Black Rice

The African Origins of Rice Cultivation in the Americas

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Asia. At the end of an especially brutal century of slavery, rain-fed and tidal production dominated the West African rice landscape. Produced with less labor and landscape manipulation, these rice systems confirmed long-standing beliefs that disparaged African achievements in agriculture and technology.

Over this same century, rice emerged in North America as the leading export crop of coastal South Carolina and Georgia. Prized in European markets for its high quality, Carolina rice served as the global standard for evaluating the types of rice systems encountered in different parts of the world at the end of the eighteenth century. Thus one French commandant based in the tidal rice region of Senegambia around 1770 could predict, “Rice may be produced here as much as in the Provinces of Carolina and Georgia.” What he failed to know was that it had been, and since ancient times.

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Rice Origins and Indigenous Knowledge

Rice cultivation by irrigation and rice cultivation by submersion—this is the difference between Asian and African civilizations.
—Pierre Viguier, La riziculture indigène au Soudan français (1939)

RICE CULTIVATION is essential to cultural identity throughout much of West Africa. Among those ethnic groups for whom the crop is the dietary staple, unless a meal includes rice, they claim not to have eaten. Its cultural importance is evident in village celebrations and even in the funerary customs of some groups, where spirits of the dead are propitiated by an offering of rice. Female labor is central to the cultivation of rice throughout West Africa, either as a crop that women alone grow or through the specialized agricultural tasks that they alone perform. The Diola of Casamance, Senegal, refer to rice cultivation as a “woman’s sweat” while the Serer of Senegambia note the importance of female labor in all foodstuff processing by placing the deceased’s mortar and pestle on her grave. With the dawn of each day women’s pounding of rice awakens millions of African villagers, the rhythmic striking of rice grains by the pestle providing the steady heartbeat of community life. Rice is central to subsistence and cultural identity over a broad area of West Africa; it was to become equally so in communities of the Americas settled by enslaved persons from the rice region and their descendants.

The cultivation of rice contributed to the dense populations of the Upper Guinea Coast that Europeans plundered during the 350 years of the Atlantic slave trade. An examination of the history of rice in West Africa and its forms of production reveals the significance of agriculture
to culture in centuries past and the role of rice in the complex knowledge system that male and female slaves brought to the Americas.

Unlike the case of Africa, Asia has never been doubted as a center of rice domestication, even though the exact area of the crop's origins and its antiquity have been disputed. However, archaeological excavations throughout Asia now indicate that the domestication of rice, *Oryza sativa*, occurred some seven thousand years ago. The species likely evolved independently yet concurrently in multiple sites over a broad belt that extended from the Gangetic plain below the foothills of the Himalayas near Assam, across upper Burma, northern Thailand, North Vietnam, and into Southwest China near Yunnan. Asian rice was first domesticated on floodplains as a shallow- or deep-water crop, with cultivation later extended to the rain-fed uplands. By the second to third century B.C., large-scale centrally managed irrigation systems were in place, whereas plowing by water buffalo, manuring, and transplanting developed early in the first centuries A.D.⁴

The beginnings of African rice history are just becoming known. The reasons for this tardy awareness are multiple. The long-standing research bias against Africa and its peoples and deep-seated views within European and American culture that the development of technology was beyond the ken of Africans certainly have contributed. Belief that Africans failed to domesticate crops, a step crucial for the emergence of civilization, and their presumed acquiescence to slavery, impeded the advance of scholarship that would illuminate a different vantage point. An examination of rice history and its underlying knowledge base in Africa reveals the depth of such erroneous yet enduring legacies of the Atlantic slave trade.

A Shifting Paradigm on Rice

Despite observations of rice cultivation along the West African coast from the earliest Portuguese voyages, remarkably, until the twentieth century no scholar suggested the crop might have been established prior to the arrival of Europeans. Prejudicial views toward Africans precluded the consideration that rice farming might be indigenous or Africans capable of developing the irrigated systems Europeans found south along the coast from the Gambia River. Scholars routinely assigned the establishment of rice cultivation in West Africa to the Portuguese, whom they credited with introducing the crop from Asia as well as the irrigation techniques needed for growing it.⁵ No one questioned how or why Portuguese sailors would be likely tutors for imparting this sophisticated knowledge.

Only twentieth-century botanical research raised questions about this long-standing interpretation. As Europe carved Africa into colonies during the 1880s and forced Africans to grow export crops desired in the metropole, whole systems of agricultural production were disrupted. Throughout the interior of the Upper Guinea Coast emphasis was placed on peanuts and cotton grown exclusively for metropole markets.⁶ Food shortages became a persistent feature of colonialism as punitive tax structures forced farmers to cultivate cash crops at the expense of the traditional rain-fed staples, sorghum and millet. The cultivation of rice in lowlands received increasing emphasis for its ecological complementarity with cash crops on the uplands, and colonial botanists set out to improve the crop's performance.⁷

At the end of the nineteenth century a French botanical expedition (1898–1900) to the newly founded colonies of Senegal and Niger made an unanticipated and startling discovery. In 1899, in the region between the upper Senegal and upper Niger Rivers, they encountered a type of rice distinctly different from the Asian varieties familiar to them. South of Gambia in Casamance, Senegal, they found similar specimens: a red rice that grew on floodplains and in the water but bore little resemblance to any cultivated rice previously seen.⁸ Their botanical collections revealed several wild relatives of this rice but none showing Asian parentage.⁹ Its distinctive traits suggested an African origin.

Research on the distribution of this rice and its varietal diversity prompted French botanists to reexamine two collections of rice made in West Africa during the first half of the nineteenth century. Botanist Leprieur in Senegal collected the first specimens over the period 1824–1829, while Edelstan Jardin’s collection came from islands off the coast of Guinea Conakry in 1845–1848. Both collectors identified their samples as *Oryza sativa* (Asian rice), the only species known in the Linnaean classification that had been established in the eighteenth century.⁴ An early examination of the Jardin collection by German botanist Ernst Gottlieb Stedel in 1855, however, had led him to conclude that the samples represented a rice species distinct from *Oryza sativa*, which he named *Oryza glaberrima* for its smooth hulls.⁵ Nevertheless
his research did not suggest an African origin for this rice. The rediscovery of Steudel’s study in tandem with the botanical evidence led French botanist August Chevalier and his colleagues in 1914 to advance the hypothesis for an indigenous African rice.\textsuperscript{11} Their research attributed the center of African rice domestication to the inland delta of the Niger River in Mali, a center of \textit{glaberrima} diversity.\textsuperscript{11}

Thus began a debate on rice origins in Africa that would ensue over many decades. The view that rice was grown prior to the arrival of Europeans and domesticated independently south of the Sahara met with considerable skepticism. Only in the 1970s, with the accumulation of overwhelming evidence from disparate fields of scholarship, was the contention for an African origin universally accepted. The significance of this research for views on Africa and its peoples is just being grasped.

Recognition of a Separate Species of Rice in West Africa

A great deal of intellectual capital was at stake in accepting the proposition that rice was domesticated separately in West Africa. When Linnaeus (1707–1778) classified rice, scientists recognized the domestication of only one species, \textit{sitric}, in Asia. The view of a single Asian origin for rice persisted and was championed by other scientific luminaries such as Alphonse de Candolle, in his 1866 compendium on the origin of cultivated plants.\textsuperscript{19} For Chevalier and his colleagues to suggest otherwise was to go against a large body of European scholarship that attributed the emergence of agriculture and urbanism to one place, the Near East, and its diffusion from there to Europe and Asia.\textsuperscript{15} Even the noted Russian geneticist N. I. Vavilov, whose pathbreaking research in the 1920s on indigenous centers of plant domestication was undermining the view of a single center for agricultural origins, failed to dislodge this view. While recognizing plant domestication as having developed in the Ethiopian highlands, Vavilov made no claim for rice domestication in Africa.\textsuperscript{16}

Meanwhile Chevalier pressed ahead with his contention that \textit{glaberrima} represented a separate and African species of rice. The first challenges came from scholars who proposed instead that this rice was probably of Asian origin and entered Africa at an earlier period, perhaps with the expansion of Islam between the eighth and fourteenth centuries.\textsuperscript{19} However, several problems emerged with this proposition.

A review of Muslim accounts did indeed establish the cultivation of rice prior to the arrival of Portuguese caravels along the West African coast. While rice is mentioned in Arabic accounts from the tenth century, Islamic scholar al-Bakri provided the first indication of its deliberate cultivation along the Niger River in 1068.\textsuperscript{18} He described the planting of rice twice a year, once at the time of the Niger flood, and again when the ground was still wet, evidently a reference to flood-recession agriculture.\textsuperscript{19} The adaptation of rice to different hydrological conditions suggested a production system that predated the relatively recent period of Islamic expansion. When Moroccan scholar Ibn Battuta journeyed along the Niger River to the Mali Kingdom during the fourteenth century he, too, noted the abundance of rice. But he claimed the consumption of rice harmful for nonblacks, revealing perhaps indirectly the association of rice cultivation with the black peoples south of the Sahara.\textsuperscript{20} Leo Africanus, who traveled twice to the region, in 1511 and 1512, observed rice farming and sales along the Niger and Senegal Rivers at about the same period the diverse areas planted to the cereal were capturing the attention of Portuguese mariners.\textsuperscript{21}

Translations of Muslim documents thus established the cultivation of rice prior to the arrival of the Portuguese and the existence of a production system older than the period of Islamic expansion into the region from the tenth century. But these references to rice also revealed another important point. Only in West Africa did Islamic scholars note a fully evolved rice culture. If Muslims had introduced the crop from Asia, a geographic link to East Africa or the Middle East should be evident. None has yet been discovered. Nor did an examination of other sources reveal an even earlier corollary of rice introduction along the Nile. There was no mention by Greek historians of its cultivation along Nile floodplains or reference to the cereal in ancient Egyptian hieroglyphics. The Greek geographer and historian Strabo (63 B.C. to A.D. 20), however, did record one instance of rice being planted (circa A.D. 12) in the oasis of Cyrenaica, located in Libya astride the caravan route to sub-Saharan Africa.\textsuperscript{22} Polish scholar Tadeusz Lewicki, who translated so many of the early Arabic descriptions of West African food systems, has claimed Strabo’s was the earliest reference to \textit{glaberrima} rice.\textsuperscript{23}

Linguistic evidence provided additional support for West Africa as an independent center of rice domestication. In regions of Africa where
rice cultivation was unknown before the arrival of European traders, the local words borrow the names of those who introduced it, and thus the Arabic and European names *oza*, *oza*, *avas*, *riz*, *ris*, *rijat*, and *rice* are used. However, in the areas where rice cultivation was known or the crop formed part of an active trade in cereals, no borrowing of names occurs. Peoples throughout the Upper Guinea Coast of Africa use names for rice derived from African languages. For example, in Senegal and Gambia, reached by the Portuguese in the mid-fifteenth century, the terms *maro* (Mandinga) and *maal* (Wolof) or some derivative of *maro/marsro* are employed for the native African rice. These same names were later extended to *sativa* rice, which Europeans introduced from Asia during the period of global seed transfers known as the Columbian Exchange.

The areas of West Africa adopting Asian *sativa* varieties were the same ones that figured in early Portuguese commentaries on rice-growing societies, and Africans extended the native words for rice to these introduced varieties. Between the 1940s and 1960s French botanist Roland Portères determined two feet along the West African coast where Asian varieties initially took root in African rice farming systems: one located between the Casamance and Cacheu Rivers between Senegal and Guinea-Bissau, the other in the region between Conakry in Guinea and Buchanan in Liberia. This includes the area where Europeans encountered irrigated rice farming in West Africa. In noting that *sativa* rice only became established in areas of Africa with a history of *glaberrima* cultivation, Portères underscores a crucial point: that the adoption of Asian varieties presupposed populations already skilled in the techniques and practices involved in growing rice.

In the face of so much evidence, opposition to an independent African center of rice domestication finally gave way during the 1970s, even if its implication for perspectives on Africa was not widely appreciated. But the belief that Africans were incapable of sophisticated technological development remained tenacious. Even the French botanists conducting the pioneering research that established the independent domestication of rice along the banks of the Niger River in Mali could not imagine Africans capable of developing the sophisticated irrigated rice system found south of the Casamance River along the coast. Constructed by speakers of the West Atlantic language group, the system proved the hallmark of African achievements in rice culture. The diversity of *glaberrima* seed collected from the area by Jardin in the 1820s failed to make botanists question whether the irrigated planting system where they were collected could in fact be of African origin. Instead, the mere presence of some Asian rice varieties in the region was enough to attribute a Portuguese origin to the system.

Africans were only credited with developing rice cultivation on tidal floodplains, those planted along the middle to upper reaches of the Niger, Senegal, and Gambia Rivers. Even the French botanist August Chevalier, who had done so much to substantiate an independent center of rice domestication in Africa, did not question the irrigated coastal systems as the product of Portuguese tutelage. He stressed this cultural distinction between the two primary concentrations of wetland rice cultivation in West Africa: "The coastal regions (the Southern Rivers) of West Africa, from Casamance (Senegal) to the frontier of Sierra Leone, where the Portuguese, established there for many centuries in the region, perfected [rice] culture by making a truly irrigated culture...[in addition to] the valley of the Niger where rice cultivation is quite ancient." Chevalier regarded this second African rice system as rudimentary, since farmers just let tides roll across the floodplain instead of canalizing their water for irrigation. Colonial officials over the years echoed his view of the unrealized potential of irrigated rice on river floodplains, blaming Africans repeatedly for the failure of irrigated rice projects. The French did not understand the rationale of tidal rice farming, which formed part of a complex land-use system involving cattle herding, fishing, and rice cultivation. This land-use strategy strengthened regional subsistence security through diversified food supplies in an ethnically diverse region. Europeans never considered that the cultivation of rice by river tides might form part of a clever land-use strategy for a drought-prone region.

Nonetheless, the irrigated rice system along the coast suggested to the biased European perspective that Africans learned it through contact with the Portuguese. Arguments for a Portuguese origin for this most sophisticated of African rice systems failed to question the improbability of mariners, much less traders, teaching African farmers how to grow irrigated rice. Europeans simply could not imagine that the Africans themselves had experimented and adapted irrigation to their lands independently. This prejudice extended even to historical
scholarship, which did not survey fifteenth-century Portuguese accounts of Africans and their rice systems. Claims for Portuguese tutelage can at long last be dispelled. Africans along the coast adopted *sativa* rice just as they would other Asian and American crops of the Columbian Exchange. The successful establishment of Asian varieties occurred because a system of irrigated rice culture and methods to null the cereal already existed.

By the 1970s the pioneering French botanical research on *glabrerrima* had become widely known within the international scientific community, which accepted the conclusion that the species was indeed of independent African origin. Of the more than twenty species of rice found on the planet, only two were domesticated, one in Asia (*Oryza sativa*), the other in West Africa (*Oryza glabrerrima*). Botanical research indicates that the cultivation of *O. glabrerrima* occurred over a broad region of West Africa from Senegal southward to Liberia and inland for more than one thousand miles to the shores of Lake Chad (Figure 2.1). It is believed that *glabrerrima* was originally domesticated in the freshwater wetlands of the inland delta of the middle Niger River in Mali, an area where rice is grown almost within reach of the Sahara Desert. Genetic diversity in *glabrerrima* also suggests two secondary centers of African rice innovation and development. One emerged on wetlands in the area north and south of the Gambia River between the rivers Sine and Casamance in Senegal, where salt water from marine tides flows over mangrove-covered floodplains. The other secondary center of *glabrerrima* diversification developed in the Guinean highlands between Sierra Leone, Guinea Conakry, and Liberia in a region of abundant rainfall. The diffusion of African rice cultivation appears then to have shifted from initial domestication in freshwater wetlands to marine estuaries and rain-fed, upland areas.

During the 1950s French botanist Roland Portères made the first attempt to speculate on the antiquity of African rice cultivation. On the basis of preliminary radiocarbon dates of megalithic stone sites located along former river courses in the rice region, he attributed the domestication of *glabrerrima* to a period about 3,500 years ago. Archaeological evidence from the postulated center of African rice domestication in the inland delta of the Niger River confirms a more recent date. In Jenné-jeno, located in the middle Niger along with Timbuktu and other early urban centers in Mali, archaeologists Susan and Roderick

McIntosh have established the presence of *glabrerrima* by A.D. 300. The earliest occupation of Jenné-jeno dates from the second century B.C., not long after the appearance of iron smelting in the area. This enabled the making of metal tools that in turn allowed the exploitation of the Inland Delta's clay soils for rice cultivation.

The cereal's antiquity in the secondary centers of *glabrerrima* diversification is not yet known, although its diffusion is often attributed to Mande speakers who migrated from the middle Niger River between the twelfth and sixteenth centuries. While they expanded rain-fed rice cultivation into the Guinean highlands, the mangrove or irrigated rice system found along the marine-influenced coastal estuaries developed among speakers of West Atlantic languages, a distinctly different linguistic family. These earliest inhabitants of the coastal littoral who grew rice included the Bagas, Bainouk, Manjaks, Nunus, Balants, and Diolas. The Atlantic secondary center of rice diversification may well represent innovation from contact between two distinct farming systems—one Mande, based on freshwater floodplains; the other West Atlantic, located along marine estuaries influenced by salt water. Until paleobotanical research illuminates rice prehistory along West Africa's mangrove coast, current evidence establishes *glabrerrima* cultivation along the middle Niger in Mali some two thousand years ago.
Rice Domestication and Empire Formation

It is no coincidence that the great West African empires emerged in the region south of the Sahara following the domestication of rice. By the final millennium B.C., there were already present numerous Mande-speaking peoples adapted to wetlands, who lived between the watersheds of the Senegal and middle Niger Rivers. Their accomplishments as fishers, aquatic hunters, metallurgists, collectors of wild grasses, and farmers were already in place long before the region became linked to the trans-Saharan trade in gold and empires formed. At some point over the six hundred years of severe regional desertification that marked the period from 300 B.C. to A.D. 300, these Mande speakers turned the region into a cradle of agricultural innovation by domestici-

cation of rice. Their wetland resource strategies, so vital to cultural survival in an increasingly drought-prone area, would make the fertile middle Niger contested territory for successive empires.

By the period when rice was domesticated, the Mande language family had divided into a northern and southern branch. In the north the Soninké branch included the Nono, who were settled to the east along the western edge of the middle Niger (Figure 2.2). Oral traditions claim them as the earliest farmers of *glaberrima* rice. Under pressure from a drying climate, the development of rice culture along floodplains provided the Nono and other Mande speakers a vital food security strategy to complement the increasingly riskier regional production of rain-fed millet and sorghum.

From the eighth century A.D. the Ghana Empire arose in the Soninké area between the mid-Senegal and middle Niger Rivers. Gold, ivory, kola, and slaves from lands to the south were exchanged by Mande speakers for the salt, copper, and luxury goods transported across the Sahara by Berber caravans. Following another period of declining rainfall the Ghana Empire was eclipsed by the territorial expansion of speakers from the Mande linguistic heartland. This southern branch of the language family, located in the wetter lands to the south and in proximity to the headwaters of the upper Senegal and Niger Rivers, originated close to the contemporary border of Mali and Guinea Conakry. By A.D. 1100 these Mande speakers were laying the foundation for the Mali Empire, which extended in a northeast direc-

tion along the Niger River, absorbing the kingdom of Songhai centered near Gao in the Inland Delta.

