

‘With Grains in Her Hair’: Rice in Colonial Brazil

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Introduction

Most people associate rice with Asia. But rice is also of African origin. Among the two dozen species of the *Oryza* genus only two were domesticated, one in Asia (*Oryza sativa*), the other in West Africa (*Oryza glaberrima*).¹ While Asia has long been synonymous with the culture of rice, Africa has not. However, a notable exception occurs in isolated communities of north-eastern South America where descendants of slaves and maroons commemorate rice as part of their African heritage. From Suriname to Cayenne and across the Amazon to the Brazilian states of Amapá, Pará and Maranhão, an oral tradition claims that an African woman introduced rice by hiding grains in her hair. The precious seeds escaped detection and this, they explain, is how rice came to be planted. Even the rice plantation economy of colonial South Carolina suggests a similar account. In 1726 Swiss correspondent, Jean Watt, noted that ‘it was by a woman that rice was transplanted into Carolina’.²

The oral narrative presents a contrasting perspective on the transoceanic seed transfers that took place between the sixteenth and eighteenth centuries. It substitutes the usual agents of seed dispersal celebrated in Western accounts – European navigators, colonists, and men of science – with an enslaved African woman whose deliberate effort to sequester grains of rice in her hair enabled her descendants to survive in plantation societies.³ The oral history links seed transfers to the transatlantic slave-trade, African initiative, and the subsistence preferences of the enslaved. This view of rice introduction is established across a broad region where three European powers created plantation economies. It sharply contrasts with written accounts that credit European mariners with bringing the seed from Asia.⁴ The only shared perspective between the two versions is that rice was introduced to the Americas.

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This paper focuses on the history of rice in Brazil, where the cereal was grown for subsistence a century earlier than its appearance shortly after the founding of the Carolina colony in 1670. It offers a comparative perspective on the cereal's introduction to the western Atlantic during the colonial period while engaging scholarship that argues enslaved West Africans, already practised in growing rice for subsistence, established its cultivation in South Carolina and provided the expertise for its development as an export commodity. From initial cultivation for subsistence to the emergence of a rice plantation economy two hundred years later, Brazil followed a development trajectory similar to that of South Carolina. Moreover it shares the rice origin legend of Cayenne and Suriname, with a crucial emendation, as it is told by descendants of those forced to labour on Maranhão's rice plantations.

An examination of Brazilian rice history provides a comparative case study of the cereal's history in the Americas under a contrasting colonial experience (Portuguese versus English), power relations (European compared to enslaved African), and historical claims (oral versus written). The objective is to illuminate the immigrant cultural traditions that initiated the establishment of the cereal in the American Atlantic for subsistence and export.

Atlantic Rice History: Overview and Context

Europeans routinely purchased surplus rice from African societies to provision slave ships throughout the era of transatlantic slavery, but neither Linnaeus nor his successors imagined that the cereal originated anywhere else but Asia. Scholars attributed the cereal's early presence in West Africa to Portuguese navigators who carried seed from Asia to the Upper Guinea Coast. This view only came under scrutiny at the end of the nineteenth century when colonial botanists increasingly suspected the red rice grown throughout French West Africa was an independent species. By the middle of the twentieth century, the international scientific community corroborated this hypothesis. However, botanical confirmation of an indigenous African species did little to displace the longstanding view that Europeans introduced rice culture to West Africa and the Americas.⁵

The evolution of the rice economy in colonial South Carolina brought attention to the cereal's history in the Americas. Peter Wood (1974) and Daniel Littlefield (1981) added a critical perspective to the prevalent view that planters, lacking prior experience with rice farming, ingeniously figured out how to shape the colony's wetland environments for the cereal's cultivation. They drew attention to the prior familiarity with rice cultivation of many enslaved West Africans, the early establishment of the cereal, and the deliberate importation of ethnic groups with that knowledge as the plantation economy developed. Carney's (2001) research showed that descriptions of

African rice cultivation were already widespread in the earliest Portuguese accounts of voyages to West Africa. Moreover, they illuminated the African growing and processing methods evident in the Carolina rice economy.⁶

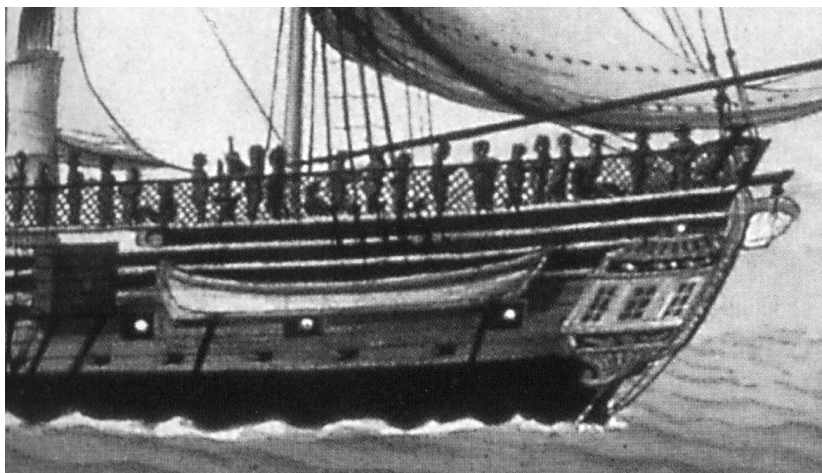
While based on just one study, archaeological research in the Niger River's inland delta in Mali confirms the presence of African rice in the soil horizon 2,000 years ago.⁷ Botanical evidence on rates of species diversification and research in historical linguistics on the emergence of the word for rice in African languages place domestication of *Oryza glaberrima* between 3,500 and 4,500 years ago. From its presumed domestication in the Malian wetlands, African rice diffused over a broad area. On the eve of the Atlantic slave-trade, the cereal was planted along the coast from Senegal to Côte d'Ivoire and inland all the way to Lake Chad in the country by that name.⁸

When European slavers arrived in the indigenous West African rice region, they encountered dense African populations thriving on the botanical achievements of their civilizations which, in addition to rice, had domesticated sorghum, millet and yams. Following the precedent of Portuguese navigators, Europeans relied on many of these staples for food and routinely purchased surpluses as provisions for slave ships.⁹ Centuries of transatlantic slavery brought repeated deliveries of African staples to the Americas and the opportunity for the enslaved to establish their dietary preferences in the American Atlantic. The introduction of rice depended on the transfer of seed as well as a method to mill the cereal for consumption. The archival record reveals that European slavers purchased red rice from West African societies for food, at times milled, but frequently 'in the husk', which meant that it had to be milled aboard ships.¹⁰ Unmilled grains can serve as seed rice. A few surviving archival sources and images indicate that aboard slave ships carrying unmilled rice, enslaved females were charged with milling the grains by hand with a mortar and pestle as was customary in African societies (Figure 1).¹¹

The maroon legend of a female ancestor introducing rice from a slave ship is thus grounded in several historical facts. The indigenous African cereal was a dietary staple of many African peoples living along the Upper Guinea Coast; unmilled rice figured as provision across the Middle Passage; and enslaved females milled the cereal with their traditional African method. Any unhusked grains remaining from a slave voyage could have served as the seed rice mentioned in maroon legends.

Rice was established as a subsistence crop within the first century of Brazil's colonization, as were many foods that originated in Africa. The Jesuit priest José de Anchieta noted in 1560 that 'from Guiné there are many squashes and beans that are better than those from Portugal'.¹² Other plants of African origin grown in the early plantation era included okra, pigeon peas, black-eyed peas, millet, sorghum, yams, the African oil palm,

FIGURE 1
TWO FEMALE SLAVES POUNDING GRAIN WITH A MORTAR AND PESTLE,
LOCATED LEFT OF THE MAIN MAST, ON THE QUARTERDECK.



