

YELLOW FEVER IN THE 1790s: THE BRITISH ARMY IN OCCUPIED SAINT DOMINGUE

by

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IN THE Caribbean and on the North Atlantic seaboard, 1793–98 were years of notably high mortality, the result of a pandemic of yellow fever spread by the great population movements caused by revolution and war. In the West Indies, as in Philadelphia—but far more strangely—the disease was often treated as a ghastly novelty. Fifty thousand British soldiers and seamen are said to have died in the West Indies in this period and an equal number had to be discharged as invalids.¹ The forces which for five years occupied the French colony of Saint Domingue are remembered for having suffered particularly disastrous losses. However, although there is still no cure for yellow fever, scholars nowadays stress that it is not usually a high-fatality disease.² While revising some well-known mortality estimates and comparing British and French modes of treatment, this paper looks at the public reaction to the pandemic of the 1790s and at the experience of the troops in Saint Domingue in an attempt to establish how exceptional such losses were and exactly why they were so severe.

I. YELLOW FEVER IN THE WEST INDIES

It is not entirely clear how unusual outbreaks of yellow fever were in the eighteenth-century Caribbean. Relying only on contemporary clinical descriptions, one cannot be sure. The eighteenth-century mind tended to confuse one fever with another and medical men were especially contradictory on the subject of “yellow” fever. Historians, however, mostly agree that the disease was introduced into the West Indies from Africa in the 1640s and that thereafter it enjoyed a spasmodic history, appearing as epidemics of the “black vomit fever” or *maladie de Siam*.³

Yellow fever begins with lassitude, a sudden headache, and burning fever. It can vary greatly in severity, but in “classic” cases the eyes become inflamed, nausea is experienced, and pain in the muscles and back. The pulse is initially high but falls as

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¹ Sir John Fortescue, *History of the British army*, 13 vols., 2nd ed., London, Macmillan, 1910–30, vol. 4, p. 565. The “160,000” in Sir Neil Cantlie, *History of the Army Medical Department*, 2 vols., Edinburgh and London, Churchill Livingstone, 1974, vol. 1, p. 230, is a misprint.

² George K. Strode (editor), *Yellow fever*, New York, Toronto and London, McGraw Hill, 1951, pp. 397–398, 422; note 40 below.

³ Harold H. Scott, *History of tropical medicine*, 2 vols., 2nd ed., London, Edward Arnold, 1942, vol. 1, pp. 279–453; Henry Rose Carter, *Yellow fever: an epidemiological and historical study of its place of origin*, Baltimore, Williams & Wilkins, 1931, *passim*.

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compulsive vomiting sets in. Jaundice and delirium may appear, but its most characteristic symptoms are a falling pulse accompanied by continued high temperature, the vomiting of partly-digested blood and, in the later stages, generalized haemorrhage. It is not contagious, and survival of an attack gives immunity for life. Unfortunately, its clinical resemblances to pernicious tertian malaria, viral hepatitis, and several other fevers, makes it difficult to diagnose even nowadays. Even so, after considering all the clinical and epidemiological evidence, one may be fairly certain that the grisly descriptions of the “St. Domingo Remittent” published during and after the occupation generally refer to yellow fever.⁴

Robert Jackson and Hector McLean, who served as Assistant Inspectors of Hospitals with the British forces in Saint Domingue, realized that jaundice was not necessarily present in an attack and that it also occurred in other diseases, as did occasionally the vomiting of altered blood. While stressing the appearance of haemorrhage and black vomit, they both noted the fall in the pulse, the reversion from constipation to diarrhoea, the coated tongue with bright red edges, and other significant symptoms. They also remarked how the symptoms changed on the third day. The disease occurred all year round but principally from May to November. It was largely confined to the ports. Typically affected were young men recently arrived from northern climates. It was neither contagious, nor amenable to treatment with cinchona bark, and rarely occurred twice, they thought, in the same person. Yellow fever is the obvious diagnosis. It is true that McLean insisted that the disease was different from the one that ravaged Philadelphia in 1793, now acknowledged to have been yellow fever, but quite clearly he was misled by reports that it was contagious.⁵

The epidemics that spread through the Caribbean were similarly often thought to be contagious.⁶ When death rates were high and the disease appeared to have been imported, it was a logical deduction to make for men, dissatisfied with “climatic” explanations of epidemic fevers and over-inclined to assimilate them to typhus. Moreover, urban yellow fever tends to be localized; its vector, *Aedes aegypti*, rarely travels over 100 metres. Hence, one can see how such a confusion might take place. More surprising, the disease was often regarded as something horribly new. It was claimed, in fact, that until the Port au Prince outbreak of June 1794, yellow fever was known in Saint Domingue only by name.⁷ This might make one think that either this disease or its antecedents were not actually yellow fever. Yet, it was everywhere observed that “Seamen and Strangers” proved far more vulnerable to it than did colonists. West Indian-born whites and other long residents suffered little more than the black and coloured population, which generally escaped infection.⁸ Curiously,

⁴ Robert Jackson, *Outline of the history and cure of fever endemic and contagious*, Edinburgh, Mundell & Son, 1798; Hector McLean, *Enquiry into the nature and causes of the great mortality of the troops at St. Domingo*, London, Cadell & Davies, 1797; William Fergusson, *Notes and recollections of a professional life*, London, Longmans, 1846, pp. 142–161.

⁵ McLean, *op. cit.*, note 4 above, preface, pp. 73 and 137.

⁶ William Wright, *Memoir of the late William Wright M.D.*, Edinburgh and London, William Blackwood, 1828, pp. 371–375; Colin Chisholm, *Essay on the malignant pestilential fever*, London, C. Dilly, 1795, pp. 93–103; Alexandre Moreau de Jonnés, *Monographie historique et médicale de la fièvre jaune des Antilles*, Paris, Migneret, 1820, pp. 83–85.

⁷ Pierre-François Venault de Charmilly, *Lettre à M. Bryan Edwards*, London, 1797, p. 165.

