian troops in retaliation for the French invasion of Portugal. At the time, Prince Regent Dom João ordered the occupying troops in Cayenne to leave the La Gabrielle botanical garden intact, possibly because of Portugal's interest in expropriating the French arboretum's plant assets. João Severiano Maciel da Costa, governor-general of Cayenne during the occupation⁶, indicated how important this conquest was in this regard:

⁶ In 1819, Maciel da Costa was appointed director of the JBRJ.

⁷ He may have been speaking of *Saccharum officinarum*.

⁸ An example is the notification issued by Prince Regent Dom João regarding prizes and concessions in recognition of notable accomplishments with new crops (Brazil, July 27, 1809).

⁹ Some authors, such as Maria Odila da Silva Dias (1968, p. 135), consider this the first periodical to publish scientific texts.

I took all possible advantage of that conquest ..., ordering the transplant to Brazil of what [the garden] held of precious genera, both indigenous and foreign ..., including cloves and mustard; and ultimately vulgarizing Cayenne sugarcane,⁷ which is so superior to the Brazilian creole that the yield at mills has tripled (Costa, 1821, cited in Jobim, 1986, p.80).

The occupation of the French territory played an important role in the creation of a network of gardens, states Jobim (1986), because it permitted the exchange of plants between Cayenne, Belem, Olinda, and Rio de Janeiro. According to the author, these Brazilian botanical gardens were so successful that three similar parks were created, in São Paulo, Ouro Preto, and Salvador.

Laws dating from that time⁸ leave no doubt about how the government encouraged the cultivation of exotic spice crops, promising prizes and customs exemptions for anyone who raised them. In the periodical *O Patriota*⁹, published in 1813, division chief Luiz d'Abreu wrote an article that illustrates the enthusiasm

aroused by these plants back then. Adding a few dashes of heroism, Luiz d'Abreu tells how he had been a prisoner of war on the Isle of France in 1808, where the Pamplémousse botanical garden was located; after negotiating his release together with another 200 comrades-in-arms, he planned "at the same time to rob the colony, in order to bring wealth to this state, of part of the riches with which Mrs. de Poivre e Menonville, in 1770, had so greatly illustrated ... a large number of trees of spices and exotic seeds." Furthermore, upon disembarking in Brazil, he advised the Prince Regent of the feat and received an order to distribute the material to the Real Junta do Comércio and to lieutenant-general Carlos Antônio Napión, director of the Gunpowder Plant, as well as to other officials. Luiz d'Abreu also tells that in 1809 he received a gold medal accompanied by a letter from Dom João, thanking him for his "zeal and patriotism." We can thus conclude that the plants were the target of 'piracy', even with the encouragement of the Crown, which from exile looked for any means of retaliating against France and sought ways to get its hands on plants that might yield the old power and splendid profits enjoyed by Portugal during the days of its spice monopoly.

In this context, the JBRJ may have begun its activities in a secretive fashion as a strategy for not revealing its goals. Contrary to what historiography tells us, no royal decree, *alvará* (writ), or *ordem régia* (royal order) involving creation of a botanical garden was handed down. It was only in 1811 that the existence of the institution appeared in the official records, in the form of an *alvará* (Brazil, Mar. 1, 1811). Yet other documents from 1808¹⁰ make reference to its activities, using a number of names in doing so: Jardim de Aclimação (Acclimatization Garden), Jardim Botânico Rodrigo de Freitas (Rodrigo de Freitas Botanical Garden), Real Horto (Royal Garden), and Jardim da Lagoa (Lagoon Garden), among others.

Tea production

In one of the first treatises on agriculture in Brazil, written in 1829, Taunay (2001) offered a favorable analysis of tea growing. He argued that the product was among those with greatest economic potential for the country, given its success among 'civilized' people; he also underscored the fact that China had long been the zealous holder of age-old knowledge on how to grow and process tea.¹¹ Taunay commented on political problems, criticized the political disregard and intrigues that hampered progress, and insinuated that a batch of processed tea ready for consumption and on sale in England had been sabotaged, since "a feature alien to the process of growth and preparation had lent the tea a scent of varnish that discredited it" (p.172). He encouraged

¹⁰ As an example, see Coutinho, Nov. 18, 1808, and Castro, Nov. 20 and 29, 1808.