Painting of the Danish slave ship, Fredensborg II, c.1785. Reprinted with permission of The Danish Maritime Museum, Kronborg, Denmark.

hibiscus, sorrel, meleguetta pepper, tamarind and castor bean (whose oil was used for lamps).¹³ Many of these plants would give regional Brazilian dishes their distinctive taste, in a manner similar to the role of African dietary staples in the ‘soul food’ of the US South. As growers and cooks of both food and export crops in plantation economies, enslaved Africans left a culinary legacy that is seldom considered in standard historical treatments of rice origins in the western Atlantic.¹⁴

This neglect stems in part from a scholarly bias that privileges the seed over the cultural forms of knowledge that guide crop adoption elsewhere. In emphasizing seed diffusion from one part of the world to another, rather than the purpose such seeds serve and the process that originally led to their establishment, Europeans place themselves in the foreground of historical narratives. But rice culture depends on more than the mere exchange of seeds: indigestible husks must be removed through a processing method that keeps the grains whole. Until the mid-eighteenth century, when mechanical mills were finally perfected, only the African mortar and pestle (Portuguese: *pilão*) could serve this purpose.¹⁵ Accounts that credit Europeans with the origins of rice culture in the Americas fail to address the issue that its cultivation depended on crucial African technology and expertise. An examination

of Atlantic rice history thus demands attention to transatlantic slavery, ethnic and gendered forms of agricultural knowledge, and to the initiative of slaves in establishing dietary preferences. The wholesale transfer of African rice cultivation systems, processing methods and culinary influences to the American Atlantic is not adequately supported by discussion of seed exchanges alone.

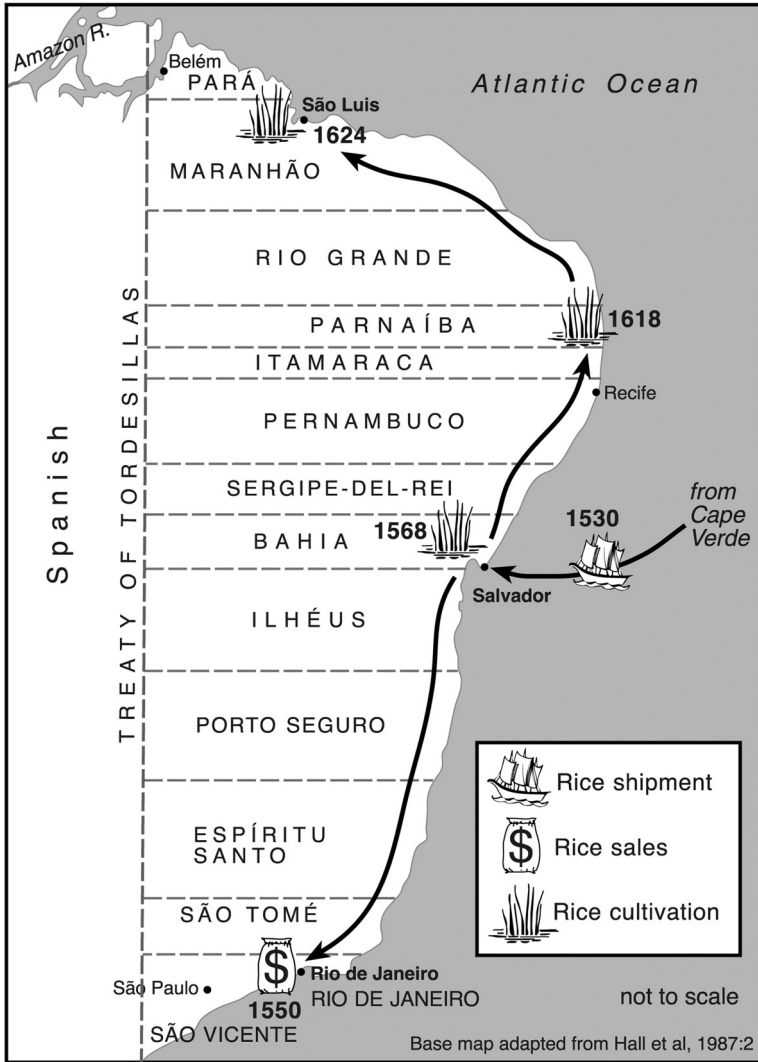
While archaeological research has not yet searched for *glaberrima* in the western Atlantic, it was unexpectedly encountered in French botanical collections from the 1940s to 1950s in Cayenne and growing in a semi-wild state on the perimeter of a former sugar plantation in El Salvador.¹⁶ The *glaberrima* variety reported in Cayenne was in fact collected in a community descended from maroons. Over the period 1550–1640, more than one-third of the Africans forced into transatlantic slavery probably originated in the rice-growing region of the Upper Guinea Coast.¹⁷ The West African rice region overall contributed 40 per cent of the Africans enslaved on Carolina plantations and 35 per cent of those destined for north-eastern Brazil.¹⁸ Their forced migration to the Americas certainly makes plausible African agency in pioneering rice culture in the western Atlantic.

Rice Beginnings in Brazil: North-east

Reference to rice cultivation appears so early in Brazil's history that well into the twentieth century some scholars believed the cereal a native domesticate.¹⁹ Confusion resulted from the presence of four indigenous wild species of *Oryza* in Brazil that grew spontaneously along riverbanks.²⁰ When Linnaeus assembled his plant classification system in 1753, only one domesticated species of rice was known, Asian *sativa*. Archival sources make frequent reference to a red rice that grew in Brazil's early settlement period, but they do not state clearly whether it was a cultivated or wild type.²¹

Brazil's rice history begins three decades after Cabral claimed the territory for Portugal. The Crown had by this time divided Brazil into 15 parallel captaincies that stretched westward into the interior to the unsettled boundaries of Spanish America (Figure 2). The royal contract establishing the sugar trade in Brazil in 1518 led to organized colonization in 1531 and the arrival of caravels carrying enslaved Africans to Bahia. From 1538 the burgeoning sugar plantation economy relied on regular shipments of slaves from the Cape Verde islands and São Tomé.²² In 1568 Brazil's Portuguese population was estimated at 3,440. By 1600 the number of enslaved Africans ranged between 13,000–15,000. Nearly half were working on Bahia's sugar plantations.²³ Records suggest that slaves from Guinea-Bissau accounted for at least 25 per cent of those brought to Spanish and Portuguese America in this early colonial period.²⁴

FIGURE 2
RICE DIFFUSION IN COLONIAL BRAZIL, C. 1530–1620S



Source: Base map adapted from Hal et al. 1987, p.2 [???

Pero de Magalhães Gandavo provides the earliest reference to rice growing in Brazil, noting in 1568 the cereal's presence in Bahia. As Portuguese and their slaves had settled the area, it was likely a cultivated rather than wild *Oryza* species. An account by Catholic friar Gaspar Madre de Deus a decade earlier also is suggestive that rice was being planted, as he records sales of unmilled rice near Rio de Janeiro over the period between 1550 to 1557.²⁵ These two records suggest rice cultivation was underway within 20 years of the earliest established sugar plantations in the region of densest African enslavement.

Confirmation that rice was deliberately cultivated occurs a few years later in the *Tratado descritivo do Brasil*, written over the period 1570–87 by a Bahian sugar planter, Gabriel Soares de Sousa. Soares noted that slaves were growing rice for food in lowland swamps as well as on drylands with rainfall.²⁶ References to rice cultivation increase over the next decades with the expansion of the plantation economy throughout Brazil's North-east. Writing in 1618, sugar merchant and plantation owner Ambrósio Fernandes Brandão noted that rice had overtaken maize as the second-most consumed staple food (after manioc), which suggests that the cereal's cultivation had been underway for some time in Pernambuco and Paraíba.²⁷ Reporting a few years later on São Luís, Maranhão, Simão Estácio da Silva observed that 'there was a lot of rice in the area and it was good.'²⁸ Whether it was established there with French settlement (1594–1615) or following Portuguese recapture is not known; however, Silveira noted that the French had introduced many plants and animals to Maranhão. Rice cultivation was so widespread in the North-east that in 1627 Frei Vicente do Salvador wrote that it was grown all over.²⁹ Figure 2 locates these early references to rice and charts the cereal's diffusion over the first century of Brazil's settlement.