⁸ Wright, *op. cit.*, note 6 above, pp. 371–375; Chisholm, *op. cit.*, note 6 above, pp. 93–102; William

we find the same phenomenon in the Cartagena outbreak of 1729—local inhabitants largely immune, yet adamant they had never before encountered the disease.⁹

It was in the south Caribbean that the great epidemic of 1793 first took hold. The French troops sent to Saint Domingue in 1792 to put down the slave rebellion had suffered very severe losses from disease, and at the end of the year, sickness was also said to have reached exceptional levels in the Jamaica garrison. However, these outbreaks attracted little attention and their cause remains unknown. In March 1793, a “malignant, pestilential fever” of novel appearance broke out in Grenada, possibly introduced by a ship from Boullam in West Africa.¹⁰ Whether the fever was really spread by shipping has been hotly disputed, but it soon appeared in neighbouring islands and in May was seemingly carried north to Jamaica. Not till October, however, when some thought it was re-introduced by sailors, did it really begin to spread there. After disappearing for five months, it returned with renewed violence in the summer of 1794. In the Island Hospital, “fever” case fatality was as follows: 1791, seventeen per cent; 1792, fourteen per cent; 1793, fifty-three per cent; 1794, fifty-nine per cent.¹¹ At first, some Jamaicans thought it to be the plague; some, an entirely new disease; others, “a severe version of the common remitting fever of this isle”. Only in mid-1794, after much acrimonious debate, were doctors identifying it as the *synochus putris* or “the yellow fever of the West Indies”.¹²

When British troops landed in Martinique in June 1793, they stayed on shore only forty-eight hours, but immediately contracted a “putrid” fever which revealed itself on the return voyage.¹³ Refugees from Martinique already seem to have carried the disease to Dominica and Barbados, where by October it had killed 500 and 300 whites respectively.¹⁴ In July, as is well known, a great epidemic was started in Philadelphia by refugees fleeing from Saint Domingue, or, more likely, by mosquitoes in the ships they sailed in; over 4,000 died in four months.¹⁵ At the same time, “calenturas putridas, malignas, de toda especie” destroyed the Spanish battalions guarding the Santo Domingo frontier.¹⁶ Nevertheless, only in June 1794, it was

Lempriere, *Practical observations on the diseases of the army in Jamaica between the years 1792 and 1797*, 2 vols., London, T. N. Longman, 1799, vol. 2, pp. 22–28; notes 10 and 12 below. There were two exceptions. In Dominica there perished hundreds of refugees from Martinique, black and white: Moreau de Jonnés, *op. cit.*, note 6 above, p. 84. In the autumn of 1794, almost the entire population of the Bahamas was stricken with fever and many died: Public Record Office, London, (hereinafter: P.R.O.), WO 1/62, p. 455.

⁹ Noah Webster, ‘Letters on yellow fever addressed to Dr. William Currie’, *Bull. Hist. Med.*, supplement no. 9, p. 38.

¹⁰ Chisholm, *op. cit.*, note 6 above, *passim*; Webster, *op. cit.*, note 9 above, pp. 39–46.

¹¹ *Royal Gazette* (of Jamaica), 1793, no. 4, p. 19; 1794, no. 6, p. 20; and no. 32, p. 20; Lempriere, *op. cit.*, note 8 above, p. 98. In Port Royal naval hospital, fatality in “fever” cases, excluding “intermittent fever”, totalled forty-one per cent in 1794: P.R.O., ADM 102/426, hospital register. In 1741–42, yellow fever case fatality in the same hospital was reckoned by the surgeon to be nearly twenty-five per cent. He said it was greater in military hospitals: *Letters and essays on the smallpox . . . the yellow and remitting and intermitting fevers of the West Indies . . . by different practitioners*, London, J. Murray, 1778, p. 242.

¹² *Royal Gazette*, 1793–94, *passim*; Lempriere, *op. cit.*, note 8 above, vol. 2, pp. 44–54.

¹³ P.R.O., CO 318/11, p. 290; Chisholm, *op. cit.*, note 6 above, p. 129.

¹⁴ *Royal Gazette*, 1793, no. 41, p. 23, and no. 44, p. 20.

¹⁵ J. H. Powell, *Bring out your dead*, Philadelphia, University of Pennsylvania Press, 1949, *passim*.

¹⁶ Antonio del Monte y Tejada, *Historia de Santo Domingo*, 4 vols., Santo Domingo, Amigos del País, 1890, vol. 4, pp. 49–81.

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claimed, did *la fièvre jaune* first reach Saint Domingue, introduced by troops from the fever-ridden army in Martinique.

This clearly cannot be true.¹⁷ Some contemporary geographical works did class Saint Domingue, unlike Jamaica and Martinique, as salubrious, but Moreau de Saint-Méry and other colonial writers leave one in no doubt that the haemorrhagic *maladie de Siam* had already had a long history in the colony.¹⁸ More important, under the occupation the colonists seem to have been immune, despite some evidence to the contrary, to the disease that decimated the British forces, just as the refugees who caused the outbreak in Philadelphia rarely fell victims to it themselves.¹⁹ Although there may have been a high death rate among recently-arrived colonists, it cannot be doubted that most *habitants* had had prior experience of yellow fever.

“Contagionist” arguments for the origin of fever often concealed an element of *parti pris*. No one wished their own town to be branded a source of deadly infection. Disease, therefore, had to be shown to be imported. Moreover, West Indians who traced the Grenada outbreak to the Boullam expedition were only too happy to discourage rival colonizing ventures in West Africa which were supported by anti-slavery interests.²⁰ Similarly, it was precisely those colonists who had brought the British into Saint Domingue who said yellow fever was not previously known there. Nonetheless, though they had good reason to lie, their statements need not be dismissed as fabrications. As noted already, a great many who experienced the epidemics of the 1790s had difficulty relating them to any previously-known disease. The dramatic impact of the 1793–94 pandemic and contemporary confusion as to exactly what was yellow fever can best be explained if one examines its previous history in the West Indies.

Epidemics of yellow fever had been at their most common in the Caribbean in the period 1690–1770, when the proportion of non-immunes in the population was assuredly at its highest. They tended to appear in areas of most rapid development—at first in Barbados, then Martinique, Saint Domingue, in the 1730s and 1740s, the Guianas and Windward Isles in the 1760s, Cuba somewhat later. However, it is important to realize that few outbreaks have been recorded in the two decades after 1770, especially among civilians.²¹ Dr. William Wright practised in Jamaica during the years 1764–77 and 1783–86 without ever, it seems, encountering the disease.²²

¹⁷ British troops entered Port au Prince on 4–5 June. We do not know when the epidemic began there but, as the sick reinforcements arrived from Martinique on 8 June, it must have been soon after for a causal connexion to have been presumed. However, if infected mosquitoes brought by the reinforcements transmitted the yellow fever virus, it would not have become apparent for at least three to six days, because of the incubation period. If the sick troops themselves were the source of the infection, it would have taken two weeks.

