ECONOMIC BOTANY IN THE INDIAN OCEAN: OFFICIAL AND UNOFFICIAL BOTANICAL GARDENS ON ILE DE FRANCE AND ILE DE BOURBON UNDER THE FRENCH REGIME, 1735-1810

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ABSTRACT

France was late to enter the European race for empire in Asia, but it was the earliest nation to employ colonial research gardens to organize the push eastward. The French botanical vanguard settled on the Mascarene Islands in the Indian Ocean where, beginning in the 1730s, a series of gardens contributed to France’s imperial fortunes and provided a model for later plant research networks in other European empires. In spite of past interpretations of French colonial science, there emerges a compelling argument that a dynamic interest in practical applications of scientific knowledge was present in the Indian Ocean region during this period. Botanical gardens on Ile de France and Ile de Bourbon performed rôles central to the direction of overall French colonial activities. Applied botanical gardens helped develop colonial economies. They exchanged plants with other French colonies, notably in the West Indies. They also provided information and plants, for various purposes, to the metropole. The botanical gardeners of the Mascarenes also represented France to other nations, functioning on its behalf as botanical diplomats sharing knowledge and specimens with foreign countries. This period of economic botanizing ended, for France, in 1810 with the loss of its Mascarenes colonies to the British.
# TABLE OF CONTENTS

Abstract .................................................................................................................. ii
Table of Contents .................................................................................................. iii
Text: Economic Botany in the Indian Ocean......................................................... 1
List of Sources ...................................................................................................... 37
Appendix ................................................................................................................ 42

Appendix 1: Map of Ile de France (Mauritius) ...................................................... 43
Appendix 2: Map of Ile de Bourbon (Réunion) ...................................................... 44
Appendix 3: “The house of Cére´ at Pamplemousses” ........................................ 45
Appendix 4: “Jardin de Mon Plaisir” ................................................................. 46
Appendix 5: “Mon Plaisir” ................................................................................ 47
Appendix 6: “Le Réduit” .................................................................................... 48
Appendix 7: “The Garden at Leiden” ................................................................ 49
Appendix 8: “The Jardin du Roi at Paris” ........................................................ 50
France was late to enter the European race for empire in Asia, but it was the earliest nation to employ colonial research gardens to organize the push eastward. The French botanical vanguard settled on the Mascarene Islands in the Indian Ocean where, beginning in the 1730s, a series of gardens contributed to France's imperial fortunes and provided a model for later plant research networks in other European empires.¹

Until the loss to the British in 1810 of France's Indian Ocean possessions, Pamplemousses on Ile de France and other gardens like it performed rôles central to the direction of overall French colonial activities. Applied botanical gardens helped develop colonial economies. They exchanged plants with other French colonies, notably in the West Indies. They also provided information and plants, for various purposes, to the metropole. The botanical gardeners of the Mascarenes also represented France to other nations, functioning on its behalf as botanical diplomats sharing knowledge and specimens with foreign countries. These three broad types of activity are diverse, but if any one term could be used to describe the activities of these gardens, it could easily be "economic botany."²

¹The Mascarenes under French control consisted of Ile de France (now Mauritius), Ile de Bourbon (now Réunion), and Rodrigues — the last never the scene of any significant colonial activity during the French period.
²Lucile Brockway, in Science and Colonial Expansion: The Role of the British Royal Botanic Gardens (Studies in Social Discontinuity, New York: Academic Press, 1979), seems to have been the first to use the term but she did not elaborate it beyond identifying "an era of economic botany" in the eighteenth and nineteenth centuries when "the usefulness of new plants to the national economy [of Britain] was prominent in the minds of all but the purest taxonomists." (p. 75) James E. McClennan III, in his 1992 work (Colonialism and Science: Saint Domingue in the Old Regime, Baltimore: Johns Hopkins University Press, 1992) went much further by describing an eighteenth-century economic botany where "without plant transfers and government policies promoting the cultivation of economically useful products, Saint Domingue and other similar colonies would never have existed." (p. 148) He continued, "as plantation systems and colonial economies developed in the eighteenth century, the great mercantilist powers invested significant resources in programs of applied botanical research and development. Following on initial botanical explorations of their territories, the French, the British,
Daniel R. Headrick, in *The Tools of Empire*, accounted for the success of the second British empire by crediting a number of European technological innovations — the breechloader, the machine gun, the steamboat and steamship, and quinine — with lowering the cost, "in both financial and human terms, of penetrating, conquering, and exploiting new territories."³ Similarly, the French in the Mascarenes employed an evolving technology of botanical gardening to investigate and assess potential and existing colonies. Once that was done, colonial gardens were used in research, communication, and diplomatic activities. Gardens were not a single, discrete technology in the exact sense that Headrick uses the term, but as technological agents they employed technologies and thinking that might be together termed economic botany to make good their missions. Headrick advances his case further by stating that European technology succeeded, in part, simply because it was an advantage other nations did not have. This, too, was the case with economic botany in the Mascarenes.

Gardening on Ile de France and Ile de Bourbon has previously been studied by Mauritian scholar Madeleine Ly-Tio-Fane. She was described by a colleague in the preface to her 1970 work as "an historian, a historian of economics, and at the same time a historian of botany" who had produced model publications.⁴ Lio-Ty-Fane launched her career in 1958 while assistant to the Dutch actively sought to identify new, economically useful plant (and animal) products and to introduce them into large-scale production, as had been done previously with coffee and sugar." (p. 147) Discerning a strong connection between colonial gardening activities and larger imperial agendas, McClennan observed that "Programs of direct applied botany sought to achieve an immediate or near-term economic benefit for the nation funding the enterprise, and in this area the knowledge of scientific experts promised great returns on the investment." (p. 148)

⁴Madeleine Ly-Tio-Fane, *The Triumph of Jean-Nicolas Céré and his Isle Bourbon collaborators, Documents Preceded by an Introduction*, in series from École Pratique des
librarian at the Mauritius Institute in the capital, Port Louis. Her first book was a survey of archival documents about the beginnings of the Mascarenes spice trade. A second volume was published in 1970, this time with Fernand Braudel’s support in the second series of Le Monde d’Outre-Mer Passé et Présent, a project of the École Pratique des Hautes Études. Ly-Tio-Fane’s research drew upon libraries and archives in Mauritius, Europe, and the United States. Her approach in both books was to illuminate the major personalities of the spice trade by presenting their selected correspondence and writing brief introductory essays. In neither case was gardening a primary topic of inquiry, but because her subjects were so closely connected to botanical enterprise the two books constitute a useful primary source in the study of economic botany in the Indian Ocean. Later articles to 1991 were more analytical than the archival collections and described the operations of colonial gardeners and plant collectors.

In addition to casting light on a previously obscure area, Ly-Tio-Fane’s work may be viewed as an early challenge to the view that eighteenth century French botanical efforts were ineffectively devoted to colonial ends. Headrick advanced this argument in The Tentacles of Progress, stating that compared to Britain and Holland, France was not committed enough to international trade to exploit gardens effectively, did not possess an elite sufficiently interested in agriculture, and culturally was unable to see beyond the “purely scientific ap-

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5Madeleine Ly-Tio-Fane, Mauritius and the Spice Trade, 1. The Odyssey of Pierre Poivre, Publication No. 4 in Mauritius Archives Publication Fund series, Port Louis, (Mauritius): Esclapen Limited, 1958.
6See footnote 4.
proach" of botanical research. It is true that French applied science stagnated in the nineteenth century, but the flaw in Headrick’s analysis is that he failed to note examples of prior success. The findings of James E. McClennan, in his recent Colonialism and Science: Saint Domingue in the Old Regime, support the challenge to Headrick’s view. McClennan concluded that “the powers that be in the Old Regime made every effort to exploit science and medicine in the promotion of economic growth and economic development.”

