

## Problematic Progress: Reading Environmental and Social Change in the Mekong Delta

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*Colonial engineers and administrators often referred to the pre-colonial Mekong Delta landscape as a vast solitude yet to be reorganised through their hydraulic technology. However, the environmental history of the Delta's waterways is more complex, suggesting that colonial projects were to some extent embedded within an existing infrastructure. This problematises the rhetorical concept of Progress within a colonial context and its value as a metaphor to understand human changes to the landscape.*

In 1930 the Governor-General of French Indochina, Pierre Pasquier, spoke at the inauguration ceremony for a new canal in the western Mekong Delta. French planners had designed the canal to improve transportation along the coast of the (then) Gulf of Siam between Rạch Giá and Hà Tiên; it was to carry fresh water into coastal lands seasonally inundated by salt water, one of a series of projects to expand settlement into the Long Xuyên Quadrangle (*Tứ giác*), a depressed floodplain covering more than 400,000 hectares between the Hậu Giang River and the Gulf. The Quadrangle is bounded at its corners by the towns of Long Xuyên, Châu Đốc, Hà Tiên and Rạch Giá. Pasquier used the opportunity to defend the colonial position in Indochina at a time when anti-colonial uprisings were mounting. He celebrated France's 'civilising touch' in these new works, which he took as evidence of the benefits of colonial rule:

What brighter proof of the continuity and benefit of our policies than this hydraulic management of Cochinchina, pursued since the first days of the conquest, continuing 60 years without pause to realize a plan that provides, by a network of canals extended by our engineers in the Mekong and Donai [*sic*] Deltas, development for the benefit of the Annamite [Vietnamese] people from these alluvial soils, heavy with silt, heavy with their future crops....

From the heights of one of these dredges, instruments of progress that have continued without pause through the forests of 'tràm' [malaleuca] and mangrove [*rhizophora*] – swamps that were inhabited until very recently by wild elephants .... Now they are opened up to the sun by these waterways, life-giving furrows traversing an uninhabited, uncultivated plain ... I would like to show this to all denigrators of the French work [*l'oeuvre française*], these immense expanses ... yesterday they were dismal, vast solitudes, but today they are rich patchworks, sumptuous *cloisonnés* in which the golds and emeralds of the peaceful fields are set as far as the eye can see ....<sup>1</sup>

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<sup>1</sup> Inspection Générale des Travaux Publics, *Dragages de Cochinchine: Canal Rachgia-Hatien* (Saigon: n.p., 1930), pp. 6-7; translation by the author.

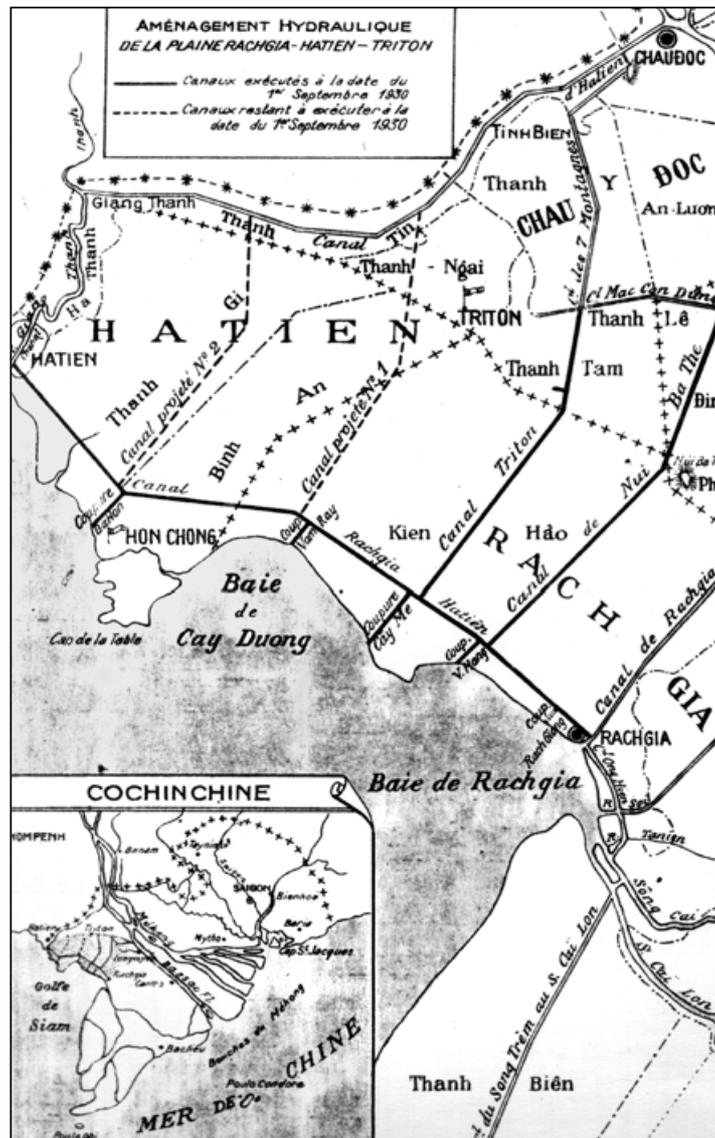


Figure One

**Vinh Tế Canal:** Waterway dug between 1819 and 1924 connecting the Mekong River to the Gulf of Thailand and forming part of the border between Cambodia and Vietnam.

**Seven Mountains:** Granitic mountain island in the middle of the territory and site of frequent uprisings against the French. It is not depicted on this map, but it lies north and west of the town marked 'TRITON' next to the Vinh Tế Canal.

**Ba Thê:** Smaller mountain outcropping, site of Oc Eo cultural site and third-century canal. Located at the bend in the 'Canal de Nui Ba The' and partially labelled with the Cambodian word for mountain, 'Phnom'.

**Hà Tiên:** Chinese-founded port (1714) and seat for the city-state that controlled the territory until 1771. Western terminus of the Vinh Tế Canal located on the Giang Thanh River along the border with Cambodia.

**Thoại Hà Canal:** Canal dug in 1816 and connecting Rạch Giá to the Mekong River at Long Xuyên. Here it is labelled 'Canal de Rachgia'.

**Rạch Giá:** Gulf fishing port and southern terminus of the Rạch Giá – Hà Tiên canal, here labelled as 'Canal Rachgia Hatien'.

This 1930 colonial map shows existing and projected canal projects in the Long Xuyên Quadrangle. The inset map shows the location of the Quadrangle with respect to the larger area and the two main branches of the Mekong River in the delta: Hậu Giang ['Bassac Fl.'] and Tiền Giang ['Mekong Fl.'].  
 Source: Inspection Générale des Travaux Publics, *Dragages de Cochinchine*.

Pasquier's speech conjures a familiar colonial image: European engineers and machines, etching straight lines through an unorganised, tropical landscape and creating an orderly canal network in its place. It is true that the colonial Public Works Department and its dredging contractor created many new canals and significantly changed the Delta landscape. Colonial statistics suggest rapid agricultural growth and environmental change during this period. From 1880 to 1930, the total volume of earth dredged in the Mekong Delta totalled 165 million cubic metres; this compares with 210 million for the Panama Canal and 260 million for the Suez.<sup>2</sup> These new canals drained large areas and complemented the demands from an increasing population of Viet (ethnic Vietnamese) farmers migrating in from the north. Cultivated land area rose from 200,000 hectares in 1879 to 2.4 million in 1929. This represented an increase from roughly 5 per cent to 60 per cent of the total surface area in the Vietnamese portion of the Mekong Delta.<sup>3</sup>

However, the Mekong Delta before the French works was not a 'vast solitude' in the colonial sense of a chaotic wilderness or a blank slate. The French conquered what was already a landscape that had been organised by others before them. The earliest known Delta settlements were concentrated in the Long Xuyên Quadrangle from 200 BCE. (Archaeologists group them into what is roughly described as the 'Óc Eo' or 'Funan' culture.)<sup>4</sup> Pre-Angkorian settlements continued here from the sixth to seventh centuries CE to the foundation of the kingdom of Angkor in the ninth century. The influence of the Angkor and Champa kingdoms diminished in the Mekong Delta following the Siamese army's victory at Angkor in 1431 and the Đại Việt (Vietnamese) defeat of Champa in 1471.<sup>5</sup> The Siamese and Vietnamese kingdoms expanded their influence to control respectively the Battambang-Tonle Sap (Great Lake) and the Đồng Nai-Sài Gòn areas. The Mekong Delta still remained under the nominal control and sparse settlement of the Cambodian kingdom while Siamese and Vietnamese settlers continued to clear lands on the western and eastern frontiers of Cambodia.