¹¹ Ferrão (1992, p. 52) explains that the Orientals wrapped the cultivation and preparation of *Camellia sinensis* in a cloak of secrecy. In fact, up until the nineteenth century black tea and green tea were believed to come from distinct plants. Freire-Allemão (1856, p. 575) states that tea was consumed in Europe as early as the seventeenth century and in Brazil as of the eighteenth. It was, however, Linnaeus who first obtained a living plant, in 1763, "after 20 years of fruitless attempts." Freire-Allemão also states that the Chinese were most secretive about the seeds and hampered things for voyagers, who were "fooled by the Chinese, who gave them *Camellia* seeds as tea seeds" (p. 576).

anyone interested in growing tea and stressed how easy it is to plant and to obtain seedlings and seeds, which the JBRJ would provide free to those who requested them.

Originally from China, tea (*Camellia sinensis*, or *Tea viridis*, as it was called earlier) was also grown in Japan and India. There too crops went to supply the European market, especially England. According to historiography, in about 1812, Dom João had some three hundred Cantonese sent to Brazil from Macao to help raise tea at the JBRJ and the Fazenda Imperial de Santa Cruz, west of Rio de Janeiro. Many problems ensued, since the Chinese who came were not farmers and, further, because the language barrier was construed as a trick that the immigrants used to conceal the secrets of tea production (Sacramento, 1825). As soon as the plantation began producing, seeds were distributed throughout Brazil. According to ministerial reports, the results were satisfactory: in 1828, the equivalent of 23 *arrobas* were harvested (about 338 kilograms).

Carl Seidler, a German traveler who was in Brazil in the 1820s, wrote in his notes: "Here [at the Botanical Garden], tea is the only product that is an exception, for it is harvested regularly ... It was a happy and successful idea" (Seidler, 1980, p.64). The botanist Frei Leandro do Sacramento initiated tea growing in Brazil at the JBRJ. During his term as director of the institution, he applied himself to the acclimatization and planting of seedlings and devoted himself to the crop. For decades, the garden distributed free seeds and also offered free advice to farmers in the form of manuals and practical demonstrations on everything from propagation of seeds in hotbeds to harvesting and drying them for consumption. Reports of excellent results obtained using seeds distributed by the JBRJ started coming in from other regions, like São Paulo and Minas Gerais. Following the 1840s, the institution slowly abandoned tea, mostly because funds were not sufficient to increase the number of slaves as well as planted area and thus boost production.

I am focusing on the large-scale production and preparation of tea at the JBRJ not to construct a history of the crop but in order to understand the concept of scientific research as embraced by this institution in the first half of the nineteenth century. Traditionally concerned with identifying, describing, and classifying plant species, during this period botanical research was restricted to the identification of plants that might prove useful from a commercial angle. So the art of cultivation, that is, agriculture, consisted in part of applying botanical classifications. Heloísa Domingues (1995) states that the distinction between botanical and agronomic activities became more evident when agronomy began incorporating practical knowledge from the field of chemistry. The author adds that prior to 1860, it was believed that land in Brazil

was “abundant and fertile and presented no obstacle to cultivation” (p.302), whatever the crop in question. The scientific debate centered on the identification of exotic or native species promising worthwhile economic return. So botanical research was highly useful to agronomy, as growing new crops entailed identifying species and studying varieties that would best adapt to the region’s climate and soil, while agronomy helped botany through experiments with its ‘art’. Although botanical and agronomic activities were distinct, they were at times complementary. In terms of tea growing, for example, research maintained a constant dialog between the two disciplines and the results enhanced knowledge in both fields.

When the formal teaching of botany and agriculture was instituted, the two courses were linked. This fact is reflected in the decree establishing a course in botany and agriculture in Rio de Janeiro at the Academia Médico-cirúrgica (Academy of Medicine and Surgery) in 1814: “... and taking into consideration the great advantages that can be expected from the propagation of such important knowledge in a country endowed by nature with such rich products and that owing to a lack of good principles in Agriculture has not achieved the prosperity destined to it” (Brazil, Dec. 9, 1814).