It was only when the French withdrew from colonial areas that their research efforts and organizations withered. The Mascarenes gardens, like scientific enterprise in Saint Domingue, “marched at the vanguard, not the rear guard of colonialism.”

Of three official and two important private gardens on Ile de France between 1735 and 1810, Pamplemousses secured from the beginning a leading place for botanical gardening in the Mascarenes. Pamplemousses eventually became — according to botanist and Royal Society of London president Joseph Banks — one of the three best botanical gardens in the colonial world and an exemplar of applied tropical research as an effective instrument of colonialism.

8McClennan, op. cit, p. 289.
9Ibid.
10"Pamplemousses" or grapefruits is, interestingly, a citrus species native to the West Indies, where it probably arose as a hybrid of two or three indigenous species and was noted in Barbados by 1750 (McGraw-Hill Encyclopedia of Science and Technology, 7th ed. 1992, v. 8, New York: McGraw-Hill, p. 186). The act of thus naming the district of the first garden is suggestive, perhaps, of the kind of ambitions placed from an early time upon Ile de France botany to pursue interests common throughout the empire.
12Banks was so impressed with what he had learned of Ile de France botany that he wrote to an associate of "the attention, paid by the French nation, while under the ancient government, to the transportation of useful plants from one part of the globe to another,
On the older colony at Ile de Bourbon were two successive official garden sites and at least two private gardens whose owners contributed to official efforts. On Bourbon as on Ile de France, the official gardens were not the only places where research activities took place. Unofficial gardens operated by enthusiasts often reinforced official facilities that were constrained by lack of resources and they did so without challenging the jurisdiction of the official gardens.

The gardening enterprise was one part of a multi-faceted effort on the part of the French to establish the Mascarenes as colonies that would help assure viable shipping on the route to the East Indies. From 1715 to the early nineteenth century the islands occupied a diminutive but vital niche in a dynamic French colonial empire. Among its functions, the island was a supply port that serviced Indian Ocean shipping of all flags; it was a frontier station for French exploration of the Indies and Antipodes; and it was an offshore banking haven for British merchants repatriating wealth from India.

During this time the model of the scientific botanical garden of the early sixteenth century was replaced and later overtaken by what McClennan called the "applied botanical garden." The difference was that the older type of garden was mostly concerned with collecting and classifying plants, while the
applied botanical gardens were, to use McClennan's definition, "government institutions and elements in government policy to promote national and colonial economies"\textsuperscript{15} that also carried out some of the original functions such as taxonomy and providing medicinal herbs. This transition, vividly illustrated by the Mascarenes experience, took place because commercial interests invaded the garden, but it was an invasion welcomed by applied gardeners themselves. Gardeners came from many walks of life and the category encompassed dedicated amateurs, aristocratic dilettantes, government officials, plantation owners, and professional scientists (inasmuch as such a term may be used in relation to the eighteenth century). Gardening increased the status of these individuals in colonial society and made available to them resources unattainable by other means for understanding and exploiting the wider world. By the late eighteenth century this marriage of the academic and the worldly had contributed to an explosion of interest not only in practical gardens but botanical enclosures of all kinds. In Europe alone, some 1,600 botanical gardens existed by century's end.\textsuperscript{16}

Early French settlers on Île de France would have been conscious of a rich culture of gardening that by the mid-eighteenth century in France was elaborately expressed in the grounds of all the wealthy as well as in major cities where collecting gardens were well established. Gardens of all kinds abounded in France. The contributor on gardens to Diderot's \textit{Encyclopédie} could articulate no fewer than five types of garden: "estate gardens, floral

\textsuperscript{15}McClennan, \textit{op. cit.}, p. 148.
gardens (or gardens of flowers), fruit gardens, kitchen gardens, and botanical gardens.17

After 1700, few new colonies of any European empire were created that
did not from the outset contain botanical gardens.18 Often these gardens
combined features of two or more of the types of gardens Diderot
distinguished. Perhaps it was easier to do it this way since the garden facilities
served limited populations struggling to establish themselves quickly in new
lands. In any case the French — usually under the aegis of the Compagnie des
Indes — became the first Europeans to develop a significant network of
gardens. While the West Indies were the scene of high botanical activity later
in the eighteenth century, the mid-century elaboration of garden functions
defined on the Mascarenes foreshadowed future directions in economic
botany. This was the case not only in the French realm, but elsewhere as well.
Joseph Banks' clear admiration of the French system19 was translated into
British action by gardeners at Kew that included intensification, especially
early in nineteenth century, of inter-colonial plant transfer activities. The
Dutch, whose early garden at the Cape of Good Hope from 165220 was envisaged
mainly as a food-production facility but “soon became a garden of
acclimatization,”21 had by the late 1750s followed at least in part the examples

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17d'Alembert Diderot, *Encyclopédie ou Dictionnaire Raisonné des Sciences, des Arts et
des Métiers, par une Société de Gens de Lettres*, v. I-V and supplements, Paris, 1751-76,
V, p. 499.
18Of the tropical British colonies, Brockway has shown gardens to be a constant presence;
McClennan's survey of French colonies in addition to Saint Domingue revealed a similar
circumstance. A wider study would be instructive if it could show how widespread
applied botanical gardens actually were among Europe’s colonizing nations.
19See footnote 5.
21Ibid., p. 48.
of France and Britain by founding an official medicinal garden in Batavia;\footnote{22} applied research stations followed in Java and Ceylon.\footnote{23} Colonial gardens in the tropics were, in short, widely implemented. Their attraction was infectious, particularly from the 1750s onward — about the same time the gardens of Île de France began to flourish.

Île de France, 1,865 square kilometres in area, was first investigated by Europeans in the early sixteenth century when the Portuguese explorer Mascareñas found it uninhabited but did not stay. By the 1630s English navigators had marked the spot as a layover where fresh water could be obtained.\footnote{24} The Dutch, who gave Île de France its most enduring name of Mauritius,\footnote{25} found its location in the western Indian Ocean 880 kilometres east of Madagascar to be useful as a supply-station for ships and to some extent a colony in its own right — although Mauritius was not sufficiently attractive to siphon off any of the energies devoted to Cape Town. Fitfully settled through the seventeenth century, the island then was exploited mainly for its timber; "settlers ruthlessly plundered the indigenous forests (especially the ebony trees)"\footnote{26} with the side-effect of "extinction of many plant and animal species" including the dodo, other bird species, and types of tortoise.\footnote{27}

\footnote{23}McClenann, \textit{op. cit.}, p. 148.
\footnote{25}Toussaint, 1977, \textit{op. cit.}, p. 19
\footnote{26}\textit{Ibid.}, p. 19.
The Dutch had, however, decided to concentrate their regional colonizing efforts at Cape Town. Their departure in 1710 was hastened by nearly constant poor management, rat-infested crops, and the Dutch administration’s failure to encourage women to come to the island and so increase the likelihood of permanent settlement. Despite agricultural improvements towards the end of the Dutch regime the only enduring legacy left behind was a small sugar cane industry that would later, in the nineteenth century, become the island’s economic mainstay.