¹⁸ M. L. E. Moreau de Saint-Méry, *Description de la partie française de l'isle Saint Domingue*, 3 vols., Paris, Société de l'histoire des colonies françaises, 1958, first published 1797, vol. 2, pp. 672–673, 721–722, 1067, 1116; vol. 3, p. 1187; Pouppé-Desportes, *Histoire des maladies de Saint Domingue*, 3 vols., Paris, 1771, vol. 1, pp. 191–193.

¹⁹ Fergusson, *op. cit.*, note 4 above, p. 151; Edward Bancroft, *Essay on the disease called yellow fever . . .*, London, Cadell & Davies, 1811, pp. 350 and 372.

²⁰ Webster, *op. cit.*, note 9 above, pp. 42–46.

²¹ See the data in August Hirsch, *Handbook of geographical and historical pathology*, trans. from the German 2nd ed. by C. Creighton, 2 vols., London, New Sydenham Society, 1883, vol. 1, pp. 229–315; and in Scott, *op. cit.*, note 3 above, vol. 1, pp. 324–332.

²² Wright, *op. cit.*, note 6 above, p. 104.

Though medical historians have generally assumed otherwise, it was probably malaria rather than yellow fever that decimated the British expeditions sent to Havana in 1762 and San Juan in 1781.²³ In Saint Domingue, Moreau de Saint-Méry implied, the disease had become fairly unusual by 1790. Both there and in Jamaica it was believed to affect only newcomers.²⁴ What is more, it seems to have become less virulent. With a remarkably felicitous choice of metaphor, an early nineteenth-century writer described the years 1773–93 as follows: “les germes de la fièvre jaune demeurés latens, dans les lieux qu’elles avaient infectés, se développèrent pendant cette période, quand des circonstances favorables le leur permirent; mais il parait que . . . la maladie . . . dans le cours de ces vingt années devint aux Antilles, sporadique, individuelle, lente dans sa marche, et incertaine dans ses effets meurtriers”.²⁵

One might assume, therefore, that yellow fever had become both less virulent in this period and effectively endemic. Local inhabitants must have acquired immunity in childhood or shortly after arrival in the Caribbean, often through a very mild or inapparent attack. It thus did not, as some historians have thought, appear solely in epidemics, disappearing for many years at a time.²⁶ The disease was probably maintained through the regular introduction of infected mosquitoes by slave ships from West Africa or by shipping from other infected areas.²⁷ Given the presence of infected *aegypti*, the incidence of yellow fever is determined mainly by the proportion of non-immunes in a population and their physical proximity. Since infection can be spread only by non-immunes in the early stages of an attack, the relation between incidence of immunity and of infection is more geometric than arithmetic—hence the disasters that befell European armies crowded into Caribbean port towns in wartime. In the late colonial period, though the influx of newcomers was great, they were absorbed piecemeal into a largely immune population. Moreover, a growing percentage of them went to work on coffee plantations in the mountains far from the towns that were the foci of infection. These factors ensured that new arrivals did not become infected *en masse*. At the same time, increasingly frequent contacts with West Africa, as the slave trade reached its peak, ensured they did, in time, become infected. By postulating a low level of endemicity, one may thus account for both the decreased incidence of yellow fever epidemics and the immune status of the resident population during the 1770s and 1780s.

²³ See Thomas Dancer, *Brief history of the late expedition against Fort San Juan*, Kingston, Douglass & Aikman, 1781, p. 20n; Francis R. Hart, *The siege of Havana*, Boston and New York, Houghton Mifflin, 1931, pp. 32–33. Note the rural environment and predominance of “intermittent” fevers.

²⁴ Moreau de Saint-Méry, *op. cit.*, note 18 above, vol. 2, p. 673; Robert Jackson, *Treatise on the fevers of Jamaica*, London, J. Murray, 1791, p. 250; Pouppé-Desportes, *op. cit.*, note 18 above, vol. 1, p. 192.

²⁵ Moreau de Jonnés, *op. cit.*, note 6 above, p. 83. Cf. Jean Devèze, *Traité de la fièvre jaune*, Paris, A. Comte, 1820, pp. xxx and 44–45.

²⁶ Cantlie, *op. cit.*, note 1 above, vol. 1, p. 231, states there was “no yellow fever” in Saint Domingue between 1763 and 1793. Carter, *op. cit.*, note 3 above, pp. 66–67, was probably also wrong to think it entirely disappeared from the Windwards in the 1770s and 1780s. He ignored evidence of local immunity and relied too much on Chisholm’s biased account.

²⁷ The cases of the Bahamas and Martinique, mentioned above, note 8, could be explained in terms of their very low slave imports. Monkeys, the main maintenance host of the yellow fever virus, are not found in the West Indies outside Trinidad.

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More difficult to explain is why the disease became less virulent. It may be that decreased incidence of itself led to decreased virulence. As the virus cannot be transmitted from mosquito to mosquito, fewer infected humans at any given moment also meant fewer infected mosquitoes. The chances of infection resulting from the bite of only one mosquito, rather than of many, were thus increased and, therefore, it could be argued, the prospects of acquiring immunity via a mild or inappreciable attack. This might seem a likely hypothesis, given that cases are usually more severe in epidemic than endemic situations and yet vary considerably within those situations.²⁸ However, experiments with monkeys have so far failed to reveal a marked correlation between initial dosage of virus and the severity of an attack.²⁹

Alternatively, it could be that different strains of the yellow fever virus, although producing cross-immunity, vary greatly in virulence.³⁰ In the decades before the Revolution, the strain prevalent in the Caribbean could have been of a mild variety, sometimes described as “yellow fever”, sometimes as a type of “common remittent”, which nevertheless rendered its victims immune against other more fulminating varieties known earlier in the century and which regained prevalence in the 1790s. Interestingly, both Dr. Jackson and William Lempriere observed that the “common remittent” of Jamaica tended to produce immunity against “yellow fever”.³¹ Thus, it might not have been without reason that most doctors in Jamaica and those tending the British troops in Saint Domingue considered “yellow fever” to be merely an “aggravated” form of the “common remittent”.³²

It is not clear how far the epidemics of the 1790s were actually spread from island to island and how far they resulted simply from an influx of non-immunes. In the first case, the idea of a particularly deadly strain of virus is peculiarly apposite; in the second, it is superfluous. Whether or not the virus was unusual, the pandemic was doubtless intensified by the movements of refugees and soldiers from island to island which increased the circulation of infected men and mosquitoes.

Greatest stress, however, should be laid on the wartime influxes of non-immunes and their dense concentration. One cannot agree with Cantlie that “it was only a tragic coincidence that the pestilence reappeared”.³³ What is more, the great inflow of soldiers and seamen, their wives and children, prisoners of war, military contractors and their clerks, doubled the white population of many West Indian towns.