Vietnamese and Chinese settlers first migrated to the Mekong Delta from Biên Hoà in the 1600s. In the seventeenth and eighteenth centuries, they expanded rice paddy and built plantation-garrisons called *đôn điền* along large rivers and creeks. By 1810, the Vietnamese kingdom had established formal jurisdiction in the Delta through the administration of five military provinces. In 1820, a military governor, Nguyễn Văn

2 Ibid., p. 20.

3 Ibid., p. 25; *Development of farming systems in the Mekong Delta of Vietnam*, ed. Võ Tông Xuân and Shigeo Matsui (Hồ Chí Minh City: Hồ Chí Minh City Publishing House, 1998), p. 18. The total area of the Mekong Delta extending from Kompong Cham in Cambodia to the South China Sea is 5.9 million hectares, of which roughly 4 million are located in present-day Vietnam. The present-day boundaries almost exactly match those in the colonial and pre-colonial periods after 1800.

4 Perhaps still the most complete – though dated – discussion of the earliest inhabitants of the Delta is Louis Malleret, *L'Archéologie du delta du Mékong* (Paris: École Française d'Extrême-Orient, 1959). See vol. 1, pp. 27-33, for an excellent discussion of the evidence for ancient hydraulic infrastructure and pre-Angkorian settlements dating to 604 CE in the same area as present-day Châu Đốc and the Vĩnh Tế Canal. The archaeological and historical records do not yet offer much detail about the period between the eighth and roughly seventeenth centuries. The 'Óc-Eo Culture' is linked to an archaeological site located in the Mekong Delta along the important trading route between India and China. Ba Thê and other sites in the Delta include remains of stone foundations, Hindu statuary and traces of ancient canals that date from roughly the second to seventh centuries.

5 The kingdom of Champa occupied what is today the central and southern coast of Vietnam; it was gradually conquered and absorbed by successive Vietnamese rulers. Champa was an Indianised state with extensive trading and political relationships to the Malay world.

Thoại (often referred to by his noble title, Thoại Ngọc Hầu), started construction of the Vĩnh Tế Canal with Vietnamese and Khmer conscript labourers. The labour force at any given time numbered in the thousands. By 1836, the Court at Huế had established cadastral records for Delta villages. Emperor Minh Mạng reorganised the five military cantons into six regular provinces. Before the French assault on Đà Nẵng in 1858, the Nguyễn Court had also repelled Siamese incursions in the 1830s and 1840s, continuing to integrate the Delta into the kingdom.

With this quick sketch of the Delta's long history, how do we understand the effects of colonial projects in an environment where plans for infrastructure and land management were already being built? Assessing more recent political and environmental impacts requires not just a study on the individual colonial projects, but also an understanding of their place within a deeper context of social and environmental history implicit in the Delta landscape. The discursive implications of linking colonial works with pre-colonial infrastructure can be interesting. Could the French *oeuvre* – dredging canals and building the agricultural economy – be considered as an extension to the existing Vietnamese mode of human–environment interaction (with exceptions for new technologies)? To what extent was the colonial project a new work and to what extent was it simply a technical adaptation to the indigenous *oeuvre*? The same question might also be posed regarding the nineteenth-century Vietnamese projects and their Khmer and pre-Khmer predecessors. To answer these questions, we would have to determine what is meant in social and technical terms by French, Vietnamese or Khmer works in order to connect them to each other.<sup>6</sup>

Pasquier linked the colonial canal network to a rhetorical and ideological civilising work – expanding French civilisation physically and politically in new territory. While it is difficult, if not impossible, to know how Khmer and Vietnamese engineers might have envisioned their projects in societal terms, these pre-colonial and colonial projects did have a few common features: they were national (and sometimes international) projects intended to alter the local environment to better serve state economic and strategic needs. It is also true that large canals generally required significant investments of outside money, technology and labour, causing an in-migration of labour and military that had lasting effects on local society.

This process of national integration was more a concern for central governments than for local people. Concepts such as 'progress' and 'development' were applied by government figures such as Pasquier – administrators, engineers, planners – people who saw 'the big picture'. Whether or not conditions for the local area or nation improved as a result of the canal project depended on its effects within an historical and ecological matrix of intersecting social and ecological relationships. Public works such as canals should not be seen as ends in themselves, but as objects that realign existing ecological and socio-political relationships in a region. It is these relationships connected with the work, rather than the work in and of itself, that frame significant historical and environmental change as a result of public works. Locating a canal project in such a matrix of surrounding relationships also calls into question histories that represent the colonial state as the primary catalyst for environmental change in the Delta's recent past.

<sup>6</sup> Another more technical problem in studying historical waterways in such a densely settled place is that often new canals are dug along the traces of historic ones, thus making it very difficult to determine the extent of a pre-colonial, pre-Vietnamese, or pre-Angkor canal network.

The real effect of colonial technology and engineering can be better understood in its location into a landscape already shaped by ecological and social trends. Colonial technology was partly an adaptation to these conditions.

This essay examines in detail these ecological and social trends in pre-colonial and colonial canal projects to better assess their historical effects beyond inherently colonial concepts of 'progress' and 'oeuvre'. The works and environment discussed in this essay are located within one sub-region of the Mekong Delta: the Long Xuyên Quadrangle, notable for the number of ancient, pre-colonial and colonial canals crossing the area. One ancient canal stretches over 90 km from Rạch Giá to Ba Thê Mountain and Tak Ev in Cambodia. One of the largest pre-colonial projects, Vĩnh Tế Canal extends over 67 km along the western edge of the Quadrangle and forms part of Vietnam's border with Cambodia. The Rạch Giá – Hà Tiên Canal, site of Pasquier's inauguration ceremony in 1930, skirts the coastal edge of the Quadrangle.

### **Ecological relationships in the Quadrangle**

The Long Xuyên Quadrangle is a depressed floodplain averaging just a half metre above sea level and lying between the Mekong River and the Gulf of Thailand. The plain is punctuated by vertical granite and limestone outcroppings that form clusters of island-like mountains 200 to 300 metres high. These mountain groups extend from the Elephant Range in Cambodia to Phú Quốc Island in the Gulf of Thailand and Ba Thê and Núi Sập near Long Xuyên. Seven Mountains (Bảy Núi or Thất Sơn) is an important group close to the present-day frontier with Cambodia. The Vĩnh Tế Canal passes by the western base of these mountains. Ba Thê Mountain was an important centre for the area designated as 'Funan' in the third century; near its base is the trace of the ancient canal crossing the plain from Rạch Giá to pre-Angkorian temple complexes at Angkor Borei.

The Quadrangle floods annually at the end of the rainy season from August to November, when water levels in the Mekong rise almost three metres at Châu Đốc, where the river enters the lower Delta. Much of the floodwater here overflows into the Quadrangle and exits to the sea. In peak flood years, water completely covers fields and dikes, making it difficult to locate canal embankments. This annual flooding regime continues to the present day.<sup>7</sup> The history of settlement and hydraulic engineering depended largely on this pattern of monsoon floods. Until 1900, local people seasonally inhabited the floodplains to harvest floating rice, to fish and to hunt. Khmers typically built villages on the lower mountain slopes while the Viet and Chinese built villages and markets along the river banks and the coast. The year was divided into roughly six months of heavy rainfall and flooding and six months of intense sunshine and drought under a monsoon system which continues to influence agricultural work and water management at present.

7 Võ Tòng Xuân *et al.*, 'History and future of farming systems in the Mekong Delta', in Xuân and Matsui ed., *Development of farming systems*, pp. 16-80, provides an overview of the Delta's environment and agriculture. For listings of flora and fauna as well as good explanations of processes such as salinisation and acidification, see Birdlife International Vietnam Programme and Institute of Ecology and Biological Resources, *The conservation of key wetland sites in the Mekong Delta: Conservation report number 12* (Hanoi, 1999). The older monograph series entitled *Géographie physique, économique et historique de la Cochinchine* gives excellent introductions to general geographical and historical features for each province in French Cochinchina. For this article see in particular Société des Études Indochinoises, *Monographie de la province de Châu-Đốc* (Saigon: Imprimerie L. Ménard, 1902) and *idem.*, *Monographie de la province d'Ha-Tiên* (Saigon: Imprimerie L. Ménard, 1901).