The French Compagnie des Indes claimed Mauritius and renamed it Ile de France in 1715 before occupying it four years later. The new colony lay north of the “great route” to the Indies established in 1611 to replace the channel route between Mozambique and Madagascar. This made it an attractive layover point for French ships which, unlike the Dutch and British, were unable while in the region to drop anchor in ports under their own nation’s rule. Compagnie des Indes shipping volume to the East had been rising slowly from the 1660s when 24 vessels were sent to Asia during the decade, more than doubling to 55 for the 1720s, and multiplying again to 109 the following decade. A ceiling of 303 ships was reached during the decade 1780-90. The need for a safe harbour under the French flag was satisfied with Port Louis on the island’s northwest coast. A minor attempt at colonization in 1722 brought 100 or so settlers who struggled with little success.

30 Ibid., pp. 21, 23.
31 Ibid., p. 18.
to establish themselves. In 1729, the Compagnie once again resolved to develop its Indian Ocean outpost. Around this time the Compagnie's shipping volume increased to the point of rivaling that of the English East India Company.

By the 1730s the French company's mission was perceived by one writer to be the acquisition of:

spices, drugs and other things not produced in our country, which we cannot do without and which we would be absolutely required to get from our neighbours, [for] if we ceased to fetch these goods ourselves we would be under the necessity of acquiring them from the Dutch or from other foreign nations who do carry them, to whom we would have to pay not only the purchase price in the Indies but also the costs which they incur in acquiring them and the profits which they make on resale.

Not until 1734 did the French trading monopoly effectively seek to solve the middleman problem by exploiting its new Ile de France possession, and even then its prospects "did not seem bright." A more serious attempt in that year saw a governor appointed with the resolve that Ile de France be developed to provide a much-needed safe port and to rival the productivity of the Spice Islands. To that time — and beyond — Dutch presence in the East Indies continued to give the Verenigde Oostindische Compagnie (VOC) control over the spice trade, while the English East India Company maintained its strong position in India.

Port Louis became, in the following decade, "de facto the strategic capital of the French empire of trade in the East Indies" and it remained that

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33 Meyer, op. cit., p. 137.
36 Toussaint, 1977, op. cit., p. 29.
until surrender to the British in 1810. At the physical centre of an overseas commercial empire, the island was located in a position convenient to all, as a French observer remarked in the early 1800s:

The colony of Ile the France is, in a way, a central geographical point between every other place in the world. One might travel there from Copenhagen, Amsterdam, London, Bordeaux, Marseille [sic], Boston, Peru, the Philippines, China, Pegu [near Java], Bengal, Madras, the Malabar Coast, the Gulf of Persia, Moka, or Mozambique — and in each case arrive there after a journey of four months.38

Smaller, neighbouring Bourbon had been surveyed in 1638 by the French who took possession in 1649 and established a tiny colony in 1665.39 Settlers began early experimentation in crops and patterns of botanical research were established that, though informal compared to what came later in Ile de France, would persist in various forms for more than a century. In 1681, “an attempt was made to acclimatize the clove, and in 1702 to acclimatize the pepper plant; both failed.”40 In 1718, coffee was confirmed as a viable crop for Bourbon, and the island began to develop primarily as an agricultural colony — a rôle the French administration regarded as particularly suitable since an absence of useful harbours relieved Bourbon of any chance of becoming a seafaring colony.41

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38 This observation was made by Felix Renousard de Sainte Croix in an 1810 publication quoted in Madeleine Ly-Tio-Fane, “Contacts between Schönbrunn and the Jardin du Roi at Isle de France (Mauritius) in the 18th Century: An Episode in the Career of Nicolas Thomas Baudin,” pp. 85-109, *Mitteilungen des österreichischen Staatsarchivs*, 1982, p. 91.
40 Ibid. p. 27.
41 The port problem was caused mainly by steep cliffs all around the island. Bourbonese settlers, in order to ship their export crops, resorted to various ingenious methods including, at one point, a floating jetty. See Toussaint, 1977, *op. cit.*, p. 30.
transported" by the company, shipping average annual cargoes of 1,300,000 pounds in the early eighteenth century.42

Early company policy portrayed Ile de France and Bourbon "as two colonies with complementary functions,"43 the former as a colony of seafarers and Bourbon a colony of farmers, one of them "a port and the other a granary."44 Strangely, however, while this policy held true for Bourbon — the island remained agricultural though it never matched the modest prosperity of its neighbour — Ile de France became both a successful port and a thriving agricultural colony. Pamplemousses quickly grew in its "seafarers" colony setting while the official garden at St. Denis, capital of Bourbon, remained for a time, until its later relocation, a "neglected, sodden patch behind the governor's bakery."45 The Ile de France gardens, including the main Pamplemousses facility, were located close to the main port, which was convenient because many garden functions, such as supplying food for ships and dispatching plant samples by sea, depended upon harbour access.

The Mascarenes' first botanical garden at Pamplemousses was founded in 1735 under the patronage of company Governor Mahé de Labourdonnais as an addition to his country estate Monplaisir situated in hill country fifteen kilometres northeast of the capital.46 The promptness with which Labourdonnais instituted the new garden suggests it was considered as important an element of colonial infrastructure as the roads, hospital, canals,
government offices, and batteries that the new governor also built immediately. Labourdonnais appears to have established the gardens privately but sold them, along with the estate he had built, to the company almost immediately.

Pamplemousses seems to have had multiple functions and a diverse character from the start. Although written descriptions of any of the early Mascarenes gardens are scarce, a recent account described the Pamplemousses gardens circa 1970 as a rambling, 57-acre park featuring heavy, ornate gates, palm arcades, statues, a long lily pond, botanist's house and herbarium (both probably dating to the post-1810 British regime), giant tortoises, exotic fish in a canal around the palm island, a ravine, and the "bridge of sighs."

The Mascarenes botanical gardens likely followed their continental contemporaries closely in appearance. The most obvious physical feature would have been their enclosing walls. Contemporary sketches from Diderot's *Encyclopédie* depict high-walled gardens organized in neat seed beds and sometimes accompanied by greenhouses. Walls performed at least two functions in addition simply to defining the garden's borders. A high enclosure around a relatively small space could contribute to creating a kind of 'micro-climate' inside, where wind and heat could be manipulated to achieve ideal growing conditions. Walls offered protection from a variety of natural hazards. Céré in 1783 reckoned among his worst enemies "insect pests (such as lice), cyclones, unfavourable climactic conditions." A second

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51 Ly-Tio-Fane, 1958, *op. cit.*, p. 16.
reason for walls, particularly in the Mascarenes example, was to protect the prized spice plants within from theft or deliberate sabotage — a hazard heightened at times when prizes were offered for successful propagation.