The eighteenth century provides more detail on rice. Bahian naturalist Alexandre Rodrigues Ferreira, who undertook the country's first scientific expedition (1783–93), noted that there was only a red rice in Pará prior to the introduction of a white type on rice plantations in the 1760s. Widely planted, its cultivation was even encouraged by the government to provide sustenance for the poor. It was known in Pará and Maranhão as *arroz vermelho* (red rice) or *arroz da terra* (country rice), raising the possibility that this was the red African *glaberrima* species.³⁰

The documentary evidence thus confirms that rice was planted as a food crop in Brazil's sugar plantation region where enslaved Africans were present in large numbers. By the last quarter of the sixteenth century rice had become a favoured subsistence staple. A century before its cultivation in South Carolina, rice was well established in lusophone America. Gabriel Soares de Sousa's sixteenth-century account attributed its beginnings in Bahia to a ship bearing seeds that departed the Cape Verde islands decades

earlier. The archival record supports his commentary, noting that in 1530 a vessel left the Cape Verde Islands for Brazil carrying supplies of sugar cane cuttings, African yams, and seed rice.³¹

The Cape Verde Islands and Rice Introductions to Brazil

Located between 460 and 750 kilometres west of Senegal on the West African coast, the Cape Verde islands emerged pivotal to Atlantic commerce in the first century of plantation slavery. The Atlantic archipelago sits astride favourable maritime currents that carry ships to the Caribbean, the eastern Amazon, and southward along the African coast to São Tomé.³² Serving as points of articulation between the African and American Atlantic, ships destined for Brazil purchased slaves and provisions there. Unpopulated at the time of their discovery in 1455, the principal island of Santiago (São Tiago) was soon settled. In 1466 the Portuguese crown granted Santiago's merchants trading rights to the region between Senegambia and Sierra Leone, which brought thousands of slaves to the archipelago. Those who were not sold into transatlantic slavery were put to work cultivating cotton, sugar and indigo in addition to weaving and dyeing the cloths (panos) that were exchanged for additional captives.³³ The island traders held a monopoly on the sale of enslaved Africans until 1647, when the Portuguese crown allowed the collection of duties directly in African ports.³⁴

Settlement of Cape Verde and its emergence as a crucial entrepôt in Portuguese overseas expansion demanded cereals that would feed the population and provision caravels on outbound voyages. Its arid tropical climate was unsuitable for the cultivation of wheat and barley, the staple grains favoured by the Portuguese. The crops culturally in demand for Portuguese consumption and liturgy (bread, wine and olive oil) had to be imported from the metropolis.³⁵ For everyday food, drought-adapted African domesticates sufficed. The continent's cereals dominated the agricultural landscape of the populated islands of Santiago and Fogo. By the early 1500s enslaved Africans were growing for subsistence and sale millet, sorghum, yams and rice as well as New World maize.³⁶ In addition to weaving the cloth traded for slaves along the Upper Guinea coast, they raised the farm animals shipped as food or stock to Brazil. Enslaved labour, notes António Carreira, proved central to Cape Verdean merchants for 'without the slave it wasn't possible for them to cultivate the subsistence cereals (to provision the ships) and cotton, nor to weave the cloths, or to raise horses, donkeys, cows, and goats. And without the trade goods, without the cattle and cloths, they couldn't carry out commerce on the African coast to secure the [trading] privilege they were granted.'³⁷

In taking advantage of the botanical accomplishments of African food systems in the Cape Verde islands, the Portuguese developed a pattern of reliance on the subsistence crops produced by indigenous knowledge. This pattern would resonate in the colonization of Brazil and settlement of the tropics. Initially established outside West Africa in the Cape Verde islands, the African system found geographical expression anew with the forced migration of slaves to Brazilian sugar plantations. On plantation provision grounds and individual plots, they established African domesticates alongside the indigenous food crops developed by Amerindians.

The pivotal role of the Cape Verde islands as a supplier of slaves and provisions for transoceanic voyages had made commerce with the Upper Guinea coast indispensable, especially the stretch of mainland nearest the islands, which became known as the 'Guinea of Cape Verde'.³⁸ Located between Senegambia and Sierra Leone, this area forms the Atlantic contour of West Africa's vast indigenous rice region. It supplied slaves from rice-growing societies familiar with the cereal's cultivation and for whom rice was the dietary staple. The region became Cape Verde's 'rice bowl', providing the settlements with food and ships with provisions.

Portuguese historian, Vitorino Magalhães Godinho, offers a revealing glimpse of the early commerce in African rice between the 'Guinea of Cape Verde' and the Atlantic islands. Archival records from 1498 document in that year alone several shipments of the cereal from Guinea to Cape Verde. These are likely indicative of an earlier trade in African rice for ship provisions, as Portuguese accounts from the 1450s mention the extent of the cereal's cultivation by coastal societies and the role of African women in its marketing.³⁹ The rice shipment recorded in 1498 thus could not have been Asian, as the trade with Guinea was underway prior to Vasco da Gama's epochal rounding of the Cape of Good Hope and return voyage from India in 1499. Portuguese mariners returning from India were not responsible, as later accounts would claim, for the introduction of rice culture to West Africa.⁴⁰ The rice trade between Cape Verde and West Africa pre-dated Portuguese journeys to Asia and the dissemination of Asian rice seed.

Crucial aspects of African rice culture were present in the Cape Verde islands from an early period. Rice husks were removed in a mortar with a hand-held pestle (*pilão*) rather than with the hand mills then in use in Portugal.⁴¹ By 1522 rice was available in such quantity on Santiago that one Portuguese captain purchased three boatloads. Significantly, this rice was destined for Portugal. The commerce in African rice was not confined solely to the Cape Verde islands. *Oryza glaberrima* also reached Lisbon, where even before 1498 imports from Guinea are documented. The Portuguese metropolis continued to import Guinea rice in 1506, 1510 and 1514.⁴² Given the significance of African rice in the Cape Verde islands and its role in Atlantic commerce at

the time, the seed grains carried to Bahia in 1530 were probably *glaberrima* and delivered on a ship carrying the enslaved peoples who knew how to grow and process them.

The Cape Verde islands provided the initial geographical setting for the diffusion of African botanical resources and knowledge systems into the Atlantic. The forced migration of enslaved Africans to Brazil's North-east in the sixteenth century brought to the region people already experienced in rice culture, who adapted the crop to diverse environmental settings and used African technology for field preparation and milling.