When the acclimatization of exotic plants was no longer the government’s main investment, scholars in the fields of botany and of botany applied to agriculture also began to look for ways to identify and improve upon the potential riches of Brazil’s plants in an effort to uncover new proposals for economic growth. Evidence of this is found in an 1833 ministerial report, justifying the need to create a School of Agriculture at the JBRJ:

Once complemented by the practical School of Agriculture, the Botanical Garden will be of enhanced usefulness, as it will not only distribute exotic plants but also work to improve indigenous ones. If the grape, the pear, the apple, and other fruits quite tasteless in their primitive state are now the delicacies of Europe, how much might we not expect from the many species and varieties that grow spontaneously in our woods and fields, and that even in their wild state compete with those? ... and lend the current fate of this Garden greater merit (Brazil, 1833, p.22).

It was starting in the latter half of the nineteenth century, according to Domingues (1995), that rural landowners first struggled with the consequences of exhausted soil and the evident need to fertilize their lands and control crop pests. Scholars of agronomy began a more energetic exchange of information with other sciences, like chemistry, plant physiology, and entomology, while botanists continued their research in the area of plant

systematics, though turning their attention more and more to native plants.

Frei Leandro do Sacramento

In 1819, the JBRJ became part of the recently created Museu Real (today's Museu Nacional). The director was Severiano Maciel da Costa, a figure of note under the reign of Dom João and the first Empire; he had also served as governor-general of Cayenne and was the main coordinator of the transplanting work carried out during the Luso-Brazilian occupation, as mentioned earlier. This annexation evidently did not achieve the desired results and in 1824 was reversed. Still, it may be that for the first time in the RJBG's sixteen years, a botanist was appointed head thanks to the influence of the Museu Nacional.

Holding a degree in philosophy from the Universidade de Coimbra, Frei Leandro do Sacramento became one of Brazil's most eminent scientists; he enjoyed prestige abroad and was cited by countless naturalists with whom he maintained active correspondence. He was a member of a number of academies of science in Europe, such as Munich's (where he published his works on systematics), St. Petersburg's, and others. He earned the honor of being the first professor of botany and agriculture at the Escola Médico-Cirúrgica (Medical-Surgical School) in Rio de Janeiro, where he started working in 1814.¹² When he took office as head of the botanical garden, he was already a renowned scientist with many papers on plant identification. Under Frei Leandro, the JBRJ became a reference point for foreign naturalists and for European institutions, which requested plants both for identification purposes and to grow.

While head of the JBRJ, Frei Leandro researched and encouraged tea production. He published a paper on the topic that leaves a record of his endeavors to restore plantations and of his reasons for writing *Memória*, an informative pamphlet to be included with the seeds sent out to Brazil's provinces:

In the month of March in the year of 1824, in which I took charge of the Lagoa Rodrigo de Freitas Botanical Garden, said Garden held a considerable plantation of tea, across three plots of quite unequal size. ... My first measure was to save the plantation. ... I could not write about an object that had until then been kept a secret. ... For which [His Imperial Highness] Orders me to prepare collections of seeds of tea, cloves, etc., to be sent to different Provinces of the Empire, with these collections accompanied by a memoir that I should compose about their growing and production, etc. From that instant forth, what had been dedication within me was transformed into a sacred obligation, which I

¹² There is no current research on Frei Leandro do Sacramento; on the scientist, see Gama, 1870.

have endeavored to fulfill without delay, having organized the present memoir with the ideas that I was able to come by (Sacramento, 1825, p.7).

Frei Leandro do Sacramento's herborizations bear witness to his forays into the forests of Rio de Janeiro state. He may have been the first to introduce native plants to the JBRJ. Yet the fate of most of Frei Leandro's herborized plants is unknown; only a small number of duplicates are on deposit at the herbaria of the Museum National d'Histoire Naturelle in Paris and at Munich's Museum Mensch und Natur (Lima, Kurtz, Marques, 2001).