With respect to canal construction, two other environmental factors are fairly constant: rapid formation of sediment bars in the channels, hogsback ridges (*dos d'âne*), and rapid colonisation of open water by floating aquatic vegetation. Hogsback ridges form when turbid river water full of sediment meets opposing tidal currents pushing upstream. As the water current slows to nil, silt is deposited. Sand bars form in places where the water current repeatedly is neutralised by tides. This combination of channel contour and shifting currents leads to the formation of hogsback ridges. Various technologies may reduce siltation, the simplest being to continually dredge the ridges. The Mekong Delta is also an ideal environment for floating masses of freshwater plants called duckweed or water hyacinth (*lục bình*). Europeans most likely introduced this plant from its native Brazil into the Delta during the increased contact in the eighteenth and nineteenth centuries.<sup>8</sup> Water hyacinth, along with some other native aquatic plants, grows extremely fast in tropical conditions and floats until it reaches stagnant water, where it can grow so densely that it traps sediment and forms mats where other plants can take root. The best means of preventing this vegetation build-up is to harvest the plant or trap it in nets at the mouth of a canal. This combination of sediment deposits caused by tidal influence and rapid tropical growth of aquatic plants creates a serious natural challenge to waterway maintenance, requiring continuous and laborious cleaning of channels to allow irrigation and transportation.

Water chemistry also varies considerably in the Mekong Delta. When soil with high organic content is rotated and exposed to air through such activities as building paddy dikes or dredging canals, the oxidation of the soil creates sulphuric acid ( $H_2SO_4$ ). Water runoff leaches this acid from the soil and consequentially lowers the PH of the water to levels unsuitable for rice. Intensive flushing of soils with fresh water reduces acidity, but in the Quadrangle, less than one metre above sea-level, such flushing is difficult to control. Depending on corresponding levels of river and sea, water currents in creeks and canals frequently reverse and thus swamp a field instead of draining it. Closer to the coast, saltwater inundates low-lying areas in the dry season when the pressure of river water exiting the canals is too low. This soil must also be flushed with fresh water for some weeks before it can be cultivated in rice. Much of the land in the Quadrangle still suffers from acidification, salt intrusion, flooding and the combined effects of siltation and aquatic plants on the waterways. Despite substantial changes to the hydraulic regime since 1930, these same problems continue to shape agriculture in the Quadrangle at the present time.

This ecological interface of coastal and river processes coupled with the low-lying topography of the Long Xuyên Quadrangle presents a severe limitation to rice agriculture and irrigation. Environmental conditions fluctuate from year to year and even day to day, but up to the present they have not changed terminally. In other words, there have been no serious dike or dam constructions upstream or geological shifts to alter the fluctuation of tide and flood. Canal builders in recent times have faced ecological challenges similar to those facing their predecessors.<sup>9</sup>

8 Phạm-Hoàng Hồ, *Cây cỏ Việt Nam: An illustrated flora of Vietnam* (Hà Chí Minh City: NXB Trẻ, 1999), vol. 3, p. 467.

9 With regard to environmental conditions before 1900, acid levels may have been much lower due to the significantly lower population density. If land is inundated with water and covered in vegetation for the entire year, then the soil does not oxidise and sulphuric acid is not created. The scant evidence

**Pre-colonial human relationships in the Quadrangle:  
creating a frontier (1700-1862)**

While the ecological relationships governing the Quadrangle remained fairly constant, the political relationships defining human settlement and economy changed often. Social and economic change from the early 1700s to the French conquest in 1858 meant that the region came to form a frontier between Vietnam and Cambodia, as is still the case today. Vietnamese settled the Quadrangle in the early 1700s, clustering their settlements along creeks and the rivers, especially on river islands (*cù lao*). Khmer inhabitants continued to occupy the island-like hills in villages (called *sóc*, derived from the Khmer word *srok*), where they farmed vegetables, tobacco and upland rice. Cham people had fled southwards to Cambodia from the central coast after the fall of their capital Vijaya to the Vietnamese (1471) and the consequent contraction of their kingdom to its southernmost provinces. They later established trading posts around Châu Đốc in the 1700s, and the Nguyễn Lord granted them settlement rights on the frontier in recognition of Cham support of Vietnamese campaigns against the Khmers. (Vietnam at this time was divided into northern and southern kingdoms, both nominally under the Lê emperors in Thăng Long, later Hà Nội. The territory from what is now southern Quảng Bình province south to the Mekong Delta belonged to the southern lords of the future Nguyễn imperial dynasty.)<sup>10</sup>

In 1714, Chinese *émigrés* fleeing the Qing regime established their own settlement at Hà Tiên. The Nguyễn Court granted their leader Mạc Cửu (Mo Jiu) this area in exchange for his loyalty and defence of Vietnamese sovereignty.<sup>11</sup> The Chinese planted pepper plantations on the surrounding hills and on nearby islands. Hà Tiên quickly profited from its coastal proximity to Delta rice fields and Cambodian forests, growing rich from the trade in pepper, ivory and fragrant woods that had been controlled by Angkor and its successors since the tenth century.

By the late 1700s, diverse ethnic groups inhabiting different terrains and different economic niches worked under the authority of Hà Tiên to create a semi-independent city-state. By 1770 Hà Tiên was an important commercial and political centre, attracting merchants to the port and Buddhist scholars to monasteries and shrines in the hills behind it. As Vietnam and Siam vied for influence over Cambodia in the second half of the eighteenth century, Hà Tiên's independence diminished. In 1757 Cambodia's King Ang Tong (known as Nặc Nhuận in Vietnamese) was overthrown by his son-in-law. Ang Tong commanded the guards to take Crown Prince Ang Tonn (Nặc Tôn) to Hà Tiên for Vietnamese protection; in return, Ang Tonn later ceded the western Delta frontier – an area originally known as Tầm Phong Long, later the Long Xuyên Quadrangle – to the

available suggests that before dense settlement in the twentieth century, much of the underlying soil in the Quadrangle would have been peat 1-3 metres thick caused by almost 2,000 years of intensive organic production and limited bacterial decomposition because of relatively constant inundation throughout the year. Without adequate drainage, however, early farmers would have also encountered acidification problems as newly formed dikes would leach acid upon contact with the air.

10 The Cham settlement at Châu Giang across the river from Châu Đốc became a key trading post for Malay merchants. As a result of contacts with Malays and Javanese, Cham in Cambodia converted to Islam, and the communities straddling the border remain orthodox Muslims, while some of the coastal Cham on the original territory of their former kingdom follow a more syncretic version of Islam.

11 See Nicholas Sellers, *The princes of Hà-tiên (1682-1867)* (Brussels: Thanh-Long, 1983) for an English-language study.

Nguyễn. A southern Vietnamese official, Nguyễn Cư Trinh, took this opportunity to expand his military presence from the garrison at Vĩnh Thành (Vĩnh Long) to new camps upriver at Châu Đốc, Tân Châu and Đông Khẩu (present-day Sà Đéc). With these three new garrisons, the Nguyễn nominally controlled trade and movement in the lower Mekong Delta.<sup>12</sup>

The pressures of Vietnamese and Siamese expansion converged in 1771 when Siamese forces under General Chakri (the future King Rama I, founder of the Bangkok Dynasty) invaded Hà Tiên, sacked the city, and chased its ruler Mạc Thiên Tứ (who held the post of Governor under the overlordship of the Nguyễn) to the Vietnamese camps at Châu Đốc and Tân Châu. Vietnamese soldiers from Vĩnh Thành eventually repelled the Siamese and retook Hà Tiên. This series of struggles between Siamese and Vietnamese forces continued periodically, effectively ending Hà Tiên's role as an important commercial port.