Rice History in Portugal

The introduction of rice culture to Brazil is unlikely to have originated in Portugal. Available documentation indicates that rice was not planted in Portugal in the sixteenth century. There is no record of its cultivation under Moorish rule between the eighth and tenth centuries.⁴³ Some experimentation with growing the crop occurred during the reign of Dom Diniz (1279–1325), known as the 'Farmer King' for his interest in agriculture, but the cereal failed to take root in Portugal. While Guinea rice was imported at the end of the fifteenth century, rice did not become a dietary staple.⁴⁴

In the third decade of the eighteenth century Portugal began importing rice from Italy as well as South Carolina.⁴⁵ The reasons for this are several. There was a growing demand among the urban middle classes of Catholic Europe for rice to accompany fish on holy days, which numbered about 100 in the calendar year. But its rising importation was undoubtedly also due to the persistent cereal shortages that had emerged as an chronic feature of Portugal's economic history. Rice initially found a niche in the metropolis's markets as a substitute for deficits in domestic wheat production while Lisbon later increasingly relied upon the grain (along with cotton) to pay for goods imported from northern Europe.⁴⁶ By mid-century, there was a growing emphasis on irrigation to expand domestic food production; both maize and rice were encouraged as irrigated summer crops.⁴⁷ However, the cultivation of rice on river floodplains of southern Portugal was dwarfed by its concomitant development as a plantation crop in Maranhão from the 1760s. By 1781 all the rice consumed in Portugal came from Brazil.⁴⁸

Even though rice had developed under Moorish rule in the Valencia region of Spain, the cereal failed to make headway in Catholic Portugal until the nineteenth century.⁴⁹ One outcome of Brazil's declaration of independence in 1822 was the renewed emphasis afterwards on rice production in Portugal. Even so, the government's efforts to encourage the grain's cultivation faced the outright opposition of many Portuguese peasants, who were concerned about the detrimental health effects associated with growing it, malaria in

particular. Over the nineteenth century the cultivation of rice was banned in several parts of the country and prohibited near population centres.⁵⁰ Rice consequently failed to become a fundamental part of the Portuguese diet, unlike Brazil where it was commonplace.⁵¹

When Brazil was colonized in the sixteenth century, rice was not grown in the metropolis. Cereal shortages accounted for its steady importation into Portugal throughout the eighteenth century. These were high-yielding Asian *sativa* varieties, already milled for consumption. Brazil's rice history, however, commenced two centuries earlier, with purchases of unmilled *glaberrima* as provision aboard slave ships. The cereal was already grown for food on the margins of sugar plantations in the 1560s, nearly two hundred years before its cultivation as a plantation crop in the eastern Amazon. In South Carolina rice shifted so quickly from subsistence to a plantation crop (over the decade 1680–90) that the meagre references to early-cultivated red rice are not easily separated from the Asian varieties introduced for plantation development. In Brazil, centuries intervened in the transition of rice from a subsistence crop to a plantation economy. An overview of Brazilian rice history reveals that the earliest cultivated rice was red.

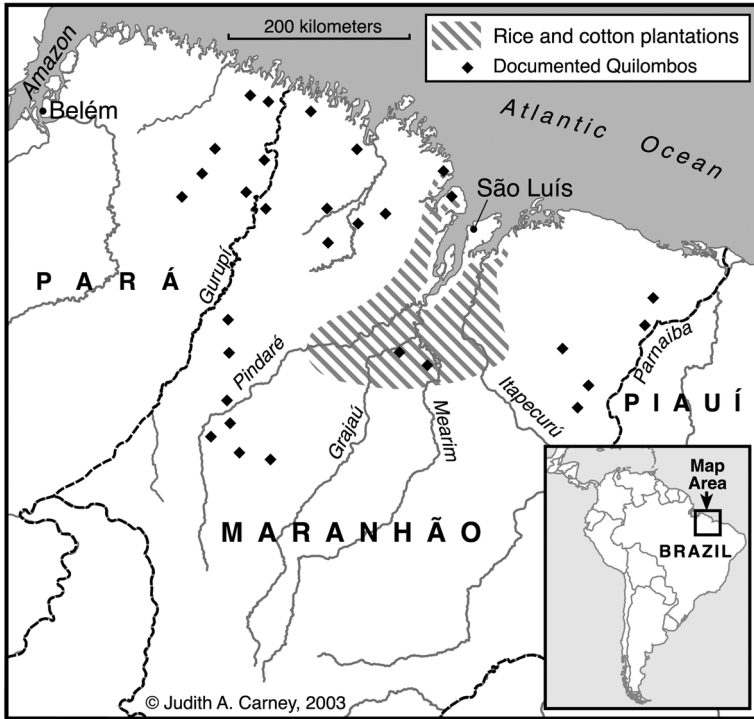
As the plantation economy and slavery were drawing to an end in the nineteenth century, written accounts of rice history were compiled. The role of the cereal in the eighteenth-century Atlantic economy folded the earlier significance of rice as a subsistence crop into a grander chronicle of Portuguese initiative and ingenuity in the agricultural development of the Americas.⁵² In this version of Atlantic rice history, enslaved Africans merely provided unskilled labour. This narrative is contradicted in oral histories recounted by their descendants in the eastern Amazon.⁵³ No other crop offers such competing views on the cultural legacy that informed its transfer and establishment in the western Atlantic.

The Rise of a Rice Plantation Economy in Maranhão

In the mid-eighteenth century Brazil's eastern Amazon (Amapá, Pará and Maranhão) became the focus of the metropolis's development policy to substitute the rice imported from South Carolina with a product produced in its colony. Rice was first cultivated on the lower Itapecurú floodplain south-east of São Luís in Maranhão (Figure 3).

Criss-crossed by numerous rivers and swamps, rice had been planted for subsistence in this region since the early seventeenth century. At the beginning of the eighteenth century a regional trade in the cereal was probably already in place, as one estate inventory in 1712 records 828 litres of rice among the deceased's assets.⁵⁴

FIGURE 3
RICE AND COTTON PLANTATIONS AND QUILOMBOS: MARANHÃO, EARLY
NINETEENTH CENTURY

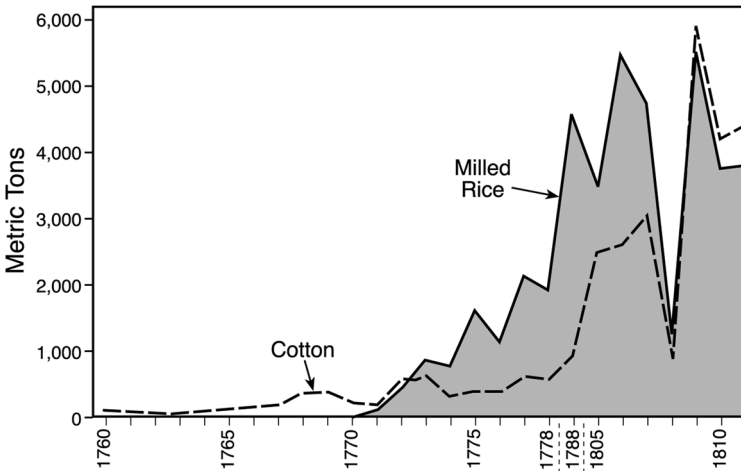


Sources: Adapted from Assunção 1996, p.435; Gomes 1997, p.216. [???

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Portuguese economic policies targeted this nascent agricultural sector for commercialization in the 1750s by stimulating export production. Portugal's Prime Minister, the Marquês de Pombal encouraged rice cultivation on lowlands and river floodplains and the production of cotton on the interfluves. As the Maranhão economy developed, Pombal established in 1772 another focus for rice plantations north of the Amazon River in Amapá (then part of Pará). A monopoly trading company (Companhia Geral do Grão-Pará e Maranhão), which operated between 1750–77, was formed. Both rice and cotton were eventually exempted from customs payments in Lisbon, given their role as payment in kind for manufactured goods imported from northern Europe.⁵⁵ Pombal's measures resulted in rice becoming Maranhão's leading export over the period from 1760–78 and the region's transition to a prosperous export economy (Figure 4).

FIGURE 4
MILLED RICE AND COTTON EXPORTS, SÃO LUÍS TO PORTUGAL 1760–1811



Source: (Years 1760–78) Nunes Dias 1970, p.430.