Contemporary drawings depicting Pamplemousses are of very little help in portraying garden interiors, for they are landscape views from a distance that do little more than show the garden's location on flat ground beside a river, with sharp volcanic hills rising in the background. It was typical at the time for gardens to be schematized with bird's-eye-view plans but no such drawings have been located for any Mascarenes garden. Another view, this of Céré's estate, shows well-tended grounds with earthwork terraces leading toward a path into what may be a cultivated forest. Pastoral buildings suggest a considerable amount of activity.

Garden sites were not chosen at random. Many considerations were prescribed, taking into account temperature, soil quality, elevation, prevailing winds, sun exposure, and proximity to water — factors that would determine not only the garden's aesthetics but, what is more important for the applied botanical gardens on Ile de France, their ability to aid efforts at acclimatization. The gardeners were well aware of the importance of "soil conditions, soil humidity, water table levels, and the desirability of maintaining an extensive protective tree cover so that agriculture on the island might prosper."52

Over time, Pamplemousses grew in size and in the number of functions it carried out, and its layout and organization evolved accordingly. At the very beginning, when Labourdonnais founded the garden first to grow food for

immediate consumption and second to develop drought-hardy plants. The early Pamplemousses was neither elaborate nor tightly organized. Small staffs—a factor in Ile de France garden budgets for decades—probably meant limited ability to carry out all objectives fully. 53 With the addition of medicinal plant cultivation (indeed, Ile de France came to be regarded as a leading world source of useful “physick” species) a more encyclopedia-like organization may have been used in that part of the garden, following the long European tradition of didactic gardens organized with mnemonics in mind. 54

The gardens might have been able to satisfy many maritime requirements with locally produced foodstuffs, but Ile de France could not, as a supply port, itself grow or manufacture every item calling ships might conceivably require. Many commodities had to be imported. While the vessels that brought the additional goods that the Ile de France middlemen would sell solved a procurement problem, they presented another one: what to embark once Mascarenes-bound cargoes had been unloaded? According to a recent writer on the Compagnie des Indes, one answer was to ship out locally produced goods, such as Bourbonese coffee. 55 A further solution existed that also promised to address the major problem for the French of having no access to the East Indies Spice Islands, then under control of the Dutch.

While the Labourdonnais garden was joined by other official and unofficial gardens from the late 1740s, the French Compagnie des Indes had by

53 Notwithstanding Joseph Banks’ frank envy of the Mascarenes garden system (see note 5), the record suggests Pamplemousses and other facilities were chronically underfunded and understaffed—certainly, skilled workers were scarce, perhaps owing to the transient nature of the port economy encouraged in Ile de France. References are frequent to (sometimes highly skilled) African slave garden workers and “the dearness of [free market] labour.” (Ly-Tio-Fane, 1958, op. cit., p. 16)
54 Prest, op. cit., p. 7.
55 Haudrére, op. cit., pp. 82-3.
that time been convinced of the economic necessity of challenging Dutch monopolies of the East Indies spice trade. Since territorial acquisitions in the East Indies were considered unattainable, another option that seemed clear enough at the time was to replicate the Spice Islands in a place that resembled them but was under French control. One such place was the Mascarenes, even though they were situated much closer to the Tropic of Capricorn than to the equatorial latitudes of Molucca and other Spice Islands; another was the West Indies, where a number of colonies were under French control. If spice plants could be procured and successfully propagated on Ile de France, and then those adapted plants shared with other colonies, the hope existed of developing a French spice trade that did not depend on other nations' monopolies. Benefits did not stop at the commercial: "If the spice venture were a success, the Dutch would be forced to come to terms with the French, and a commercial agreement with the Netherlands would constitute a landmark in the system of alliances of European sovereigns."56

Following Labourdonnais' utilitarian initial attempt at gardening during the 1730s and early 1740s, an extraordinary figure entered the scene who would meet some of the wider objectives by advancing the development of the gardens at Pamplemousses and elsewhere around the Mascarenes. Pierre Poivre (1719-1786) was a prolific author, explorer, and one-time Jesuit before becoming a Compagnie des Indes agent (1746-55) and arriving at Ile de France in the mid 1740s. He initially sailed to the Indies from Ile de France on a botanical mission in 1749. It was the first of his many such voyages to bring back nutmeg and clove trees for acclimatization in the Mascarenes, and he was

assured by the new Ile de France governor, who by this time had succeeded Labourdonnais, that he could depend upon having:

a garden [in Ile de France] to receive the plants. [The governor] could think of no better place than the spot he had chosen for the shelter of the ladies in case of an invasion, actually the site of [the governor's country estate] Le Réduit where he had started to build a magnificent country residence. He begged [company directors] to give greater attention to the state of the fortifications of the island which he judged inadequate. In the last war, the Dutch had been keener than the English on the capture of the island, and it could be foreseen that on a renewal of hostilities, they would increase their efforts to turn the French out, especially if they heard that spice plants had been conveyed there.57

This second, official garden at Le Réduit was established southeast of Port Louis and, like Pamplemousses and most other Mascarenes gardens, was located inland and up river.58 Evidently, however, the garden was not implemented to Poivre's satisfaction, because four years later he wrote the governor from Manila to recommend once again “the creation of a special garden to receive his plants.”59 Poivre's request for a more serious attempt seems to have been heeded, for in 1753 a botanist and apothecary from France, J.B.C. Fusée-Aublet, arrived at Le Réduit with instructions from the Compagnie to establish a central pharmacy and botanical garden, which he did with some success (in spite of being “compelled to act as house-porter, butler, poultry-yard steward”60 while at Le Réduit) until 1761.

After 1750, besides developing other gardens such as the one at Le Réduit, “colonial administrators [had] upgraded and enlarged Pamplemousses, which then functioned as an experimental station.”61 The arrival in 1755 of a

57Ly-Tio-Fane, op. cit., 1958, pp. 5-6.
58McClennan, op. cit., p. 150.
60Ibid., p. 9.
61McClennan, op. cit., p. 150.
new governor who was "hostile to [Poivre's] projects"\(^{62}\) may have slowed the growth of gardening. Over subsequent decades, however, Pamplemousses appears to have overcome such obstacles. The garden was eventually enlarged, partly by amalgamation into the official gardens of other, nearby facilities. Besides Labourdonnais’ original site dating to 1735 there was Poivre’s own Monplaisir, which became the focus of official research activities and indeed the heart of the botanic agglomeration; Nicolas Céré’s adjacent Belle Eau, pictured in an 1812 drawing as a country idyll complete with a pond with swans, rowboat, and angler;\(^{63}\) and the “model garden” of Françoise Le Juge, a member of the Ile de France Conseil Superieur and plant lover whose estate at Mongoust was the recipient of spice seedlings in 1753.\(^{64}\) A number of other gardens existed as well.\(^{65}\)

The Pamplemousses garden, which after the colony was retroceded to the French crown in 1767 was often referred to as the Jardin du Roi, “was soon to rank among the most celebrated gardens of the world”\(^{66}\) — in spite of having to deal with all kinds of hindrances such as “insect pests, cyclones, unfavourable climatic conditions, dearth and dearness of labour.”\(^{67}\) Céré said