At the same time that Vietnamese troops faced military incursions from Siamese troops in the western Delta, the Nguyễn rulers in Huế faced their own civil war: the Tây Sơn Rebellion, which broke out in 1771 under the leadership of three brothers from the highlands – Tây Sơn was the name of their home village in western Bình Định province. In 1774 the Tây Sơn chased Lord Nguyễn Phúc Thuần and his army out of Huế to Gia Định (present-day Hồ Chí Minh City), then to Châu Đốc, and finally via the swamps of the Long Xuyên Quadrangle to Hà Tiên and Phú Quốc Island. Nguyễn Phúc Thuần died in battle three years later and was succeeded by his son Nguyễn (Phúc) Ánh. After several years of combat in the Mekong Delta, Nguyễn Ánh and his supporters took refuge in Bangkok with the newly crowned Rama the First. In 1787, with assistance from French mercenaries and supporters in Vietnam, the Nguyễn forces returned by way of Phú Quốc and the Quadrangle and fought their way north over the next fifteen years, finally recapturing the Nguyễn palace in Huế and defeating the Tây Sơn in Hà Nội. After unifying the nation in 1802, Nguyễn Ánh took the imperial title Gia Long and founded the Nguyễn Dynasty.

Given continuing Siamese efforts to expand their influence to the Mekong upriver from the Delta, the Nguyễn Court saw Châu Đốc as an ideal location to protect the Delta and prevent incursions from upstream, as it was approximately half way between Phnom Penh and Hà Tiên. Gia Long encouraged Vietnamese settlement of this far-western region by exempting newly cultivated lands from taxation. The interior of the Quadrangle was still sparsely settled – mostly dense swamp forest and flood plain. Vietnamese farmers followed the riverbanks and smaller creeks (*rạch*), digging irrigation ditches (*muong*) from these streams into their fields. Because of annual high floods in the area, they typically grew floating rice with long, fast-growing stems adapted to survive in rising flood waters.

In 1816, the Nguyễn Court ordered construction of a stone citadel at Châu Đốc to safeguard the southern frontier. Since the land had first been ceded to Vietnam in 1757, the Nguyễn had fought intermittently with Siamese and Cambodian forces to retain

12 Son Nam, *Lịch sử An Giang* [History of An Giang] (Long Xuyên: NXB An Giang, 1986), pp. 3-5. On the cession of territory, see Quốc sử quán Triều Nguyễn, *Đại Nam nhất thống chí* [Gazetteer of imperial Vietnam] (Huế: NXB Thuận Hoá, 1992), vol. 5, p. 158. See also Nguyễn Văn Hào, *Thoại Ngọc Hầu và những cuộc khai phá miền Hậu Giang* [Thoại Ngọc Hầu and the settlements of the Hậu Giang region] (Saigon: Hương Sen, 1972), pp. 229-33.

control of it. Generals Lưu Phước Tường and Nguyễn Văn Thoại served Nguyễn Ánh throughout the Tây Sơn rebellion. After taking power in 1802 as Gia Long, he sent these generals to the Mekong Delta to oversee campaigns there.<sup>13</sup> Lưu Phước Tường served as military governor at the Vĩnh Thành citadel (Vĩnh Long today). Under the emperor's orders, he recruited soldiers and labourers to build the citadel at Châu Đốc. Nguyễn Văn Thoại at this time served as one of the officials overseeing the Vietnamese protectorate at the Cambodian Court. He convinced the Cambodian ruler (allied with Vietnam) that the citadel would stabilise the region for the dual benefit of both countries. Thoại's influence at the Cambodian Court helped him recruit Khmer officers and soldiers into the Vietnamese army.

In 1817, Emperor Gia Long ordered Thoại and his troops to dig a canal from Đông Xuyên (Long Xuyên) to Rạch Giá. In the spring of the following year, with a force of about 1,500 labourers, he widened the existing Tam Khế River to Rạch Giá. The natural orientation of the river aided construction by flushing debris out quickly from the new basin. The new canal, renamed Thoại River (*Thoại Hà*), has remained a viable waterway to the present day. This work was the first major Vietnamese project to open settlement in the interior and facilitate communication with the port at Rạch Giá.<sup>14</sup>

Social relationships in the two centuries preceding French colonial conquest changed frequently. Political allegiances in the lower Delta shifted from the Khmer capital at Phnom Penh to Hà Tiên in 1714. After three decades of Siamese raids and civil war, the Long Xuyên Quadrangle's political autonomy was replaced with Vietnamese military garrisons commanded by generals such as Thoại. Rebellion and repeated Siamese invasions shaped the political landscape of the Quadrangle from a relatively prosperous city-state into a frontier lying at the limits of an expanding Vietnamese kingdom. The rivalries within the Cambodian royal family played an important role as Vietnamese generals forged alliances with Phnom Penh in their efforts to build up Vietnam's economic and defensive infrastructure.

The Vietnamese competed with Siam for hegemony in the Indochinese peninsula. This competition was played out in both kingdoms' claims on Cambodia as a weaker tributary; they conscripted Cambodian soldiers and through various tactics sought to shape Cambodian politics to protect their own economic and strategic interests along their frontiers. For the Cambodians' part, their kings acted to play one nation against the other in a delicate balance to preserve what autonomy and power they could. King Chan (r. 1806-35) had grown estranged from Siam and King Rama I in the years preceding his coronation. He increasingly relied on Vietnamese aid to protect his rule from potential upset by others in the royal family perhaps more sympathetic to the Siamese. In 1810-11, fighting broke out in Cambodia between Vietnamese and Siamese troops that ended in a stalemate but drove the Cambodian king further into Vietnamese protection. (The Thai in this conflict supported one of Chan's brothers, Duang, who wanted to claim the throne and in return become a vassal of Siam.) With Chan's success surviving the

<sup>13</sup> Ibid., p. 143.

<sup>14</sup> Ibid., pp. 167-79, and Trần Ban Hạnh, 'Les inscriptions de Thoại Sơn et de Vĩnh Tế', paper presented at the Premier Congrès International des Études Extrêmes-Orientales, Hà Nội, 1903; consulted in the Library of the Institute of Social Sciences, Hồ Chí Minh City. Given the extremely short time required to dredge this long and wide canal, it is possible that it had originally been dug much earlier, perhaps even as far back as the 'Funan' period. Because of the effects of dredging the bottom of the channel and the fairly dense settlement along the canal, it is difficult to determine whether it pre-dated the 1816 project.

Siamese attacks, Vietnamese officials assumed more direct control over Cambodian affairs and the frontier.<sup>15</sup> They garnered the support of Chan to conscript Cambodians into the Vietnamese army and to raise labour forces for new public works projects such as the Vĩnh Tế Canal.

#### **Construction of the Vĩnh Tế Canal (1819-24)**

Vĩnh Tế Canal was a bold strategic measure to aid Vietnamese settlement and water transport in the western frontier. The Siamese expeditionary forces in recent years had fought their way closer to the Mekong River at Stung Treng and Kratie. The canal served the dual purpose of protecting small outposts on the Delta coastline and encouraging Vietnamese settlement along the frontier. The land itself was not ideal for irrigation; had the choice been only about land, the canal builders would have probably preferred to expand existing networks closer to Saigon, Mỹ Tho and Vĩnh Long in the eastern half of the Delta. For Gia Long, however, the strategic benefits outweighed the tremendous costs.

After successful negotiations with King Chan in 1818 at Gia Định Citadel, Gia Long moved ahead with a plan for the waterway – stretching over 67 kilometres from Châu Đốc to the Giang Thành River and Hà Tiên Bay.<sup>16</sup> Dredging was difficult for many reasons: flooding, soil with high clay content, rock at the base of mountains, outbreaks of cholera and dysentery, and water shortages in the dry season. Estimates of the total labour force needed for five years vary from 50,000 to 80,000 labourers, with roughly 5,000 people working at any one time. Steles erected to commemorate Nguyễn Văn Thoại at Sâm Mountain near Châu Đốc list several thousand Vietnamese and Khmer workers who perished while working on the project. Thoại's assistants Nguyễn Văn Tuyên and Nguyễn Văn Tôn managed the dredging. Tuyên had previously served the Nguyễn fighting pirates and the Siamese, while Tôn was an ethnic Khmer born in Trà Vinh who quickly rose through the ranks of Nguyễn officers as an effective leader of Khmer troops. In 1818, he led his Khmer regiment to Châu Đốc to start digging but died from disease the following year.<sup>17</sup>

Work moved slowly with frequent stops due to weather, labour disputes and shortages of food or water. In 1822, Gia Long's successor Minh Mạng ordered the southern viceroy, Lê Văn Duyệt at Gia Định Citadel, to mobilise 39,000 people from all of the garrisons of the Delta, along with 16,000 people from Cambodia, to finish the remaining sections of the canal. Severe droughts at the end of the spring halted the works as most of the conscripts fled from severe food and water shortages. A final corps of 25,000 finished the last sections from 1822-4, linking Châu Đốc to Hà Tiên.<sup>18</sup> The canal was named Vĩnh Tế in honour of Governor Thoại's wife Châu Thị Tế, and Governor Thoại was bestowed with the noble title 'Thoại Ngọc Hầu' – *hầu* is usually considered the equivalent of a marquis – for completing the project. Following this work he returned to Cambodia to serve as a Protectorate Governor before his death in 1828.