²⁸ George Augustin, *History of yellow fever*, New Orleans, Searcy & Pfaff, pp. 1052–1054, concluded that virulence was determined by the number of bites, after observing how the gradual eradication of mosquitoes from New Orleans during the 1905 epidemic reduced both the incidence and virulence of the disease.

²⁹ Strode, *op. cit.*, note 2 above, p. 448.

³⁰ See G. N. Hunter, J. C. Swartzwelder, and D. F. Clyde (editors), *Tropical medicine*, 5th ed., Philadelphia, London and Toronto, W. B. Saunders, 1976, p. 26.

³¹ Jackson, *op. cit.*, note 24 above, p. 250; Lempriere, *op. cit.*, note 8 above, vol. 2, p. 29. Cf. Jackson's descriptions of the “putrescent” type of “common remittent” (*ibid.*, p. 140); also Lempriere's not very convincing attempts to distinguish the “common remittent” from the “continued fever”, i.e. yellow fever (*ibid.*, vol. 2, pp. 58–71). On the other hand, the “common remittent” was said to recur.

³² Jackson, *op. cit.*, note 24 above, p. 247, and *op. cit.*, note 4 above, introduction; McLean, *op. cit.*, note 4 above, *passim*. Dancer, *op. cit.*, note 23 above, p. 53, observed that the “remittent” sometimes “developed into” yellow fever.

³³ Cantlie, *op. cit.*, note 1 above, vol. 1, p. 231.

Simply by over-stretching the existing medical services and creating in themselves new health risks (and, therefore, the chances of multiple infection), they might explain much of the apparently increased virulence of yellow fever in the 1790s. Here the example of Jamaica is instructive. The greatest increase in the death rate of the island garrison in these years took place in 1792, before the pandemic had begun and when several new regiments arrived. Furthermore, during the war its overcrowded seaports witnessed a general increase in morbidity that affected everybody, and an increased case fatality in many diseases besides yellow fever.³⁴

A third contributory factor may have been the climate. Rainfall, and more particularly temperature, can affect the incidence of yellow fever through its influence on the breeding of the *Aedes aegypti*. Temperature also affects the speed of development of the virus. While in the 1780s Jamaica and Saint Domingue experienced long periods of drought, we know that the Jamaica and Philadelphia epidemics of 1793 were preceded by unusually hot, dry weather following on exceptionally heavy rains.³⁵ During the years the British occupied Saint Domingue, rainfall was observed to be unusually high at the generally dry, and healthy, Mole Saint Nicholas and everywhere temperatures were thought to be higher than usual.³⁶ Increased rainfall, it is true, would have had more impact on the malaria-bearing *Anopheles* than the domestic *Aedes*, which breeds in man-made containers rather than in puddles, and certainly, dual infection may have been an important factor behind the high death rates that will be examined below. However, given that Port au Prince's water supply was cut off for much of the occupation, thus increasing reliance on storage vessels, it is highly significant that urban water shortages are known to cause the number of *Aedes* in a town to multiply.³⁷ In Philadelphia and Baltimore, during the epidemics of 1793–94, it was noted that mosquitoes had become unusually numerous.³⁸ This may well have been the case in Saint Domingue.

Thus, in addition to the great influxes of non-immunes into an endemic region, the movements of population between infected areas and the possible introduction of a new strain of virus, Saint Domingue in the 1790s probably witnessed a notable increase in the vector population as well. These factors go far in explaining the level of mortality in British-occupied Saint Domingue.

II. COUNTING THE DEAD

British forces first disembarked in Saint Domingue in September 1793, and their numbers rose in nine months from 600 to nearly 4,000. During their first five months in the colony, mortality and morbidity among the troops were, if anything, rather low. This was the "healthy" season. Most of the early contingents, sent from Jamaica, had already spent at least a year in the West Indies and were, therefore, to some extent acclimatized. Many, moreover, were stationed in Jérémie, the most salubrious

³⁴ See Lempriere, *op. cit.*, note 8 above, vol. 2, pp. 22–56.

³⁵ *Ibid.*, vol. 2, pp. 47–58; Powell, *op. cit.*, note 15 above, pp. 1–2. This was also said of the Saint Domingue epidemics of the 1730s and 1740s: J. Tommasini, *Recherches pathologiques sur la fièvre jaune*, Paris, Arthur Bertrand, 1812, pp. 48–49.

³⁶ Jackson, *op. cit.*, note 4 above, p. 82; McLean, *op. cit.*, note 4 above, p. 72.

³⁷ See Carter, *op. cit.*, note 3 above, pp. 11–13.

³⁸ Scott, *op. cit.*, note 3 above, vol. 1, pp. 293 and 333.

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of Saint Domingue's towns, owing to its elevated, breeze-blown position. Battle casualties were few, as was the case throughout the occupation. In March and April, however, disease spread rapidly through the outposts, so that by 4 June about fourteen per cent of the soldiers sent from Jamaica had already perished.³⁹ Governor Williamson, however, was not unduly concerned. Probably most of the fever cases in these early months were either malaria (the "intermittent fever" common in the dry season) or some other local fever with relatively low mortality that was considered a normal part of West Indian life.⁴⁰ Only when new troops fresh from Europe captured the capital, Port au Prince, was it reported that "incredible numbers" were dying of "a most dangerous fever".⁴¹

The level of mortality among the British troops after June 1794 was thus thought exceptional. While the death rate for the army as a whole in the period 1 June to 1 September apparently averaged a lugubrious ten per cent per month (at least), that of the Port au Prince garrison was even higher. Phenomenal losses were incurred by the newly-arrived 23rd and 41st regiments, three-quarters of whose men were stationed in the capital (Table 1). Their sister regiment, the 22nd Foot, stationed mainly in the small garrison town of Mole Saint Nicholas, escaped serious loss until September. Then, it, too, was decimated, losing sixty per cent of its complement in eight weeks.

TABLE 1
Estimated monthly death rates, summer 1794 (partly-acclimatized and unacclimatized troops)

	Men dead per 100			Percentage dead in 3 months	No. dead in 3 months
	June	July	August		
1st Foot	10	8	8½	24	107
49th Foot	6	5½	10½	20	65
23rd Foot	22	29	10	48	319
41st Foot	15	24	12	44	318

Sources: WO 17/95, 125, 151, 162 and 1986.