Although Frei Leandro's contributions to the field of botany were of undeniable value, his main biographers have little to say about the period during which he was head of the JBRJ. Roquette-Pinto (1933) stated that Frei Leandro "received an amusement park [and] left a scientific garden" (p.115). The likely exaggeration of this comment notwithstanding, Frei Leandro's term as director seems to have been a milestone in the history of the institution. In his book (Rodrigues, 1908), Barbosa Rodrigues writes that when the botanist stepped in as director, the JBRJ was in a state of "appalling abandon," a situation that was corrected thanks to many reforms. Barbosa Rodrigues sought to pay tribute to the Frei in different ways, including a monument located on a hillock alongside the lake named in his honor.

After Frei Leandro's death in 1829, Bernardo José de Serpa Brandão took over as director of the JBRJ, a post he held until retiring 22 years later. Little is known about his administration, nor is much known about his biographical data (Domingues, 1995). He was from the state of Pernambuco, like his predecessor, and had received his degree at Coimbra. Although he was considered a disciple of Frei Leandro (Domingues, 2001, p.35), unlike his master he left no recognized scientific production in the field of botany. We only know he was an active member of the ephemeral Sociedade Vellosiana and took part in the Botanical Commission, which was created to compile an inventory of plants introduced to Brazil after its discovery (Lopes, 1997, p.131).

The Serpa Brandão administration lodged repeated annual requests for greater budgetary funding to stave off the decay slowly overtaking the institution, as tea production declined and the arboretum trees began dying. These pleas fell on deaf government ears. In 1845, with a view to studying solutions to the Garden's problems, a commission of noteworthy names was drawn up, chaired by Frei Custódio Serrão.¹³ The Commission's report included such ideas as growing forest plants for research purposes and later economic use. Other proposals: the introduction of horses and wool-producing animals at the JBRJ and the planting of arti-

¹³ Director of the Museu Nacional from 1828 through 1946 and later head of the Jardim Botânico (1859-1861).

ficial fields where they could feed; improvements to fruit-bearing trees, medicinal plants, and food plants; silkworm and bee raising; upgrading of charcoal kilns; potash production; and experimentation with compost heaps. To make these projects possible, the Commission recommended the annexation of national forests and lands near the JBRJ.

The government rejected the proposals, alleging a lack of funds for the suggested projects. Still, the government's constant demands that the JBRJ try to place less of a burden on the national treasury were no longer brought up in subsequent years. The institution seems to have limited itself to preserving the arboretum's collections. This suggests there were substantial differences between the government's expectations regarding the JBRJ, the feasibility of developing projects, and the institutional reality described by its directors for decades.

In 1838, a decree was handed down approving Police Regulations for the Lagoa de Rodrigo de Freitas Botanical Garden (Brazil, Sep. 6, 1838). Its articles reveal a preoccupation with defining rules appropriate to a kind of leisure different from that engaged in at public parks; another concern was taking into account the institution's two branches of activity, so that scientific initiatives would coexist easily alongside recreation. The decree couched it in these terms:

... so that people who visit [the JBRJ] can take advantage of what it offers in terms of recreation, curiosity, and scientific research. ...

No one shall be allowed to have lunch, dinner, snacks, or any other food or spirits inside the Botanical Garden without the prior authorization of the director ...[or] bathe inside the Garden, even if wearing decent dress. ... The director ... shall arrange for any persons entering the Garden to be accompanied by watchmen whenever possible.

While the JBRJ was gaining legitimacy as a space for the population's enjoyment, downtown Rio's Passeio Público was transformed into a botanical garden, likewise in 1838. Since the late eighteenth century, this park had been one of the few public areas in the city center where people could enjoy leisure activities and contact with nature; it was transformed into a place of botanical research as well, with Police Regulations identical to those pertaining to the JBRJ (Brazil, Jan. 18, 1843). Even though it did not achieve any real success because of insufficient funding, for some years the Passeio Público botanical garden provided the capital of the Court with another scientific establishment open to the public, which suggests this was an attempt to create an institution that could fulfill goals unmet by Rio's original

botanical garden. In the decree defining administration of the Jardim Botânico do Passeio Público, tasks are assigned that befit a true botanical garden of those days:

... classify and grow, acclimatize and propagate exotic and indigenous plants for which a catalog should exist ... maintain correspondence ... engaging in appropriate exchanges of observations and of plants, seeds, etc. ... teaching botany, especially agricultural botany, in all its breadth (Brazil, Jan. 18, 1843).