15 David P. Chandler, *A history of Cambodia*, 2nd edn (Boulder, CO: Westview Press, 1992), pp. 118-23, gives a more detailed account of the increasing Vietnamese influence over Phnom Penh in the early 1800s.

16 Société des Études Indo-Chinoises, *Monographie de la province d'Ha-Tiên*, pp. 10-11.

17 Nguyễn Văn Hầu, *Thoại Ngọc Hầu* remains one of the best accounts of the construction, drawing on Nguyễn dynastic sources, inscriptions and several unpublished manuscripts; see pp. 181-211 for these events.

18 Ibid.

When finished, the Vĩnh Tế Canal opened up the coastal salt marshes to cultivation and linked the coastal settlements with garrisons on the river. Families of labourers and new immigrants followed the canal banks, clearing adjacent lands to lay title to new fields. The main canal and its branches required continual maintenance to prevent hogsback ridges and aquatic vegetation from choking transport on the canal. Permanent settlements provided labourers necessary to continually clean the canal basin. During the first nine years after the canal's completion, soldiers and farmers registered villages and *đôn điền* along its banks.

Social changes in the Vietnamese kingdom as well as continued external struggles with Siam led to the canal's deterioration by the end of its first decade, however, notably with the outbreak of the Lê Văn Khôi Rebellion. After Lê Văn Duyệt – the viceroy and *de facto* ruler of the southern provinces – died at Gia Định in 1832, Emperor Minh Mạng took the opportunity to reorganise the existing system of military cantons (*trấn*) into six regular provinces (*tỉnh*), which came to be known collectively as *Nam kỳ Lục tỉnh* (Six provinces of the South). He ordered newly appointed civil governors to take up posts in the new provincial capitals and dismissed many of the old military governors. The viceroy Duyệt had enjoyed strong popular support among the diverse population of Viet, Chinese and Khmer living in the Delta. When Minh Mạng refused to recognise Duyệt's adopted son Khôi as heir to his father's position, Khôi led a revolt against the Nguyễn Court lasting from 1833 until he died of illness in 1835; the rebellion ended in defeat the following year.<sup>19</sup>

Lê Văn Khôi sought Siam's assistance to repel the Nguyễn forces in the Delta and preserve his family's rule at Gia Định. Siam sent a naval force to seize the coast and five battalions across the Central Highlands to attack the Nguyễn army's rear flank.<sup>20</sup> While Siamese armies fought the Nguyễn forces in the mountains, naval fleets invaded by the Vĩnh Tế and Thoại Hà Canals. Siamese forces reached Vietnamese encampments at Phnom Penh and held these until 1835. They set up camps on the Vĩnh Tế Canal, and sporadic fighting continued until 1845, when the recognition of dual Siamese and Vietnamese suzerainty over Cambodia stabilised the situation.

Political relationships from the time of the Vĩnh Tế Canal's initial construction in 1819 to the French invasion in 1858-9 changed dramatically. Minh Mạng succeeded in his campaign to centralise control of landholdings in the western Mekong Delta, but the subsequent fighting and Siamese occupations of the Quadrangle led to the abandonment of villages and waterways by settlers and labourers during the successive waves of fighting, which generally weakened the region's ability to resist the French. By 1867 France had seized all of the six southern provinces and established the colony of Cochinchina under control of the Navy. The context of social relationships radically shifted from civil war and regional struggle to European conquest and a subsequent colonial administration organised in Sài Gòn and directed from Paris. Two hundred years of political negotiation among Siamese, Khmer and Vietnamese were now

19 An excellent historical study of Lê Văn Duyệt's life in Gia Định and the events following his death can be found in Hoàng Lại Giang's retelling of popular stories in *Lê Văn Duyệt: từ nắm mồ oan khuất đến Lăng Ông: truyện danh nhân* [Lê Văn Duyệt: from an unjustly scorned grave to an honoured tomb, the story of a famous person] (Hà Nội: NXB Văn hoá và Thông tin, 1999).

20 Sơn Nam, *Lịch sử An Giang*, p. 9. See also *Minh Mệnh chính yếu* [Essential policies of Minh Mạng] (Huế: Thuận Hoá, 1994), vol. 3, pp. 149-200, for an account of these events.

augmented (but not replaced) by shifting allegiances with and against the French.

As a Vietnamese *oeuvre*, the Vĩnh Tế Canal failed to spur lasting settlement or allow successful defence of the coast. One unintended purpose which it did serve was to demarcate Vietnamese territory in the Mekong Delta. After the colonisation of Cochinchina was completed in 1867, French surveyors followed Vietnamese cadastral records and the trace of existing waterways to determine the boundaries of their new colony with the kingdom of Cambodia (by then a French protectorate). What, then, led to the demarcation of the Vietnamese frontier – the canal or the French? It was the intersection of both the social relationships resulting from the French invasion and the pre-existing conditions of the altered natural landscape. Had the French not succeeded in their colonial conquest and the Vietnamese continued to fight the Siamese, the canal might have played no role whatsoever in determining contemporary borders. The creators of French Cochinchina, for their part, did not arbitrarily select boundaries to create their new state, relying instead on natural and existing political boundaries constructed by the Vietnamese before them. They read not only the natural landscape but also the pre-existing political landscape, establishing their provincial headquarters in old citadels and using canals and rivers as provincial boundaries. Earlier intentions of the Vietnamese kings to develop the area now were lost, but the physical and cadastral vestiges of their *oeuvre* transmitted certain configurations of physical and social space, which French engineers then incorporated into the political and geographical creation called *Cochinchine*.

#### **The French colonial regime in the Delta and the colonial dredging programmes**

The first stage of the French conquest lasted from their near-disastrous assault on Đà Nẵng in 1858 through their successful campaigns at Gia Định (Sài Gòn) in 1859 to Emperor Tự Đức's formal cession of the three eastern provinces (Đồng Nai, Biên Hòa and Gia Định) in 1862. Fighting continued in the three western provinces of the Delta until Vietnamese soldiers surrendered in 1867. From that point until a reorganisation of the colony in 1881, French Admiral-Governors focused their attention on improving navigation to allow more access for their gunboats.

The Vietnamese defeat in 1867 did not mean that fighting had stopped, especially in the Quadrangle. During the days of the Vietnamese surrenders at An Giang (Long Xuyên) and Hà Tiên, one local rebel, Trần Văn Thành, continued his organisation of anti-colonial forces in the region. Thành was a leader of a local religious movement called Bửu Sơn Kỳ Hương (Strange Fragrance from the Precious Mountain). This millenarian Buddhist movement was popular as a protective association for mostly illiterate farmers eager to protect themselves against the frequent violence and the outbreaks of cholera in the region. Thành and his group had fled during the recent siege to reorganise; they returned via the Vĩnh Tế Canal and picked up former royal troops who had refused to surrender to the French.<sup>21</sup> From 1867 to 1873, they led a rebellion in the lowland forest called Bảy Thưa between the Seven Mountains and the Hậu Giang River. Rebellions also broke out in the Plain of Reeds and other areas inaccessible to

21 Trần Thị Thu Lương and Võ Thành Phương, *Khởi nghĩa Bảy Thưa (1867–1873)* [The Bảy Thưa Uprising] (Hồ Chí Minh City: NXB Thành Phố Hồ Chí Minh, 1991), p. 72. For a detailed study of the Bửu Sơn Kỳ Hương, see Hue-Tam Ho Tai, *Millenarianism and peasant politics in Vietnam* (Cambridge, MA: Harvard University Press, 1983).

French gunboats. Until the 1890s, French marines frequently found themselves slowed by shallow waters and swamps. Without the aid of gunboats and heavy artillery, they were forced to fight on equal terms. Thus, the early dredging of canals was immediately important for colonial military campaigns and for re-establishing basic commerce in the region.