Not surprisingly, the "Jamaican" regiments fared rather better (Table 1). Yet, it is strange to note that in the summer the detachments of "Jamaican" troops at Port

³⁹ The statistics used in this paper are mainly derived from the P.R.O., WO 17 series, regimental and garrison returns. Readers requiring more detailed documentation are referred to D. Geggus, 'The British occupation of Saint Domingue 1793-98', D. Phil. thesis, York University, 1978, chapter 14.

⁴⁰ Generalizations about mortality rates in tropical fevers are risky. Mild cases are easily overlooked and yellow fever can vary greatly in severity, though case-fatality is usually under ten per cent. Losses of over fifty per cent have been known, and this is also true of pernicious malaria, but in the Americas yellow fever has proved the more lethal disease. See note 2 above; Hunter, etc., *op. cit.*, note 30 above, pp. 26, 384; C. E. Winslow, *Man and epidemics*, Princeton University Press, 1952, p. 184.

⁴¹ P.R.O., WO 1/59, p. 429.

au Prince generally suffered fewer sick and dead than did their comrades in the other outposts. The explanation is probably twofold. As immunity to yellow fever is acquired after only one attack, while immunity to malaria in the West Indies is a product of several years' exposure to the disease, one might presume these troops were more vulnerable to the latter than to yellow fever. In the summer, when yellow fever raged at Port au Prince, malaria was probably not present there to the extent it was in the more rural areas.

The capital, indeed, was only partly responsible for the hecatomb that engulfed the British forces. Of the 2,000 soldiers who died between June and December, not 60 per cent were stationed in Port au Prince, where the death rate during the autumn fell below that of the army as a whole. The mean monthly rate of loss for the period 31 August to 31 December was about 9.5 per cent. Possibly, this period saw yellow fever transmitted from Port au Prince to the other outposts, particularly to Saint Marc and the Mole Saint Nicholas, where the 22nd Foot was suddenly stricken and where from August to October two-thirds of the garrison were sick. This hypothesis receives some support from the registers of the Mole naval hospital, in which the percentage of fatal cases caused by "fever" and the percentage of "fever" cases resulting in death rose to exceptional levels in the last quarter of the year (respectively seventy-three per cent and fifty-six per cent, excluding "intermittent" fevers).⁴² Throughout the occupation, Port au Prince was to retain its reputation as a death-trap but it came to be recognized that between August and October, and especially in November, the Mole was equally or even more unhealthy.

Always split up into several detachments, the 49th Foot served at one time or another in almost all the outposts of the occupied zone. Although it proved one of the most durable of the British regiments, and was therefore exceptional, its experience of Saint Domingue was in a sense representative. It appears that from the end of March until December, this "healthiest" of regiments always had between a quarter and a half of its men sick. By August, in fact, it was the only regiment with half its men fit for duty. However, in most corps morbidity levels began to drop in October, and by December Port au Prince was the only centre where the sick still outnumbered the healthy. In its second year in Saint Domingue, the 49th's mean monthly rate of loss did not fall but rose, from 4.6 per cent to over five per cent, and when the regiment was drafted at the end of August 1795, only 125 veterans were still alive. The originally much larger 23rd and 41st regiments had shrunk to almost the same size, burying in their first year in Saint Domingue over three-quarters of their men.

Catastrophic though they were, the losses of 1794 were outmatched by those of the following year. As always, in the early months of the year mortality was low. However, in May and June fever once more spread throughout the army. Chiefly affected was the 96th regiment that had arrived from Ireland in April, along with the 81st. Least affected were the original "Jamaican" regiments, while the 22nd, 23rd and 41st suffered to an intermediate extent. By 1 July, the 96th had lost since embarkation forty-one per cent of its men. Yet, the worst was still to come. The desperately needed reinforcements that appeared in August and October (including recruits for the

⁴² P.R.O., ADM 102/730, hospital register.

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96th) disembarked straight into their graves. As Table 2 shows, they disappeared at a rate scarcely credible.

TABLE 2
Selected monthly mortality rates—1795

	Officially reported deaths per 100 men				
	July	August	September	October	November
81st Foot	7.0	8.6	25.4	27.4	17.2
96th Foot	23.6	c.35.5	42.4	8.5	?
82nd Foot		5.1	14.8	23.2	24.2
83rd Foot		1.1	27.8	c.60.0	?
130th Foot		0.8	34.2	c.33.0	62.3
All British forces	13.5	c.15.5	17.7	21.4	17.4
Total no. reported dead	334	381	552	547	371

Source: WO 17/1987

TABLE 3
66th Foot: monthly mortality rates 1796

Total strength		Percentage dead	No. dead
1105	March	0.3	3
1103	April	9.1	100
1018	May	17.1	174
844	June	19.2	162
683	July	5.9	40

Sources: WO 17/186; S.R.O., GD 188/28/6.

For the period 1796–98, however, calculations become steadily more hazardous. The number of regiments and parts of regiments sent out to Saint Domingue greatly increased, and some did not stay very long. Very few returns survive for this period and their accuracy is questionable. Sir John Fortescue, historian of the British Army, thought losses were deliberately covered up.⁴⁸ So they probably were, but not to the

⁴⁸ Fortescue, *op. cit.*, note 1 above, vol. 4, p. 473.

extent he imagined. When Pitt's government was forced to lay before Parliament the cost of the Saint Domingue campaign, it reported that up to the end of September 1796 7,530 British troops had died. Fortescue was convinced the figure was "positively misleading and should at the very least be doubled",⁴⁴ but a close examination of the sources suggests that 9,000 is nearer to the truth. From May through September 1796, over 600 soldiers died each month, as epidemic diseases raged in almost all the outposts. Though the death rate for the whole army never seems to have exceeded nine per cent per month, the York Hussars lost in just ten days twenty-three per cent of its men—eight officers, sixteen N.C.O.s, 150 troopers.⁴⁵ Table 3 records the early experience of another newly-arrived regiment.

In 1797, however, the situation changed. From its usual low point in February–March, the death rate scarcely rose in April, although sickness spread rapidly. In May, when one-quarter of the British forces were sick, it was still "only" 2.5 per cent. The army was becoming increasingly acclimatized. Even so, over a third of a regiment such as the 67th Foot consisted of recruits arrived within the previous nine months, and its fatalities in June, July, and August amounted respectively to just 2.7 per cent, 2.6 per cent, and 4.2 per cent. Partly responsible for this improvement were the reforms of the new commander, General Simcoe, which are discussed below. By July 1798, however, when evacuation was under way, the 2,100 British survivors were all seasoned men, "by no means liable to the violent disorders of the Climate; but falling off gradually from waste of Constitution."⁴⁶ The 82nd Foot, 989 strong three years before, now consisted of thirty other ranks and one private.⁴⁷

In five years, out of 20,200 British troops sent to Saint Domingue, about 12,700 lost their lives and nearly 1,500 had to be sent home as invalids. Probably another 1,000 died on their way there, mainly of typhus in Ireland. Naval hospital statistics suggest some 2,500 seamen also perished.⁴⁸ One is thus a very long way from Colonel Malenfant's estimate that Britain lost 45,000 white soldiers in Saint Domingue,⁴⁹ and even farther from the absurd figures reported by the historian of yellow fever, Béranger-Féraud.⁵⁰ Conversely, Cantlie's figure of 7,500 is far too low.⁵¹ The statistics of Sir John Fortescue also clearly need revision.^{51a}

One would like to know just how unusual British losses were in the context of the

⁴⁴ *Ibid.*, p. 565.