\(^{62}\)Ly-Tio-Fane, 1958, op. cit., p. 9.
\(^{63}\)Appendix 3.
\(^{64}\)Ly-Tio-Fane, 1958, op. cit., p. 8.
\(^{65}\)Another private garden was established in 1764 at Palma, in Plaines Wilmens area about 15 kilometres southeast of Port Louis, on the estate of traveler and agriculturist and close friend of Céré, Joseph Francois Charpentier de Cossigny (Ly-Tio-Fane, 1970, op. cit., p. 36). What started as “a small experimental garden” based on plants Cossigny had brought back from his travels “was to vie in splendour with the riches of the official botanical gardens of Le Réduit and Monplaisir.” (Ly-Tio-Fane, 1970, op. cit., p. 37) In 1775, a garden at Palma, most likely Cossigny’s, was designated an official facility and thus became the third of three Ile de France botanical gardens. (McClennan, op. cit., p. 150.) A garden in the area remained until the 1970s (or later) an official botanical garden that housed the offices and nursery of the island’s forestry department. (Wright, op. cit., p. 36.)
\(^{66}\)Ly-Tio-Fane, op. cit., 1958, p. 16.
\(^{67}\)Ibid., p. 16.
of it in 1772, "All these natural riches lie here, touching my own land; I am 100 toisses [600 feet] from the famous garden of Monplaisir, and I have occasion to see growing in this manner, under my eyes, all of the things that this immortalized and celebrated man [Poivre] placed here that had never been on our island before."68

Upon his departure from Ile de France in 1772, Poivre sold Monplaisir to the king, who decided it should become the intendant's country residence69 but management of the garden was made a separate function under Nicolas Céré (1737-1810), the native-born man whom Poivre had groomed to succeed himself.

The gardens were political entities and were susceptible to administrative infighting. Before leaving Ile de France for the last time, Poivre attempted to appoint Céré his successor. The new intendent, hostile to Poivre, blocked the move by appointing a non-botanist "quite ignorant of the art"70 to head the garden. This man in turn appointed an even greater horticultural incompetent to operate Monplaisir. When, in 1772, the Seychelles were botanically colonized by Ile de France, the mission was undertaken by two rather unimpressive botanical pioneers: one an enthusiastic but not highly regarded civil servant and the other an "ancien soldat."71

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68 Ly-Tio-Fane, 1970, op. cit., p. 35.
69 Ibid., p. 15.
70 Ibid., p. 35.
71 Ibid., p. 32. The pair, equipped with spices and other plants, was charged with the task of establishing a jardin du Roi that would help determine whether the islands offered growing conditions that warranted escalating the level of settlement. See Ly-Tio-Fane, op. cit., 1958, p. 14.
Working in tandem with state mariners like Bougainville and La Pérouse, whose voyage instructions regarding botanizing alone for his 1785-89 circumnavigation of the world take no fewer than 25 pages, the colonial gardeners operated at several levels and their progress was closely monitored in Paris and Versailles.

One early objective was "to provide fresh fruit and vegetables for the settlement and for ships calling at port." Ile de France was located in an ideal spot — four to five months out of France by sea — for ships to stop over to find cures for crew and passengers by then suffering from scurvy, a disease that required several months to manifest itself and so be deemed in need of treatment. By the time ships out of Europe neared the Cape or the Mascarenes, scurvy usually presented a good reason to lay over and take on fresh provisions. In addition, Labourdonnais "also introduced many spice plants as well as cassava for feeding the slaves." A third objective, closely tied to the first two, was based on fears that Ile de France, with an unpredictable and often dry climate, could not be counted on as a reliable home for the subsistence crop species colonials wished to grow. The botanical garden could help to alleviate this by being used to pursue "the specific objective of breeding drought-resistant crops to tide the population over the leaner years."

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74 Haudré, op. cit., p. 82.
75 Ibid.
76 Grove, op. cit., p. 332.
Activities at the Mascarenes gardens extended from or were in some sense peripheral to the objective of gathering together in one place plants or plant parts — seeds, grafts, cuttings — for observation, storage, and experiment in controlled conditions. Poivre and his cohorts and successors most famously concerned themselves with spice plants, but garden inventories at Ile de France as at other, contemporary botanical gardens elsewhere, were vast and included many different types of plants. Besides spices, the main categories in the collection were industrial species, including woods; food plants; and medicinal herbs. Gathering of plants purely for ornamental reasons does not seem to have been a significant factor in this period. However, since all of the Ile de France gardens were at some point attached to country estates it is unlikely esthetic interests were absent. As has been suggested, colonial gardens tended to combine in single facilities many of the functions that in Europe were regarded as separate.

Four spice plants have most often been mentioned in relation to attempts at Mascarenes production: cloves, nutmeg, cinnamon, and pepper. Of these, the first two were accorded by far the greatest importance and dominate accounts of the period. The gardeners met with limited success in propagating the plants Poivre had procured for Ile de France but they persisted. Progress slowed during the 1760s after Poivre retired to France, but resumed with vigor when he was asked to return by the French government, which assumed control of Ile de France in 1767 after the Compagnie's collapse. Poivre’s appointment as the colony’s Commissaire-Ordonnateur (1766-72) gave gardening a higher profile and enabled Poivre to call upon his contacts in the Paris Jardin du Roi. The earlier efforts at spice having not succeeded in

77Toussaint, 1977, op. cit., p. 36. A useful account of events leading to the Compagnie's bankruptcy may be found in Furber, op. cit., pp. 201-10.
producing the valuable products desired, nutmeg seeds and seedlings and clove seedlings were once again collected and deposited, in 1770, at Poivre’s Monplaisir garden.

The garden at Pamplemousses was designed to receive spice seeds, seedlings, and plants from ships landing at Port Louis. Pamplemousses served as a research centre, for example a Mascarenes site for experimenting with grafting spice trees, as well as a local distribution centre that circulated to other gardens and to plantations living specimens that would then be nurtured at the new locations. In the race to develop a Mascarenes spice industry, colonial garden administrators were responsible for awarding the king’s prize of two slaves for the first person to produce fruit successfully on a nutmeg or clove tree; on another occasion, a dozen slaves were offered by the king. When, under Céré after 1772, the Pamplemousses garden succeeded in producing the first fruit from a clove tree the occasion was marked with an elaborate ceremony held in the garden’s grounds. Céré, who through business dealings on the island had incurred a large debt underwritten by the king, was relieved of the burden in recognition of his work in the garden.

On one occasion in 1770 when nutmeg seeds and seedlings and clove seedlings arrived at Isle de France, “The plants were deposited in the gardens of Monplaisir, Pamplemousses, the private residence of Poivre, where they could be cared for under his eyes”; Poivre and the governor then signed an ordinance that would make all unofficial attempts to export the plants “treasonable, and various penalties were prescribed against those who might

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rob or damage the plants.” This legislation was invoked later by Ile de France colonists, unsuccessfully, to prevent plants from being shared with French colonies in the West Indies.

Plants whose by-products had industrial uses were of great interest as well. At Ile de France, the gardens investigated cotton and indigo production. Attempts were made at rearing on local cacti the insects, native to South America, that yielded the bright-red cochineal dye that had already been successfully become the basis of an industry in Saint Domingue. Ebony was exported to Asia and research conducted into various other forest products such as roots, barks, and leaves that might be useful to make dye.