The first French dredging operations commenced in 1866 along existing waterways and rivers, but without lasting results. In 1875, Cochinchina Governor Admiral Duperré established a permanent commission to oversee the dredging of new canals in the Mekong Delta. Most of these early projects were small connective waterways between natural waterways such as the Vàm Cò River system and the Tiền Giang River or between the Tiền Giang and Hậu Giang. These projects extended the transportation network from Saigon to the Delta. Among these early canals were the Trà On (1876), Chợ Gạo or Duperre (1877), Set Say (1878), Phụ Tục (1878), Saintard (1879) and Mirador (1879). However, the combined natural forces of hogsback ridges and dense aquatic plants quickly choked off the new canals, rendering all but the Chợ Gạo Canal useless by 1881.<sup>22</sup>

In 1879 a naval hydrographic engineer, J. Rénaud, set out to determine the cause of the troublesome sandbars and to assess the possibilities for improving the system of waterway construction in the Delta. Rénaud and his crew visited many key waterways, including the Vĩnh Tế Canal, aboard a gunboat refitted for surveying. During the dry season in the spring of 1879, Rénaud's team surveyed the entire canal from Hà Tiên to Châu Đốc; they studied it in segments, measuring depth, width, currents and the channel contour. Rénaud described three major sandbars at Tinh Biên, Vĩnh Lạc and Vĩnh Diêu villages where hogsback ridges restricted navigation. Upon reaching Thoại Mountain, where Thoại Ngọc Hầu and his wife were entombed, the crew transcribed and translated the steles commemorating the construction of the canal. In his published report, Rénaud remarked:

After 12 years we have conquered this portion of Cochinchina without having maintained the considerable works of the Vietnamese and Cambodians. The diggings of Thoại are no longer navigable and plants clog the Vĩnh Tế Canal to the point that the water basin is no more than a stream where the boats can clear a passage only with difficulty. In continuing the work of civilization begun by the Vietnamese, to get in touch with the actual needs of commerce, we will fulfil the double goal that we have set for the populations of this province in distributing to them our benevolence and in creating for our colony a new commercial route, a new source of wealth...<sup>23</sup>

Rénaud and colonial administrators recognised Vĩnh Tế Canal as a potentially viable shortcut to the Gulf. Twelve years had passed since the conquest ended and still there was no action to improve this project. Rénaud recommended that the newly formed Colonial Council fund a project to rehabilitate the canal and Hà Tiên's harbour. The Council recommended the project as part of a larger public works budget to the Ministry of Colonies in Paris.

The *mission civilisatrice* might have dictated the restoration of existing works, but the new Ministry of Colonies did not agree. In response to the Council's proposal, they

<sup>22</sup> Inspection Générale des Travaux Publics, *Dragages de Cochinchine*, pp. 12-14.

<sup>23</sup> J. Rénaud, 'Étude sur l'approfondissement du canal de Vinh-té et l'amélioration du port d'Hatien', *Excursions et Reconnaissances*, 1 (1879): 66.

sent their chief engineer, Charles Combier, to assess proposed projects for Cochinchina. (The Ministry, not the Council, maintained executive power over colonial decisions, including the power to finance projects.) Combier spent several visits over a two-year period making detailed hydrographic calculations and cost-benefit analyses of proposed projects. His mission was best known for the uproar caused by his criticism of a proposed railway system in the Delta to be financed with tax proceeds from opium sales. The colony's own chief engineer, Thevenet, gave critiques of Combier's studies, arguing that the creation of a railway was the best way to wrest control of transport from Chinese and Vietnamese merchant networks. The debate found its way into the press back in France, highlighting important issues such as the sale of opium in the colony, the extent of metropolitan control over local affairs and the future role of the Colonial Council.<sup>24</sup> In essence, Combier favoured a more fiscally conservative approach, improving existing networks of transport at a lower cost to the colony rather than embarking on risky new ventures. For new projects, he recommended canals and roadways over railroads, but most importantly projects closest to Sài Gòn and Chợ Lớn. These events played a formative role in shaping colonial policy, with priority given to the colonial capital at Sài Gòn.

Combier reviewed Rénaud's calculations on the Vĩnh Tế Canal. He questioned the observation that there was a consistent difference in elevation of at least a half-metre between the river's water level at Châu Đốc and the mean high-tide mark at Hà Tiên. He pointed out technical difficulties in digging canals that opened directly to the sea and traversed such difficult soil conditions. Finally, he did not doubt that with further study, a technical solution could overcome these problems. Instead of denying the project on technical grounds, Combier assailed its economic basis. How would it benefit Cochinchina to have vessels from the Gulf of Siam passing easily through the Mekong Delta as a shortcut to China? In the interests of profit and protection of French economic interests, he recommended against improving the Vĩnh Tế Canal.<sup>25</sup> Combier focused on projects that would profit and protect the colonial centre; the canal served no strategic purpose, nor did it fit into French economic schemes. Twenty years after French conquest and sixty years after the canal's creation, colonial engineers and politicians abandoned it. This point in the canal's demise illustrates the importance of political relationships over works themselves in the environmental history of the Quadrangle. With Cambodia now under French influence and Siam reduced to negotiating its independence between the British and French, the canal was no longer strategically important. Colonial engineers as well as settlers shifted their attention to richer lands in the centre of the Delta and closer to Sài Gòn.

Despite the rejection of this project, Rénaud's and Thevenet's observations and measurements led to technical innovations that were employed in other canal projects to prevent the formation of hogsback ridges. One of these was the creation of a parallel

24 The Combier Mission and subsequent debates in the Paris newspapers are discussed in John Bassford, 'Land development policy in Cochinchina under the French' (Ph.D. diss., University of Hawai'i, 1984), p. 30.

25 Ch. Combier, 'Rapports présentés à S.E. le Ministre de la Marine et des Colonies sur les grands travaux projetés en Cochinchine' (1881), Folio 4-904(3), pp. 16-19; this document is in the Social Science Library, Hồ Chí Minh City. These three reports summarise Combier's position and describe in ascerbic detail his views on technical and policy issues in the development of new public works in the early years of the colony.

cleansing basin (*basin de chasse*) that diverted excessive tidal surges from the main canal channel; experiments on the Saintard Canal in 1893-4 proved the value of this technique. Following the colony's recovery from bankruptcy in 1887-90 and Thevenet's successful demonstrations of the *basin de chasse*, Governor-General Jean Marie de Lanessan in 1894 issued a call for bids on dredging contracts worth more than 12 million francs. Only one firm, Montvenoux, submitted a bid; it was then granted the contract. De Lanessan set a base price that would be paid per cubic metre of earth dredged. Département des Travaux Publics (DTP) engineers measured and estimated this volume independently of the contractor's daily records.<sup>26</sup> One of the biggest effects of a contract system was to establish the use of mechanical dredging and machines especially suited for local soil and water conditions. Montevenoux failed to overcome various technical and financial difficulties, and in 1900 the colony organised a commission to determine a new programme for canals. The Société Française Industrielle d'Extrême-Orient (SFIEO) bid on a new contract and absorbed the Montvenoux equipment into its new fleet of steam-powered dredges.