⁴⁵ Cf. Boston Public Library, Journal of Lieutenant Howard, manuscript in 3 vols., vol. 1, p. 62; and P.R.O., WO 17/1988, July returns.

⁴⁶ P.R.O., WO 1/68, p. 205.

⁴⁷ Scottish Record Office, Edinburgh, GD 193/3/5, return of 26 August 1798. After a year, in fact, it had numbered barely 100 men and by June 1797 was down to thirty-nine. No regiment, however, "perished to a man", despite the claims of, among others, Bryan Edwards, *Historical survey of the French colony in the island of St. Domingo*, 2nd ed., London, 1801, p. 385. Neither his nor Fortescue's calculations can be relied on.

⁴⁸ P.R.O., ADM 102/704, 730 and 731.

⁴⁹ Colonel Malenfant, *Des colonies, et particulièrement de celle de Saint Domingue*, Paris, Audibert, 1814, p. 91.

⁵⁰ L. J. B. Béranger-Féraud, *Traité théorique et clinique de la fièvre jaune*, Paris, Octave Doin, 1890, pp. 61–62.

⁵¹ Cantlie, *op. cit.*, note 1 above, vol. 1, p. 250.

^{51a} Cf. D. Geggus, 'The destruction of the British Army in the West Indies: some further comments', *J. Soc. Army Hist. Res.*, forthcoming.

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eighteenth-century Caribbean. McLean thought them unique.⁵² However, comparable data is not easily come by, nor can one generalize too readily about the British experience itself. While the 1st and 49th Foot lost some forty-five per cent of their men dead in their first year in the colony, the 23rd, 41st, 96th, and 130th lost about the same proportion in only three months. Some cavalry regiments that arrived in May 1796 lost little more than thirty-three per cent in a year; another, the 29th Light Dragoons, lost sixty-four per cent in six months. Death rates were higher in 1794–95 than in 1797–98, but overall were usually in the range fifty to seventy-five per cent per annum.⁵³

Amazingly, under the *Ancien Régime*, the average annual mortality of the Saint Domingue garrison had been only 6.25 per cent, (sailors, 3.13 per cent). Moreover, by 1786 these rates had improved to 2.86 per cent and 1.85 per cent.⁵⁴ At the Mole during the 1780s, the Cambrécis Regiment lost only 100 of its 1,200 men in seven years.⁵⁵ Similarly, in Jamaica the garrison death rate was less than four per cent per annum in 1790–91, rising to over 5.5 per cent in 1792, and about nine per cent per annum in 1793.⁵⁶ At Martinique during the years 1770–73, the Périgord Regiment was said to have been persistently attacked by yellow fever but still lost only thirty-five per cent of its men.⁵⁷ Apparently, it was in wartime that the West Indian disease environment was at its deadliest. “A los primeros pasos de la Guerra”, wrote a Spanish colonial administrator in 1795, “el Europeo blanco esta moribundo”.⁵⁸

In Jamaica, however, where the mortality of the 1790s was thought by Lempriere to be unprecedented, death rates in the garrison never approached anything like those in British-occupied Saint Domingue.⁵⁹ Lempriere was wrong, for Jamaica had fared far worse during the American War, losing twice the number of troops in half the time, that is 3,500 in three and a half years. Even then, however, in the dozen regiments involved the mean death rate for the first year after arrival was still under thirty per cent. Furthermore, overall morbidity never rose above one-third, it seems.⁶⁰

If we are to find mortality statistics comparable to those of the British in Saint Domingue, it is, fittingly, in the chaotic, makeshift world of military expeditions. In 1781, the fever-smitten expedition that marched to San Juan in Nicaragua lost seventy-seven per cent of its 1,400 men. British losses in occupied St. Lucia were apparently even greater, and of similar magnitude were those of the occupying army in the French Windwards during the Seven Years' War.⁶¹ Between June and October 1762, forty per cent of the British troops who captured Havana died of disease, while

⁵² McLean, *op. cit.*, note 4 above, p. 1.

⁵³ Total mortality for the whole occupation was around sixty-three per cent but several regiments spent under a year in the colony.

⁵⁴ Moreau de Saint-Méry, *op. cit.*, note 18 above, vol. 2, p. 1068.

⁵⁵ Colonel Chalmers, *Brief remarks on the late war in St. Domingo*, 2nd ed., London, Rivington, 1803, p. 71.

⁵⁶ Data from Lempriere, *op. cit.*, note 8 above, vol. 1, pp. 224–232.

⁵⁷ Bérenger-Féraud, *op. cit.*, note 50 above, p. 54.

⁵⁸ Universidad Católica de Madre y Maestra, Dominican Republic, Colección Incháustegui, Documentos AGI-AGS 1750–99, vol. 2, José de Urizar to duque de Alcudia, 25 de junio de 1795.

⁵⁹ Lempriere, *op. cit.*, note 8 above, vol. 1, pp. 2–3, 224–232.

⁶⁰ Data from John Hunter, *Observations on the diseases of the army in Jamaica . . .*, 3rd ed., London, Payne, 1808, pp. 33–60. Cantlie, *op. cit.*, note 1 above, vol. 1, pp. 163–165, cites only the worst cases.

⁶¹ Data from *ibid.*, vol. 1, p. 166; Hunter, *op. cit.*, note 60 above, p. 48.

of the 12,000 British and Americans who laid siege to Cartagena in 1741 seventy per cent perished, including seventy-seven per cent of the British.⁶² Returning to Saint Domingue, an examination of data relating to eight of the French corps sent there in 1792 reveals death rates broadly comparable to those later exhibited by the British regiments. One exception is the Provence Regiment, of which disease claimed “only” thirty-six per cent in eleven months, total losses amounting to forty-three per cent,⁶³ (perhaps because men from the Mediterranean seaboard enjoyed a significant degree of immunity to both the *falciparum* and *vivax* strains of malaria). The Leclerc expedition of 1802 lost almost 25,000 of its 35,000 men in nine months.⁶⁴

Clearly, deaths from disease were far more frequent in wartime than in peace, and particularly so when soldiers were serving in a foreign colony. Much more work needs to be done comparing the epidemics of the 1790s with those of the American War and Seven Years’ War. Tentatively, however, one might conclude that any variation through the decades in the virulence of yellow fever was less significant as regards a regiment’s health than factors specifically relating to war-time expeditions.