This southern branch of Mande speakers fanned out from the middle Niger River over a vast region of West Africa. They diffused the cultivation of rice in two principal directions. One migratory wave proceeded southwest into the highlands and forests of Guinea, Ivory Coast, Sierra Leone, and Liberia. The other path of Mande expansion followed the floodplains of the Gambia River and its tributaries nearly to the coastal settlements of West Atlantic speakers. Even though the linkage of the mangrove rice system they developed is poorly understood in relationship to the crop's diffusion by Mande migrations from the middle Niger, these rice growers on floodplains inundated with salt water forged a remarkable material civilization. On land seemingly ill disposed for the cultivation of rice, they developed three principles that would make theirs the most productive of all African rice systems. In contrast to the practice in the Inland Niger Delta of planting along freshwater floodplains, mangrove rice growers turned
over their soils for aeration and cultivated the cereal atop ridges in estuaries within reach of the forceful marine tides. Rather than sowing seeds directly into the floodplain, mangrove growers transplanted their rice. And for lifting and aerating the heavy clay soils, they invented a specialized agricultural implement, a long-handled shovel.46

Mande migrations resulted in the expansion of *glaberrima* cultivation over a considerable area of West Africa. But from the mid-fifteenth century, at about the time Portuguese explorations were reaching the Upper Guinea Coast, the Mali Empire began losing its territorial grip. With the empire's fragmentation, Nilotic-speaking Songhai established an empire in the Inland Delta centered on Timbuktu, which had become a fabled center of Islamic learning. The Songhai was the last of the great empires in the western Sahel. After the seventeenth century, empires would never again form in the region. The onset of the Atlantic slave trade over the following hundreds of years would bring increasing political fragmentation, unparalleled social disruption, and depopulation as millions were enslaved for New World plantations.

From the eighth to the sixteenth centuries the fertile wetlands located between the Senegal and middle Niger Rivers witnessed repeated emigration and migration formation. The Sahel's first cities emerged in the region where Mandespeakers planted, and likely domesticated, rice. This was a region where fishing and animal husbandry complemented the collection of wild grasses, while the growing of rice on river floodplains minimized the risks to food security involved with planting rain-fed cereals. As the climate grew steadily more arid, the wetlands became a vital repository of cumulative indigenous knowledge. Groups specialized in fishing, livestock management, and farming became interdependent through the diverse ways they coexisted in the landscape. Wetland cultivation contributed to the region's emergence as an ecological crossroads at the nexus of long-distance trade routes to the north and the south. In the western Sahel, located between the Sahara and the forested regions to the south, traders converged to restock caravan food supplies.

Since ancient times the fertile wetlands along the rivers Niger, Senegal, and Bani supplied grain, smoked fish, and meat for caravans traversing the Sahel, as they also must have for those journeying to gold fields in the south. Muslim accounts provide a glimpse of the significance of the area's food surpluses for long-distance traders. When Ibn Battuta followed one route through the Mali Empire in the mid-fourteenth century, he observed the abundance of rice being cultivated and marketed.47 An account by an Algerian-based Italian merchant, Antonio Malafante, in 1447, similarly noted the surplus of food, with one Muslim trader informing him of the widespread availability of rice in Gao, Timbuktu, Jenne, and Mali: "They have an abundance of flesh, milk, and rice, but no corn or barley. Through these lands flows a very large river, which at certain times of the year inundates all these lands... There are many boats on it, by which they carry on trade."

The domestication and diffusion of rice resulted in an indigenous knowledge system that sustained human settlement over a broad and geographically diverse region of West Africa. This process of learning to cope with climatic instability through the management of wetland resources unfolded against the dramatic climatic shifts of past millennia. Despite the significance of indigenous practices and technologies in providing for collective regional food needs, the ecological significance of the area of *glaberrima* domestication remains to this day unappreciated. Historical accounts routinely emphasize the influence of exogenous peoples. Muslims from North Africa and Portuguese from Europe, in the region, which has contributed to views of the western Sahel as a region marginal for human settlement. This was certainly not always the case. Only by understanding the adaptation of Mande-speaking peoples and their neighbors to this ecologically complex area can we begin to grasp what they accomplished and the legacy they left in the Americas.

The domestication of *glaberrima* rice in the geographic setting of the Inland Niger Delta was thus in place long before any navigator from Java or Arabia could have introduced rice to the African continent via Madagascar or the East African coast.48 From the sixteenth century African rice crossed the Middle Passage of slavery to the Americas, not merely as food in ship cargoes but also as an indigenous knowledge system known to so many of the Atlantic slave trade's victims.

The Environmental Setting of the West African Rice Region

The traditional rice-growing region of West Africa extends south along the coast from northern Senegal to the Bandama River in the
central Ivory Coast and eastward into the interior for some 1,800 kilometers all the way to Lake Chad in the country of that name (Figure 2.1). A region of considerable ecological and climatic diversity, the West African rice area reaches from the parched margins of the Sahara to the humid tropical forests of the Guinea highlands. Precipitation increases dramatically over short distances in the direction north to south but remains fairly consistent over even greater distances from west to east. For example, in the northern part of the West African rice region, annual precipitation averages only ten to twenty inches, and this low rainfall pattern characterizes the enormous distance between Senegal on the coast and Chad in the interior. A similar rainfall pattern prevails a short distance to the south in The Gambia, where precipitation reaches thirty to forty inches per annum over a broad savanna area to the east. Rainfall again increases in Guinea-Bissau, averaging between thirty-eight and forty-three inches. The pattern of gradual precipitation increase continues steadily southward to the Guinea highlands and forested regions of Sierra Leone, Liberia, and the Ivory Coast, where rainfall may exceed eighty inches (Figure 2.3).

One of the most remarkable features of the traditional rice-growing area of West Africa is the extent of the territory that falls within the drought-prone Sahel and savanna, where rainfall grades from ten to thirty inches. Drought presents a constant specter over much of the Sahelian region traditionally planted to rice. The amount and pattern of rainfall, however, is a function of longer-term climatic cycles that cause the Sahara to advance and retreat as much as 180 kilometers, much like an ocean tide. Comprising the Sahel and the area affected by its cyclical ebb and flow are many countries of the West African rice region: Senegal, Mali, Niger, Chad, The Gambia, Burkina Faso and the northern portions of Guinea-Bissau, Guinea Conakry, the Ivory Coast, and Nigeria. These are countries where rainfall can vary considerably from one year to the next, and even in relatively wet years, its poor distribution over an agricultural season may cause crops to fail.

But the threat of famine acted as an incentive for developing one of the world’s most ingenious cultivation systems. In an area where the cultivation by rainfall of other subsistence crops like millet and sorghum periodically results in failure, rice flourishes. Thousands of years ago Sahelian peoples responded to mounting aridity in the region by domesticating a grass of the Oryza species that they discovered grew well in surrounding wetland swamps. From then on their farming system would mitigate the vagaries of rainfall availability by the cultivation of rice in areas within reach of river tides and groundwater resources.

The diverse wetlands planted to rice in West Africa include river floodplains, coastal estuaries, inland swamps, hill slopes overlying subterranean streams, and bottomlands with high water tables. In the Sahel and savanna region, which forms the northern half of the West African rice region, rice is a wetland crop. Its cultivation is especially concentrated along the floodplains of the area’s major rivers, the Senegal, Gambia, Niger, and Bani. The other great arc of wetland cultivation straddles the northern and southern halves of the West African rice region along the Atlantic coast south of Gambia to Sierra Leone. This is the mangrove system, where planting occurs in coastal estuaries. Rainfall is captured in enclosed plots to desalinize otherwise fertile alluvial soils, a practice that after a few years makes them optimal for rice farming.

The southern half of the West African rice region receives more than forty inches of rainfall, the ample precipitation favoring emphasis on rain-fed rice in upland areas. In the Ivory Coast, Sierra Leone, and Liberia, rice is grown along a landscape continuum that grades from its
cultivation with rainfall atop a slope to planting the crop in lowland swamps.

The practice of wetland farming throughout the West African rice region represents an imaginative adaptive strategy to regional climatic and topographic differences, whether in the Sahel or as part of an upland-lowland farming system in the Guinean highlands to the south. Growing rice in wetlands allows farmers to extend the agricultural calendar beyond the confines of the rainy season. Planting diverse microenvironments along a landscape gradient with distinctive water regimes minimizes the risk of crop failure while adding flexibility to farming practices. Rice in each microenvironment consequently matures at different periods over a cultivation cycle, enabling agricultural practices to unfold in a sequence where labor is spread out over a farming season. A diverse selection of seeds designed to flourish and mature under different conditions and duration periods aids in this land-use strategy.

Land Use in the West African Rice Region

The West African rice region bifurcates into a northern and southern portion at about thirty-five inches of annual precipitation. The result is two distinctive land-use systems for rice cultivation that informed the practices brought by enslaved West Africans to Carolina plantations. In the northern half, rice cultivation unfolds on wetlands in conjunction with cattle grazing. South of the area where annual rainfall exceeds thirty-five inches, animals figure less centrally as land use shifts from an agro-pastoral to a mostly agricultural system.

Ever since the period of the Mande expansions in the twelfth century, the forty-inch rainfall belt has roughly corresponded with the northern limit of the tsetse fly that carries the trypanosomes of sleeping sickness, a disease that is especially fatal to domesticated animals, as already noted. Extensive herds of domesticated herbivores, including the indigenous longhorn cattle and the introduced zebu breed, thus dominate the northern half of the West African rice region. Managed by pastoral Fulani, cattle form an integral part of the complex settlement history that characterizes the rice landscape. In the southern portion of the rice region, cattle are less significant. Within the transi-

tional rainfall area, only the small ndama breed of cattle, resistant to trypanosome infection, survives. Here a landscape devoted to agriculture meets the eye.

The agro-pastoral system of the Inland Niger Delta unfolds on the vast expanse of wetlands fed by the Niger and Bani Rivers in the modern country of Mali. Annual flooding in the region inundates some fifty-five thousand square kilometers, the Delta's location within the arid Sahelian zone rendering it of vital importance for rice, fish, and livestock production. This area of glaberrima domestication represents a crucial multipurpose resource for farmers as well as for more mobile fishing and herding peoples. Throughout the entire trypanosome-free zone of the rice region, land use shifts from rice farming during the rains to pasture in the dry season. Following the rice harvest in the fall and early winter, cattle enter the fields to graze upon the crop residue, their manure fertilizing the soil. This seasonal rotation between rice cultivation and pastoralism embraces a clever land-use strategy that satisfies both cereal and protein (especially milk) needs while improving crop yields through the addition of animal manure. Rice farmers south of the trypanosome belt do not have these advantages: in the absence of cattle they must rely upon other techniques to maintain soil fertility, such as rotating fields with nitrogen-fixing legumes and intercropping plants that add crucial nutrients to the soil. Meat and milk must be obtained elsewhere.

In the northern portion of the West African rice region, rice cultivation along freshwater floodplains does not involve landscape transformation with embankments and canals for drainage. The objective instead is to allow the unimpeded flow of water across the rice fields. While the annual rise and fall in river tides deposits fertile alluvium, the unencumbered landscape also facilitates the movement of both animal and fish populations.

Even when land use on the floodplain shifts to grazing during the dry season, an additional cropping cycle is sometimes established along the inner edge of Sahelian rivers with an ebbing tide. Farmers may plant a second rice crop, sorghum, or vegetables with flood recession. They wait for the retreat of floodwaters to plant in the moisture-holding soils. The seasonal rotation of land use along floodplains, where rice cultivation and animal grazing is succeeded by cattle pasture and a
Black Rice

Flood-recession crop during the dry season, illuminates the ingenuity of West African farmers in adapting rice culture to existing environmental conditions.

Even though the African method of shifting land use between rice and cattle supports a complex land rotation and diversified nutritional base, the underlying rationale of the system eluded Europeans until well into this century. They viewed the wetlands of the Inland Delta, for example, as perfectly suited for the cultivation of two irrigated rice crops. That such a system had failed to develop autochthonously in an eminently appropriate environment confirmed for European colonial officials the supposed technological limits of African societies on the eve of the Atlantic slave trade. The land-use strategy developed by the region’s farmers, herders, and fishers for coping with persistent drought served instead to bolster views of African cultural inferiority. In an era of scientific racism and colonialism, the denial of African accomplishment in rice systems provides a stunning example of how power relations mediate the production of history. As a result, researchers ignored African rice history until well into the twentieth century.

European observers thus placed African farmers on a less evolved level within the hierarchy of agriculture, civilization, and progress. Formalizing the partition of Africa in the mid-1880s with colonial rule, Europeans saw themselves as bearers of a civilizing mission that would deliver technology and progress to the peoples of the Dark Continent. Eyeing the vast expanse of wetlands in the Inland Delta, colonial agricultural agents could only see before them a rice system of unrealized potential, one whose trajectory in Africa fell far short of the accomplishments of Asia, where the development of irrigated rice had led to cultural florescence and civilization. Armed with a cultural-evolutionary view of technology development, Europeans either outright denied African technological achievement in rice culture, as along the coast, or portrayed the systems in place along Sahelian rivers as examples of arrested technological development, thereby underscoring long-standing racial prejudices.

The floodplain cultivation system, such as existed along the inland delta of the Niger, symbolized then the limits of African technological accomplishments. Racial biases portrayed farmers as exerting little effort to subdue nature for food surpluses. Believing Africans lacked the

Rice Origins and Indigenous Knowledge

Acumen to develop more sophisticated double-cropping systems, officials denigrated floodplain cultivation along freshwater rivers for having failed to achieve the Asian trajectory of technology development toward irrigation systems with full water control. French irrigation specialist Pierre Viguier, who worked in the inland delta of the Niger in Mali, echoed prevalent European views in 1939. He attributed the presumed gulf between the levels of civilization attained by Asia and Africa to the technological gap between planting rice with irrigation and planting via tidal flow. “Rice cultivation by irrigation and rice cultivation by submersion,” he noted, “is the distance between Asian and African civilisations.”

The Atlantic slave trade and its legacy of racism, combined with the inherent sense of Western superiority during colonialism, conditioned European perceptions of African rice systems. In the years between the two world wars, colonial irrigation engineers and botanists aimed to bridge the perceived technology gap by developing large-scale irrigation projects along Sahelian rivers. In promoting rice cultivation year-round, these European-initiated projects radically disrupted the traditional balance achieved in alternating land use between farming and grazing systems. Despite the repeated failure of these irrigation schemes, the blame was always placed upon the presumed inability of Africans to comprehend the sophisticated concepts embodied in technology transfer rather than on the ill-conceived plans of outsiders.

Rice and Women’s Work

Throughout the West African rice region seed selection is the responsibility of females. Varieties exist for all the major problems encountered in landscapes planted to rice: deep or shallow flooding, seasonal salinity, cultivation with moisture reserves exposed by a falling river tide, acidity, drought, and high iron toxicity. The amount and timing of water availability also affects the growth period, with seeds selected to mature in periods that range from three to six months. Among the remarkable varieties cultivated by Sahelian rice growers are those planted with the annual flood of the Niger River, known as “floating rice” for the mats of vegetation they form along the river. This type of rice is harvested after 180 days of growth. Seeds are additionally selected to repel predators, such as weaver birds, a pest in rice fields, whose dam-
age is minimized by varieties selected for spiky awns. In just the Inland Delta alone, colonial officials in the early twentieth century recorded more than fifty distinct types of rice being grown, with another thirty-five varieties collected in the mangrove rice area.

The diversity of seed reflects women’s keen awareness of local environments and deep familiarity with rice culture. Throughout the Inland Delta, women are the harvesters of wild rice varieties, women’s enduring association with seed selection is in fact suggestive that females may have initiated the process of rice domestication. The large number of varieties selected just for milling and cooking attest to the traditional female role as plant breeders. Seeds are chosen for cooking properties, taste, ease in milling, and storage qualities. In addition to *glaberrima*, women farmers also plant Asian (*sativus*) rice. These two types of rice do not readily intercross and are prized for their respective properties, Asian varieties for their higher yields and African ones for their productivity on problem soils. *Glaberrima* grows better than *sativus* in conditions of soil acidity, salinity, flooding, iron toxicity, and phosphorus deficiency. Although generally lower yielding than *sativus*, African rice develops quickly, making it more competitive with weeds than Asian varieties. But its suitability for commercial purposes is weakened by the tendency of African rice to shatter easily with mechanized milling.

Another characteristic of African rice that distinguishes it from most *sativus* varieties is the red color of its bran, which shifts between purple and black tones in different varieties. Even in Figure 2.4, a black-and-white photograph (where Mande women of Casamance, Senegal, display bundles of *glaberrima* [left] and *sativus* [right] rice they have just harvested in their fields), the color difference between African and Asian rice is apparent. But the “great red rice of the hook of the Niger River” is not the only red rice, making identification solely by color problematic. Many wild *sativus* are also red in color, as in the bran of some cultivated varieties found in subtropical Himalayan valleys.

Women’s roles in rice culture, however, involve considerably more than seed selection, hand milling, and cooking. From the earliest period of the Atlantic slave trade, Europeans had noted the crucial role of females in African rice cultivation. Wherever rice is grown in West Africa, women continue working in the fields and their labor remains associated with the specialized tasks of hoeing, sowing, weeding, and transplanting. Central to the visual imagery of a West African rice landscape is a woman with her baby on her back, hoeing a field under unrelenting heat and humidity (Figure 2.5).

The centrality of the historical role of women in West African rice farming enables the identification of three broad production systems that illuminate gendered skills and work patterns long characteristic of the crop’s cultivation. Each system is associated with the three major areas of *glaberrima* development—the primary center of domestication along the floodplains surrounding the buckle or inland delta of the Niger River and the two secondary centers of domestication, mangrove rice along the coast and the upland-inland swamp-planting system found in the area near the Guinea highlands. The role of female labor in each system varies in relationship to the significance of rice in the farming system, with male participation in cultivation more marked in
cultures dependent on rice as the dietary staple. When rice assumes a less central role in the regional food system, the crop is often farmed solely by women.44

Along freshwater floodplains of the Sahel and especially where Mande languages are spoken, rice is usually a woman’s crop, grown with little assistance from men. Women and their daughters carry out all the field operations involved in rice farming, from preparing the fields with hoes to harvest. A wholly different system of production characterizes rice growing in coastal mangrove swamps, planted by West Atlantic ethnic groups. Here, men and women grow rice in a system where gender differentiates responsibilities in farming. Males perform the heavy work of field preparation, while females are charged with sowing, weeding, and transplanting. Both sexes participate in the harvest.45

Yet another system characterizes the upland-inland swamp-planting system that typifies the southern portion of the West African rice area reached by Mande linguistic groups between the twelfth and the sixteenth centuries.46 In a system dominated by rain-fed cultivation along a landscape gradient, women carry out the specialized tasks of sowing and weeding rice in upland fields as well as the work associated with intercropping those fields with other subsistence staples such as cassava, maize, and vegetables. The cultivation of rice in the valley bottoms of this upland-inland swamp system, however, usually remains the domain of women, perhaps indicative of the long-standing association of females of Mande language groups with wetland farming.47

While three types of gendered production systems are evident in the West African rice region, only women are involved in the processing and cooking of the cereal. After the crop is harvested females mill the rice with a mortar and pestle, winnow the grain in coiled baskets, and prepare the cereal for consumption. However, with newly harvested rice at the end of the cultivation cycle, when food is scarce and the grain not yet properly dried, the rice may be prepared by parboiling (Figure 2.6). Parboiling involves soaking the rice with its hulls still at-
tached in cold water prior to cooking, steaming, and drying, a process that drives the oils into the bran, thereby facilitating hull removal.