Food plants, the original interest under Labourdonnais in the establishment of Pamplemousses, continued to occupy the gardeners. Indigenous local species were of less interest than the possibility of introducing plants whose qualities were already well known. Rice, various grains, cassava, breadfruit, mango, mangosteen, and cocoa are just some of the plants acclimatized. Although little mention is made of European staple foodstuffs being grown, undoubtedly colonialists wanted to preserve as much of their accustomed diet as possible. Perhaps the familiarity of such plants meant those who documented garden activities did not bother to mention them; or it may be that, since food supply was the earliest task of Pamplemousses, the most common European plants had already been acclimatized and were already in wide distribution by Poivre’s time.

80Ly-Tlo-Fane, 1958, op. cit., p. 12.
81Ly-Tlo-Fane, 1970, op. cit., p. 64.
82McClenann, op. cit., p. 155.
83La Pérouse, op. cit., p. 129.
Céré, was not afraid of experimenting with the dietary possibilities of unfamiliar indigenous plants. In one letter to a colleague on Bourbon he commented on the texture and flavour of a biscuit that had been made from the flour of a white root found on the smaller island.  

Sugar cane, a legacy of the Dutch era, was increasingly a staple of the colony's economy, although the lack of discussion of its cultivation in gardens suggests that it presented few problems to plantation owners that needed to be addressed by botanical experts.

Ile de France was highly regarded as a source of plants with medicinal qualities known or waiting to be discovered. It was also a nursery for imported species. When he arrived in Ile de France in 1768 after being released as naturalist on Bougainville's expedition, Philibert de Commerson wrote, "Providence has placed at our disposal, in these two islands [Ile de France and Bourbon], plants that are the best treatment there is against the illnesses prevalent locally." Commerson had been seconded to an Ile de France government position by the intercession of Poivre, and it was intended Commerson should carry out "a pharmacological and timber resource survey of the Mauritius forests," which did occur and resulted in legislation protecting remaining forests with their rich stores of known and possible medicinal plants. While Commerson's records were largely lost after his death because of the "combined negligence of himself and the royal officials at the Jardin des Plantes [in Paris]," interest remained in medicinal plants.

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84Ibid., p. 149.
86Grove, op. cit., p. 335.
87Spate, op. cit., p. 196.
It was recognized early that "the medicinal plants of Mauritius had a multitude of uses, varying from arresting gangrene and earache to soothing fish wounds, unspecified, and hysteria."\textsuperscript{88} Some plants were indigenous while others, like ayapna from Brazil at the end of the eighteenth century, had been imported. The \textit{Jardin du Roi} at Pamplemousses evidently played some role in both propagating medicinal plants and distributing them to those who needed them. In one case, "the sick flocked to the Pamplemousses Gardens where the plant [ayapna] grew."\textsuperscript{89} One illustrator working during the 1840s documented a great variety of known pharmacological plants, some of which were likely native while others, judging by their names, originated as far away as Java and Mexico.\textsuperscript{90}

While details of the \textit{Ile de France} gardens' herbal component are obscure, European traditions of physick gardens were likely incorporated at Pamplemousses. It was not the only source of medicines. The \textit{Le Réduit} garden was for a time under the control of the botanist Fusée-Aublet, who between 1753 and 1761 established it as a central pharmacy.\textsuperscript{91}

The European medicinal garden traditionally had both dispensing and didactic functions. The latter seems not to have been a significant presence at least in a formal way since there were no institutions of higher education in the Mascarenes. However, a dispensary would have served local needs, as in the Pamplemousses ayapna example above. If either \textit{Le Réduit} or Pamplemousses was organized similarly to the \textit{Jardin du Roi} in Paris, or to the

\textsuperscript{89} Ibid., p. 122.
\textsuperscript{90} Ibid., pp. 8-9.
Horti Academici at Leiden, then it would have been arranged within a square or rectangular grounds in intricately designed planting beds, a design echoed and repeated in garden schematics dating from the seventeenth and eighteenth centuries and prominent in Diderot's drawings in the Encyclopédie of "Agriculture, Jardinage" and "Jardin Potager," where plants were often arranged in alphabetical or thematic order to aid students.

Besides their local activities, the colonial gardens also conveyed exotic and useful plants such as cassava, breadfruit, palms, and indigo, from colony to colony and often from colonial hinterland to imperial centre.

Vigorous activity took place between gardeners in France and the Mascarenes. Although at least two governors during the 1740s may have lacked Labourdonnais' "breadth of view," and did little to foster agricultural research, botanists like Poivre cultivated political connections assiduously. Poivre communicated with the Compagnie des Indes and with fellow naturalists in the Paris Jardin du Roi. The king's garden in Nantes, which Versailles had designated a collection centre for incoming maritime botanical specimens in 1709, was probably one destination for Mascarenes specimens. Poivre contributed articles and memoranda to the Académie Royale des Sciences. Céré had left the island as a young man, traveled to France for his education and there developed expertise as well as personal ties that would later be useful. He then returned home to assume the post of chief botanist at Pamplemousses upon Poivre's retirement. Céré contributed articles on botany to a French encyclopedia and throughout his correspondence with prominent

94 McClennan, op. cit. p. 149.
95 Ly-Tlo-Fane, 1970, op. cit., p. 29.
Parisian botanists Buffon, Daubenton, Thouin, and Lamarck became an influential figure in scientific circles. He won a gold medal from the Société d’Agriculture in 1788 and through his career was noted as an accommodating host to visiting naturalists.96

Both Poivre and Céré met many obstacles and frustrations in attempting to carry out their tasks. Despite having strong Compagnie endorsement for his plan to carry spice plants illicitly from the Dutch East Indies to Pamplemousses, Poivre found the directors’ commitment to his enterprise could waver when it came time to produce promised expedition funding. His efforts of the 1750s were, however, rewarded when a new Comptroller-General at Versailles “advised the king to grant a pension to Poivre” before calling him back “on the bankruptcy of the Company, when the islands of Bourbon and of France were retroceded to the King” and the French government thought that given “appalling” economic conditions in the Mascarenes, “the formation of spice plantations on Ile de France was the panacea.”97 When Poivre did finally leave, he sold his Monplaisir estate, including the highly regarded garden it contained, to the crown “to become the country residence of the Intendents.”98

After 1767, the year the French government retroceded the Mascarenes following the final collapse of the Compagnie des Indes, the future for economic botanizing looked brighter than ever. Lio-Ty-Fane has commented of post-1767 French government policy that “hopes of building [Ile de France’s] prosperity on the development of the port into an entrepôt came second to those placed on an agricultural venture involving the ac-

96Ithier, op. cit., p. 33.
97Ly-Tio-Fane, 1958, op. cit., p. 9.
climatization of foreign plants and long experimentation.” In 1770, the central government then controlling Ile de France promulgated an ordinance “which explained in its opening clauses that it had been considered necessary to ensure to the colony the exclusive possession of the plants recently introduced.” The crown was willing to enforce this declaration with the full force of the empire, declaring spice plants vital to the colony’s survival.

Even when they had strong central support in principle, however, the Ile de France official gardeners struggled to win the resource allocations they believed they needed to do their job well. In the early 1780s, Pamplemousses under Céré was faced with possible closure under budget pressures at home and suggestions the colony was being poorly managed, a possibility that created alarm when the commissioner-general of colonies paid a personal visit in 1785. The prospect of losing his operating funds had earlier, in 1783, prompted Céré to petition the director of colonies at Versailles, promising to send more plants to the king’s garden in Paris and reminding the chief bureaucrat of the garden’s successes during and since Poivre’s time.