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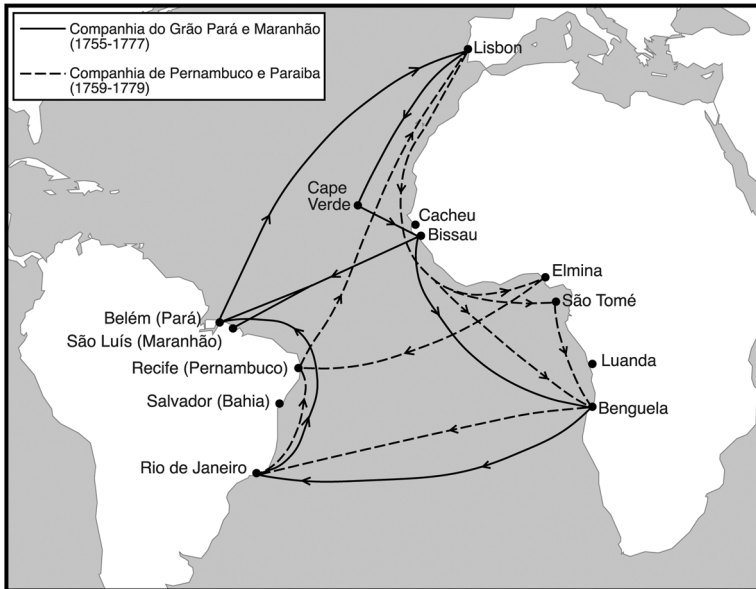
The plantation economy, modelled after the successful Carolina system, favoured high-yielding seed and the installation of mechanical devices to process the rice for market. In Maranhão rice plantations concentrated along the tidal floodplains and wetlands surrounding the Itapecurú, Mearim and Pindaré rivers (Figure 3). What enabled the plantation sector to flourish was the availability of mechanical mills, whose prototypes had revolutionized the Carolina rice economy, and Asian varieties that resisted breakage in milling. Notable among the high yielding varieties introduced to Maranhão was ‘Carolina white’, which made its appearance in 1766.⁵⁶ The husking and pounding mills that developed over the second half of the eighteenth century significantly reduced the arduous labour demands of milling the entire export crop by hand with the pilão, which was previously the only way to process rice. The husking mills removed the indigestible hulls from the grains.⁵⁷ But until efficient water-driven stone mills came into operation in 1774, the second processing step – polishing the grain to achieve the whiteness desired in export markets – still depended upon the pilão.⁵⁸

The rice and cotton plantation economy demanded enslaved labour. The metropolis licensed two trading companies in 1755 to deliver slaves to Brazil, granting the Companhia Geral do Grão-Pará e Maranhão the exclusive right to supply slaves to the eastern Amazon region. Over the next 22 years of its operation, the Company shipped more than 25,000 slaves directly from

West Africa to Maranhão and Pará (Figure 5). Of the total, some 70 per cent or 17,591, originated in the Guinea ports of Bissau and Cacheu. About 9,000 – one-third of the total – disembarked at São Luís, Maranhão to carry out the gruelling work of transforming wetlands into rice paddies.⁵⁹ A substantial percentage of the enslaved Africans arriving in Maranhão at the onset of rice plantation development originated in West Africa's indigenous rice region, where sophisticated wetland systems had supplied Portuguese ships with surpluses since the fifteenth century. The slaves commanding the highest prices were those from ethnic groups experienced in rice cultivation (the Bissago, Feloup [Diola], and Balanta).⁶⁰ In selecting slaves with this prior experience, the Portuguese emulated the pattern of deliberate imports of enslaved Africans with experience growing rice that also proved characteristic of the Carolina rice economy.⁶¹ The Crown's economic stimuli resulted in a vast output of rice and cotton exports from Maranhão that endured long after the Company's commercial monopoly terminated in 1778 (Table 1).

The techniques of rice culture established in Maranhão followed those long used in West Africa. The field was cleared of brush and burned prior

FIGURE 5
SHIPPING ROUTES OF MONOPOLY TRADING COMPANIES



Sources: Adapted from Carreira 1983, p.57; Nunes Dias 1970, p.461.

TABLE 1
MILLED RICE AND COTTON EXPORTS SÃO LUÍS TO PORTUGAL SELECTED YEARS,
1760–1812

| Year | Rice tons (metric) | Rice arobas ¹ | Cotton tons (metric) | Cotton arobas |
|------|-----------------------|-----------------------------|-------------------------|------------------|
| 1760 | | | 95.62 | 6,510 |
| 1761 | | | 76.33 | 5,197 |
| 1762 | | | 49.88 | 3,396 |
| 1763 | | | 53.74 | 3,659 |
| 1764 | | | 95.12 | 6,476 |
| 1765 | | | 110.47 | 7,521 |
| 1766 | | | 164.76 | 11,217 |
| 1767 | 3.30 | 225 | 186.61 | 12,705 |
| 1768 | 4.01 | 273 | 349.72 | 23,810 |
| 1769 | 8.15 | 555 | 374.10 | 25,470 |
| 1770 | 9.21 | 627 | 228.28 | 15,542 |
| 1771 | 119.46 | 8,133 | 176.48 | 12,015 |
| 1772 | 443.83 | 30,217 | 546.92 | 37,236 |
| 1773 | 844.05 | 57,465 | 599.46 | 40,813 |
| 1774 | 747.91 | 50,920 | 308.36 | 20,994 |
| 1775 | 1,609.79 | 109,599 | 380.21 | 25,886 |
| 1776 | 1,103.86 | 75,154 | 374.85 | 25,521 |
| 1777 | 2,127.48 | 144,845 | 595.64 | 40,553 |
| 1778 | 1,895.22 | 129,032 | 558.89 | 38,051 |
| 1788 | 4,603.72 | 313,434 | 932.83 | 63,510 |
| 1805 | 3,455.25 | 235,243 | 2,477.76 | 168,693 |
| 1806 | 5,498.17 | 374,331 | 2,599.91 | 177,009 |
| 1807 | 4,723.59 | 321,595 | 3,032.32 | 206,449 |
| 1808 | 1,228.99 | 83,673 | 864.73 | 58,873 |
| 1809 | 5,529.62 | 376,472 | 5,908.16 | 402,244 |
| 1810 | 3,731.82 | 254,073 | 4,198.76 | 285,863 |
| 1811 | 3,788.21 | 257,912 | 4,385.57 | 298,582 |
| 1812 | | no data | 3,194.21 | 217,471 |

Q4

Note: 1. arroba: former Portuguese measurement of weight, used in Brazil (1 arroba = 14.688 kilograms).

to cultivation. With a long handled hoe, it was readied for sowing, which involved puncturing the ground with a stick, dropping the grains of rice into the hole and covering it with the foot, a method also established on Carolina rice plantations.⁶² The rice was harvested and cut 'with a small knife, cutting the stems one by one . . . [and] at night beating them with a branch to loosen the grains'.⁶³

Lisbon attempted to stimulate Maranhão's plantation sector by advancing just a few large landholders credit for purchasing the improved Asian rice seed, mechanical mills, and imported slaves.⁶⁴ The monopoly, however, fostered a dependency relation between the majority of growers, who did not receive subsidies, and the mill owners and retailers who kept service charges high. Storage and shipping also compounded problems, as the stored product

suffered losses from mould and infestation while periodic delays in the onset of the rainy season meant the crop was not always milled when the shipping fleet departed for the metropolis in August and September.⁶⁵ The presence of such problems meant that many of the smaller-scale producers could not afford to process their rice mechanically and required their enslaved labour to carry out this onerous task. For local markets and subsistence, rice continued being milled by hand, as in Africa, with the *pilão*.⁶⁶ Two systems of rice production consequently operated in the plantation area of Maranhão, one for export, monopolized by capitalized large growers with mechanical devices for milling, the other by growers who were in a dependent relationship to them and whose production satisfied local markets as much as export ones.