III. CAUSES OF MORTALITY

Wartime expeditions to the Caribbean resulted first and foremost in dense concentrations of non-immunes, otherwise rarely found after the early days of colonization. Less obviously, they also created other circumstances which, acting together, help us understand how rates of death from disease could vary so strikingly between times of war and peace. These were the siting of camps with regard only to military not medical considerations, lower standards of medical care, of nutrition, and of military discipline, which in turn facilitated an excessive consumption of alcohol by troops and permitted low standards of general and personal cleanliness. From the 1780s onwards, these were persistent themes in a growing literature aimed at reducing the loss of life in West India garrisons.⁶⁵ The writers concerned, men of the empirical school, were not always correct in their reasoning but their observations and recommendations were frequently sound.

In Saint Domingue, the battle casualties of the British regiments were always remarkably low. The great majority of the British dead—about ninety-five per cent—unquestionably died of disease. Yet, beyond the general impression given by contemporary accounts that most British deaths in Saint Domingue were due to yellow fever, it is not easy to assess the relative importance of the different factors involved. Contemporary clinical descriptions and epidemiological evidence leave one fairly certain that the epidemics which swept Port au Prince in 1794 and Port au Prince and the Mole in 1796 were yellow fever, and that regiments like the 66th Foot and the 29th Light Dragoons which suffered dramatic losses were also its victims. It was

⁶² Hart, *op. cit.*, note 23 above, p. 48; Moreau de Jonnés, *op. cit.*, note 6 above, p. 48.

⁶³ *Royal Gazette*, 1792, no. 28, p. 19; Archives Nationales, Paris, DDxxv, 49/466; Institute of Jamaica, Kingston, Ms. 36, f. 4; P.R.O., CO 137/91, memoir by Colonel Thiballier; Bernard Foubert, ‘Les volontaires nationales de l’Aube et de la Seine Inférieure à Saint Domingue’, unpublished paper.

⁶⁴ Foubert, *op. cit.*, note 63 above. Battle casualties, however, were relatively severe.

⁶⁵ See the works cited in note 83 below; also, James Anderson, *A few facts and observations on the yellow fever of the West Indies*, Edinburgh, Mudie, 1798.

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said, moreover, to occur all year round. It is true that some of the worst losses, those of 1795 and particularly in the 96th regiment, were attributed by McLean to “ship fever” (i.e. typhus) that the troops brought with them from Ireland.⁶⁶ However, this diagnosis was not the product of his own observations. In view of the rarity of typhus in the West Indies and also of the contemporary tendency to associate the two fevers, it seems more likely that when the troops disembarked, the typhus then on board ship merged into an epidemic of yellow fever.

However, yellow fever, an urban disease in the West Indies, was clearly not the sole scourge of the British troops. Even at Port au Prince, where it was “strongly marked”, the discerning Dr. Jackson thought that from April to December a variety of fevers were present. “Flux” and diarrhoea were common throughout the year, as at Saint Marc, doubtless because of the appalling sanitation in both towns, and their use of wells for drinking water.⁶⁷ The Mole tended to be healthier, except in the autumn, when “intermittents” (presumably malaria) were just as common as “remittents”. There were no swamps in the area, unlike at Port au Prince, and we probably see here the influence of the increased rainfall of these years.⁶⁸ “Fever” (excluding “intermittents”) was responsible for only half the deaths in the Mole naval hospital, “flux” and scurvy killing large numbers.⁶⁹ At Mirebalais, yellow fever in its most virulent form existed alongside protracted “double tertians”, which seem to have killed many colonists. In other rural areas, such as the Cul de Sac and the swampy district of Les Irois, malaria was not surprisingly prevalent, and this was also true of the lower mountain slopes.⁷⁰ Around Les Irois, it sometimes assumed the pernicious form still called “bilious remittent”. This was also found at Saint Marc and in both places killed many colonists. Jackson thought it a variety of yellow fever but his description and the slow, imperfect recovery of those who survived it are suggestive of *falciparum* malaria.⁷¹ The terrible disease that decimated the York Hussars at Saint Marc, leaving them “drowned in their own Blood”,⁷² may have been yellow fever but its rapid termination also suggests pernicious malaria.

Malaria, therefore, may well have been as common among the British forces as yellow fever, especially as it can recur, whereas the latter leaves its victims either dead or immune. What is known of soldiers who survived two years in Saint Domingue, though they were of course a minority, suggests that they experienced at least two or three bouts of fever. Even so, despite being confined to the ports, yellow fever doubtless killed more soldiers than did malaria. It is usually more fatal (though some might dispute this); observers certainly thought it so at the time, and it had and has no cure, while malaria was treated with cinchona bark shipped out to the West Indies by the ton. Dosage, it is true, was often insufficient, but Jackson realized this and recommended a minimum of three ounces.⁷³ The decreased mortality but continuing high

⁶⁶ McLean, *op. cit.*, note 4 above, pp. 73–74, 220.

⁶⁷ Jackson, *op. cit.*, note 4 above, p. 91.

⁶⁸ *Ibid.*, pp. 50–51, 82–85, 92.

⁶⁹ See note 48 above.

⁷⁰ See Jackson, *op. cit.*, note 4 above, pp. 62–71, 86, 92; Fergusson, *op. cit.*, note 4 above, p. 152.

⁷¹ See Jackson, *op. cit.*, note 4 above, pp. 67, 81–82; Hunter *et al.*, *op. cit.*, note 30 above, pp. 383–385.

⁷² Lieutenant Howard’s journal, cited note 45 above, vol. 1, p. 62.