The mission of the official Ile de France gardens included cooperating with other French colonies by supplying plant materials and information that would assist them in developing local industries. To a much lesser extent, Ile de France could expect to receive materials in return.

For Ile de France during the period in question, botanical intercolonialism concerned latter-day attempts to colonize the Seychelles, and

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99 Ly-Tlo-Fane, 1958, op. cit., p. 10. 
100 Ibid., p. 31. 
101 Ibid. 
102 Ly-Tlo-Fane, 1970, op. cit., p. 64. 
103 Ibid., pp. 258-9.
serving the West Indian colonies. Pamplemousses also received contributions from Madagascar, whose botanical wealth was well recognized. 104

Neighbouring Bourbon continually received spice plants from Pamplemousses. The Ile de France gardeners were willing to instruct their official and unofficial counterparts on the other island in solving cultivation problems. Regular correspondence dealt with specific problems; visitors from Bourbon were made welcome at Pamplemousses to see for themselves how best to achieve useful results through experimentation.

In France's grand imperial plan, by far the most important relationship was with the West Indies, principally Saint Domingue, Cayenne, Guadeloupe, and Martinique. The empire had contracted with the Treaty of Paris at the end of the Seven Years' War in 1763 removing territory in Canada, the West Indies, and Louisiana from the fold. 105 The distributed resources of an applied botanical garden network represented one way to make the most of relatively slim resources separated by great distances and so keep together what remained.

Cayenne was identified as early as 1771 as a site arguably superior to Ile de France for the cultivation of spices. A Versailles official described it as very close in latitude and climate to the Moluccas, where many spice plants had originally been gathered. 106 Increasing the productivity of West Indies plantations was of prime importance.

Fusée-Aublet, formerly director of the Le Réduit gardens, became botaniste du roi and garden director in Cayenne in 1762 107 — an instance of

105 Meyer et al., op. cit., p. 114
106 Ly-Tio-Fane, 1958, op. cit., p. 137.
107 McClennan, op. cit., p. 151.
not only plants and information, but also personnel being exchanged between the Indian Ocean and the gardens of the West Indies. In 1773, spice plants were received from Ile de France and distributed in Saint Domingue. In 1786, original Indian Ocean plants established in Saint Domingue were shared with Cayenne. In 1788 Saint Domingue received from Ile de France a shipment of pepper plants, cinnamon trees, mango trees, mangosteen fruit, breadfruit trees from Tahiti, and a large number of different types of seeds.\footnote{108} Although in this last case most plants died because they were kept in the ship's hold, some did survive. In 1782, the British at Jamaica received a windfall when a navy squadron captured a nursery ship from Ile de France bound for Saint Domingue that carried "some plants of the genuine cinnamon, the mango, and other oriental productions."\footnote{109}

An inventory of the Saint Domingue Jardin du Roi from 1788 listed many plants from the Indian and Asian regions, including spices, fig trees, palms, jasmine, indigo, tea, litchi trees, Chinese rose bushes, bamboo, and others. Many of these undoubtedly had been conveyed there via Ile de France.\footnote{110}

Along with maintaining local and intra-imperial relationships, the Mascarenes gardens were expected to represent France to its European allies. In so doing, the gardens brought fame to themselves, honour to those upon whom its favours were bestowed, and reflected glory to their imperial creator. Plants and knowledge about them were regarded as precious enough commodities that in 1781, by way of thanks for protection he had offered

\footnote{108}Ibid., p. 158.  
\footnote{110}McClenann, \textit{op. cit.}, p. 162.
French commerce and shipping during the American revolutionary war (1778-83), Joseph II, Emperor of the Holy Roman Empire, received from the Jardin du Roi at Ile de France a collection of plants and plant material "to adorn the Gardens of Schönbrunn [in Vienna], to which the Emperor was at that time giving particular attention."¹¹¹ This shipment, the first of several, included a large collection of live plants, preserved specimens of clove, nutmeg, and other curiosities, and the seeds of 60 different species.¹¹² Céré gushed, in his accompanying letter to the emperor, that he loved to see the astonishment of visitors from England, Portugal, Spain, Sweden, Denmark, Germany, and the Netherlands at finding on such a distant island "a place so beautiful and famous."¹¹³

The emperor was evidently pleased with what he received, for in 1785 the chief gardener of Schönbrunn was dispatched to the Indian Ocean and two years later visited Ile de France, where Céré enthusiastically offered to tour him around the island and help plan a collecting mission to the East Indies, the products of which were to be marshaled at Ile de France. The chief gardener was given free run to pursue his work in the Jardin du Roi and, following a cyclone that nearly destroyed it, was invited to take with him what he pleased from what remained standing.¹¹⁴ The gardener, Franz Boos, was toured around Bourbon as well during his eight-month stay and returned home with a cargo consisting of more than 250 crates:

112 Ibid., p. 87.
113 Ibid.
114 Ibid., p. 94.
and specimens of indigenous and exotic woods; shells and madreporas from neighbouring and distant seas; insects and butterflies from the Indies, minerals and crystals from Madagascar; living animals, birds and fishes.\textsuperscript{115}

When it reached Europe the collection was gratefully received and contributed to Joseph II's ambition to "make the Schönbrunn Gardens the foremost in the world."\textsuperscript{116}

During the severest manifestations of France's internal crisis from 1789, when the Isle de France was in a precarious position,\textsuperscript{117} gifts of spice plants were made to the nations with which the colonists wanted to maintain good relations. Danish trading companies who had "rendered great services" to the island during the revolutionary wars received a gift of spice plants from Pamplemousses in 1805. The plants were taken to the Danish colony in Tranquebar, near Madras.\textsuperscript{118} Mascarenes spice-plant stock also found its way in similar fashion to Madagascar, Zanzibar, and perhaps eventually, via Cayenne, to French Guiana and West Africa.\textsuperscript{119}

By 1810, the concluding year of French control of the Mascarenes, the chronicle of gardening and spice culture had also come to something of a conclusion. The gardens continued to exist after the transfer of power but their main job, the task that from the 1750s to the 1790s had brought them attention, talent, and resources, was done. That job had been to establish a spice industry to compete with other European nations' trading monopolies. The decades of research had paid off. At the turn of the century Bourbon was producing 100 tonnes of cloves annually and as much as 800 tonnes in the best year on

\textsuperscript{115}\textit{Ibid.}, p. 99.
\textsuperscript{116}\textit{Ibid.}, p. 98.
\textsuperscript{117}Ile de France was able to maintain some stability; during the French Revolution the island declared republican allegiance early. See Toussaint, 1977, \textit{op. cit.}, p. 43.
\textsuperscript{118}Ly-Tio-Fane, 1958, \textit{op. cit.}, p. 20.
\textsuperscript{119}\textit{Ibid.}, p. 21.
record, 1837.\textsuperscript{120} The Dutch monopoly of the East Indies was overtaken by the 1820s when Bourbon produced as much as twice the VOC's shipments of clove. However, on Ile de France the original prophecy was fulfilled of the island as a seafaring place with little potential for a diverse agricultural industry (apart from the sugar cane monoculture). In spite of mid-century indications that spice cultivation might be viable on a large scale, Ile de France clove production was, by 1827, "insignificant."\textsuperscript{121}

In the French West Indies colonies, spice production based on plants acclimatized in the Mascarenes took hold slowly. During the early nineteenth century the new industry did not, as some colonists on Ile de France had feared, undermine their spice production. What did eventually kill the Mascarenes industry was widespread competition from new agricultural colonies in Penang, Zanzibar, Madagascar, and the British West Indies.\textsuperscript{122} Sugar cane, later in the century, became the chief crop of both Ile de France and Bourbon and it probably contributed to the decline of gardening in the region. A French commentator complained in the 1890s that: "Our colonies themselves, in gradually becoming dominated by a single crop, let the rich botanic gardens they once possessed decay and in certain cases disappear."\textsuperscript{123}

The gardens that during the mid to late eighteenth century had enjoyed such attention were marginalized in the nineteenth. The chief task of spice propagation done, the other jobs concerning food, drugs, industrial materials, taxonomy, collecting, and diplomacy may have remained but in a diminished state. They had lost the glamour of association with the promising spice trade.