The division of labor typical of West African rice cultivation extends to the specialized agricultural implements that developed over time for carrying out field tasks. This is especially evident in the great diversity of hoes for field preparation, which one researcher regards as "the best symbol that one can find of African agricultural systems." Most hoes employed in rice cultivation are strictly associated with either female or male use. For instance, use of the long-handled *baaró* (Mandinka)—indispensable for preparing freshwater floodplains for cultivation—is exclusively the domain of women. The handle of this iron-bladed implement often attains a woman's height because females work the *baaró* in a semi-upright position to break up clods of dirt and tear up roots (Figure 2.7). Weeding and transplanting, in contrast, demand a bent-over position, with women using the shorter hand hoe, the *dahó* (Mandinka) (Figure 2.8).71

Men's work in rice cultivation also involves specialized implements that women do not use. In the coastal mangrove area, preparation of the heavy clay soils demands lifting in order to improve aeration. Men perform this grueling task, turning over the soil with a long-handled, flat-bladed shovel that varies in length from 1.6 to 3.5 meters.72 With this *keyendo* (Diola) men put up embankments, construct ridges and furrows, and overturn and bury weeds in a rice plot (Figure 2.9). In the upland-inland swamp system of the southern part of the rice region, men sometimes use a short-bladed hoe on a bent handle (known as the *dunkourtong* among Mande speakers) to ridge and furrow the fields.73

Rice Cultivation Systems in West Africa

West Africans plant rice in a complex system of production, which occurs in distinct environments along a landscape gradient.74 In the Sahel this planting strategy unfolds along an undulating wetland landscape of microenvironments flooded with varying intensity and depth whose differences are only evident to the most practiced eye. The fact that cultivation occurs along a landscape gradient becomes far clearer south of the savannas, where the observer views rice being planted with rain-
fall on plateaus and in lowland swamps. Growing rice along an upland-to-lowland-swamp continuum enables farmers to utilize different forms of water that may be available. Specific water regimes such as the onset of rains, the amplitude of river tidal flow during the wet season, or the depth of the groundwater table regulate sowing and harvesting dates. Such considerations require a variety of seeds adapted to the growing season of different environments, with shorter-duration (90-120 day) varieties grading into longer-duration (140-160 day) ones as the cropping system shifts from upland to lowland cultivation. The planting of rice in different production zones along a landscape continuum extends the agricultural calendar so that cultivation precedes or extends beyond the actual wet season, with harvests along the gradient occurring at different dates.

Even though the diverse microenvironments planted to rice are regulated by a similar precipitation and temperature regime, their location along a landscape gradient means that water affects soils and cropping in different ways. Rain-fed cultivation thrives on well-drained upland fields at the upper end of the continuum, while midway down the slope are a variety of inland swamps with drainage ranging from good to poor. At the bottom of the landscape gradient are poorly drained marshy lowlands with deep flooding.

One overall classification of the diverse soil and water parameters that define different cultivation systems revealed more than twenty distinct microenvironments grown to rice in West Africa, including some that are not even planted in Asia. However, position along a landscape gradient, principal water regime, and the key techniques that characterize cultivation can be generalized to provide a basis for comparison with the environments subsequently planted in South Carolina from the end of the seventeenth century. The principal environments of the upland to lowland landscape gradient fall into three broad categories of rice production: tidal floodplains; inland swamps using either high groundwater tables, subterranean streams, or moisture-holding soils; and rain-fed uplands (Figure 2.10).

Of the three forms of rice cultivation, the upland or rain-fed system occurs along the elevated position of a landscape gradient, where planting depends strictly upon precipitation. The upland system, which may actually rest only a mere hundred feet above sea level, is characterized by clearing forest for the planting of well-drained soils. Seed is planted in furrows, either by broadcasting or by dropping rice grains into a hole made by puncturing the soil with a special hoe. Then the shallow hole is covered with the heel of the foot, a technique that literally involves “sole on rice.” Because the upland rice system is regulated by the length of the wet season, West African farmers usually plant seed varieties of short duration, grown over a three- to four-month period.

The productivity of upland rice cultivation varies considerably in re-
lation to climatic factors and land use. Where rainfall is ample and cattle manure available, yields may exceed one ton per acre. In areas of variable precipitation, or where soil fertility is not adequately restored by fallowing or crop rotation with legumes, yields often only reach a few hundred pounds per acre. Generally upland rice cultivation occurs under favorable climatic, soil, and land-use systems, as in Sierra Leone and Liberia. There it dominates in a production system that includes the farming of valley bottoms. Although the initial effort expended for land clearance can be considerable, valley-bottom cultivation demands less labor than planting rice in wetlands.

The second principal rice system encountered along a West African landscape gradient is cultivation in inland swamps, where groundwater reaches the root zone for most of the growing period. The inland system overcomes the precipitation constraints of upland production by capturing water reserves from artesian springs, perched water tables, and orographic run-off. Soils are often poorly drained, which facilitates moisture retention. Inland swamps actually refer to an array of micro-environments which include valley bottoms, low-lying depressions, and areas of moisture-holding clay soils. The broad range of inland swamps known to rice reflects a sophisticated knowledge of soils and their moisture-retention properties as well as methods to facilitate water impoundment for supplemental irrigation. Where high groundwater tables keep inland swamps saturated, rice planting may begin before the rains, continue beyond the wet season, and thrive despite low rainfall.

Cultivating rice in inland swamps requires careful observance of topography and water flow. Farmers construct earthen rims (bunds or berms) around the plot to form a reservoir for capturing rainfall to keep soils saturated through dry spells in the cropping season (Figure 2.11). Control over water inflow and outflow is achieved by piercing plot bunds with the hollowed trunks of palms, which are plugged with thatch (Figure 2.13). The practice keeps soils saturated during dry cycles within the cropping season. Farmers often improve drainage and aeration in inland swamp plots by mounding and ridging the soil.

Seedlings are then sown either directly atop the ridges or transplanted, the latter method being favored when waterlogging poses a risk to seedling development. In such cases, the young plant is established near the village and transplanted to the inland swamp about three weeks later. Transplanting is the labor of women, who often do the work with nursing infants strapped to their back (Figure 2.13). Though labor intensive, transplanting confers many advantages, which include economy in the use of seeds and less work weeding. The process of pulling up the seedlings additionally strengthens the root system and promotes tillering, which causes the shoots at the base of the stem to multiply. Yields in transplanted rice plots increase by as much as 40 percent over direct-seeded ones. Finally, in areas where water availability varies from one year to the next, transplanting provides a cushion against seed loss; hand-watered seedlings are established near a house and only moved into the swamp when conditions prove propitious. Such practices in inland swamp rice production result in rice yields that often reach over five hundred pounds per acre.

The remaining African production system is located downslope of a landscape gradient on floodplains of rivers and coastal estuaries. Dependent upon tides to flood and/or drain the fields, tidal cultivation involves techniques ranging from those requiring little or no environmental manipulation (such as planting freshwater Sahelian floodplains) to ones demanding considerable land modification for irrigated rice farming (coastal mangrove estuaries). The mangrove rice system embodies complex hydrological and land management principles that
prove especially pertinent for examining the issue of African agency in the transfer of rice cultivation to the Americas.

These floodplain environments can be divided into three types: ones that occur along freshwater rivers, those where river water becomes seasonally saline, and those in coastal estuaries under marine influence. Techniques of cultivation in the first two involve similar methods of production, letting river tides irrigate the rice fields, while the third combines principles of each major rice system to enable irrigated cultivation under problematic soil and water conditions. All of these floodplain systems involve preparing land for cultivation with hoes designed for farming different types of wetland soils and for specialized use by males or females.

The riverine floodplain in the first two systems actually includes two flooding regimes, the deeply inundated area alongside a river irrigated by diurnal tides and the inner margin of the floodplain where the landscape gradient begins to rise. The inner floodplain, less deeply submerged, may only be reached by river water during full moon tides, so cultivation relies largely on moisture retention in the soil. The sowing of seeds in shallow flooded areas usually involves broadcasting, scattering them by the handful across the landscape. While this technique saves on labor, it requires a large amount of seed, and resultant losses to birds, insects, and microbes run high. To deter this problem farmers sometimes first envelop the seed in a film of mud or cow dung, which provides a protective casing. Once dried or germinated, the seed is then broadcast. In areas where deep flooding might sweep away seed, a different technique is employed. Rice is usually first established on higher ground and then transplanted as seedlings.

Although the tidal flats adjoining freshwater rivers are sometimes cultivated year-round, the seasonally saline floodplain can only be planted after fresh water returns to the river, usually weeks to a month after the rains begin. Because rivers in West Africa follow a low gradient, with fresh water meeting marine water tides some distance upstream, salt water constantly menaces the downstream reaches of rivers. This effect wanes with the onset of the rainy season, which discharges a flood of fresh water that makes the saltwater interface retreat toward the river's lower reaches (Figure 2.14). The distance downstream reached by the seasonal freshwater flood is a function of rainfall.
preparation and weeding. The annual deposit of fertile alluvium along both types of floodplain results in similar yields, which routinely reach about one ton per acre.79

The third form of floodplain cultivation, mangrove rice, represents the most sophisticated production environment in West Africa. Located along the coast south from the Gambia River, this rice system developed in a region where rivers cut serpentine paths across the littoral. In a landscape mantled by mangrove thickets and swept by ocean tides that reach up to eighteen feet, there developed the most productive rice system of West Africa. An insalubrious environment that would seem inhospitable to all but mosquitoes, crabs, crocodiles, and birds served in fact as the locale for the hardworking and decentralized societies that created an ingenious system of irrigated rice.80

The principles underlying this system have not been sufficiently understood by historians of rice development in South Carolina who have looked to West Africa for potential influences. Their comparisons of rice production on both sides of the Atlantic basin single out for analysis the freshwater floodplain cultivation system, the production environment that sustained the antebellum Carolina rice economy. Because this environment is used for both rice and cattle production, it involves minimal landscape manipulation. Thus the irrigated rice system that appeared in South Carolina appears to bear little resemblance to the one that developed along African freshwater floodplains.

This type of comparison, however, actually distorts our understanding of rice history in the Americas. The analytical separation of one from several microenvironments typically planted along a landscape gradient obscures the full range of principles known and routinely used in African rice farming and does not accord proper attention to the rationale of the underlying land-use system. In the West African rice region the rationale is subsistence in a complex environmental setting and a cropping system that even out labor demands over the agricultural calendar. In South Carolina, the land-use system was designed for profit, regardless of its demands on labor. This misunderstanding of the West African floodplain system contributed to obfuscating the African origins of American rice cultivation and the role of slaves in the crop’s emergence in the Carolina colony.

The focus on one floodplain environment among the many planted in West Africa consequently misses the key insight of Otter Dapper's
seventeenth-century informants—namely, rice as a complex production system with the crop simultaneously managed in distinct environments along a landscape gradient. In isolating for comparative analysis just one among several floodplain environments—especially the freshwater system the Europeans regarded as primitive—scholars glimpse only a fraction of the agronomic techniques and specialized knowledge that informed indigenous West African rice cultivation. The case for African agency in introducing the sophisticated soil and water management infrastructure to South Carolina floodplains shifts considerably when detailing the mangrove rice system.

Floodplains of the lower reaches of West African rivers are located in permanently saline water due to the influence of marine tides. Yet these same tides also deliver fertile alluvium that becomes trapped by the aerial roots of the mangroves found along the littoral. The deposited organic matter results in a heavy clay soil that is extremely fertile although waterlogged, known in Senegambia and Sierra Leone as *pote-pote*. Though rich in organic nutrients, these soils present the drawback of being quite acid, especially if they are drained for cultivation. *Pote-pote* soils depend upon submersion to prevent them from oxidizing and developing the acid-sulfate conditions that would render them too acid for cultivation.

This constraint failed to discourage West Africans from adapting rice cultivation to an otherwise fertile floodplain environment, even though the soils are difficult to lift and aerate for land preparation. Rice farmers responded to the environmental challenges by developing cultivation on land cleared of mangroves, a system known as mangrove rice. The most sophisticated and productive form of African floodplain rice cultivation, mangrove rice is characterized by farming in saline estuaries. The abundant rainfall is captured in order to desalinate the soils. Environmental constraints are overcome through the construction of an irrigation infrastructure, an elaborate network of embankments, dikes, canals, and sluice gates that serves to bar the entry of marine water while retaining rainfall for field saturation and rice cultivation.

We now know that this indigenous form of irrigated rice cultivation flourished in coastal estuaries south of the Gambia River. Eventually it extended along the coast from Casamance, Senegal, south of Gambia to Guinea Conakry, in areas of permanently saline water conditions and where annual rainfall generally exceeds forty inches. In the nineteenth century, British colonial officials reported mangrove rice cultivation along the northern coast of Sierra Leone settled by the Temne. By manipulating water regimes and developing a sophisticated irrigated infrastructure, generations of rice farmers had succeeded in putting a highly productive system in place. Indeed, mangrove rice is the highest-yielding crop in the West African rice region. Proper management avoids the formation of acid-sulfate conditions, while taking advantage of soil fertility from organic deposition along the floodplain.

During the Atlantic slave trade the mangrove rice system caught the attention of Europeans like Captain Sam Gamble, who described and sketched it among the Bagas in Guinea Conakry around 1793 (see Figure 1.2). His drawing details embankments, sluices for irrigating and draining fields, and canals as well as field preparation with the *kayendo* shovel that men still use in lifting the heavy *pote-pote* soils for cultivation. Mangrove rice demands considerable landscape modification. It also requires cooperation among villagers and between villages to manage the extensive water control system. This remarkable form of cultivation led Gamble to conclude: “The Bagas are very expert in Cultivating rice and in quite a Different manner to any of the Nations on the Windward Coast.”

Significantly, this irrigated system developed in relatively unstratified societies, disproving the overly deterministic contention of Karl Wittfogel that irrigated rice led inevitably to centralized water control and social hierarchy, as it had in Asia. The pattern in Africa followed a notably different trajectory. Instead of evolving along Wittfogel’s model, the West African mangrove system thrived under decentralized water management and with a high level of intra- and intercommunity cooperation. This cooperative effort barely survived the eighteenth-century slave trade, which sent ever more victims across the Middle Passage. Enslavement of the Bagas, the Diola, and other mangrove rice practitioners profoundly disturbed the system, forcing many groups to flee to more remote locales. Their irrigated mangrove rice system managed to endure in less accessible locations in Senegal, Guinea-Bissau, and Guinea Conakry, where it continues in use to this day.

Preparation of a mangrove rice field begins with site selection and construction of an earthen embankment parallel with the coast or riverine arm of the sea. Frequently more than one meter in height and
width (the dimensions needed to block the entry of marine tides onto the rice field), the embankment stretches for several kilometers, at times threading together rice fields of different villages. A stand of mangroves is often left in place between the estuary and the rice perimeter to reduce tidal force. The void left by soil removal for the embankment establishes the location of the principal drainage canal. A series of lower embankments (dikes) are then formed perpendicular to the main one in order to divide the perimeter into the individual rice fields. Men accomplish the earth-moving activities with the flat-bladed, long-handled zembe. This hoe is unchanged in appearance from the one depicted in Gamble's drawing over two hundred years ago.

Water management in the mangrove rice system achieves a dual purpose. It captures rainfall for irrigation while storing water for the controlled flooding that drowns unwanted weeds. Sluices are usually made of palm or bamboo, which is plugged with thatch, to facilitate irrigation or drainage through the plot's canals. These smaller sluices drain into a more substantial one located in the principal embankment or exterior dike. One abandoned sluice constructed from a tree trunk is shown in Figure 2.15. The principal floodgate set into the field's embankment is sometimes fashioned from an old canoe with a board vertically positioned to control water flow, much like a ship's rudder.69

Once enclosed, rainwater is impounded and evacuated from the field at low tide. Rainfall (or in some cases seasonal freshwater springs) leaches out the salts, which low tides help evacuate into the estuary. It takes two to three years to desalinate a mangrove field before cultivation ensues. Each season, as growers await the rains to rinse away residual dry season salts, women establish rice in nurseries near the village where the seedlings can be hand watered.64 After about a month's growth they are transplanted atop the rice field's ridges, a practice that helps protect them from residual salinity. At this point the mangrove rice field reverts to rain-fed cultivation. Harvest occurs about four months later, the crop ripening from accumulated moisture reserves after the rains cease. The fields are turned over to cattle, whose manure enriches the soil, while compost and the burning of seashells also contribute to fertility. Mangrove rice soils can consequently be planted year after year without having to lie fallow.

Because the soil has often dried out at the beginning of a cultivation season, farmers open the sluices at high tide to facilitate the inflow of marine water. This action moistens the soil, thereby making it easier to lift and aerate, and reduces any process of soil acidification while enabling the deposition of organic matter. In the month or so preceding cultivation, the sluices once again are closed to block the entry of salt water. Farmers prepare the plot for the new cultivation cycle by layering the ridges with accumulated deposits of swamp mud; the first rains will eliminate the salt that accrued from opening the sluices to marine water.

The creation of an irrigated rice system from mangrove estuaries demands an extraordinary amount of labor over a period of several years. First, the mangrove vegetation must be cleared. Then, the salt-influenced soil needs repeated lifting and aeration in order to accomplish desalination. Embankments require construction and repair. Irrigation canals need to be cleaned of debris and silt to maintain their flow during the rainy season. The labor demands that men and women, households and communities, work together for the collective purpose of ensuring subsistence and cultural survival. Work of this nature, on such a monumental scale, rewards its practitioners with some of the highest yields in traditional rice cultivation, frequently exceeding one ton per acre. The mangrove system illustrates a preexisting West African fa-
miliarity with a sophisticated irrigated rice culture long associated with the South Carolina and Georgia tidal rice plantation.

The complexity of indigenous soil and water management is embodied in the practice of planting rice along a landscape gradient. Such detailed knowledge systems permitted the cultivation of rice under differing climatic and microenvironmental conditions over a broad region of West Africa. Coming to understand the range of techniques, practices, and seed selection utilized by African rice farmers over centuries serves to restore rice to its proper historical-geographical location, as an important crop within a sophisticated African agricultural system already well in place at the dawn of the Atlantic slave trade. This assemblage of techniques and practices was to resurface in a radically different manner with slavery in the Americas, providing its bearers a means to negotiate the circumstances of bondage across the Middle Passage.