The government still harbored hopes that the JBRJ would research, raise, and improve the cultivation of native plants. After botanists had managed the institution for nearly three decades, with unsatisfactory results, an individual with broad knowledge of public administration and experience in the legislature was appointed its director. Cândido Batista de Oliveira, who headed the Garden from 1851 to 1859, seemed quite fitting a choice to resolve the problem of insufficient funds and to finally launch projects that had never left the drawing-board.

Oliveira, who held a mathematics degree from the Universidade de Coimbra, served in the Empire's most noteworthy public posts: he was a senator in two legislatures, representative, diplomat, and minister both of the Treasury and Foreign Affairs and of the Navy, in addition to performing other important duties within the public administration. In the field of science, he earned fame as a scholar and proponent of the metric system, later adopted in Brazil. A member and vice-president of the Instituto Histórico e Geográfico Brasileiro and professor at the Academia Militar, he was a respected figure among scientists from a wide range of fields.

Despite his undeniable political prestige and his good relations even with the intellectual elite, ministerial reports indicate that Cândido Batista de Oliveira ran into numerous problems during his eight-year administration. He failed to receive the coveted increase in funding, nor did he manage to push through creation of the long-postponed Normal School. He tried to introduce live animals (quadrupeds and birds), which, according to his account, was a way of expanding the RJBG's activities to encompass the study of zoology and also of providing visitors with further entertainment, but neither did this project get off the ground.

Likewise in an effort to produce profitable merchandise, Oliveira invested in making so-called Panama hats. Then in fashion, these hats were made from the straw of a plant known commonly as jipijapa (*Carludovica palmata*, from the family *Cyclantaceae*), a plant native to other regions of South America that had adapted successfully to the Amazon. A facility was set up on the grounds of the JBRJ in 1854, and a Peruvian specialist in raising, drying, weaving the straw,

and in making hats was hired. The initiative seems to have met with a certain success in the beginning, but three years later trouble arose. The problems were blamed on the Peruvian expert, who, according to the director, did not know how to prepare the straw. Although this employee was replaced, further efforts to produce these hats also failed and the crop was abandoned.

Cândido Batista de Oliveira's appointment as head of the JBRJ raises two questions. First, we must ask why someone with a résumé that qualified him for higher posts within the Empire and whose academic work was focused on mathematics, astronomy, and economics—in other words, someone with no background in either agriculture or botany—would find this particular assignment attractive. All indications are that there was a near consensus in governmental spheres that the JBRJ was being poorly managed and that the institution could practically achieve economic self-sufficiency if the right projects were undertaken. It may be that Cândido Batista shared this idea and foresaw a chance to carry out projects that had always been put off.

In the second place, we must ask why the government decided to appoint someone whose background had so little to do with the RJBG's projects and activities. This suggests that the Empire wanted to appoint a representative of its strategic policy, someone who would be able to put the Garden on the same footing with its counterparts in Europe, serving as a showcase for both tropical nature and the progress of Brazil. Cândido Batista de Oliveira intended to bring to fruition projects that had been delayed—in his opinion—by a lack of administrative talent. When he stepped into the job, he indicated that he intended to show that nature was in and of itself an attraction, although it was also necessary to demonstrate the country's progress through government intervention. From his report forwarded to the minister of the Empire in 1852:

Given that this [botanical garden] ranks among the most unusual features found in this capital, to be viewed by both Brazilians and foreigners, it calls for the construction of appropriate buildings and their administration, for what currently stands here in this regard is nothing more than the remains of crowded, defective, poorly placed structures left from the earlier establishment of the Gunpowder Plant, whose mediocrity stands in sharp contrast with the brilliant image of its magnificent arboretum, and with the beauty of the locale (Brazil, 1853, Attachment, p.5)

It is clear that the new director was concerned about buildings: nature was already beautiful enough; what he wanted to show was the government's investment in the institution. In this regard, it seems that Cândido Batista advocated a project distinct from that

of previous, botanist-led administrations.