This period of SFIEO canal construction lasting from 1900 to 1929 was one of the most rapid dredging programmes at the time. SFIEO, along with DTP engineers, emerged as a powerful colonial institution in the Mekong Delta. Between 1900 and 1910 DTP and SFIEO, together with smaller work crews of roughly 1,000 labourers per project, constructed a number of key canals, especially in the Hậu Giang and Long Xuyên regions: Xà No (1903), Ô Môn (1908), Bassac-Cái Lớn (1908), and Quán Lo – Phụng Hiệp (1918).<sup>27</sup>

These technical and financial innovations in canal construction significantly changed relationships between capital, labour and nature connected to the creation of new waterways. The introduction and refinement of steam dredges significantly lowered the costs of dredging and, more importantly, it reduced the amount of physical human labour required. In 1928, after roughly thirty years of intensive migration from the northern Red River Delta, the Mekong Delta was still relatively empty as a rice-growing region in Asia. That year Nam Định Province in the northern Delta had a recorded population density of 594 people per square kilometre while Mỹ Tho province in the Mekong Delta had a population density of 148. In the Quadrangle the figure was roughly 71. An estimate for densities thirty years prior to the start of the dredging programme in 1894 ranged from 25-50 persons per square kilometre, suggesting that the Vietnamese settlement was significant but in no way yet matched the densities of the Red River Delta.<sup>28</sup>

#### **The Quadrangle during early colonial rule (1881-1911)**

Steam dredges saved political and economic costs associated mainly with the otherwise large force of labourers; they changed the costs of waterways. Thevenet's and Renaud's innovations in canal design reduced the ecological challenges from siltation. During this early period of colonial rule, however, few of the benefits from such technological innovation reached the Quadrangle. Despite continuous complaints from administrators living in the pre-colonial Châu Đốc and Hà Tiên garrisons, little changed

26 Inspection Générale des Travaux Publics, *Dragages de Cochinchine*, p. 16.

27 Ibid., p. 18.

28 Yves Henry and Maurice de Visme, *Documents de démographie & riziculture en Indochine* (Hanoi: Bulletin Économique de l'Indochine, 1929), pp. 10, 18.

along the banks of the Vĩnh Tế Canal. In the floodplains, farmers grew floating rice and fished. Most people from outside the area travelled to Long Xuyên, Hà Tiên and Châu Đốc by steamboat rather than the new colonial roads. In Hà Tiên, none of the roads were paved, while in Châu Đốc the main paved road along the lower bank of the Hậu Giang River was regularly flooded from August to November. Hà Tiên's primary cash crop remained pepper, while French *colons* unsuccessfully tried coffee and other crops on the hillsides. Châu Đốc's recorded population as of 27 December 1901 was:<sup>29</sup>

French (civilians)	44
Mixed (French citizens)	5
Foreign Europeans	9
Mixed ( <i>Indigène</i> )	5
Vietnamese (from Cochinchina)	107,672
Vietnamese (Annam and Tonkin)	362
Chinese-Vietnamese	1,944
Chinese	1,816
Cambodian	28,847
Cham (and Malay)	4,459
Indian	31
Garrison (French)	59
Garrison ( <i>Indigène</i> )	146
<b>Total</b>	<b>145,399</b>

Of the 275,876 hectares in the province, 24,039 hectares were planted in rice. Most Vietnamese paddies were located on alluvial islands between the two branches of the Mekong, which drained more predictably than the depressed plain and allowed cultivation of transplanted, short-stem rice. A total 17,397 hectares were forested, primarily around the Seven Mountains; the other lands were covered in reeds, grasses and brush. Farmers cultivated floating rice in large parts of the floodplain. Besides rice cultivation, the other primary occupation was fishing (including shrimp and shellfish), which employed 8,470 individuals.<sup>30</sup> The 1901 report listed just one European plantation in operation.

Downriver in Cần Thơ and Sóc Trăng Provinces during this same period, colonial engineers with crews of labourers and mechanical dredges began work on some of the largest projects in the colonial period, connecting the Hậu Giang to the Gulf coast and the Cà Mau Peninsula. Fields there were better drained and closer to local markets (Cần Thơ, Vĩnh Long, Mỹ Tho, Sài Gòn and Chợ Lớn). New canal projects stimulated real increases in land surface under cultivation, in resident population and in revenues. Engineers shelved work on the Vĩnh Tế Canal in favour of these more immediate projects, citing both economic and technical reasons. After fifty years of conflict between the Vietnamese and Siamese, followed by a half-century of French control, the canal continued to revert to swamp and marsh, failing to register as commercially or strategically important for the colonial government. Its continued deterioration was due not just to political reasons, but also to the intersection of natural and demographic

29 Société des Études Indochinoises, *Monographie de la province de Châu-Độc*, p. 46.

30 Ibid., pp. 25-34.

conditions with regional social and political factors. That the French would renew all pre-existing works as part of their *mission civilisatrice* was the political imagination of the time; colonial planners did not and could not separate a particular *oeuvre* on the landscape from its economic, environmental and political context. Vĩnh Tế Canal was a significant accomplishment by any standards, but its social and political context had changed.<sup>31</sup> There was no progressive logic at work here in the sense of a timeless commitment to building a greater civilising project out of barren landscapes and pre-existing works. Proponents of such ideas were repeatedly overruled by those acting on a case-by-case basis and facing more immediate economic and strategic concerns.

Despite the lack of interest in the Vĩnh Tế area on the part of the DTP and the colonial government in general, an administrator (provincial chief) in Châu Đốc developed his own dredging scheme to redevelop the old basin. Georges Lamarre wrote to the Governor in 1903 asking to open an account for voluntary donations to fund the purchase of a dredger for the province's own use. Citing the willingness of village leaders and landowners, Lamarre estimated that the population could raise enough money to buy their own dredger and thus speed up the improvement of the local irrigation system irrespective of the central government.<sup>32</sup> Governor Beau permitted the scheme but expressed reservations that donations filtered through local notables might not reach the account.

By August the following year, Lamarre had accumulated 56,500 piasters, roughly 60 per cent of what was needed for the purchase and delivery of a dredger from a Parisian firm. He corresponded with a French manufacturer on dredger designs and selected one he thought suitable for the proposed work; he then submitted drawings and corresponded with the DTP for assistance. The chief engineer advised against this purchase, however, citing the technical specifications needed to handle the soil and water conditions of Vĩnh Tế. High clay content required higher horsepower engines, and alternating high and low water levels required a more versatile dredging apparatus. Lamarre continued to argue the province's case, noting the insufficient supply of manual labour to dredge the channel, the incomplete quay and streets of Châu Đốc which needed fill, and the independent nature of the purchase. The Governor sided with the Chief Engineer, however, and the dredger was never purchased. (Archival records tell nothing further of the 56,500 piasters.)<sup>33</sup> The interesting feature of this proposed *oeuvre* was its local character: landowners – mostly Vietnamese – contributed funds to purchase what they referred to as 'our dredge'. The Chief Engineer explained that although Lamarre had raised funds to buy the dredger, DTP could not approve such a local programme on technical grounds; moreover, DTP and SFIEO had also planned for their own dredgers to repair the Vĩnh Tế Canal within a few years.<sup>34</sup> SFIEO

31 An interesting side topic worthy of further consideration would be the French attitude towards ancient monuments, especially Angkor Wat. They spent considerable resources to rehabilitate these monuments and various colonial sources speak about 'restoring Cambodia'. It can be argued that a more detailed analysis of colonial restoration of monuments at Angkor would show that it was the present-day context of the site as a tourist attraction that convinced colonial administrators to invest in its preservation, rather than a desire for continuity with earlier Khmer uses of Angkor as a religious and political city centre.

32 Letter from Georges Lamarre, Châu Đốc Administrator, to the Lieutenant-Governor of Cochinchina, 18 July 1903, National Archives of Vietnam No. 2, Fonds Goucoch, folio IA 19/244(4). All subsequent references to archival documents are from this collection.

33 Lamarre to Lieutenant-Governor of Cochinchina (Cabinet), 8 Aug. 1903, IA 19/244(4).

34 'Rapport par l'Ingénieur en Chef au Lt. Gouverneur relatif à l'achat d'un drague à vapeur pour la province de Chau Doc', 25 June 1904, IA 19/244(4).

would have been very reluctant to lower the contracted volume of work by allowing a local competitor to dredge there.

The planned work on the canal was delayed another ten years. In September 1914, during the highest waters of the rainy season, SFIEO sent two dredges to start work on the canal (Figure Two). Over the next few months, the *Nantes* dredged a section from Châu Đốc to kilometre 28 before encountering a mixture of clay soil and sandstone that halted its progress. On the Hà Tiên side, the *No. 1* stalled at kilometre 45 in 1.5 metres of water, and the enterprise discontinued work until 1915. Unexpected rapid decreases in the water levels at the end of the floods that year led to a second suspension of dredging the final 17 kilometres until the next high water season in 1916, when the remaining section was finally cleaned and work on the main channel was completed.<sup>35</sup> Settlement and land cultivation increased as further dredging projects in the 1920s extended the canal system into the interior of the Quadrangle. The completion of the Rạch Giá-Hà Tiên Canal in 1930 – the occasion for Pasquier’s comments on France’s civilising touch in the ‘vast solitudes’ of the Mekong Delta – opened up coastal lands for freshwater irrigation by flushing more fresh water into formerly brackish water estuaries.