3

Out of Africa: Rice Culture and African Continuities

Particular know-how, rather than lack of it, was one factor that made black labor attractive to English colonists.

—Peter Wood, Black Majority (1974)

The source of the food for the ships that left African shores with their human cargo reveals a crucial aspect of the Atlantic slave trade. Slavers arriving in Africa depended a great deal upon food surpluses produced there for provisions across the Middle Passage. The indigenous armies that sent captives into transatlantic slavery also made demands on food supplies. The growing need for surplus food in Africa was met by native African cereals as well as by crops introduced through the Columbian Exchange from the sixteenth century. The onset of the Atlantic slave trade was accompanied by the reorganization of African agriculture for surplus production. Although the ways in which this occurred have yet to be fully charted by scholars, they can be broadly outlined.1

By the sixteenth century the role of rice as a subsistence staple in West Africa was shifting. Warfare demanded a reorganization of agricultural systems to produce surpluses. Rulers of the Songhai state, located in the heart of African rice domestication in the interior of Mali, depended on rice plantations worked by slaves to provide cereal surpluses to chiefs and armies.2 As the Atlantic slave trade intensified the growth of indigenous slavery during the seventeenth century, African nobles increasingly relied on servile agricultural labor to produce the food surpluses necessary to support the incessant wars that provided the trade's quarry. During the 1620s English trader Richard Jobson ob-
served slaves organized for cereal production in agricultural villages along the Gambia River.1

Observations from the early eighteenth century report the widespread existence of slave villages throughout the Guinea region producing the food surpluses that provisioned rulers, armies, caravans, and slave ships. Europeans visiting Senegal and Gambia mention *runbés*, villages where slaves cultivated the “plantations” of their owners.2 Commenting at the end of the eighteenth century, which sent more Africans into slavery than any previous period, explorer Mungo Park reported that slaves nearly universally performed agricultural production throughout the western Sudan, the region where rice was widely grown.3

In its earliest phase indigenous slavery was more akin to European serfdom than the absolute control over a human being as property that became the distinguishing feature of chattel slavery.4 Commentaries on the social organization of African agricultural production from the early period of the Atlantic slave trade suggest that a moral economy regulated the claims made on indigenous slaves working in agriculture. Europeans mention the use of indigenous slaves for cultivation but also refer to their rights. Alvise da Cadamosto, a crew member on a Portuguese caravel that traveled to the Senegal River between 1455 and 1456, reported a Wolof king turning war captives to agricultural production. A half century later Valentim Fernandes described Wolof domestic slaves having one day a week to work for themselves; André Alvares de Almada, writing in 1594, referred to “Fula slaves ruling the Wolofs.”5 Similar arrangements were in place on the sugar plantations of São Tomé in the period between 1520 and the 1540s.6 Indigenous slaves in agriculture retained rights that specified days of the week or hours of the day for working on their own fields, and this apparently endured even into the 1820s.7 René Caillié remarked that indigenous slaves in Guinea performed specific agricultural tasks five days a week, from early morning until early afternoon; but they “are allowed two days in the week to work in their own fields.”8 Slaves would later try to renegotiate such rights elsewhere in the Atlantic basin and occasionally succeeded, as on Carolina rice plantations, in a system that became known as task labor.

The earliest European references to indigenous sub-Saharan slavery indicate that those enslaved in Africa were not considered merely ani-

mate commodities; they retained rights within the social structure, and there were established limits on the hours or days their labor could be appropriated. The deepening of the Atlantic slave trade during the eighteenth century resulted in a loosening of the norms regulating those who could be sold to Europeans. No longer were they just captives taken in warfare, or individuals accused of capital crimes. Slavery was evidently shifting to facilitate European purchase.9 Minor improprieties could designate someone as chattel for Europeans. Rural life grew increasingly insecure, and efforts to carry out daily activities became rife with danger. Many narratives of freed slaves reveal that they were captured while traveling to field, market, or home.10 The breakdown of African societies was eroding the norms that had previously regulated those who could be sold to Europeans.

Those remaining as indigenous African slaves were disproportionately female because of the greater demand for male slaves on New World plantations. Over the course of 350 years, male slaves were shipped to the Americas in roughly a two-to-one ratio over females, leaving women particularly burdened with the crucial role of food production in Africa.12 The slave trade favored adolescents to thirty-year-olds, and these males and females also contributed to African cereal production. They were often set to work in agricultural villages during the interlude between their capture and their deportation overseas.

Europeans aimed their slave ships to arrive in West Africa between the months of November and May, the dry season for much of the Upper Guinea Coast and the period of the year with favorable trade winds. Besides the dry season’s navigational value, travel to the region during that time reduced the risk of death from malaria, rampant during the rains. Slaves captured in the off-season and awaiting transatlantic shipment were frequently set to work growing crops under strict supervision. This meant that captives held for later shipment could be made self-sustaining, perhaps even producing a small surplus for sale to slave ships over the food requirements for their own subsistence.13 The pattern of using indigenous slaves for surplus food production endured even beyond the British abolition of slavery from Africa in 1807.14 For instance, several members of the 1839 slave uprising on the *Amistad* recalled being forced to grow rice in Sierra Leone during the interlude between their captivity and shipment across the Middle Passage.15

Following the precedent established by Portuguese caravels, Euro-
peans continued to depend upon African food surpluses during the Atlantic slave trade. Journals kept by ship captains make abundantly clear the extent of their demand for cereals to provision slaves across the Middle Passage. Their accounts record purchases of rice, especially along the Rice Coast, from Senegambia south to Liberia. In the early eighteenth century rice, maize, millet, and manioc had become the primary cereals purchased by slave ships. The foods in demand, observed a ship's surgeon, John Atkins, in 1721, were vegetables, horse (fava) beans, rice, maize, and manioc meal, which provided the “common, cheapest, and most commodious Diet” for crossing the Middle Passage. 

Alonso de Sandoval, an observer of the slave trade to Cartagena, Colombia, over the same period, noted that slave ships frequently purchased maize and millet for provisions.

The Atlantic slave trade prompted an immense demand for cereals. 

Conservative estimates record that over the trade’s 350-year duration more than twelve million persons left Africa as slaves. These are the numbers documented by surviving records, but figures may easily have reached twice that number given the fragmentary evidence and the high toll on life that characterized the trade. Mortality rates across the Middle Passage, a journey that could last from six weeks to three months, averaged 20 percent on slave ships. It is difficult to grasp the magnitude of agricultural production that was required to meet the food demand of the Atlantic slave trade. Just to keep a human being alive as chattel in Africa required about a kilogram of grain a day. And even if the period from time of captivity in Africa to landing in the Americas proved swift, the aggregate food requirement would demand at least four months of food rations per person. At the peak of the slave trade in the eighteenth century 100,000 slaves were being removed from West Africa annually. Some existing figures reveal the food demands on slave ships during this period. In 1750 John Newton bought nearly eight tons of rice for feeding 200 slaves, while John Matthews estimated that from 700 to 1,000 tons of rice would feed 3,000 to 3,500 slaves purchased along the Sierra Leone coast. Those left in indigenous captivity were burdened with the need to produce surpluses that would sustain the enormous numbers sent across the Middle Passage. Women, children, and the old disproportionately shouldered this immense work burden.

In response to the demand for food surpluses, African societies swiftly adopted introduced crops, especially maize and manioc from the New World and some higher-yielding Asian rice varieties introduced to the irrigated systems along the coast. Maize, a plant of Amerindian origin, led the seed introductions in importance. Perhaps grown in West Africa within just a decade of the first voyage of Columbus, maize cultivation had become widespread in the Cape Verde Islands and along the Upper Guinea Coast by the mid-sixteenth century. Several features of maize reveal the paramount importance of African-grown cereals, both indigenous and introduced, for the Atlantic slave trade. Adapted to the tropics, easily produced, storabale, and cheaply transportable, maize became indelibly associated with slavery in Africa as well as on New World plantations. With yields generally higher than those of millet and sorghum, by 1729 maize was the staple food fed to slaves along the Senegal River.

Another New World domesticate, manioc, had also been introduced to West Africa by 1700 for provisioning slave ships. Unless converted into a meal or flour, root and tuber crops like manioc cannot compete with cereals for their ease in storage, transport, and cooking. The staples of slave ships were cereals, chiefly ones adapted to the growing conditions of the African tropics, such as rice, maize, millet, and sorghum. The two most popular for their yields and taste, maize and rice, have long been claimed for the Columbian Exchange. But the attribution of Asia for rice diffusion has obscured the significance of African rice in global seed transfers. Between the sixteenth and the eighteenth centuries rice from Asia played a minor role in West Africa compared with that of indigenous African rice. We know this because accounts by colonial officials in the early twentieth century note the diversity of glaberrima varieties and the limited geographical distribution of sativa, confined principally to the two irrigated areas Portères identified along the coast. Even at the start of the twentieth century the West African rice region remained largely a zone of glaberrima cultivation.

Rice Diffusion in the Atlantic Basin

The geographic pattern of the unfolding of the Atlantic slave trade along the West African coast in its first centuries influenced the diffusion of rice to the Americas. During the fifteenth and sixteenth centu-
ries the trade concentrated in the rice region between Senegal and Sierra Leone, within easy reach by European ships and the Cape Verde Islands.\textsuperscript{27} From the time of its settlement in the mid-fifteenth century, Cape Verde emerged as a major entrepôt for the new trading relations being established between Portugal and West Africa and, subsequently, Latin America. The island chain lay west and southwest of the mouth of the Senegal River, where the Sahara Desert grades into the Sahelian savanna. In 1466 the Portuguese crown granted European colonists settled there the right to trade along the western coast of Africa. The island archipelago lay within easy reach of the region between Senegambia and Sierra Leone that the Portuguese called the “Guinea of Cape Verde.”\textsuperscript{28}

This trade rested on slaves brought to the islands to grow crops for subsistence and sale and to weave cotton into the cloth that was used as a medium of exchange in the coastal trade.\textsuperscript{29} Ships routinely stopped in Cape Verde on voyages to Africa or Europe for food and repairs. The islands quickly emerged as a major entrepôt for seed transfers and experimentation with the crops of the Columbian Exchange that then diffused to the “Guinea of Cape Verde.”\textsuperscript{30} A major area where rice was grown in West Africa served as the source for slaves in the Cape Verde Islands.\textsuperscript{31} And rice came to the islands with them.

At the beginning of the sixteenth century the German Valentin Fernandes recorded earlier mariner accounts that mentioned the cultivation of rice on the principal island of Cape Verde, Santiago. He attributed its introduction, along with cotton, to the Upper Guinea Coast.\textsuperscript{32} Two types of rice cultivation are reported in subsequent records, one planted in inland swamps, the other grown by rainfall. The cultivation of additional African plant domesticates is also recorded at an early date: yams, sorghum, and millet.\textsuperscript{33} The mortar and pestle which women use to prepare all African cereals also transferred to the islands in conjunction with these crops.\textsuperscript{34} The commercial ties between Cape Verde and the “Guinea of Cape Verde” involved enslaving numerous West Africans from a region where rice formed the dietary staple. Many would have been skilled in rice cultivation and growing the crop in wetlands. In that this was a period in which Portuguese ships had barely rounded the Cape of Good Hope, the subsequent claim for this rice being of Asian, not African, origin is not very credible.

The initial crops of the Columbian Exchange, then, as the example of the Cape Verde Islands illustrates, were chiefly African. These African domesticates served as the primary food source for slaves and Portuguese alike prior to the voyages to the Americas that decades later resulted in the transfer of Amerindian crops like maize and manioc to the Cape Verde Islands and the African coast. The transfer of seeds, as noted, proved so important that it came to be known as the Columbian Exchange. The initial contact period between Portugal and Africa brought slaves and the plants they favored from West Africa to the previously uninhabited Cape Verde Islands. Within decades rice was accompanying Portuguese ships and the African exodus to the Americas.

The active trade in rice on Cape Verde is revealed through the cargo lists of ships departing during the years 1513–1515.\textsuperscript{35} During the 1530s, within decades of Cabral’s sighting of Brazil, Cape Verdean vessels bound for Portugal’s new colony were supplied with seed rice, sugarcane cuttings, and African yams.\textsuperscript{36} There is no need to look half a world away to Asia for the origins of this rice trade. The Columbian Exchange almost certainly involved glaberrima rice from West Africa. Just as the cereal and its cultivation accompanied slaves from the “Guinea of Cape Verde” to the island chain, so is it likely that African rice and slaves pioneered the crop’s establishment in the sixteenth century across the Middle Passage to Latin America and the following century to North America.

Rice cultivation figured so early in the settlement history of Brazil that the German botanist F. C. Hohene considered the possibility that its presence predated the arrival of the Portuguese.\textsuperscript{37} Within one generation of the conquest of Peru, a report mentions that rice was being grown on wetlands there.\textsuperscript{38} This observation occurs during a period when the first groups of slaves arriving in the New World originated in the region from Senegal to Sierra Leone. Although the historical record is meager, surviving records of slave imports to Peru from the mid-sixteenth century illuminate the geographic bias of the Atlantic slave trade during this period. Three-quarters of the slaves reported as Africa-born in Peru between the years 1548 and 1560 came from the rice-growing region of Senegambia and Guinea-Bissau. A second account from Mexico in 1549 shows that 88 percent originated from the same region.\textsuperscript{39} Over most of the seventeenth century, the slave trade to South America shifted from dependence on Senegambia to an equally heavy dependence on the region around Angola as the principal source.
of supply. The geographic pattern of the Atlantic slave trade for the sixteenth century in Latin America means that there were abundant numbers of slaves with the knowledge and skills to pioneer the cultivation of their principal food staple.

In subsequent decades other vessels delivered seed rice to the state of Bahia, which from the 1540s became the locus for the emerging sugar plantation system in Brazil's Northeast. In recounting the crucial role of the Cape Verde Islands for animal and crop introductions to Brazil, Bahia planter Gabriel Soares de Sousa noted in 1587 the cultivation of both rain-fed and swamp rice, the use of the mortar and pestle for milling, and the triumph of African dietary preferences among the slave population. French historian Jean Suret-Canale would later claim this wholesale export of crops and food-processing techniques from Africa to tropical Brazil as the cornerstone of the civilization that Africans brought under bondage to the Americas:

The blacks had an agricultural civilisation already well adapted... and it was in just this sense that in Brazil in 1827 Brigadeiro da Cunha Matos, a convinced slaver, affirmed the civilising character of Africa in relation to America. It was even said in the Brazilian Chamber of Deputies by Bernardo Pereira de Vasconcelos in 1843: "It is Africa that has civilised Brazil." In effect, a whole material civilisation, including nutritional practices, was implanted in tropical America, not only in the African populations but in many areas among those of European origin. It was an imported African material civilisation. This imported African civilization, as Suret-Canale correctly observed, rested on agriculture as equally as it did on culture, because of the centrality of food for affirming cultural identity.

In 1637 the Dutch launched an expedition to northeast Brazil, where they took over an existing Portuguese settlement to establish a colony at Pernambuco. This settlement proved among the more remarkable of all those established in the Americas because of its scientific objectives and promise of religious freedom for its settlers, who included some Jews displaced from the Iberian Peninsula. Among the savants accompanying the governor-designate Count Johan Maurits of Nassau-Weissenfels was the Dutch physician Willem Piso, whose seven-year stay resulted in the first truly scientific study of the geography and botany of Brazil. Although rice interested Piso for its presumed medicinal properties, his account indicates that the crop was already present in the area when the Dutch first settled there, as were okra and ginger, which he claimed arrived in Brazil aboard ships from Angola.

These crops were planted by slaves in provision gardens and maintained in communities of runaways, known in Portuguese as quilombos. The largest maroon community of the Americas, the Palmares settlement in the adjoining state of Alagoas, included some twenty thousand escaped slaves living in nine hamlets. Already in existence at the time of Dutch settlement, it was located just two hundred miles southwest of the Dutch colony at Recife, seventy kilometers inland from the coast in the rainforest, extending from the Mundaú river up a five-hundred-meter escarpment. For most of the seventeenth century Palmares survived repeated Portuguese and Dutch military expeditions to destroy it. It was an African nation in Brazil, with a well-organized system of agriculture where blacks planted "extensive fields of cereals, excellently irrigated." While the crops are not mentioned, the description and Piso's commentary suggest wetland rice may have been one of them.

Rice certainly figured prominently among the crops planted in quilombo communities of runaway slaves throughout Brazil. In Maranhão and Amapá in the eastern Amazon where the Portuguese would establish cotton and rice plantations in the eighteenth century, maroons grew manioc, rice, and maize for subsistence. In the archives of the state of Bahia, historian Stuart Schwartz uncovered a remarkable document from the eighteenth century—a peace proposal by rebel plantation slaves setting forth the conditions under which they would return to the fields. Among their demands was the right “to plant our rice wherever we wish, and in any marsh, without asking permission for this.”

After the Portuguese reestablished control of Pernambuco in the middle of the seventeenth century, the Dutch moved their colony to the Guianas, the region that today includes Suriname and part of Cayenne. During the eighteenth century this was one of the plantation economies with the highest ratio of Africans to Europeans (65:1 compared with Jamaica’s 10:1). Rice was among the crops slaves planted for food. It also emerged a favored food staple among the maroons who fled slavery for freedom in the rainforest hinterlands. When mercenaries sought to capture these fugitives on expeditions to the interior of
the Guianas during the eighteenth century, they reported the cultivation of rice in forest clearings and inland swamps.\textsuperscript{56} Maroons even named one of their rebel settlements after its suitability for the cultivation of rice. It was called Reise Condre, after the quantity of rice it afforded.\textsuperscript{56}

Publications written on areas of black settlement history along the Pacific lowlands of Ecuador and Colombia, eastern Nicaragua, Jamaica, and Cuba mention in passing the presence of rice from an early date.\textsuperscript{57} But the historical research that might reveal its linkage to slavery, as historian Peter Wood meticulously undertook for South Carolina, has yet to be done. This is regrettable since the establishment of rice in Latin America dates more than one hundred years in advance of its cultivation in North America, making such recovery crucial for understanding the role of slaves and African rice in the agricultural history of the Americas.

An African Knowledge System in South Carolina

Nowhere in the Americas did rice play such an important economic role as in South Carolina. Rice and South Carolina share a history that led to the establishment of the crop early in its settlement and the colony’s growing emphasis on rice as a plantation crop by the end of the seventeenth century. Within just twenty years of its founding, the crop was being cultivated for export. By the mid-eighteenth century the cultivation of rice extended along the Atlantic coast from North Carolina’s Cape Fear River to the St. Johns River in Florida and inland for some thirty-five miles along tidal waterways (Figure 3.1).\textsuperscript{58} On the eve of the American Revolution, over the years 1768–1772, rice exports from South Carolina exceeded sixty million pounds annually. Already rice had become the first cereal to be globally traded.

Production steadily increased during the antebellum period, and before the outbreak of the Civil War, an estimated 100,000 slaves were planting between 168,000 and 187,000 acres of wetlands to rice.\textsuperscript{54} The antebellum rice economy included the richest planters of the U.S. South, and the region’s capital, Charleston, gloried in one of the greatest concentrations of wealth in the world.