In order to settle the problem of insufficient project funding without placing a further burden on the Treasury, he proposed selling the lands occupied by 186 renters on the Fazenda Nacional da Lagoa Rodrigo de Freitas, where the Garden was located. Despite repeated endeavors, Cândido Batista's project was not approved, and without a larger budget he was unable to create the coveted School of Agriculture or build new facilities. He was limited to beautifying the arboretum.

His proposal to produce scientific research and provide seeds and seedlings at no cost to any farmer who asked for them, while opening a 140-hectare area to the public, suggests that the idea of achieving economic self-sufficiency was not really feasible. This notion reflects the tension between the institution and the government, a relationship that oscillated between warmer and colder moments during the history of the JBRJ in the first half of the nineteenth century.

Efforts to bring in a steady supply of funds by extensive planting of crops such as tea, raising silkworms (and mulberry trees to feed the cocoons), and introducing jipijapa to make panama hats met with failure, owing to problems enforcing governmental policies and to competition from producers who had the advantage of the free seeds distributed by the JBRJ, which had born the cost of research investments.

In 1859, Cândido Batista de Oliveira was replaced by Custódio Alves Serrão, an administrator with vast experience accrued while head of the Museu Nacional. Known as a polemicist and an ardent defender of teaching and research (Netto, 1870), he was unable to achieve much at the JBRJ, mainly because he disagreed with the idea then under discussion, that is, to make the institution part of the Imperial Instituto Fluminense de Agricultura. He was removed from his post in 1861, the year in which administration of the garden was placed under the latter institute.

Conclusion

Analyzing the trajectory of the JBRJ during the first half of the nineteenth century presents major challenges. Primary documentation is rare and scattered. Furthermore, secrecy surrounded the very creation and operation of the garden under the Court and remained the rule from at least 1808 until the period when relations were re-established with France, further hampering efforts to locate pertinent primary sources.

As with other nineteenth-century scientific institutions, the JBRJ suffered from a lack of continuity in terms of conception and goals (Lopes, 1997). This meant that sometimes agriculture stressed exotic

species for use in making products, while at other times it encouraged species improvement, and at still other times, the focus was on planting hardwood trees so their properties could be researched and then new timber introduced or reforestation take place. In other words, these demands suffered alteration as the institution attempted to adapt, but it failed to devise an effective strategy for its operations.

These constant changes resulted in what Sanjad has called “institutional creation and recreation” (2001, p.195). The government seems to have searched for purposes for the JBRJ, possibly because the original motivations for its founding in 1808 had modified over the years, and society’s new demands were not always fully met by the institution. Yet, given the almost total absence of political continuity, it was impossible to wait for desired results; after all, nature demanded that some projects take time—often a long time—to reach their fruition.

The idea of investing in plant products thus collided with a very objective concern: time. The process of choosing a plant necessarily required empirical experimentation. The process of acclimatization usually encompassed cycles of germination, time in a nursery, and planting. Depending on the species, growth could be rather slow and commercial returns were not immediate. Not only was it necessary to wait for the plants to grow; they also had to develop and be transformed into profits, that is, they had to be produced in larger quantities and use the soil for shorter periods. Moreover, product quality had to surpass that of any competing or similar products. So it might take some years to see results, and these results were not always similar to those obtained in other regions where the plant had been fully developed.

Given the lack of continuity in governmental economic and agricultural policies, the delay in achieving immediate results quite likely presented a strong obstacle to the success of the agricultural crops tested at the institution, and the upshot was a history of failed attempts in economic terms. However, the improvement of native and exotic species and their adaptation to the Brazilian climate and soil possibly benefited from the research conducted at the botanical gardens.

Some of the problems encountered by the JBRJ can be traced to the goal of adopting models from similar institutions, above all, European ones. This idea of transplanting a foreign model made the local institution the object of constant comparisons and disparagement. Foreign travelers who visited the Garden were delighted by its beautiful, generous nature and often criticized the human failure to take advantage of it, as Europe would probably do if it boasted such bountiful nature. In an account of his visit to the JBRJ in 1835, Carl Seidler, a German, stated: “We see clearly

here the infinite goodness, we could even say favoritism, with which mother nature has blessed this land abundantly more than all others. ... But the government's disregard does not allow for anything else, and the innate sloth of the Brazilians is not meet for the most useful reforms" (Seidler, 1980, p.64). These records bequeath us a derogatory impression of the institution, which was accused of being unscientific and reduced to a mere public park.