#### Problems with progress

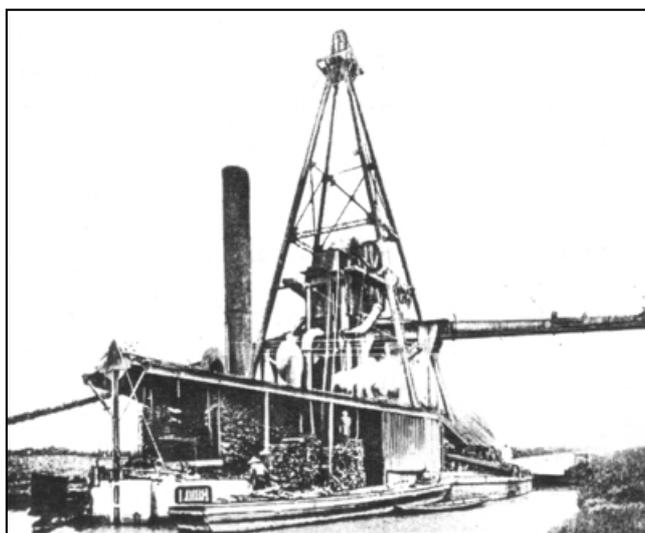
In the case of the Vĩnh Tế Canal and development of the Long Xuyên Quadrangle in the colonial period, ‘progress’ as an organising metaphor to understand the effects of colonial works is misleading. As a notion, ‘progress’ was partly born out of colonial rhetoric itself, with the suggestion by people such as Pasquier that individual public works were steps in some linear process to create a managed, modern landscape – converting wild swamps to peaceful, productive fields. However, while a new canal project may have immediately increased paddy production along its banks, in a more extensive ecological context it may also have destroyed existing paddy and the corresponding pre-canal hydrology in neighbouring areas. In the case of the Bassac-Cái Lớn Canal, finished downstream in 1908, one wealthy *colon*, Robert Labaste, sued the colonial government for 293,760 piasters. He claimed that he lost this sum from decreased productivity resulting from increased flooding caused by the new canal and that the productivity of his land had decreased from 120–200 *gia* (1 *gia* = 20 kg) per hectare to less than 30 *gia* during and after construction.<sup>36</sup> Inadequate understanding of local hydrology or rice cultivation often led to degradation of the existing agricultural regime.<sup>37</sup> It was only later, in the 1930s, that the French began to distinguish successful agricultural canals from transport canals; rarely could a waterway serve both needs well.

The term ‘progress’, then, is of doubtful value to designate changes in land conditions during this period. Even measuring quantitative progress would only be

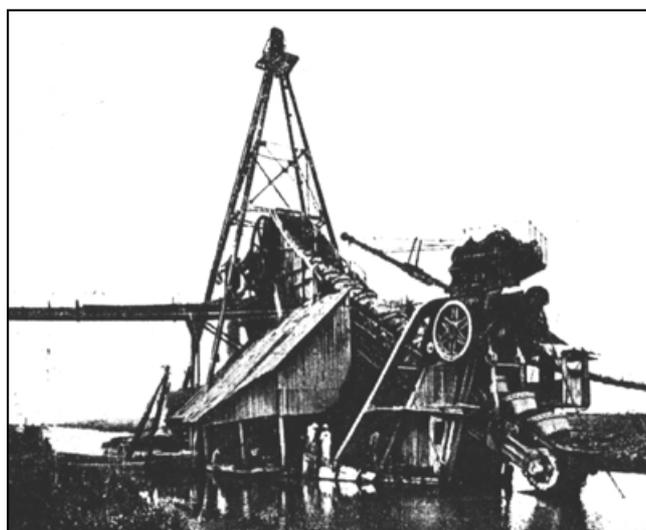
35 ‘Rapport de l’Ingénieur en Chef sur les travaux de dragage du Canal de Chaudoc à Hatien’, 22 Sept. 1915, IA 5/023(1).

36 Charousset, secretary of Thioller (lawyer in Sài Gòn) to Governor General, 22 May 1912, IA 19/244(4).

37 This conclusion is based mainly on reports of the situation after French dredging in the Phụng Hiệp and Ô Môn areas. New canals linking the Hậu Giang River with the Gulf destroyed the existing tidal pulsing of water through natural creeks and rivers, thus swamping traditional rice lands and reducing productivity from roughly 3000 kg/ha to 800 kg/ha, a drop of roughly 70 per cent. Evidence of these miscalculations in French projects can be found in the letters and reports of the Travaux Publics in the Vietnam National Archives; for the case of Phụng Hiệp, see complaints by villagers and *colons* in IA13/236(3).



Dredge *Loire*, front view.



Dredge *Loire*, rear view.

**Figure Two: Illustrations of a typical dredge**

Front and rear views of a dredge showing the chain-driven series of metal scoops in the front of the craft and the wood charcoal-burning steam-driven engine in the back. Long boom arms on either side carried dredged mud to the sides of the canal. This mud formed canal levees and today supports much of the road network in the Delta. The *Loire* and the *Nantes* used in the Vinh Té canal in 1915 were of the same type, used in large canals with shallow waters.

*Source:* Inspection Générale des Travaux Publics, *Dragages de Cochinchine*.

possible in locations where selected indicators – agricultural yields, water quality, individual wealth or biodiversity – could be traced and contained within a relatively closed system. Even on individual parcels, soil and productivity changed from year to year depending on cultivation techniques and neighbouring influences. Irrigation agriculture and aquatic ecosystems were not closed systems; they constantly depended on neighbouring conditions.

As a metaphor in historical writing, ‘progress’ is closely linked to its use in colonial rhetoric. Like nationalist narratives, progressive narratives on colonial public works may ignore the role of the pre-existing conditions within which these projects were located. In a recent essay, Keith Taylor argues that histories of nations as uniform experiences often neglect or suppress local differences, which are silenced in an effort to present the nation as one complete object.<sup>38</sup> The same situation applies to environmental histories that begin by assessing history limited to the colonial *oeuvre* itself without considering how pre-existing ecological and social relationships shaped the conditions in which people located that work. The mistake in accepting object-oriented narratives in historical writing is that, like the nationalist histories characterised by Taylor as focusing on the nation-as-object, they silence important social and ecological relationships that may precede and succeed the life of the project.

Unlike the tangible solidity of a canal (or bridge or road), ecological and social relationships are invisible, and thus more difficult to define. The terms of their existence are a subject of open debate, whereas a canal is proof enough of its own existence. Yet these perceived relationships in ecology and society frequently determine the lifetime of a work and its continuing utility for such tangible things as increasing food supply, allowing people to move freely and quickly, establishing towns, etc. These external relationships also give a work its meaning. Migration from the densely settled Red River Delta to the Mekong Delta, for example, has been one of the most significant factors affecting irrigation projects in the latter region since 1600. Despite all the upheavals from colonial conquest to the Indochina Wars, Vietnamese farmers from the north have continued to migrate to the Delta. The historical and economic relationships among Thai, Vietnamese, Chinese and Cambodians doing business there have also persisted while the memory of French dredges and *colons* fades. Ecological relationships, while difficult to define scientifically, provide visible signs of improvement or deterioration with respect to canal projects – water chemistry, vegetation and soil fertility, for example.

If environmental history is to inform these more complicated problems surrounding public works infrastructure, then it has to address the invisible relationships interwoven into the Delta landscape. Historical commemorations of the work itself may serve rhetorical purposes to glorify the actions of engineers, politicians and labourers; but unless these histories connect to conditions surrounding the work, they can be of only limited use. The progressive narrative, rooted in colonial ideas of machines and *oeuvre* turning blank-slate wilderness into ordered landscapes, distorts our understanding of the Delta’s past as well as its present. It reduces the intellectual focus from a dynamic matrix of historical and ecological forces to a simple icon – the *oeuvre* itself.

38 Keith W. Taylor, ‘Surface orientations in Vietnam: Beyond histories of nation and region’, *Journal of Asian Studies*, 57, 4 (1998): 949-78. Taylor suggests that we consider historical surfaces as bounded historical experiences limited to place and time that often conflict with more epic narratives. Such surfaces, he argues, give a pluralistic voice to those experiences that have differed (and perhaps did not survive) the present nationalist views of the past. The resulting history takes a less linear shape but is more accurate in its inclusiveness of the various connected and disjunct local stories. This essay borrows his idea and applies it to environmental history, looking at an actual surface of land in Vietnam and examining the contours of its history.