In 1860 large landholdings, prototypes of today’s agribusiness complexes, characterized rice production with acreage concentrated in

about 1,600 plantations and farms.\textsuperscript{59} Rice exports from the South reached about 182 million pounds per year, with South Carolina accounting for about two-thirds of the total, Georgia most of the rest.\textsuperscript{55} The rice industry, growing phenomenally, relied exclusively upon slave labor to plant, harvest, and mill the crop for overseas markets.

Even though abolition doomed this slave labor system, a plantation economy that for over 150 years had delivered princely fortunes was not so easily extinguished in the memory of planter descendants. As blacks faced the failed promises of Reconstruction—second-class citizenship in the Jim Crow South of segregation and limited economic opportunities—planter descendants began their own reconstruction of historical facts to present slavery as a benign institution. Well into the twentieth century, memoirs written by descendants of rice planters nostalgically recounted the antebellum period, investing it with the
kind paternalism that allegedly marked planter-slave relations. They celebrated the profitable landscape planters fashioned from malarial swamps and, especially, the ingenuity of their forebears in developing a crop so eminently suited to the region’s tidal floodplains. Their tributes to the rice plantation era never presented African slaves as having contributed anything but their unskilled labor.

Scholarship in recent decades, however, has told a different story. Peter Wood has established the presence of African slaves in South Carolina from the outset of settlement in 1670. Early accounts indicate that bondsmen produced their own subsistence crops and that the English and French planters had no prior rice-farming knowledge. Many of these early English-born planters had left land-scarce Barbados with their slaves in search of new plantation land. Displaced French Huguenots soon joined them in mainland North America. Neither European group had a history of rice cultivation. But this was not the case with some of their enslaved work force. The origin of Carolina rice agriculture, Wood argued, was likely African. Addressing the potential linkage of Carolina rice cultivation to West Africa, historian Daniel C. Littlefield focused on several issues. He looked at floodplain rice cultivation in Africa, the geographic origins of Carolina slaves during the crucial period of the crop’s development in the eighteenth century, and archival sources that might reveal planter awareness of specific African ethnic groups with rice-farming skills.

Littlefield established similarities between tidal cultivation in West Africa and its development in a similar environment in South Carolina and Georgia. He also noted that during the crucial period of rice development in the Carolina colony, more than 40 percent of its slaves originated in areas of West Africa with a tradition of farming rice. Additional documentation demonstrated planters’ awareness of the African regions and ethnicities involved in rice cultivation as well as their requests for slaves of specific ethnic groups with this expertise. Whether or not planter requests were in fact ultimately met, the evidence reveals their awareness that certain African peoples possessed crucial knowledge and skills in rice cultivation.

Although this scholarship has resulted in a revised view of the rice plantation economy as one influenced by slaves from Africa, the role of slaves in its evolution is still debated. The question is whether slaves from West Africa’s Rice Coast were recruited as skilled laborers in a cropping system planters had already ingeniously developed, or whether slaves expert in rice cultivation showed Carolina planters how to adapt a preferred dietary staple to diverse lowland settings. Addressing this question through documents is difficult; archival evidence for rice beginnings during the colonial period is fragmentary, as are any documents that reveal slaves’ experience in their own voice. The paucity of records and the fact that racism over time institutionalized white denial of the intellectual or skilled capacity of bondsmen contribute to the problem of trying to determine whether slaves played a tutorial role in the Carolina rice beginnings. But there are other ways to give voice to the historical silences of slavery.

This examination of Carolina rice history and African agency in its diffusion across the Atlantic uses a geographical perspective focused on culture, technology, and environment to support the contention that the origin of rice cultivation in South Carolina is indeed African, and that slaves from West Africa’s rice region tutored planters in growing the crop. In this approach the historical record is reconstructed to elucidate the environments planted to rice in the colonial period. This involves shifting research attention from rice as an export crop grown by slave labor to rice culture, the underlying knowledge system that informed both the cultivation and the milling of rice. Thinking about rice as a knowledge system reveals dynamics of agrarian diffusion, innovation, and the origins of specific agricultural practices that promote historical recovery. This perspective especially underscores the significance of wetland cultivation and how knowledge of growing rice by submergence provided slaves leverage to negotiate and alter some of the terms of their bondage.

The literature on the Columbian Exchange shows how seeds may diffuse independently of the people who domesticated them. Varieties of Asian rice transferred to the Americas long in advance of Asians. But the adoption and establishment of these varieties required the presence of human beings already familiar with rice culture, the knowledge to grow the crop in wetland environments and the means to mill the rice once it had been harvested. The only people in South Carolina possessing this familiarity were Carolina slaves who originated in the rice region of West Africa. To find the origins of rice cultivation one must thus look to Africans, who were among the earliest settlers in the Americas, for adapting the crop to challenging New World conditions.
The crucial period for examining these issues is the first century of settlement in South Carolina, from 1670 to the American Revolution, when coastal lowlands were transformed from woodlands and marsh into plantation landscapes based on the cultivation of irrigated rice. The period can be divided into two, with the Stono slave uprising in 1739 providing the demarcation. In the decades preceding Stono, rice emerged as the colony’s principal export crop with its cultivation increasingly focused on productive inland swamps. The growing of rice on floodplains was at an incipient stage. In the period immediately following the Stono rebellion, slave imports into the colony declined. When they resumed in the 1750s the cultivation of rice was already shifting to floodplain irrigated systems.

In the initial decades of the Carolina rice economy, the work demand of shaping plantations from the wilderness placed the labor relations between black and white, slave and planter, in flux, because survival and success required mutual interdependence. Blacks’ escape to establish maroon settlements in the interior or flight to Indian communities was a real possibility, as were alliances against white rule. As we shall see below, by 1712 conventions between slave and master were already in place over the permissible norms regulating work in the rice economy.45 Slavery during this early frontier period involved a negotiated relationship.

By the decade of the 1730s, the relationship between black and white had profoundly altered. The Amerindian population had sharply declined due to warfare with colonists, slaving expeditions against them, and the introduction of diseases against which they had no immunity.46 Their conquest was accompanied by an extension of white land ownership along the coastal lowlands of South Carolina. Slaves of African origin were in demand, and imports grew dramatically from 1720. In the decade preceding the 1739 Stono rebellion, over twenty thousand slaves were imported from Africa, a more than twofold increase over the twelve thousand present in the colony in 1720.47 The work of clearing swamps for rice cultivation was arduous and accompanied by great loss of life.

White repression increased with the constant flow of new slaves into the colony and labor demands to clear swamps for cultivation, but the pattern of the slave trade in the decade prior to Stono presented new possibilities. Seventy percent of these slaves originated in Angola and its interior, giving the colony’s black population a rare degree of cultural and linguistic homogeneity among New World plantation societies. The result was their attempt to throw off the yoke of bondage, known as the Stono rebellion. While the revolt was unsuccessful, fear of what had been attempted resulted in a near ten-year moratorium on further slave imports into the colony.48 When imports resumed in mid-century, the frontier had vanished and rice cultivation was spreading to Georgia, closing avenues for escape from slavery. The institution of bondage had deepened, diminishing the space for negotiation between slave and master. The first century of black settlement in South Carolina and Georgia, the period that historian Ira Berlin terms the slaves’ charter generations, remains crucial for understanding the linkage of rice cultivation to West African slaves.49

White and black settlement of South Carolina occurred at the same historical moment. About a hundred slaves accompanied the first settlers arriving in South Carolina from Barbados in 1670; within two years they formed one-fourth of the colony’s population, and by 1708 blacks outnumbered whites.50 From that period on South Carolina became a colony with a black majority. Documenting rice cultivation appears early in the colonial period. With food supplies limited before 1700, slaves raised their own subsistence crops. A pattern similar to the Cape Verde Islands and South America probably resulted in rice being grown as a preferential food among blacks in the earliest settlement period.51 No official document mentions the cultivation of rice before 1690, even though English officials from an early date considered the cereal a potential export crop for South Carolina.

But several facts point to the likelihood that rice was grown from the beginning of the colony’s settlement. In 1674 several English indentured servants who ran away to Spanish St. Augustine, Florida, claimed to Spanish officials that “some rice . . . grown on the soil was shipped to Barbados.”52 In 1690 one plantation manager, John Stewart, claimed to have successfully planted rice in twenty-two different locations.53 His occupation and nationality make it quite unlikely that he, a Scot, literally planted a crop that was not even grown in the country of his birth. His slaves were the ones growing rice. Already present in the colony and among Stewart’s slaves were those skilled in rice cultivation who were pioneering its establishment in diverse environments under both rain-fed and wetland conditions. These fragmentary references indicate that the planting of rice in South Carolina was under way by 1690.

But to develop as an export crop, rice would have to be milled before
shipment to overseas markets. The consumption of rice depends upon removing the indigestible hull and bran without damaging the grain they enclose. This was not so easily accomplished at the end of the seventeenth century with available forms of European milling. Unlike the cereals known to Europeans, which involve using a millstone to make flour, the objective of rice milling is to keep the grain whole as the husks are removed. Until the advent of machinery around the time of the American Revolution to do this, the only method employed for milling rice was the mortar and pestle used by African women. A report from 1700 suggests the transfer of this knowledge had already taken place by the late 1600s. Edward Randolph, who visited the colony twice in 1697 and 1698, implied the African method of processing rice with a mortar and pestle was being used in South Carolina in his report to the Board of Trade, writing, "They have now found out the true way of raising and husking Rice." In 1690 John Stewart's correspondence mentioned the demand for Carolina rice in Jamaica, but the first record of its export is in 1697, with the shipment of one and one-fourth barrels to that island. The shift of rice from a subsistence to an export crop over the decades from the 1690s to 1720s was indicative of the cereal's increasing economic importance in the colony. Exports reached 330 tons in 1699, and by the 1720s rice emerged as the colony's leading item of trade. Years later, in 1748, Governor James Glen would underscore the significance of experimentation with rice during the 1690s for the development of the Carolina rice economy.

Although experimentation with growing rice in diverse microenvironments would have revealed the higher yield potential of wetland forms of cultivation, the initial emphasis was on the rain-fed production system. As rice became established as a viable export crop in the early eighteenth century, its cultivation shifted to the higher-yielding inland swamps and from the 1750s, to the even more productive but labor-demanding tidal floodplain system that would dominate Carolina and Georgia rice plantations until the Civil War. The historical record of the crop's development in South Carolina shows a changing economic emphasis on three main production systems over the first century of the colony's rice history, from rain-fed to inland swamp and then to tidal cultivation. While rice was planted in numerous locales during the period when the crop was becoming the leading export, these distinctive forms of production were evident at crucial historical junctures in the evolution of rice as a commodity. An overview of each of these reveals linkages to West African rice systems.

Upland or rain-fed rice production was emphasized into the early 1700s for its complementarity with forest clearance and stock raising. Slaves performed the labor of felling pine trees for wood and extracting the pitch, tar, and resin sold for boat caulking. Beef also entered the export trade as salted meat for ship crews on transoceanic voyages. The clearing of forests resulted in a landscape devoted to raising cattle and subsistence farming. The rain-fed system of rice cultivation developed as part of a rotational land use with cattle, similar to what already existed in Africa. Some of the slaves entering South Carolina possessed knowledge of both rice farming and cattle tending, since herding was widespread along the Upper Guinea Coast north of equatorial Africa's trypanosome-bearing tsetse fly belt. The South Carolina system, as in Africa, relied upon cattle grazing the stubble during the dry season, with their manure renewing soil fertility for the next cultivation period.

During the early colonial period planters in many regions of the Americas exhibited some preference for slaves with herding experience. In the mid-seventeenth century Cape Verdean mariner Lemos Coelho remarked upon the demand for slaves from the Senegambian area because of their skills with horses and cattle. African specialized knowledge of cattle-raising and equestrian skills were already valued on mid-sixteenth century Hispaniola estates, where nearly all the vaqueros and ganaderos (cowboys) were Africans from Fula, Wolof, and Mandinka areas of the Sahel, especially Senegambia. These herders were from the rice region of West Africa, where grazing and the cultivation of rice figure prominently in land use. From the earliest settlement date in South Carolina, slaves were expanding the frontier for their owners through cattle grazing and by developing cow pens in remote areas. Their experience with livestock management led to South Carolina's emergence as an early center of the open-range cattle industry in the colonies. Livestock production figured crucially in the colony's early economic history while experimentation with rice was under way. But for rice to become a feasible export crop, production would have to shift to higher-yielding but more labor-demanding wetland environments.

The export of salted beef, deerskins, and pine-tree byproducts for production...
naval use generated by forest clearance and animal husbandry provided the funds for additional purchases of slaves, whose numbers dramatically increased in the first decades of the eighteenth century. In 1703, slaves numbered about three thousand, but over the short period from 1720 to 1739, the colony's black population rose from twelve thousand to twenty-nine thousand. This vast increase in slaves gave planters the labor force to clear swamps and construct the infrastructure necessary for relocating rice cultivation to the higher-yielding inland swamps.

Cultivation in inland swamps illustrated mastery of key principles of water control that could only be realized by a considerable exertion of labor. Trees like bald cypress (Taxodium distichum), tupelo (Nyssa aquatica), and sweet gum (Liquidambar styraciflua) needed to be cleared from swamps infested by venomous snakes and biting insects. Following removal of the vegetation, the land was leveled and enclosed by earthen banks that retained or released water through a network of bunds and sluices. Rice cultivation in inland swamps involved impounding water from rainfall, subterranean springs, high water tables, or creeks for soil saturation. In some places this system of rice farming enabled the release of reserve water on demand for controlled flooding at critical stages of the cropping cycle, the objective being to drown unwanted weeds and thereby reduce the labor spent weeding. The principle of controlled field flooding was identical to the one found in the West African mangrove rice system.

Because there were different types of inland swamps, field flooding for irrigation and weed control occurred in a variety of ways. For instance, swamps located within reach of streams or creeks often used the landscape gradient for supplemental water delivery. Placement of an embankment at the low end of an undulating terrain kept water on the field while the upper embankment dammed the stream for occasional release. Sluices positioned in each earthen embankment facilitated field drainage and irrigation as desired. Similar principles were evident in the cultivation of rice in coastal marshes near the ocean. Under special hydrological circumstances, like the location of a saltwater marsh near the terminus of a freshwater stream, rice was grown in inland depressions that were flooded by marine water. The conversion of a saline marsh to a rice field depended upon soil desalination, a process facilitated by a coastal rainfall regime that averaged between forty-eight and fifty-two inches annually, which is slightly above the range found in the mangrove system that developed under similar conditions in West Africa.

Often a creek or stream served the purpose of rinsing salts from the field. Once again the water control system relied upon proper placement of embankments and sluices. The lower embankment permanently blocked the inflow of salt water at high tides, while opening the sluice at low tides enabled water discharge from the plot. A sluice positioned in the upper embankment delivered stream water as needed for desalination, irrigation, and weed control. This type of inland swamp system functioned in the vicinity of the embouchure of the Cooper River, where "rice marshes tempted planters as far down the river as Marshlands [Plantation], nearly within sight of the ocean. Here they had to depend entirely on 'reserve' waters formed by damming up local streams." The principle of canalizing water for controlled flooding also extended to settings where subterranean springs flowed near the soil surface. In 1839 Edmund Ravenel described one system that was still functioning on the eve of the Civil War: "The water here issues from the marl which is about two or three feet below the surface at this spot. This water passes South and is carried under the Santee Canal in a Brick Aqueduct, to be used on the Rice-Fields of Wando Plantation." During the antebellum period another inland swamp system existed alongside tidewater rice cultivation. While its colonial antecedents remain uncertain, this system flourished where a landscape gradient sloped from rain-fed farming to the inner edge of a tidal swamp. Enclosing a tract of land with earthen embankments on high ground created a reservoir for storing rainwater, the system's principal water source. The reservoir fed water by gravity flow to the inland rice field through a sluice gate and canal. Excess water flowed out of the plot through a drainage canal and sluice, placed along the lower end of the rice field. The water then drained into a nearby stream, creek, or river (Figure 3.2).

Many of the techniques for water control evident in this inland swamp production are reminiscent of the mangrove system of West Africa. Desalinating fields with rainfall, employing a landscape gradient for rice farming, converting a swamp into a reservoir with earthen embankments, and using sluices and canals for water delivery were many
of the practices that Europeans had described in rice cultivation along the West African coast. The development of a separate reservoir for water storage, however, suggests a South Carolina innovation. Only further research on the history of Atlantic basin rice systems can determine whether the creation of a supplementary reservoir for irrigating a swamp field is West African, European-American, or the hybridized contribution of both cultures.

Evidence from the early colonial period suggests that the principles of growing rice on tidal floodplains were known prior to the Stono slave uprising. One of the earliest references to tidewater rice, as it came to be known, appeared in 1738 with notice of a land sale by William Swinton of Winyah Bay, South Carolina: “Each [field] contains as much River Swamp, as will make two Fields for 20 Negroes, which is overflow’d with fresh Water, every high Tide, and of Consequence not subject to the Droughts.”

From the mid-eighteenth century rice production was steadily shifting from inland swamp systems to the even higher-yielding tidal river floodplains in South Carolina and then, just prior to repeal of its anti-slavery law in 1750, into Georgia. By 1752 rich Carolina planters were commanding their slaves to convert inland swamps and tidal marshes along Georgia’s Savannah and Ogeechee Rivers to rice fields, a process actively under way during the 1772 visit by the naturalist William Bartram. The shift to production on alluvial floodplains remained the basis of the region’s economic prominence until the demise of rice cultivation in the region by the 1920s.

With the resumption of imports from the late 1740s, the swelling number of Africans entering South Carolina made possible the shift in rice cultivation from inland swamps to tidal floodplains. Crucial for the transition from the 1750s to the 1770s was the large number of slaves imported directly from the rice area of West Africa who possessed knowledge of the crop’s cultivation. Over fifty-eight thousand slaves entered South Carolina in the twenty-five years between 1750 and 1775, making the colony the largest direct importer of African slaves on the North American mainland. The share of slaves brought by British slavers into South Carolina from rice cultivation areas of Senegal, Gambia, and Sierra Leone grew during these crucial decades of tidewater development from 12 percent in the 1730s to 54 percent from 1749 to 1765 and then to 64 percent between 1769 and 1774. By the American Revolution slaves from Senegambia and Sierra Leone formed the majority of forced migrants into South Carolina.

Planters knew such slaves grew rice; they also knew which ethnic groups specialized in its cultivation. This knowledge came from their sustained contact with slaves in shaping the Carolina frontier and growing food staples for mutual survival. The pattern of selecting ethnic groups experienced in cattle herding repeated with rice cultivation as planters in the early colonial period learned of the ethnic groups and geographical areas of West Africa specialized in growing rice on wetlands. Recognition of this knowledge held by some slaves was certainly evident in the initial period of settlement of Virginia, where experimentation with rice had also occurred. One surviving letter sent to England in 1648 records: “The Governor Sir William [Berkeley], caused half a bushel of Rice (which he had procured) to be sown, and it prospered gallantly and he had fifteen bushels of it, excellent good
Rice, so that all those fifteen bushels will be sown again this year; and we doubt not in a short time to have Rice so plentiful as to afford it at 2d a pound if not cheaper, for we perceive the ground and Climate is very proper for it [rice cultivation] as our Negroes affirm, which in their Country is most of their food."