The year 1767 witnessed the first exports of milled rice to Portugal, 225 arrobas (3.3 metric tons) (Table 1). By 1781 production in the eastern Amazon (chiefly Maranhão) satisfied the metropolis's entire import demand, which enabled Lisbon to bar the importation of rice from Carolina altogether.⁶⁷ Production peaked at 313,434 arrobas (4,604 metric tons) in 1788 before declining to an annual average of 272,000 arrobas (3,994 metric tons) during 1805–11, influenced by the combined effects of cheaper rice from South Carolina, the Napoleonic upheavals in Europe, and the royal government's exile to Rio de Janeiro.⁶⁸ After Brazilian independence in 1822, rice exports to Portugal subsided, and the cereal resumed its importance as the regional dietary staple. Maranhão remained Brazil's leading rice producer until the second half of the twentieth century when development of 'green revolution' varieties, double cropping and pump-irrigated systems shifted commercial production to the country's South.⁶⁹

However, Maranhão's transition to a rice plantation economy was an uneven process. Another type of rice, long planted for subsistence, to be grown[???]. This was the *arroz vermelho* (red rice) or *arroz da terra* (country rice) that was cultivated in a variety of environments. Grown since 'remote times' and easily shattered with milling, this rice may well have been African *glaberrima*.⁷⁰ Perhaps it was deliberately planted for its distinctive nutty taste and cultural significance. Slaves in South Carolina continued growing a variety known as 'Guinea rice' on their individual plots in the early nineteenth century despite the cultivation of higher-yielding rice as the plantation crop.⁷¹ Initially encouraged for its ease of cultivation and the sustenance it gave the poor, *arroz vermelho* was eventually perceived to be a problem on rice plantations seeded to the 'Carolina white' variety.

Maranhão's traditional red rice was officially outlawed in 1772, when Governor Joaquim de Mello e Póvoas forbade its cultivation in favour of the imported Carolina varieties. The Governor's repeated attempts to suppress planting the red rice, however, had faced 'strong opposition on the part of farmers, who didn't want to adopt a substitute variety for the red'.⁷²

Q5

Growers preferred cultivating the local rice, which was heavier and larger grained, and because there was a shortage of mechanical mills to process the Carolina variety.⁷³ Seeking to eradicate it completely, the Governor enacted punitive measures against those caught growing the red rice. He applied these measures across the entire region, where rice formed an important subsistence crop and quilombos (Portuguese: maroon communities) flourished. For whites caught planting the red rice, he decreed a mandatory year's jail sentence and fine; Indians doing so faced two years imprisonment; slaves were whipped as well as sentenced to two years imprisonment.⁷⁴

While the reasons for the Governor's severe measure are not specified, it invites speculation. The interdiction suggests that red rice was widely grown as a food crop but that its cultivation reduced the quality of the product produced on the plantations. In rice areas across the world, birds are considered problems to cultivation. They eat the grain but also disperse it elsewhere, thereby introducing undesirable varieties that reduce quality and yield. Another concern of the plantation rice sector in Maranhão was to obtain a 'perfect milling so that the seeds would not break'.⁷⁵ The ban on red rice cultivation perhaps aimed to prevent its mixture with Carolina white, either in the field or in the mills. The rice export economy depended upon a product of consistent quality, namely, seed of uniform property and a variety whose grains would not break in the mechanical water mills in use for hulling. Milling dissimilar rice varieties together increases the potential for breakage, which reduces the market price. If *arroz vermelho* was African *glaberrima*, the Governor's action would make additional sense. The prospect of commercializing African rice for gourmet markets is frustrated to this day by its propensity to break apart with mechanical milling.⁷⁶ The only way to remove the hulls without shattering the grain is by hand, with the pilão, the African method still used in isolated hamlets claiming quilombo descent in rural Maranhão (Figure 6).

Governor Mello e Póvoas' proclamation illuminates the socio-economic landscape of rice production in the eastern Amazon during the 1770s, where a handful of wealthy landholders monopolized a plantation economy for export. Placed in dependent relationships with them were those long accustomed to growing red rice: the poor, enslaved as well as free. For reasons that remain unclear, they resisted efforts in the 1760s aimed at coercing them to abandon red rice cultivation; only the threat a decade later of draconian punishment forced the recalcitrant to comply.

A social memory of red rice persists in the region to this day. 'We remember this rice' recalled one 83-year-old woman interviewed in August 2002. She farms land once part of a rice plantation owned by the Belfort family in the Itapecurú-Mearim area. Dona Luciana told how her enslaved grandmother deliberately planted this variety with her friends. 'They carried the grains in a

FIGURE 6
MORTAR AND PESTLE (PILÃO) IN USE FOR MILLING RICE IN A QUILOMBO
COMMUNITY IN THE ITAPECURÚ-MEARIM REGION OF MARANHÃO

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Photo by author, August 2002.

gourd that was placed in their belt when they left the plantation to grow it . . . Only these women knew about this rice' she reflected 'because it came with them in their hair when they arrived here in Maranhão as slaves'.⁷⁷

Her account contrasts profoundly with the version offered by the nineteenth-century Brazilian historian, César Augusto Marques, who claimed the red rice grown in Maranhão from the region's early settlement period was also called 'arroz de Veneza' or Venetian rice.⁷⁸ Marques wrote his history in 1870, nearly a century after the ban on cultivating red rice in 1772. Two earlier documents informed his interpretation. One relates to an expedition by the Captain-General of Pará and a group of Jesuit priests in 1639, where the quality of rice growing near Belém is favourably compared with Venetian rice. Similarly, a report from a journey along the lower Amazon in 1749 indicates the presence of rice 'of excellent quality and in the size of its grain and flavour is not inferior to that of Venice'.⁷⁹ Other historians writing in the twentieth century have repeated Marques and elaborated the case for claiming the red rice as a Portuguese introduction of seed from Italy by colonists from the Azores (where rice was not grown).⁸⁰ There is documentation that seeds accompanied the colonists when they arrived in Pará and western Maranhão in the 1750s, but rice is not mentioned as one; it was present aboard ship only as food (and thus milled).⁸¹

On the other hand, *arroz de Veneza* is grown elsewhere in the North-east to this day and remains a well-documented variety of *sativa*. Like other *sativas*, it shows no propensity to break apart with mechanical milling.⁸² A red *sativa* from Venice certainly may have figured among those brought to the eastern Amazon, since Portugal was importing rice from both South Carolina and Italy in the mid-eighteenth century and encouraging the migration of colonists to the nascent plantation sector. However, the case for *arroz de Veneza*'s candidacy as the red rice originally planted in Maranhão in the 1600s still remains weak. Marques, writing in 1870, is the first to mention it; it does not figure in two earlier accounts of the rice economy that date to the time of the Governor's edict. If *arroz de Veneza* was the target of the ban, Raimundo José de Sousa Gaioso (1747–1813), who completed the first agricultural history of Maranhão, would surely have recorded its name. As a rice planter, Gaioso was present in Maranhão during the critical formative period of the rice export economy. He mentions the Carolina rice introduction and the suppression of the earlier red variety, *arroz vermelho*.⁸³

Arroz de Veneza similarly fails to appear in the commentary of Gaioso's contemporary, scientist Alexandre Rodrigues Ferreira, who concluded his ten-year expedition to the eastern Amazon in 1793. Ferreira discusses the new white rice arriving in Pará during the 1760s, but calls it *arroz vermelho* or red rice.⁸⁴ It is only at the end of the nineteenth century that *arroz de Veneza* makes its appearance in the historical record, when it serves as a

platform to celebrate the enduring accomplishments of Portuguese settlers. Revisionist claims by Marques and his successors fail to engage one critical issue: why a Venetian *sativa* rice would be banned from cultivation when it is easily milled to yield the desired whole white grains.

In a manner similar to the way that Carolina seed swept aside the traditional red rice pioneered by New World Africans, nineteenth-century accounts proffered a new version of Maranhão's rice history that claimed the cereal's origins as the product of Portuguese settlement, initiative and triumph over adversity. Rice was made the colonizer's achievement because seeds were privileged over the underlying knowledge systems that initially pioneered the crop for subsistence and made rice fundamental to the Brazilian diet and colonial economy. The blacks and Amerindians who had cultivated rice as a subsistence crop for nearly 150 years, as the result of a much earlier convergence of their tropical farming systems, faded from view as a new version of the grain's introduction was sown.