It is called a Botanical Garden but it does not live up to its name. ... The garden is actually little more than a place of leisure, where people go for recreation and to take fresh air (Robert Walsh, US pastor, cited in Segawa, 1996).

It is no more than a public park decorated with exotic plants (Hermann Burmeister, naturalist, cited in Segawa, 1996).

Lopes' study on scientific research in nineteenth-century Brazil, especially at the Museu Nacional (1997), helps us understand the trajectory of the JBRJ, in light of the context shared by both institutions:

The museum's lack of prestige stands as evidence that while the natural sciences were to a large extent responsible for uncovering the country's natural products, they were always seen as accessories within political spheres and by sectors of the local scientific community, given the urgent needs of medical practice and for the construction of roads and buildings (p.329).

Later on, the author concludes: "Beyond a doubt, the Museu Nacional was never what they expected of it" (Lopes, 1997, p.332). The same was true of the JBRJ: expectations were much greater than what was delivered, and the desire to put the institution on the same footing with its counterparts in Europe and the United States was partly to blame for this.

It may well be that botanical research in Brazil could not be exactly like that in Europe. However, researchers endeavored to engage in steady scientific exchange in order to keep abreast of new knowledge, often times doing so by sending collections. The great reference herbaria for the identification of flora were located in Europe. In Brazil, however, research was also done on taxonomy, despite the problems presented by a scant bibliography and the fact that herbaria were still under construction. Starting in the latter half of the nineteenth century, Brazilian botanists began a movement to have their 'discoveries' recognized by the world scientific community; at times they clashed with scientists who felt their own work had been appropriated.¹⁴

¹⁴ On this topic, see the enlightening article by Sá, 2001.

In their annual reports to the ministers of the Empire, directors of the garden were constantly pleading for more funds. We should ask to what extent the effort to reproduce a European model within such a different context, where money was short, did not breed ongoing dissatisfaction with results and prompt attempts to change directions, which nevertheless met with failure and thus fueled constant criticism and ridicule of the institution. It is possible that this assessment helped corroborate the idea that no science was done in nineteenth-century Brazil. Contemporary historiography has revised this outlook, and with each new study on nineteenth-century scientific institutions, we realize more clearly how much science was really done in that period of the country's history.¹⁵

¹⁵ On this topic, see Figueirôa, 1998; Lopes, 1997; and Dantes, 2001.

Despite these problems, the JBRJ enjoyed a certain stability compared with other Brazilian institutions that began operating in the nineteenth century. It remained under federal government guardianship and at the same location, although it did lose part of its original land. It kept the same name, and even though it was first called the Acclimatization Garden, this moniker does not contradict the concept of a botanical garden. Of the botanical gardens created at the end of the eighteenth century and during the nineteenth, it was also the only one to continue in operations. We must reflect deeply to understand the JBRJ, since it is a green space with so many unique features. History seems to have been a great ally of the garden, which eventually made its way into memory as a place that symbolizes Dom João VI, the king who 'transferred civilization' to Brazil. Perhaps the institution was preserved during the Empire as a way of revering the Bragança heritage. During the Republic, its first director, João Barbosa Rodrigues, managed to lend the institution both scientific and historical credibility, especially through the publication of *Hortus fluminensis* and *Lembrança do 1º centenário do Jardim Botânico do Rio de Janeiro, 1808-1908*, which highlight Dom João VI's act and the work of botanist Frei Leandro do Sacramento.

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Thanks to this publication by João Barbosa Rodrigues, the Jardim Botânico do Rio de Janeiro celebrated its centennial by valuing its history. In 2008, we celebrate its bicentennial and hope that the date will inspire other historical studies, as befits the oldest scientific institution still operating in Brazil.



Post card celebrating 150 years of Rio de Janeiro Botanical Garden. Seeds of the first imperial palm, planted by d. João VI, originated those that form today the Garden's main alley.

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