In South Carolina a century later, slaves from Gambie headed the list of planter preferences in the formative period of rice development. The slave trade certainly was active in this region, and Francis Moore's 1738 account of his stay along the Gambia River as a trading factor between 1730 and 1735 provides ample testimony to the arrival of slave ships bound specifically for South Carolina. Even though rice planters were not always able to obtain the slaves they desired because of availability and competition with other plantation areas, the records do demonstrate a demand by Carolina planters for bondsmen from specific regions where rice was grown. "Gold Coast or Gambias are best, next to them the Windward Coast are prefer'd to Angolas," wrote Henry Laurens, one of the leading slave importers in South Carolina, in 1755.

As with the earlier demand for Fula cattle herders, planters sought the specific skills of slaves originating in the rice region. Newspapers advertised impending sales of slaves skilled in rice; one ad in Charleston boasted of 250 slaves "from the Windward and Rice Coast, valued for their knowledge of rice culture"; another on July 11, 1785, announced the arrival of a Danish ship with "a choice cargo of windward and gold coast negroes, who have been accustomed to the planting of rice." Such prior awareness explains the stated preferences of planters for slaves from Gambia and the Windward Coast (Sierra Leone) during the crucial period of the eighteenth-century tidal rice development. Also evident is the pattern of direct imports to South Carolina of slaves from outposts of English slaving along the Gambia River and Bunc Island in Sierra Leone, where this knowledge was especially concentrated. Carolina-born, English-educated Henry Laurens, for example, had a special trading relationship with a wealthy British merchant, Richard Oswald, who owned the British slave factory on Bunc Island, located in the Sierra Leone River. From 1750 to 1787 Laurens and Oswald organized the slave trade from Sierra Leone, with Laurens importing Oswald's human cargoes directly to Charleston.

Slave laborers skilled in tidal rice cultivation wrought the vast alteration of the lowland river floodplains of South Carolina and Georgia, which was nearly completed by the Revolutionary War. They created the irrigated landscapes that fed the international demand for the famed Carolina "gold" rice. But the demands on labor would brutalize the thousands of Africans who undertook the massive transformation of wetlands to irrigated rice fields.

The tidewater system, observed one South Carolina planter, was a "huge hydraulic machine" that rested on an "apparatus of levels, floodgates, trunkals, canals, banks, and ditches requiring skill and unity of purpose to keep in order." Although most of these elements were already present in inland swamp cultivation, on tidal floodplains they were employed on a much larger scale. Slaves from the West African rice area possessing this engineering knowledge became the preferred workforce for transforming tidal swamps into productive rice fields. Even though the creation of a tidal plantation required enormous inputs of labor, once in operation the time spent weeding was greatly reduced over previous systems, due to controlled flooding. A slave was consequently able to manage five acres instead of the two typically planted to inland rice cultivation. Tidewater cultivation, which came to dominate rice production until the Civil War, led to improved labor output and increased yields in turn, helping to create one of the world's most lucrative plantation economies.

This production system occurred on floodplains along a tidal river where the diurnal variation in sea level resulted in flooding or draining a rice field. Four factors determined the siting of tidewater rice fields: tidal amplitude, saltwater encroachment, estuary size, and shape. A location too near the ocean risked saltwater incursion; too far upstream removed a plantation from tidal influence. As with the West African floodplain rice system, a rising tide flooded the fields while a falling tide facilitated field drainage. Along South Carolina rivers the rise and fall of tides varied between one and three feet. These conditions usually prevailed along riverine stretches ten to thirty-five miles upstream from the river's mouth.

Estuary size and shape also proved important for the location of tidewater plantations, since these factors affected the degree of water mixing and thus salinity. The downstream extension of tidal rice cultivation in South Carolina and Georgia reflected differences in freshwater dynamics between rivers that drained extensive piedmont uplands
(such as the Santee and the Savannah) and those with more limited inland drainage and extensive tidal flow from the sea (such as the Ashley and the Little Satilla). Because rivers of piedmont origin delivered fresh water within miles of the coast, tidal cultivation often occurred within a short distance from the ocean. But other coastal rivers are little more than arms of the sea, and the tide reaches further inland before encountering any significant influx of freshwater flows. Along such rivers the freshwater flow forms a pronounced layer on top of the heavier salt water, thereby enabling easy tapping of sweet water for tidal irrigation. Suitable sites for cultivation relied on skilled observation of tidal flows and the manipulation of saline-freshwater interactions to achieve high productivity levels in the rice field, practices already known to West African tidal rice farmers.

Preparation of a tidal floodplain for rice cultivation followed principles remarkably similar to those of the mangrove rice system. Figure 3.3 presents the sequence of activities in the conversion of a floodplain to a rice paddy. First, slaves constructed levees, or rice banks, around rectangular-shaped plots on the mudflats. The rice field was embanked at sufficient height to prevent tidal spillover, with banks often reaching six feet in height. Earth removed in the process resulted in an adjacent canal, while openings in the rice bank admitted the inflow of tidal water onto the field. The next step involved dividing the area into quarter sections (of ten to thirty acres), with river water delivered through secondary ditches. This elaborate system of water control enabled the adjustment of land units to labor demands and allowed slaves to sow rice directly along the floodplain. Sluices built into the embankment and field sections operated as valves for flooding and drainage. When opened at high tide, the tide flooded the field. Closed at low tide, the water remained on the crop. Opened again on the ebb tide, excess water was drained away from the plot. The system functioned in the same manner as that of mangrove rice in Africa.

Tidewater cultivation required considerable landscape modification. It therefore demanded even greater numbers of laborers than the initial rice systems that featured prominently in the South Carolina economy. Slave laborers literally created the shape of rice cultivation in South Carolina through their presence and experience. The labor in transforming tidal swamps to rice fields involved a staggering effort, as historial archaeologist Leland Ferguson pointedly captures for one rice plantation in South Carolina:

These fields are surrounded by more than a mile of earthen dikes or “banks” as they were called. Built by slaves, these banks . . . were taller than a person and up to 15 feet wide. By 1800, rice banks on the 12½ mile stretch of the East Branch of Cooper River measured more than 55 miles long and contained more than 6.4
million cubic feet of earth... This means that... working in the
water and muck with no more than shovels, hoes, and baskets... by 1850 Carolina slaves... on [tidal] plantations like Middleburg
throughout the rice growing district had built a system of banks
and canals... nearly three times the volume of Cheops, the
world's largest pyramid.105

Once in place, the irrigation infrastructure continued to make con-
siderable demands on slave labor, as canals needed cleaning and con-
stant vigilance to prevent their collapse. The labor involved in "mud
work" was so grueling that it proved a consistent source of friction be-
tween slaves and their overseers.106 Even after emancipation as hired la-
borers on tidal plantations, freedmen avoided mud work. Their aver-
sion was not to growing rice but rather to the back-breaking mud work
needed to maintain tidal plantations, since freedmen continued to cul-
tivate rice on their own as a cash crop on unutilized inland swamps in
South Carolina until the 1930s.107

With full water control from an adjacent tidal river, the rice crop
could be flooded on demand for irrigation and weeding, and the field
renewed annually by alluvial deposits. Historian Lewis Gray under-
scored the significance of tidal flow to the shift from the inland swamp
rice system to tidewater cultivation: "Only two flowings were em-
ployed [in the inland swamp] as contrasted with the later period when
systematic [tidal] flowings came to be largely employed for destroying
weeds, a process which is said to have doubled the average area cul-
tivated per laborer... The later introduction of water [tidal] culture
consisted in the development of methods making possible a greater de-
gree of reliance than formerly on systematic raising and lowering of the
water.”108

The systematic lifting and lowering of water noted by Gray was
achieved by sluices, located in the embankment and secondary dikes
(Figure 3.4). These crucial devices for water control assumed the form
of hanging floodgates by the late colonial period. They were anchored
into the embankment at a level above the usual low tide mark.109 One
archival photo taken in the 1920s of a Carolina rice plantation shows
the relationship of the hanging trunks to the rice field (Figure 3.5).
Gates placed at both ends of the trunk would swing when pulled up or
loosened. The inner doors opened in response to river pressure as the
water flowed through the raised outer door and then closed when the
tide receded. Field draining reversed the arrangement, with the inner
door raised, the outer door allowed to swing while water pressure in
the field forced it open at low tide.110

On Carolina plantations these floodgates were called "trunks" even
when they assumed a vertical structure. Curiosity about the origin of
the term trunk for sluices or floodgates in the 1930s led one planter de-
scendant, David Doar, to inadvertently stumble upon an issue that sug-
gests the transfer of technology from West Africa:

For years the origin of this name bothered me. I asked every old
planter I knew, but no one could enlighten me. One day a friend of
mine who planted on one of the lowest places... said to me with a
smiling face: ‘I have solved that little trunk question. In putting
down another one, I unearthed the granddaddy of plug trunks
made long before I was born.’ It was simply a hollow cypress log
with a large hole from top to bottom. When it was to be stopped
up a large plug was put in tightly and it acted on the same principle
as a wooden spigot to a beer keg.'111

Such devices, constructed from hollowed tree trunks with a stopper
at one end, preceded the innovative hanging gates of the late colonial
period. Serving as a prototype, the plug trunks were placed in an em-
bankment, which enabled control over the flow of fresh water for field
flooding and the elimination of weeds. This is the exact water manage-
ment system still used in mangrove rice production in West Africa. The plug trunk served as the initial device for water control on Carolina inland swamp plantations, and the earliest systems functioned exactly like their African counterparts. Even when the hanging gate replaced the earlier plug form, Carolina planters and workers maintained the appellation “trunk” for the horizontal sluices and the vertical gates that regulated them. The continued use of this term throughout the antebellum period suggests that the technological expertise of Africans indeed proved significant for establishing rice cultivation in the earlier colonial era.

Recent archaeological research at Drayton Hall plantation (built between 1738 and 1742) in South Carolina shows an intermediate link in technology development, one that bears the imprint of both African and European technologies for water control. Over time the original plug trunk gave way to a modified form, before its culmination in the hanging gates that appeared by the American Revolution. In 1996 archaeologists excavated from beneath the former rice fields of Drayton Hall plantation a trunk intermediate in shape between the African plug form and the hanging gate sluices that characterized antebellum plantations. The uncovered device, which dates to the nineteenth century, was a sixteen-foot-long wooden box, two feet wide and about twelve inches high, with a groove at one end in which a rectangular gate was moved up and down to regulate water flow. The evolution of trunks on Carolina plantations initially involved African experience, which later resulted in the hybridized product of both African and European inventions.

Long before millions were transported across the Middle Passage, West Africans had refined an elaborate food production system that displayed acute knowledge of landscape gradient, soil principles, moisture regimes, farming by submersion, hydrology, and tidal dynamics, and the mechanisms to impound water and to control its flow. The result was an array of rice production zones with a management portfolio more diverse than those occurring in Asia and more finely nuanced by microenvironmental soil and water parameters. This was a system that over millennia minimized subsistence risks, enhanced human survival in drought-prone environments, and contributed to the dense populations of the Upper Guinea Coast that were subsequently swept into the Atlantic slave trade.

The knowledge and the expertise to adapt cultivation of a preferred dietary staple to New World conditions proved among the scant “possessions” remaining to those pressed into slavery from rice-growing regions. For those arriving in frontier South Carolina, a similar geographic setting of diverse lowland habitats and climatic conditions optimized the transfer of a crucial African farming system to North America. But African ingenuity in Carolina rice cultivation, repeating a pattern established with irrigated rice in West Africa, would over time be attributed to Europeans. To the Portuguese who enslaved them in Africa and to the English and French slaveholders who relied on them to create Carolina’s rice landscapes would go the credit for the inventive irrigated rice system Africans had developed under diverse wetland circumstances. Planter memoirs would celebrate the brilliant cultivation system invented by their forebears, while reducing the “savages” from the Guinea Coast to mere lackeys in their glorious schemes:

Rice culture reached a development and a degree of perfection in the Carolina lowlands which had not been attained in any other rice-growing country in two thousand years... Nothing but an ocular inspection... can give an adequate idea of the skilful [sic] engineering and patient, intelligent supervision that went to the successful result. The only labor at the disposal of the settlers who
accomplished the feat was of the most unskilled character, African savages fresh from the Guinea coast. It was an achievement no less skilful than that which excites our wonder in viewing the works of the ancient Egyptians... The Southern planter who accomplished this result was a man who worked with his brains on an extended scale.\[^{11}\]

No antebellum planters or, for that matter, their descendants considered the possible role of Africans in colonial rice development. The Africans were property and, as such, incapable of contributing valuable knowledge, skills, and experience. They were treated as mere animate commodities to be set into motion by others.

**Task Labor: Knowledge, Resistance, and Negotiation**

Plantation owners in South Carolina profited mightily from a farming system perfected over millennia by West Africans, which in turn was diffused to the Americas through slavery. But an important question remains. Why would West African slaves transfer to planters a sophisticated agricultural system, based on the cultivation of rice, that would in turn impose upon them unrelenting toil throughout the year? Why then cooperate in developing an agricultural system that would expose them to deadly malaria and life-threatening anemia?\[^{12}\]

The answer to these questions can perhaps be sought by examining the definition of slavery as well as the changing lineaments of the social relations of production in South Carolina's rice economy. It is possible that the attempt to convey the meaning of slavery and bondage in an essential, clear, and forceful manner often obscures significant and complex details—details that reveal how slaves and their masters engaged in struggles marked by acceptance and resistance, coercion and consent.\[^{13}\] By recognizing the complex ways in which social relations are challenged and transformed in slave societies, we may develop an alternative perspective toward the ways in which enslaved persons may have seized rare opportunities to negotiate and improve the conditions of their unfree labor.

By the Stono rebellion in 1739, all the major rice typologies were present in South Carolina. Also evident was an innovative form of labor organization, quite different from the pervasive “gang” form: the “task” labor system. The task labor system characterized work on coastal rice plantations from the early eighteenth century up to the Civil War. Under this “new” organizational form “the slave was assigned a certain amount of work for the day, and after completing the task he could use his time as he pleased.”\[^{14}\]

This was clearly different from the more pervasive gang system, where the laborer was compelled to work the entire day.\[^{15}\] The task system represented a significant improvement in that it provided slaves the opportunity to allocate more time to cultivate their garden plots, hunt, fish, and gather products that could either go toward improving their nutritional status or be sold in local markets for small profits.\[^{16}\]

Tasks were measured in terms of an acre and on tidal floodplains, divided into units of work by irrigation ditches that demarcated boundaries.\[^{17}\]

Without overstating the differences in workload between gang and task labor, the task system did set normative limits to the number of hours demanded. Expected work burdens on Carolina rice plantations were already established in customary practice by 1712. The earliest description of work practices in the rice economy reveals a sharp distinction between the time owed the master and the slaves' own time. In the first decade of the eighteenth century some South Carolina clergy complained of slaves planting “for themselves as much as will clothe [st] and subsist them and their families.”\[^{18}\] But Johan Bolzius observed in 1751 that slaves' own time counted for just a minor portion of each day: “If the Negroes are Skillful and industrious, they plant something for themselves after the day's work.”\[^{19}\] But even such seemingly minor gains over the permissible claims to slave labor were capable of delivering tangible improvements in their nutrition and health.

The task labor system appeared at the crucial juncture of the evolution of rice as a plantation crop in South Carolina and the shift to the more productive but labor-demanding inland swamp systems. Established conventions for the task changed considerably in the period following the Revolutionary War. During the antebellum era, the labor involved in growing rice under a task system differed little in the time to completion from that facing a slave laborer in other types of planta-
tion economies. The emergence of the task system in the early colonial period, however, may provide indirect evidence for African agency in Carolina rice cultivation.

The task labor system is probably of African origin, as it was already a feature of African slavery along the Upper Guinea Coast and its hinterland during the Atlantic slave trade. Task labor guaranteed those in indigenous servitude partial autonomy from claims on their labor through conventions that regulated the terms under which slavery could be exercised. With their social status reduced to that of chattel labor on European plantations, slaves would attempt to renegotiate these rights elsewhere in the Atlantic world during the charter generations of slavery. But they would succeed in only a few places, and the most significant economy where they managed to do so was on South Carolina and Georgia rice plantations. However, whether the task labor system mentioned by Bolivar in 1751 represented the transfer of an entire labor process from West Africa or the result of negotiation and struggle between master and slave over agronomic knowledge and the labor process cannot as yet be determined from the historical record.

Historian Clarence Ver Steeg, who has questioned conventional representations of white-black relations in colonial South Carolina, suggests that prior to the Stono uprising slaves were not considered incompetent and semihuman; they were, in fact, entrusted with considerable responsibility, even to the extent of bearing arms for the colony’s defense. Perhaps the basis for this initial esteem derived from slaves’ vital role in transforming marshlands into swamps and the creativity they exercised in tailoring rice production to South Carolina’s diverse lowland environments. From this perspective, the innovative task labor system—documented to have evolved in the United States first in South Carolina—may well have been forged from the complex process of resistance and negotiation between slaves and planters in which slaves provided critical expertise in exchange for a labor regime that would improve the conditions of their bondage. If so, West African bondsmen may have attempted to ameliorate European chattel slavery to the less brutal form they knew in their own lands of origin. The historical juncture that marks the transition to wetland cultivation systems with the appearance of task labor in the decades prior to Carolina’s Stono rebellion in 1739 argues in favor of such a hypothesis.

With the consolidation of slavery following the Revolutionary War, the task labor system lost much of its flexibility. During the antebellum period the tasks for planting, harvesting, and maintaining rice fields on Carolina and Georgia plantations required long days and sustained work that differed little from the labor demanded of slaves in other types of plantation systems. The conventions that mediated the task labor system had eroded considerably by the end of the eighteenth century, probably as the result of massive imports of slaves from Africa. Between 1782 and 1810, South Carolina imported nearly ninety thousand slaves, thirty-five thousand entering in just the five years from 1803 to 1808, when the trade became illegal. This was more than twice as many as in any similar period in the colony’s history. The result of this record-breaking influx meant that slaves born in Africa composed more than one-fifth of the bondmen in South Carolina.

Although the forced immigration of Africans contributed to the distinctive regional and Africanized Gullah culture of low-country South Carolina and Georgia, the increased importation of slaves adversely affected prevailing conventions regulating the task labor system. As historian Ira Berlin observes, “slaveholders used the occasion of the entry of new slaves to ratchet up labor demands, apply new standards of discipline, and create an order more to their liking.” Thus in showing their masters the needed skills, enslaved persons were able to use their knowledge of rice cultivation to alter, albeit slightly, the social conditions of work through the task labor system. But the benefits received by the able and healthy during the charter generations of slavery would not endure after the institution’s entrenchment during the antebellum period.