Oral histories for the eastern Amazon provide a fresh perspective on Brazilian rice history. In the sixteenth century enslaved Africans in Bahia established a preferred dietary staple, the agronomic practices, and milling methods that two hundred years later would lay the foundation for a rice plantation economy reliant on high-yielding Asian seeds. With the arrival in Maranhão of more than ten thousand Africans in the mid-eighteenth century, the significance of rice as an African food crop was preserved in Brazil. In written accounts it was a tale of Portuguese seed transfers and enterprise, but it is remembered in the oral traditions of those who escaped enslavement as grains stolen by the white plantation owner. This social memory makes seed transfers an African narrative, linking it to the transatlantic slave-trade, African initiative and dietary preferences. Maroon legends from the rice plantation region preserve this subaltern voice of the cereal's history in the region.

Legend, Memory and Historical Consciousness

Rice was grown as a plantation and subsistence crop in the Brazilian states of Amapá, Pará and Maranhão, where there are numerous communities that claim descent from slaves. The arrival of more than twenty thousand African rice growers in the formative period of plantation development (1755–77) was the prelude for a second influx of slaves in the period 1812–20, when an additional 40,000 were brought to labour on rice and cotton plantations.⁸⁵ Maranhão's numerous rivers ran through areas mantled with dense rainforests, conducive for slave escape and quilombo establishment. The communities thrived by planting rice along with maize and manioc, the indigenous Amerindian domesticates, for subsistence.⁸⁶

On the eve of independence (1822) Maranhão held the greatest concentration of slaves in Brazil and a very large quilombo population.⁸⁷

In an isolated village in the eastern Amazonian state of Pará, the maroon legend of rice origins reappears, almost identical to the tale told by the Djuka in Cayenne.⁸⁸ It is recounted in an area where rice was never grown as a plantation crop but widely planted for subsistence. An elderly quilombo woman, who grew rice in her youth, narrates the account. She makes children the agents of rice dissemination when their mother, unable to prevent their enslavement, tucks the grains in their hair. Like the other accounts this version affirms the role of an enslaved female ancestor in the diffusion of rice seeds across the Atlantic. It should be noted that alone among Africa's cereals, rice has always been a crop associated with women.⁸⁹ In attributing rice origins to their ancestors, maroon legends reveal the ways in which the enslaved gave meaning to the traumatic experiences of their own past while remembering the role of the cereal in helping them resist bondage, survive as runaways, and commemorate cultural identity.⁹⁰

However, in the Itapecurú-Mearim region of rural Maranhão (Figure 2), another aged female quilombola tells a slightly different version. It is worth recording because this account appears to reveal a social memory of Brazil's rice plantation economy, which was centred in that region.

An enslaved African woman, unable to prevent her children's sale into slavery, placed some rice seeds in their hair so they would be able to eat when the ship reached its destination. As their hair was very thick, she thought the grains would go undetected. However, as they disembarked the slave ship, the planter who eventually bought them discovered the grains. In running his hands through one child's hair, he found the seeds and demanded to know what they were. The child replied, 'this is food from Africa.' This is the way rice came to Brazil, through the Africans, who smuggled the seeds in their hair.

By differing in one crucial detail, the Maranhão rendition illuminates another layer of memory and historical consciousness. When the white man discovers the seeds in the child's hair, he reveals complete ignorance of them. Upon learning what they are, he seizes the grains, and *begins to grow rice*. It was as a plantation crop that the white man grew rice. And it is the social memory of Maranhão's rice plantations that appear to inform this account.

The white man's appropriation of rice in this version attests to the power relations that transformed the cereal from a food to a plantation crop in the mid-eighteenth century. The account also challenges a Eurocentric narrative of agricultural development in the Americas that excludes African agency and initiative. The development of rice plantations depended upon the

appropriation of African expertise and labour, symbolized in the legend as the slave owner taking away the rice seeds brought from Africa. In placing that shift in terms of theft, the Maranhão account reclaims rice as a narrative of the African diaspora, thereby remembering the historical transition when their subsistence crop became a commodity produced under bondage. Rice, and the knowledge of how to produce it, remains an African possession told by the quilombo descendants of female slaves.

Conclusion

Enslaved Africans planted food crops on plantation provision fields as well as in their dooryard gardens. The abundant ('peasant breach') literature on provision grounds draws attention to its historical antecedents and the frequent right of slaves to a personal subsistence plot and control over its income. Less attention focuses on the plots' possible role as sites for establishing African dietary staples in the Americas.⁹¹ The practice of granting a small plot to enslaved agricultural workers, *Ciro Cardoso* argues, became known on New World plantations as the 'Brazilian system' for it is thought to have made its first appearance in Brazil's North-east before spreading to the Guianas, West Indies and to the southern United States.⁹² This right, and its relationship to growing rice, was underscored in one rebellion on a Bahian sugar plantation in 1790. A peaceful return to the fields was resolved only after planters agreed to the demand made by their slaves: 'We shall be able to plant our rice wherever we wish, and in any marsh, without asking permission for this'.⁹³

The enslaved grew subsistence as well as export crops in plantation economies. African domesticates formed an important component of the tropical plants that fed the plantation world. Plants native to Africa valued as medicinals and in the liturgical practices of syncretic religions also made their way to the western Atlantic.⁹⁴ The presence of rice among the cornucopia of native African plants evident within the first century of colonization reveals the profound role of enslaved Africans in establishing their botanical heritage in the Americas. Rice cultivation provides a signature of the black Atlantic, linking the Upper Guinea Coast to Brazil and South Carolina, where it was grown for subsistence prior to its cultivation as a plantation crop.

Africans actively shaped the early modern Atlantic world. Until the third decade of the nineteenth century, they crossed the Atlantic in greater numbers than Europeans. Their contributions to the economic and cultural development of the Americas endured nearly four centuries yet are still not fully acknowledged. An examination of rice reveals how Africans, despite enslavement, transferred an entire knowledge system, from production to consumption, and established a valued dietary staple in the American Atlantic.

NOTES

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53. The oral traditions collected in rural Maranhão are from communities that claim descent from quilombos (maroons). However, the interviews may have also included hamlets descended from enslaved rice growers who remained in the area without land titles following emancipation (1888). Several elderly informants in the Itapecurú-Mearim area, for instance, recounted family memories of the Belfort family whose Irish forebear, Laurence, established a large rice plantation and mill in the region during the 1760s. The quilombo communities identified by Projeto Vida de Negro, a legal advocacy organization in Maranhão, assists many of these impoverished remote settlements in their efforts to obtain land titles, now possible with changes in the 1988 Brazilian constitution that guarantees quilombo communities rights to land ownership based on their heritage of flight from slavery.