\textsuperscript{120}Ibid., p. 75.  
\textsuperscript{121}Ibid., p. 76.  
\textsuperscript{122}Ibid., p. 78.  
\textsuperscript{123}Headrick, 1988, op. cit., p. 227.
In Bourbon during the 1840s it was possible for a colonial administrator faced with budgetary restraint not only to bar public entry to the official gardens at St. Denis, but also to sell off its plants.\textsuperscript{124} When Cérè had been briefly faced with a similar prospect during the 1780s, Pamplemousses had been saved after an eloquent submission to the French director general responsible for colonies.\textsuperscript{125} While many of the traditional activities of the gardens probably continued through the nineteenth century — the main facility at Pamplemousses was, in fact, maintained — the frontier days were gone.

The gardens of the Mascarenes, like others in eighteenth century Europe and its colonial possessions, had “aimed to further new knowledge in the scientific study of the botanical world and more particularly to work out rational classification systems. The major scientific gardens served as collection centers that received specimens from outlying areas, offering considerable instruction in the scientific aspects of botany and related areas of knowledge.\textsuperscript{126} The applied botanical gardens evolved from traditional garden forms and operated as institutions within government policy “to promote national and colonial economies.”\textsuperscript{127} Botanical enterprise made necessary a complex international network dedicated to the transportation of plants from one part of the world to another and this lessened any sense of isolation individual colonies may have had; it also ensured that the benefits enjoyed by scientific advances in one colony could be shared with others. The gardens were, in effect, tools of colonial technology transfer.\textsuperscript{128}

\textsuperscript{124} Lafforgue, \textit{op. cit.}, p. 158.
\textsuperscript{125} Lio-Ty-Fane, 1970, \textit{op. cit.}, p. 66.
\textsuperscript{126} McClennan, \textit{op. cit.}, p. 148.
\textsuperscript{127} Ibid.
\textsuperscript{128} Headrick (1988, \textit{op. cit.}) must be credited for his analysis of colonial technology transfer. He offers two basic premises. The first concerns “the relocation, from one area to another, of equipment and methods, along with the experts to operate them.” The
Gardening — the activity as well as its diverse products — contributed in this one example much of the vital matter of colonial activity. Assessments made by gardeners, and the creation of gardens, could be critical in deciding whether to establish new colonies. Gardeners, at a time and place when and where France sought both to break botanical monopolies and establish thriving plantation colonies, were as central to success as couriers de bois had been to French exploitation of New France. Gardens participated in the forward deployment of imperial interests.

Gardens represented the flowering of economic botany as a deliberate element in colonial policy. Ile de France served as "the nursery where the clove and nutmeg plants were reared and the research station from which scientific knowledge of their culture spread."\(^{129}\) The island's applied botanical gardens performed several interrelated functions within France's world economy during naturalizing "plants of great rarity and usefulness."\(^{130}\) According to Richard Grove, in his study of eighteenth-century forestry conservationism on Ile de France and elsewhere, "the state botanic garden set up by Poivre at Pamplemousses provided an essential part of the intellectual and technical infrastructure needed for these innovations."\(^{131}\) The French were the first Europeans to realize the potential uses of a worldwide garden network and they developed one that was envied and emulated by other nations.

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\(^{129}\) Ly-Tio-Fane, 1958, op. cit., p. 21.
\(^{130}\) Ly-Tio-Fane, 1970, op. cit., p. 66.
\(^{131}\) Grove, op. cit., p. 337.
As French commerce in the Indian Ocean expanded, so did the requirement for better botanizing. Accordingly, more resources and initiative were put into the gardening effort. However, it remains difficult to say whether the growth of French economic botany, especially from the 1760s, can be attributed simply to expanded trade. The most significant garden accomplishments took place from the mid-1760s, after the monopolistic Compagnie surrendered control of the gardens, along with the rest of the title and administration of the Mascarene Islands, to the French crown. Successful spice grafts and producing spice trees were accomplished under government, rather than company, control. The French government was better than a trading company at supervising a colonial botanical gardens network. The Compagnie's main objective was to produce satisfactory results from year to year while the government was able to take a longer view.

Government, individuals, and trading monopolies in the eighteenth century employed gardens in the practice of economic botany to achieve particular expansionist ends. The applied botanical gardens that emerged in Ile de France from mid-century, far from being an afterthought added to colonies only when more important aspects were attended to, in the French example were part of the reason Ile de France in particular was colonized and an integral element in the most deliberate phase of what Alfred Crosby, the historian who first described the ecological consequences of imperialism and colonialism, called the "biological expansion" of Europe.132 Gardens such as those of the Mascarenes formed links in worldwide chains that could be used to transmit foreign species, by gradual acclimatization, to other colonies and to Europe, with lasting consequences.

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APPENDIX
Port Louis, the capital, is located on the northeast coast. Garden locations are underlined.

Note that garden sites are located inland and close to rivers.

The islands are situated at roughly the 20th parallel of south latitude. Mauritius consists of a central plateau rising to about 600 metres and surrounded by a ring of mountain stumps, the highest of which is less than 1,000 metres above sea level. Otherwise the landscape is flat and unvaried. (Toussaint, 1977, op. cit., pp. 6-7)

The geography is strikingly different than that of Ile de France. According to Toussaint, "From a distance the island looks like a huge mountain in the shape of a truncated cone with its base flattened or broadened." It has no "natural protection against the ocean swell... no natural harbours, only one small lagoon and two open roadsteads." (Toussaint, 1977, p. 7)

4 "Jardin de Mon Plaisir, Pamplemousses. (Colonel Dumaresq, ca. 1820. Coll. P.O. Wiehe, Réduit.) (Ph. L.S. de Réland)"
Reproduced from Ly-Tio-Fane, 1970, facing p. 80.
5 "Mon Plaisir."
Reproduced from Ly-Tlo-Fane, 1970, facing p. 81.
6 “Le Réduit. Traditional home of the governors of Mauritius.”
Reproduced from Toussaint, 1977, p. 32.
7 "The Garden at Leyden.

"P. Paaw Hortus publicus academiae Lugdunum-Batave, 1691."

"The Jardin du Roi at Paris with its different habitats. The mount can be seen in the top left-hand corner, and the lower ground lies towards the bottom right.

"G. de la Brosse Reliquae operis historici plantarum, 1641."
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