Ethnic Traditions and Farming Systems

A brief overview of the farming systems known to Europeans and Africans at the time of Carolina’s settlement provides additional evidence for the agency of slaves in the establishment of rice in colonial South Carolina. Because rice was actively promoted as a potential cash crop for the English colonies as early as 1609, doubt exists as to African inventiveness in pioneering the cultivation of rice in the United States. Even earlier than South Carolina, Virginia colonists experimented with rice, their slaves informing them that the growing conditions were suitable for the crop’s cultivation. A Virginia pamphleteer in 1648 praised...
the colony's agricultural potential, the "great Plains, fine and thick Grass, Marshes...[and] rich black mounded countries for Tobacco, Flaxe, Rice, choice trees and Timber for Shipping." But despite rice's potential, Virginia colonists tried and then abandoned its cultivation. In distinguishing the colony's marshes from the areas suitable for planting crops, the pamphlet's author perhaps reveals why. Rice experimentation took place on the uplands, alongside tobacco and flax, relying exclusively on rainfall.

Virginia colonists experimented with rice but grew it as a rain-fed crop in the manner of all the seeds they planted, in keeping with the tradition of farming they brought with them from Europe. As with tobacco, which soon emerged as the dominant export crop, the early experiments with growing rice in Virginia represented the addition of another crop of the Columbian Exchange to the farming system. This was a northern European system, where seeds were broadcast in plowed rows and grown with rainfall. Virginian colonists possessed no prior experience with growing crops under submersion in wetlands. Even though rice can be cultivated with rainfall, the yields are much lower than from planting the crop in wetlands. The feasibility of rice as an export crop would depend upon obtaining and mastering this knowledge.

From the end of the seventeenth century rice cultivation was under way in both North and South Carolina. The rice John Lawson described as being planted in North Carolina in 1709 was grown with rainfall. Rain-fed rice also figured among the earliest varieties planted during the 1690s in South Carolina, where it was grown "as barley...broadcast" and in rows—that is, with rainfall in the manner Europeans traditionally sow their cereals. But Africans also grow rice in this way. A focus on rain-fed rice does not illuminate which ethnic tradition should be credited with its establishment. The cultivation of rice in wetlands, however, is another matter, for its implementation depended upon the presence of ethnic groups skilled in growing the cereal in water.

By the end of the seventeenth century a new way of growing rice had appeared in South Carolina, cultivation in swamps. It caught the attention of one visitor to the colony, Mark Catesby, who wrote in 1731 that rice there was being grown "wholly in water." This manner of growing rice depended not merely on an environment suitable for its cultivation but also on the presence of representatives of a farming system practiced in germinating seeds for growth in standing water. Such an agricultural system developed in just two areas of the world, Asia and West Africa.

Could wetland rice cultivation in South Carolina have been learned elsewhere through, for instance, the Dutch? A review of fenland cultivation in England during the seventeenth century reveals the role of Dutch engineers in teaching proper drainage techniques for reclaiming marshes, following the procedures they had mastered in marine land reclamation for agricultural expansion in Holland. But the Dutch system of draining waterlogged soils for reclamation always turned the reclaimed areas into new land for the production of cereals with rainfall, not for cultivation in water. Nor, by the founding of the colony of South Carolina in 1699, were such drainage and reclamation methods widely known in England. There is no evidence for English or Dutch expertise in wet rice farming in South Carolina in the second half of the seventeenth century. Its origins lie elsewhere.

In 1675, just a few years after the report discussing rice cultivation in Virginia, a pamphleteer in England asked, since rice "growth in the Fenny places of Milan...why may it not grow in our Fens?" The quote indicates English awareness that rice was being planted in the Poitou area of northern Italy. Although it was not cultivated in England the crop had been grown in Italy since at least the fifteenth century, perhaps as the result of an earlier Muslim introduction via Spain or Sicily. This system of rice cultivation was somewhat different from the one that developed on the Carolina wetlands. In the Mediterranean climate of Spain and Italy, with modest winter rains and dry summers, irrigation involved storing rainwater, lifting water, or diverting streams in order to irrigate lands that could be reached by gravity flow. Rainwater was often only a seasonal resource, which affected the amount of land that could be planted and crops grown. The expansion of rice farming in northern Italy during the Middle Ages involved adjusting the crop to summer cultivation and a system of canals to deliver river water through gravity flow. It resembled more the cultivation system on levees of the Mississippi River and its tributaries, where rice planting relocated in the United States after the 1880s. Lying above flood levels, this land supports the weight of agricultural machinery and can be planted to crops other than rice, as it is in Italy where rice is grown in rotation with other rain-fed cereals.

Such principles, however, could serve as the basis for experimenting
With wetland rice cultivation elsewhere. But there was no Italian immigration to South Carolina nor is there evidence that planters had studied the systems of southern Europe as the basis for developing tidal rice cultivation during the colonial period. Neither Italian rice nor its distinctive Italian and Spanish cooking styles, whose presence would suggest an influence on Carolina rice development, appeared in South Carolina. The small, round Italian rice— with its hard endosperm and resistance to breakage with mechanical milling— only arrived in South Carolina in 1787, when Thomas Jefferson experimented with growing the crop again on uplands. The experiment did not succeed, and rice failed to become established there.

As for wild rice, *Zizania aquatica*, cultivated by some Native American groups, it could not have served as the basis for rice cultivation in Carolina. Not a true rice but a grass that is collected, *Zizania* was prepared by scouring or parching the rice, which in turn helped to remove the hulls, a different practice than that employed on Carolina plantations.

At the time of settlement of the South Carolina colony, the tidal rice system existed in only two areas of the world, Asia and West Africa. Contact with Asia at the end of the seventeenth century, during the period of Carolina settlement, however, was indirect, mainly through the purchase of coveted trade goods such as tea, porcelain, and silk. The merchants and mariners who brooked this trade in Asia rarely ventured into the hinterlands beyond coastal ports and could hardly have mastered in a quick visit the complex principles of wet rice cultivation. There is no evidence during the crucial period of Carolina rice development that European migrants possessed the detailed understanding of Asian systems that involved techniques of transplanting, irrigation, and drainage for paddy cultivation.

The origin of Carolina rice cultivation is most likely African, the product of an indigenous knowledge system introduced by West African slaves familiar with the crop’s cultivation. Among the colony’s settlers only slaves from the rice region of West Africa possessed a farming system that involved wetland cultivation. In South Carolina, as in Peru and Brazil, the planting of rice in wetlands was evident in the earliest frontier period and always in areas settled by slaves. The Carolina frontier presented to slaves a terrain more like what they knew in West Africa than anything previously familiar to the colony’s European settlers. This was an environment ideally suited to the cultivation of a preferred cereal so central to cultural identity in many parts of West Africa.

To carve plantations from Carolina landscapes, Europeans depended upon slaves for labor. But they also relied on slaves to produce food for subsistence. Rice, a favored dietary staple among many of the colony’s black settlers, could be easily grown in the abundant Carolina wetlands. The cultivation of rice proved ideally suited for the physical environment as well as the psychological terrain that shaped relations between master and slave during the frontier period. Mastery of wetland rice cultivation would deliver the high yields crucial to realizing its potential as an export crop. This accomplishment would eventually make planters rich and Carolina rice world famous, but it depended upon Africans familiar with rice culture showing the way to grow the crop in wetlands. Knowledge of rice cultivation resulted in African slaves’ establishing a plantation sector that profited from a startlingly unusual form of technology transfer, one based on their own enslavement. The psychological environment between master and slave in the early colonial period thus involved the establishment of an African knowledge system for white purposes. This is a point Peter Wood succinctly captures: “the problem faced by white Carolinians during the first and second generations of settlement was less one of imparting knowledge to unskilled [slave] workers than of controlling for their own ends black expertise.”

The evidence for the transfer of the technology of rice culture from West Africa to South Carolina shows dependence upon specific African ethnic groups familiar with the crop’s cultivation. African experience with planting a whole range of interconnected environments along a landscape gradient, first mentioned by Dutch geographer Olbert Dapper around 1640, presaged the sequence of adaptations that marked the growth of the Carolina rice industry during the colonial period. For slaves, this knowledge of rice cultivation presented a rare opportunity to negotiate the terms of their bondage to a form resembling the indescribable servitude they knew in Africa. In reaffirming the claim for autonomy over their labor for part of the day, slaves were engaged in a struggle to humanize their degraded shift to chattel. Thus in frontier South Carolina, as Africans and Europeans faced each other in new territory
under dramatically altered and unequal power relations, the outcome was agricultural diffusion, technological transfer, and novel forms of labor organization.

As involuntary immigrants, enslaved Africans constituted the largest number of settlers entering the Americas for much of the eighteenth century. Their presence in the early settlement history of the Americas profoundly influenced the development of technology in ways yet to be examined by scholars. Across the Middle Passage slaves showed the way to plant and process new crops introduced from Africa, to herd cattle in open range, and to provide techniques of weaving and dyeing. The trend throughout the subsequent centuries of slavery was to erase the momentous African contribution, which scholarship is only recently beginning to uncover. This consideration of the complexities of rice culture draws attention to just one of the numerous knowledge systems that slaves introduced to the Americas in the face of staggering difficulties and loss of personal liberty.

4

This Was "Woman's Wuck"

It was work—work consistently sustained and ruthlessly enforced.

—Charles Joyner, Down by the Riverside (1984)

The tendency of the Atlantic slave trade to ship a greater percentage of females to South Carolina than to the Caribbean reveals the crucial role of African women in plantation rice culture. Female slaves bound for South Carolina received a higher purchase price than in other plantation economies, and their labor was valued more on a par with that of male bondmen than in the slave markets of the West Indies. Indirect tribute to African women's expertise in rice culture probably underlies Thomas Nairne's observation in 1710 that female slaves in South Carolina received the same market price as males and performed equivalent tasks. More than the labor of females would be valued on coastal plantations. Key aspects of rice culture embodied specialized knowledge systems, often the domain of African women.

Over much of the northern portion of the West African rice region, rice has long been a woman's crop. Only in mangrove cultivation along the coast have women and men participated equally in rice growing, although responsibilities are sharply demarcated by a gender division of labor. A similar division of labor has long characterized the crop's cultivation in the southern portion of the rice region, but when emphasis shifts to the bottomlands of a landscape gradient—the inland swamp—cultivation becomes chiefly the responsibility of women. Wherever rice is grown in West Africa, women are involved. They display sophisticated knowledge in recognizing soil fertility by plant indicators, which reveal, for instance, soil impoverishment or recovery. Females are responsible for seed selection, sowing, hoeing, and rice processing. Seed selection in particular requires a sophisticated under-
6

Legacies

All of this was accomplished in the face of seemingly insuperable difficulties by every-day planters who had as tools only the axe, the spade, and the hoe, in the hands of intractable negro men and women, but lately brought from the jungles of Africa.

—David Dorsey, Rice and Rice Planting in the South Carolina Low Country (1956)

The nineteenth century brought an end to slavery throughout the Atlantic world. With the Civil War came emancipation of slaves in the U.S. South. In 1870 passage of the Fifteenth Amendment enfranchised African-American males with voting privileges. But in the decades that followed, as Jim Crow legislation again reasserted racial hierarchies and segregation steadily replaced slavery, descendants of planters began their revisionist memoirs of plantation days. From the 1920s, supporters of the "Lost Cause" generated numerous accounts that wistfully celebrated what they viewed as the benign paternalism of slavery. Descendants in South Carolina, where rice planters figured prominently in encouraging Confederate secession from the Union, praised planter ingenuity in developing a crop that proved so eminently profitable. In extolling the achievements of his forebears, one planter descendant captured the traditional white view of African contributions to the Carolina rice economy, a perspective then becoming the orthodox interpretation of rice history:

What skill they displayed and engineering ability they showed when they laid out these thousands of fields and tens of thousands of banks and ditches in order to suit their purpose and attain their ends! As one views this vast hydraulic work, he is amazed to learn that all of this was accomplished in the face of seemingly insu-

perable difficulties by every-day planters who had as tools only the axe, the spade, and the hoe, in the hands of intractable negro men and women, but lately brought from the jungles of Africa.3

When David Dorsey penned these words in 1936 few whites believed that slaves had contributed anything but brawn to the rice economy of South Carolina and Georgia. One year later another planter descendant, Duncan Clinch Heyward, presented his forebears as gentleman-scholars who assiduously studied methods of Chinese rice culture to improve a system they had independently invented. His view was based on little more than paintings he had seen of Chinese cultivation systems, which he presumed must have inspired his ancestors as they did him.3

Scholarship on African contributions to Carolina rice history remained mired in self-serving and racist interpretations until the 1970s, when Peter Wood rigorously engaged the issue and showed that Carolina slaves played an active role in developing the rice economy. In demonstrating that many Carolina slaves possessed prior experience with the crop's cultivation in West Africa, Daniel Littlefield's book the following decade delivered yet another critical perspective on the accounts of rice history presented by planter descendants. The research of Wood and Littlefield finally corrected the demeaning distorion of the historical record that presented the role of slaves on Carolina plantations as menial. Contemporary scholarship acknowledges their contribution, even crediting slaves with adapting the crop to inland swamps.3 But the crucial technological development in water control that led to tidewater cultivation continues to be presented in terms of planter ingenuity rather than as the product of an indigenous African knowledge system. Discussions of the principles that transformed Carolina wetlands into rice plantations remain anchored in European expertise and culture.

This book's emphasis on agrarian genealogy presents a way forward for a fuller appreciation of the contributions of both black and white Carolinians during the colonial period. Technological development is an incremental process, built upon a preexisting foundation of knowledge. On Carolina rice plantations, slaves familiar with wetland farming and the cultivation of irrigated rice provided the foundation for the water control systems that enabled the shift to tidewater cultivation.
Only after the establishment of rice culture in South Carolina did European contributions become evident. The tidewater system began as an Afro-Americanization of Carolina wetlands; European expertise then contributed additional innovations that shaped rice culture. Thus while cultivation and development of tidewater rice began as an African knowledge system, it eventually bore the hybridized imprint of both African and European influences.

By the American Revolution the technological and agronomic heritage of each knowledge system had combined in new ways to shape rice cultivation along the Atlantic Coast of the United States, a process geographer Paul Richards terms “agrarian creolization.” By way of analogy with its linguistic namesake, Richards is referring to the convergence of different knowledge systems—such as cultivation strategies, rice varieties, and milling devices—and their recombination into new hybridized forms. The outcome of this convergence in South Carolina was an agrarian landscape actively shaped by African as well as by European culture. Recognition of this fact is not intended to celebrate the roots and contributions of diverse peoples of the Americas, which are clear, but to acknowledge the depth, uncertainty, and complexity of power relations that shaped the transfer of rice culture during the charter generations of slavery.

Such issues surrounding technology transfer, indigenous knowledge, culture, and environment will certainly be clarified with additional research on Atlantic rice systems in the years to come. Recent comparative research on rice origins in other important areas of the African diaspora, such as Brazil and the Caribbean, indicates the crop's establishment with slavery more than a century earlier than in North America. The value of viewing agricultural history from a comparative framework focused on the Atlantic basin is to elucidate crucial issues of technology transfer and to restore to peoples sharing the Atlantic world their appropriate historical contributions. This process of historical recovery requires us to think of the Atlantic as a medium through which power relations forced the migration of plants and peoples across geographic space. Even if Europeans forced that transition on Amerindians, Africans, and their own poor, theirs was but one cultural fund of knowledge that informed life in the Americas. Significantly, subordinated peoples used their own knowledge systems of the environments they settled to reshape the terms of their domination.

Comparative work on rice origins in the Americas reveals the crucial linkage between culture, technology, and the environment, thereby illuminating the broader African contribution within the Atlantic basin. For Africans rice culture represented an assemblage of techniques, which enabled the application of indigenous knowledge to different environmental conditions under profoundly altered social relations of production. Slaves recombined in new ways the principles that informed African rice cultivation within the diverse physical and mental landscapes that shaped their identities in the New World. In a similar fashion, Carolina planters would later segregate those rice systems into the rain-fed, inland swamp, and tidal production environment, from the least to the most productive and remunerative systems.

The enormity of the travail endured by male and female bondsmen in cultivating and milling rice, however, underscores the limited social space that existed for negotiating the terms of bondage. Slaves successfully transferred a knowledge system from Africa and actively participated in the establishment of rice as a plantation crop. Although this reduced some of the claims on their work in the rice fields, they found themselves burdened even more with milling. The very success of rice as an export crop undermined the gains achieved in field labor, undone by dependence on the mortar and pestle to mill the expanding colonial rice output.

To recognize the achievements of slaves in introducing and adapting a cereal that became the first food commodity globally traded is to highlight the contradictory qualities of indigenous knowledge. It is to place slaves' remarkable contribution against a background of brutal and unjust power relations. Diffusion of a significant African knowledge system occurred in the context of everyday efforts to grow a favored dietary staple for subsistence. Planters would realize that rice grown in wetlands produced yields that made it a viable export crop. Blacks participated in developing the rice economy through their struggle to survive the overwhelming demands on their labor.

It bears remembering that diffusion of this significant African knowledge system to the Americas emerged within the confines of transatlantic slavery. While planters used black expertise for their objectives, slaves struggled to negotiate the conditions of their labor. Thus as Africans and Europeans faced each other in new territory under dramatically altered and unequal power relations, with a cropping
system known to one but not the other, knowledge of rice cultivation represented one way slaves could shift over so slightly the terms of their bondage. The result was the establishment of a cereal that has long served to assert African cultural identity in the Americas.

Reconsidering the Columbian Exchange

Publication in 1972 of historian Alfred Crosby’s monumental book *The Columbian Exchange* awakened scholars to the significance of intercontinental plant transfers for European global expansion. “The most important changes brought on by the Columbian voyages,” wrote Crosby, “were biological in nature.” His work showed the role of epidemic diseases in reducing Native American resistance to European political-economic control and the ecological transformations that followed the voyages of Columbus. Crosby’s illuminating perspective revolutionized the way scholars looked at the significance of plant and animal transfers for shaping the European-dominated world economy from the sixteenth century.

But scholars working in the tradition he established have yet to accord full significance to the role of Africans and African plants in European maritime expansion abroad. The Columbian Exchange has long emphasized crops of American, Asian, and European origin and the role of Europeans in their global dispersal.7 This agrarian genealogy of rice history, however, reveals a different face of the Columbian Exchange by showing that rice accompanied the forced migration of Africans and was present in tropical America from the earliest settlement period. In the first centuries of slavery, more Africans crossed the Atlantic than Europeans, and the ships carrying them were frequently provisioned with African domesticates.8 While Europeans certainly brought rice seeds from Asia to Africa as well as to the Americas, a far more significant form of transfer was unfolding with West African rice and slaves.