54. Jerônimo de Viveiros, *Alcântara no seu passado econômico, social e político* (São Luís: Imprensa Oficial, 1999), p.61.
55. Nunes Dias, *Fomento e Mercantilismo*, Vol.I p.437–40, 445–51; Acevedo, *História paraense*, p.60.
56. Gaioso, *Compêndio*, p.181; Manuel Pio Corrêa, *Dicionário das plantas úteis do Brasil*, 6 Vols. (Rio de Janeiro: Imprensa Nacional, 1984), Vol.I p.173.
57. Nunes Dias, *Fomento e Mercantilismo*, Vol.I p.442; Acevedo, *História paraense*, pp.69–70. The first of these mills came into operation in 1756 in Rio de Janeiro. D. Alden, 'Manoel Luís Vieira: An Entrepreneur in Rio de Janeiro during Brazil's Eighteenth Century Agricultural Renaissance', *Hispanic American Historical Review*, 39 (1959), pp.521–37, 531.
58. Acevedo, *História paraense*, pp.69–70; Arquivo Público do Estado do Maranhão (APEM) file on rice plantation economy, years 1771–78; Nunes Dias, *Fomento e Mercantilismo*, Vol.I, p.442.
59. The other company formed at the same time, the Companhia de Pernambuco e Paraíba, held the monopoly to supply sugar plantations with slaves from the region between Elmina (Ghana) and Benguela (Angola). Some 7,774 enslaved Africans from Angola also arrived on Company ships in Maranhão and Pará but Maranhão received a fraction of the total, 1,296. Nunes Dias, *Fomento e Mercantilismo*, Vol.I, p.465. See also, J.C. Miller, *Way of Death: Merchant Capitalism and the Angolan Slave Trade, 1730–1830* (Madison: University of Wisconsin Press, 1988.), pp.574–5.
60. Carreira, *Companhia Pombalinas*, pp.78–9, 96–8; Gaioso, *Compêndio*, pp.244–5; M. Klein, 'The Portuguese slave trade from Angola in the eighteenth century', in J.E. Inikori (ed.), *Forced Migration. The Impact of the Export Slave Trade on African Societies* (New York: African Publishing Company, 1982), pp.21–41. However, the Balanta apparently had taken up rice culture in response to the transatlantic slave trade as they retreated to isolated, coastal marshes in the seventeenth century to resist enslavement. See, Hawthorne, *Planting Rice*, pp.48–9, 155–9.
61. Littlefield, *Rice and Slaves*, pp.27–32; D. Richardson, 'The British Slave Trade to Colonial South Carolina', *Slavery and Abolition*, 12 (1991), pp.125–72.
62. Nunes Dias, *Fomento e Mercantilismo*, Vol.I, p.443; see A.B. Huger Smith illustration in Elizabeth Allston Pringle's memoir, *A Woman Rice Planter* (New York, Macmillan, 1913).
63. F.A. Brandão, Jr., *A escravatura no Brasil precedida d'um artigo sobre a agricultura e colonização no Maranhão* (Brussels: H. Thiry-Vern Buggenhoudt, 1865) reprinted in R. Edgar Conrad, *The Children of God's Fire: A Documentary History of Black Slavery in Brazil* (The Pennsylvania State University Press: University Park, 1984), p.99.
64. The first mechanical mill was built near Rio de Janeiro in 1756 while the earliest one in Maranhão was built by Irish plantation owner, Laurence Belfort. Alden, 'Manoel Luís Vieira'.
65. APEM; Nunes Dias, *Fomento e Mercantilismo*, p.441.
66. APEM; Acevedo, *História paraense*, p.72–6.
67. C.R. Boxer, *The Portuguese Seaborne Empire, 1415–1825* (London: Hutchinson, 1969), p.192; Dean, *Broadax*, p.128; Gaioso, *Compêndio*, p.181. Brazilian rice production had hurt US producers severely in Portugal's market. During the decade of the 1790s, only 5,320 tons were exported to Portugal, less than 2 per cent of total rice exported. P. Coclanis, *The Shadow of a Dream* (New York: Oxford University Press, 1989), p.279, fn.47.
68. Nunes Dias, *Fomento e Mercantilismo*, Vol. I, pp.446–51. Vol. II, pp.215–16.
69. Mário L. Ribeiro Mesquita, *Germoplasma de arroz (Oryza sativa L.) coletado na microrregião da Baixada Ocidental Maranhense* (São Luís: EMAPA, 1984).
70. César Augusto Marques, *Dicionário histórico-geográfico da Província do Maranhão* (Rio de Janeiro: Cia. Editora Fon-Fon e Seleta, 1970), p.91; Viveiros, 'Arroz no Estado', pp.201–5.
71. J. Drayton, *A View of South Carolina* (Columbia: University of South Carolina Press, 1972), p.125.
72. Almeida, *Cultura do arroz*, p.80; Alexandre Rodrigues Ferreira, *Viagem Filosófica ao Rio Negro* (Belém: Museu Paraense Emílio Goeldi, 1983), p.133.
73. D. Alen, 'Late Colonial Brazil, 1759–1909', in L. Bethell (ed.) *Cambridge History of Latin America*, (Cambridge: Cambridge University Press, 1984) Vol. II, p.641.
74. Marques, *Dicionário*, p.435–6; Dias, *Fomento*, Vol. I, p.435.

75. Quoted from Viveiros, *História do comércio*, Vol. I, pp.201–3.
76. National Research Council (NRC) *Lost Crops of Africa*, (Washington DC: National Academy Press, 1996).
77. Oral history collected by the author in Aug. 2002.
78. Marques, *Dicionário*, p.91.
79. Almeida, *Cultura do arroz*, pp.76–8; Manuel Vianna e Silva, 'Elementos para história do arroz no Brasil', *Lavoura Arrozeira*, 4, 39 (1950), pp.11–16, 14.
80. Viveiros, *Arroz no Estado do Maranhão*, p.201.
81. Viveiros, *História do comércio*, Vol. I, p.80.
82. Almeida, *Cultura do arroz*, pp.82–3.
83. Gaioso, *Compêndio*, p.181.
84. Ferreira, *Viagem Filosófica*, p.133.
85. The concentration of slaves on rice and cotton plantations made Maranhão the region with the highest percentage of enslaved persons in the Portuguese Empire (55 per cent). Matthias Röhrig Assunção, 'Quilombos Maranhenses', in João Reis and Flávio dos Santos Gomes (eds.), *Liberdade por um fio. História dos quilombos no Brasil* (São Paulo: Companhia das Letras, 1996), pp.433–66 esp. 434. Q8
86. Matthias Röhrig Assunção, 'Quilombos Maranhenses', p.448; Conrad, *Children of God's Fire*, pp.389–90.
87. On locations of quilombos in nineteenth-century Maranhão, see the document reprinted from 1853, reprinted in Conrad, *Children of God's Fire*, pp.387–8. Maranhão today claims the largest number of quilombo communities in Brazil, where 443 of the estimated total 743, are located. Wagner, *Terras do Preto*, p.17.
88. See note 2; Carney fieldwork interviews, Aug. 2002. The oral histories recorded in this section were collected by Carney and Acevedo in Pará and Maranhão. While the identity of the communities is protected, in Pará, they are located within a half-day journey by boat and car from the state capital, Belém, towards the state boundary with Maranhão. In Maranhão, the interviews took place in hamlets north-west and south-east of São Luís between Alcântara and the town of Itapecurú-Mirim.
89. Two major farming systems have historically characterized African rice production: one where only women grow the cereal, the other where men and women both participate but specialize in specific field tasks. This distinction receives attention in early European accounts of the Upper Guinea Coast. Carney, *Black Rice*, pp.49–55.
90. Pier Larson, *History and Memory in the Age of Enslavement* (Portsmouth, New Hampshire: Heinemann, 2000).
91. But see, J. Chaplin, *An Anxious Pursuit: Agricultural Innovation and Modernity in the Lower South, 1730–1815* (Chapel Hill, 1993), p.156; J. Carney, 'African Rice in the Columbian Exchange', *Journal of African History*, 42, 3 (2001), p.377–96.
92. Ciro Flamarion S. Cardoso, 'The Peasant Breach in the Slave System: New Developments in Brazil', *Luso-Brazilian Review*, 25, 1, pp.49–57.
93. S.B. Schwartz, 'Resistance and Accommodation in Eighteenth Century Brazil: The Slaves' View of Slavery', *Hispanic American Historical Review*, 57, 1, pp.69–81.
94. ¹ R. Price, 'Subsistence on the Plantation Periphery: Crops, Cooking, and Labour among Eighteenth-Century Suriname Maroons', *Slavery and Abolition*, 12, 1 (1991), pp.107–27; Voeks, *Sacred Leaves*; Hall *et al.*, *Great Things*, pp.191–220, 232–5, 241–4; J. Carney 'African Traditional Plant Knowledge in the Circum-Caribbean Region', *Journal of Ethnobiology*, 2 (forthcoming).



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