Understanding the black role in the Columbian Exchange has been partially obscured by the emphasis on the period after Europeans arrived in the New World, even though a subsequent volume by Alfred Crosby drew attention to the initial phase of European maritime expansion to the Atlantic islands.9 The forms of production they pioneered and the methods Europeans used to develop plantations and to feed slaves in the Atlantic archipelago illuminates the significance of African crops. The Columbian Exchange really began more than a century earlier when the European predecessors of Christopher Columbus ventured into the Atlantic and found the Canary Islands inhabited with a people they would enslave to extinction. Over the second half of the fifteenth century the Cape Verde Islands served to enable explorations of the West African coast and to establish sugarcane plantations with the Africans they enslaved. The economies established on these islands depended upon African labor and subsistence crops indigenous to West Africa. Even though sugar cultivation would eventually pale in significance with that later developed in Brazil and the Caribbean, the Cape Verde Islands served to establish African food systems outside the continent in the initial period of European maritime expansion. The four decades prior to Columbus’s departure for the Caribbean thus adumbrate the role that Africans and their food systems would play in the agricultural history of the Americas.

The Columbian Exchange at times also represented considerably more than the transfer of seeds revealed in most descriptions. While crop exchanges accompanied the movement of European ships across the world, the adoption of introduced seeds frequently depended upon an understanding of the methods of their cultivation. One limitation of the literature on agricultural diffusion and prevailing conceptions of the Columbian Exchange is that it divorces seed exchanges from their environmental setting and thus from the cultural funds of knowledge that often shape crop diffusion and adaptation. This book’s emphasis on indigenous knowledge views landscapes as inscriptions of cultural practices that bear the signatures of specific ethnic traditions.10

The development of rice culture in the Americas required more than the movement of seeds across the Atlantic. In Virginia rice was planted and discarded as a potential export crop by whites because cultivation with rainfall was low yielding and European milling methods could not produce a whole-grained product. In the Carolina colony blacks implemented another way of growing rice, in high-yielding wetland environments, and introduced the mortar and pestle for milling. Rice cultivation in the Americas depended upon the diffusion of an entire cultural system, from production to consumption. Emphasis on the process of the transfer of seeds in the Columbian Exchange illuminates the relationship of techniques to distinctive cultural funds of knowledge and
the dissemination of agricultural technology to the migration of specific populations.

In demanding a rethinking of the relationship of the New World to Europe, the concept of the Columbian Exchange corrected a major distortion of previous scholarship. It underscored the enormity of the role that foods domesticated by Amerindians played in facilitating the survival of Europeans and their plantation economies with overseas colonization. This fact is symbolized, for example, in the United States by the traditional corn-squash-cranberry-turkey dinner that marks the Thanksgiving holiday commemorating European settlement in North America. Europeans again appear at the center of the narrative for converting the wilderness of the Americas to landscapes of export crops, using plants brought from elsewhere in the New World and Asia. However, the literature has yet to consider crops of African origin and the agency of Africans in their diffusion to the Americas. Africa remains conceptualized as a region where crops diffused to, rather than from, and where New World domesticates revolutionized the continent's agrarian systems. 11

The slight attention accorded to African domesticates in this research reflects the minor role that scholars continue to assign to food of African origin, a point addressed in Last Crops of Africa, a volume by the National Research Council (NRC) of the United States: "Africa's cereals are inadvertently discriminated against through the way they are described. . . . All the categories have pejorative connotations. For instance, these grains [sorghums and millets] are typically referred to as 'coarse' [that is, not refined; fit for animal feed]; . . . 'famine' food [good for eating only when starving]; and . . . poor people's plants . . . scorned as fit only for consumption by the poor." 11

To a certain extent the same argument can be made about African rice, Oryza glaberrima, scarcely known outside its area of origin in West Africa. Since scientific knowledge of an independent rice origin in West Africa lagged well into the twentieth century, only within recent decades has the process of historical recovery begun to illuminate the significance of slavery for the transfer and adoption of rice cultivation systems to the Americas.

A focus on the foods of African origin, such as rice, that traversed the Middle Passage demands a different emphasis than that taken in the standard narrative of the Columbian Exchange. Frequently crop adop-
The consolidation of slavery over the next centuries resulted in the increasing portrayal of its victims as little more than animated commodities, thus dissolving any linkage between rice history, Africa, and slaves. The agricultural history of the Americas has been misunderstood and misinterpreted in ways that have significantly diminished the African origins of rice and the people who grew it, processed the grain, and prepared it as food. The view of Africans as having arrived in the Americas with nothing but their brawn has only recently begun to change. This history of rice in the Americas provides one means to reenvision the agency of slaves in the making of the Atlantic world.

Back to Africa: America, Freedom, and “Mécali”

For the slaves had learned through the repetition of group experience that freedom was to be attained through geographical movement, and that freedom required one to risk his life against the unknown. [Geography] has performed the role of fate, but it is important to remember that it is not geography alone which determines the quality of life and culture. These depend upon the courage and personal culture of the individuals who make their homes in any given locality.

—Ralph Ellison, Going to the Territory

In 1800 about half the population of Brazil was of African descent. In many areas of the Caribbean the percentage was even greater. Some fifty years before, African slaves formed the largest single group of non-English-speakers to arrive in the North American colonies. These men and women who, in forced bondage to others, cleared forest and swamp for agriculture, grazed cattle, and mined ores in the lands where they were enslaved, laid the foundations of the colonies of the Americas. Theirs was a painful and harrowing experience, one that denied their humanity while punishing them with brutal and abbreviated lives. As we enter a new millennium, we have yet to come to terms with the meaning of the experience of slavery and its legacy. The contribution of these involuntary migrants who helped build the foundations of the Americas is still not fully appreciated, and much more awaits our understanding.

In 1807 the British government passed legislation forbidding its subjects to trade in slaves. An outcome of steady abolitionist pressure from the end of the eighteenth century, the decision held profound implica-

gions for slavery in the Americas and Africa. Even if slavery were to continue in the New World, it would be against the law to bring in additional victims from Africa. Meanwhile, the growing number of free American blacks served the goals of abolitionists, who hoped to establish settlements in West Africa as the basis for spreading Christianity and ending African involvement in the trade.

Efforts to return blacks to West Africa began in England, shortly after a landmark legal judgment in 1772 that proclaimed no one could be a slave, regardless of origin. This decision immediately liberated some fifteen thousand blacks in England. The number of blacks who became free in British territory increased considerably as a result of the American War of Independence. At the outbreak of the conflict there were about three hundred thousand slaves in the southern colonies. Seeking to destabilize the American colonies' independence movement, the British promised freedom to slaves who supported the loyalist side in the Revolutionary War. As many as a third of them tried to flee slavery in areas of the Lower South, where the conflict was especially intense. But only about twenty thousand slaves managed to find their way aboard British ships. Some found freedom; others did not. Slaveholders loyal to the English were frequently allowed to reclaim their fugitives. Other fleeing slaves were deposited in Florida and in Canada. Some were even cynically sold anew to Caribbean plantations. About twelve hundred of the runaway slaves gained passage on loyalist ships that carried them to freedom in Nova Scotia. Still others got aboard British naval vessels and landed successfully in England. With the conclusion of the Revolutionary War in 1783, the swelling population of blacks in England became a matter of increasing concern to whites. A solution was found in the "Back to Africa" movement, which sought to repatriate people of African descent to the land of their ancestors while furthering religious, abolitionist, and commercial goals. A colony of grateful blacks could serve the goals of both empire and commerce.

The outcome led to the establishment of settlements along the West African coast in Sierra Leone.

In 1787 English abolitionists sponsored three shiploads of poverty-stricken blacks, some 411 of them, to found the settlement in Sierra Leone. Those in charge of the effort purchased a nine-mile stretch of land from the Tenne along the coast of Sierra Leone to encourage voluntary repatriation to West Africa. But this attempt at
settlement and other early efforts failed miserably. Death, disease, desertion, and hostilities with local peoples thwarted the repatriation objective, as did the active presence of slave traders operating on the islands of Bunce and Lomboko, just offshore from the mainland settlements. In the 1790s the British attempted to found ten missions on the mainland with freed blacks. All but one failed, and that mission was abandoned to the French. 18

Meanwhile, sympathy in England was growing for the abolitionist cause. Resettled blacks were increasingly viewed as a potential vanguard for promoting Christianity in West Africa, which many believed would end African collusion in slavery. Even though slave owners in the southern colonies of North America had little problem reconciling Christian beliefs with full participation in human bondage, English abolitionists expected that Africans' conversion to Christianity would lead them to renounce participation in slavery. The view that spreading the word of the gospel to Africans would promote this objective led the Society for the Extinction of the Slave Trade and the Civilization of Africa to send an expedition of British missionaries to West Africa in the 1790s. They believed that "nearly the whole of this vast continent, so far as we are acquainted with it, has been from time immemorial immersed in moral darkness, adapted only to exhibit scenes of the deepest human degradation and woe." 19 Setting off along the course of the 2,500-mile Niger River on its journey through the interior of the West African rice region, the missionaries dispensed English-language Bibles. They proselytized in a language almost none could understand among populations long influenced by Islam. The ill-conceived expedition found few willing converts and considerable problems, with many of the missionaries dying from cerebral malaria. 20 The spread of Christianity to the "Dark Continent" would increasingly depend upon black repatriation.

By the beginning of the nineteenth century, abolitionist funding and support increased the number of blacks settled in Sierra Leone. Joining the black urban poor affected by the 1772 decree and the ex-slaves brought to England in 1783 was another sizable number of voluntary emigrants recruited among black settlers in Nova Scotia. These were the black American loyalists landed by the British Navy after the Revolutionary War and some two thousand Jamaican maroons, deposited in Nova Scotia by the British Navy between 1796 and 1800. Many of these blacks were born in Africa and welcomed the return home; others left because the English never made good on their promise to give them land.

These freed blacks of the African diaspora were serving another abolitionist objective: the creation of export-oriented agricultural communities in Sierra Leone. Abolitionists believed that sponsored agricultural settlements would eventually weaken the institution of American slavery, because the same commodities could be as cheaply produced on the other side of the Atlantic with free labor. If cotton, sugar, and rice could be grown profitably in Africa, there would be no need to grow them with slaves in the Americas. 21 Realization of this objective, however, would await European colonialism in the mid-1880s for its full expression.

With its declaration of abolition of the transatlantic slave trade in 1807, Britain expanded its naval presence along the Upper Guinea Coast to enforce compliance. 22 Africans captured on slave ships seized by the British Navy were landed in the Sierra Leone settlement. Caught in ports or on the high seas distant from their homes, these "recaptives" swelled the population of those being repatriated to the colony from England and Canada. Their numbers would grow even more with settlements sponsored by Christian missions from the United States.

As many as 60,000 blacks in the United States had gained their freedom from slavery by 1790; in 1830 their numbers had reached 319,000. 23 Statesmen of the early independence era like Thomas Jefferson could not bear the idea of a sovereign United States with blacks on an equal footing with whites. 24 Never comfortable with blacks, especially a growing population of freedmen, many Americans, slave owners as well as abolitionists, supported efforts to sponsor their relocation to Africa. Repatriation to Africa would remove the nation of free blacks while restricting the hopes for liberty among those still in bondage. The exposure of American freedmen to Christianity, improved agricultural techniques, and the mechanical arts would, moreover, serve as a model for "civilizing" the peoples of Africa. 25

Such goals served as the rationale for the American Colonization Society, founded in 1816, which began sponsoring one of the first North American programs to repatriate free American blacks to West Africa. By 1820 the society had recruited eighty-six African Americans willing
to emigrate, but an initial attempt to settle them on Sherbo Island off Sierra Leone in 1821 failed. The terms of the treaty ending the War of 1812 excluded American vessels from operating in English waters, even near the Sierra Leone enclave in West Africa. The search for another site resulted in the establishment of a settlement south along the coast at Cape Mesurado in Liberia. The place names given to the freedmen's new homes along the West African coast speak from the dark shadows of slavery to the yearning for freedom and liberty: Freetown in Sierra Leone, Libreville in Gabon, and Liberia.

From the 1820s freed American blacks added to the steady influx of recruits from slave ships who joined the settlements established by missionaries from Gambia to Liberia along the African coast. The return of diaspora populations unfolded, however, amid commercial and religious objectives: the promotion of export agriculture in tandem with the promulgation of Christianity. Seeds were being introduced anew to the West African rice region. Cotton, peanuts, and cacao were planted for export along the coastal stretch long known as the Rice Coast, introduced again to the region in this new chapter of the Columbian Exchange. Interest in the potential of rice had not faded with the continuing success of the slave-based Carolina rice economy. Efforts to produce crops with free labor that would weaken the plantation sector in the Americas, after all, were at the center of abolitionist concern. As early as the 1770s the export potential of rice in Senegambia was anticipated: "Rice may be produced here as much as in the Province of Carolina and Georgia." As European and American abolitionists sponsored black repatriation to coastal Sierra Leone and Liberia decades later, another chapter in the region's rice history would thus be written.

Seeds and agricultural implements formed a crucial component of the goods accompanying black settlers to West Africa. In the agricultural world of that era, the economic basis of settlement rested on seeds for subsistence and export crop development. Rice figured among the seeds that reached the shores of Sierra Leone from North America in the early nineteenth century. When and how many times it was introduced remains unknown, but new varieties appear to have been present by the 1840s.

In 1839 a Portuguese ship containing a cargo of slaves purchased by a Spaniard operating from the island of Lomboko, south of Freetown,
He was a blacksmith in his native village, and made hoes, axes, and knives; he also planted rice.  
He is married, but no children; he is a planter of rice . . .  
He was caught on the road when going to Taarang, in the Bandi country, to buy clothes; he is a planter of rice.  
He was taken in the night, and was taken a six days’ journey, and sold to Garlobé, who had four wives. He said with this man two years, and was employed in cultivating rice. His master’s wives and children were employed in the same manner, and no distinction made in regard to labor.  
He is a planter of rice, and never owned or sold slaves.  
He was caught in the bush by 4 men as he was going to plant rice; his left hand was tied to his neck; was ten days in going to Lomboko.  
He is a planter of rice . . . High mountains in his country, but small streams.  
He was taken while going to a town to buy rice.  
His parents are dead, and he lived with his brother, a planter of rice.  
He lived in a mountainous country; his town was formerly fenced around, but now broken down. He was seized by four men when in a rice field, and was two weeks in traveling to Lomboko.  
He was seized by two men as he was going to plant rice.10

During the eighteen months of the court case, the Amistad blacks learned some English and received religious instruction from members of the growing abolitionist movement. Among those concerned with their welfare was philanthropist Lewis Tappan, a founder of the New York Anti-Slavery Society, who formed a commission to help them. After the trial Tappan’s committee took charge of efforts to return the Amistads to Sierra Leone, where they had originally been enslaved and where many of them had been born.

In 1841 a fully provisioned ship set sail eastward across the Atlantic with the thirty-five surviving Amistads, the direction they had futilely sought two years earlier. They left forever behind “Merica,” the name they gave to the land that finally released them from bondage. Accompanying them were free blacks recruited in the United States, mostly ministers and teachers of African-American, African-Anglo, and African-West Indian heritage. The objective of the journey was to found an American missionary settlement in Sierra Leone with the freed Amistads. The settlement became known as the Mendi Mission, after the Mende language many of them spoke.11

Although the mission’s charter was eventually transferred from the American Missionary Association to the United Brethren in Christ (a church of American Protestants of German descent), its emphasis, like that of its predecessors, continued to focus on industry, thrift, and “civilizing” the Africans. The specific cargo carried with the Amistads is not mentioned in accounts drawn from secondary sources. However, agricultural implements and seeds were vital for establishing any Christian outpost in early nineteenth-century West Africa.

Seeds consequently figured crucially in the cargo of ships returning people of African descent from the Americas to West Africa. Whether the result of the Amistad voyage or of others sponsored by abolitionist and colonization groups, the Carolina gold variety of rice still being planted by slaves in South Carolina figured among the seeds introduced to West Africa during this period of black repatriation. In re-introducing the Middle Passage of their ancestors, freed blacks were returning to the land of their forebears with a crop that for hundreds of years had symbolized African identity in the Americas. We learn of this introduction of Carolina rice to the coastal region of Sierra Leone and Liberia via black settlers during Africa’s colonial period decades later, when French botanists discovered another link in Atlantic rice history.

Colonial rule led the French to establish a sizable empire in the western Sahel that included the northern half of the West African rice region. Interest in getting Africans to produce agricultural commodities cheaply for France led to the subsequent emphasis on cotton and peanuts for export. The widespread cultivation of rice on wetlands, ecologically complementary to a system of cash-crop cultivation with rainfall, awakened French botanists’ interest in rice. Eventually curiosity about the origins of rice varieties being grown in the inland delta of the Niger River in the French colony of Mali in the early twentieth century led to the first scientific discovery of African glaberrima. Other research involved experimentation with the diverse varieties found in the region. Among those reported by French botanists was one that local people variously referred to as “Mériké” and “Mérêké.” This rice variety thrived when grown under submersion in the deep-flooded conditions of the Niger River floodplain.12 Initially thinking it a desir-
able "indigenous" variety, French botanists began breeding experiments with “Méréki” during the 1920s. But research on this variety planted in the heartland of African rice domestication showed it was in fact not *glabrerrima* rice but *sativa*. Curiosity about its odd name caused French irrigation engineer and rice specialist Pierre Viguier to ask other officials about Méréki. He learned that the variety was already present in the region by the onset of colonial rule, with the first French botanical expedition reporting its existence in 1899. Viguier learned that this long-grained rice and other “new” seeds (eggplants and a variety of hot peppers) were said to have entered Mali from Sierra Leone via Guinea. Viguier corroborated the story through an English colonial official, M. A. Allnidge, who had reported in 1917 that indeed a “beautiful variety of white rice was introduced formerly and cultivated with success in Sierra Leone by American missionaries.” Known as Méréki, this varietal name proved in fact a corruption of the name America or American, in the same manner that the Amistads shortened the name of the country that granted them their freedom. The toponym Méréki referred then to the seeds’ arrival from the United States. Subsequent research by French botanists showed the grain’s remarkable similarity to, and likely provenance from, the Carolina gold rice seed, the variety prized on antebellum tidal plantations in South Carolina and Georgia.

Though fragmentary, this evidence suggests the possibility that Carolina gold arrived in Africa around the time that the Amistads returned to Sierra Leone. Whether this was the same voyage that carried Carolina gold to Africa remains unknown. One fact, however, is certain: the variety was first grown in Sierra Leone, where the Americans had established the Mendi Mission to settle the Amistads. The subsequent diffusion of Méréki from Sierra Leone established the variety over a broad part of the West African rice region into Guinea, the interior of Mali along the Niger River, and onward to the Ivory Coast, where it was reportedly still being grown in 1996.

The circle of rice history in the Atlantic basin thus closes with the introduction of the Carolina rice of U.S. slavery to Sierra Leone and the West African rice region via freedmen and Christian missionaries. Through another African diaspora, this one based on freedom and voluntary return to the continent by some of its descendants, Carolina rice reached into the heart of Africa all the way to the floodplains of the Niger River in Mali, where farmers domesticated *glabrerrima* rice more than two millennia ago. A cereal and a knowledge system that left West Africa on ships with slaves and became established in the Americas under bondage, returned once more to African shores in freedom through the agency of black missionaries, freed slaves, and recaptives. Known as Méréki, the rice drew its name from America, the continent of human bondage. But this time the history of those who brought it would not be forgotten.