⁷³ Jackson, *op. cit.*, note 24 above, p. 318.

morbidity of the spring and summer of 1797 probably reflect a shift in the relative incidence of malaria and yellow fever, as troops moved into the countryside on campaign. However, the overall mortality of the British troops points to case-fatalities much higher than those either disease exhibits nowadays, rarely being more than ten per cent and often much less. It seems likely, however, that the high death rates are at least partly explained by multiple infection. Some regiments, we know, arrived suffering from typhus, and descriptions of yellow fever cases sometimes beginning with fits of shivering perhaps suggest the simultaneous action of both diseases. Malaria, though, was a much more probable alternative. "Remittent" fevers sometimes were observed to develop into "intermittent" fevers and the persistent problems of relapses among yellow fever convalescents suggests additional infection,⁷⁴ as normally convalescence is rapid. When Saint Marc was surrounded by an open ditch and Port au Prince general hospital was situated next to a marsh, simultaneous infection was a real risk.

Contemporaries, however, tended to explain the British troops' vulnerability to fever in terms of three factors. These were: a general level of debility, an excessive consumption of alcohol, and inept medical treatment. They were wrong, of course, to think such factors made the soldiers more susceptible to fever, but they undoubtedly affected a patient's chances of recovery or death. In the first place, these were not men in the best of health. Often recruited in prisons and workhouses, only the worst British regiments were sent to Saint Domingue. Pallid, thin men from the new industrial towns, Dr. Jackson felt they radically lowered the standards of the British Army, as regards both discipline and fitness.⁷⁵ Before disembarking in Saint Domingue some had spent from three to six months crowded on board troopships. Many had passed mid-winter camped on the Irish coast, racked by dysentery and typhus. It is worth reflecting that not a few of these troops must have contracted typhus, malaria, and yellow fever all in the space of a year. On the other hand, these new regiments often remained fit for months after their arrival, while in the long run, the German and French peasants in the "foreign corps" do not seem to have proven any more hardy, though they arrived in much better shape. Furthermore, it was precisely the healthiest, most impressive-looking regiments, such as the 82nd, which arrived after a trouble-free voyage from Gibraltar, that suffered some of the worst losses in Saint Domingue. The robust, hearty individual, in fact, was thought peculiarly prone to yellow fever.⁷⁶

Even so, as noted above, troops were progressively worn down by their life-style and conditions in Saint Domingue. Coming from a Europe slightly cooler than it is today, they had great difficulty in coping with temperatures considered high even for the Caribbean. Unwashed, clad in flannel shirts and ill-fitting woollen uniforms that were permanently caked with sweat and prevented proper thermo-regulation, soldiers became easily exhausted and subject to "heat stress".⁷⁷ Sleep was a luxury in undermanned garrisons, and soldiers often went to bed in wet clothes. What little

⁷⁴ See McLean, *op. cit.*, note 4 above, p. 123.

⁷⁵ Jackson, *op. cit.*, note 4 above, pp. 27–48.

⁷⁶ See *ibid.*, pp. 59, 63–67; McLean, *op. cit.*, note 4 above, pp. 37–39, 213, 221.

⁷⁷ McLean, *op. cit.*, note 4 above, pp. 2, 210, 269.

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nourishment they could derive from a diet entirely lacking for months on end in fresh meat and vegetables was often denied them because of persistent dysentery. The heat and the salt meat diet, the brackish or contaminated drinking water, and, not least, the mental state of the troops, all help explain what some observers considered to be the most debilitating aspect of the soldier's life—the great quantity of alcohol he consumed.

Heavy drinking can be seen as both a cause and effect of the high rate of mortality. Hector McLean has graphically evoked the claustrophobic tension and general despondency that prevailed in the British garrisons, hemmed in by an unseen enemy and haunted by the “daily spectacle of death”. “Debauches of wine”, they imagined, would “banish not only their fears but their dangers”.⁷⁸ It is also relevant that, in the folk medicine of eighteenth-century England, rum and other spirits were considered a remedy for fevers,⁷⁹ and, certainly in the Windward Isles, we find troops treating alcohol as a prophylactic, afraid that “a sober hour might give the Disease an Opportunity to attack”.⁸⁰ As death in yellow fever is usually the result of hepatic or renal failure, a patient's alcohol consumption is an important determinant of his chances of survival.⁸¹ Although officers frequently drank several bottles of wine a day, it was not the chief danger. Much more lethal was the raw cane rum on which the soldiers spent their pay. They smuggled it into their messes, and into the hospitals; they filled their canteens with it before campaigns, and on occasion they bartered their rations for it. “Drunkenness in those days”, wrote a former surgeon of the 67th, looking back from the 1840s, “was unrestrained and terrible”.⁸² This is one reason why contemporary commentators, at least since 1780, all stressed the matter of regimental discipline, pointing out that new corps with inexperienced officers generally suffered the worst losses.⁸³

IV. MEDICAL TREATMENT

The question of alcohol further overlaps with that of medical treatment, for, to the horror of the French, hospital patients usually received a bottle of Madeira per day—*le comble de la déraison!*—and wine or brandy was specifically prescribed in fever cases to raise a falling pulse. Until 1797, some patients even went on receiving their daily ration of a quarter-pint of rum. Because of lax supervision in the general hospitals, orderlies and convalescents were known to carouse together, and this frequently led, so the French claimed, to relapses and death.⁸⁴ In the Windward

⁷⁸ *Ibid.*, pp. 10–15.

⁷⁹ Neil C. Hultin, ‘Medicine and magic in the eighteenth century: the diaries of James Woodforde’, *J. Hist. Med.*, 1975, 30: 349–366, pp. 357–358, 362.

⁸⁰ Royal Army Medical College, London, Muniment Room, book no. 35, letters by Nodes Dickinson, letter No. 2.

⁸¹ Strobe, *op. cit.*, note 2 above, p. 420; Sir P. H. Manson-Bahr, *Manson's tropical diseases*, 16th ed., London, Bailliere, Tindall, 1966, p. 296.

⁸² Fergusson, *op. cit.*, note 4 above, p. 150.

⁸³ John Rollo, *Observations on the diseases which appeared in the army on St. Lucia*, London, C. Dilly, 1781, p. 151; Hunter, *op. cit.*, note 60 above, pp. 22–27; Lempriere, *op. cit.*, note 8 above, vol. 1, p. 207, 220–223; McLean, *op. cit.*, note 4 above, p. 207; Jackson, *op. cit.*, note 4 above, pp. 45–48, 67; Chalmers, *op. cit.*, note 55 above, p. 90.

⁸⁴ P.R.O., WO 1/61, pp. 46–47, 391–394, 733–734, 821; WO 1/67, pp. 245–259.

Isles, it is important to note, more fever cases died in convalescence than during the course of their illness, and doctors attributed this fact to the intemperance of their patients and the hospitals' proximity to marshes.⁸⁵ For several years, critics had condemned the unwieldy general hospitals.⁸⁶ They bred disease, it was thought. The smaller, regimental hospitals were more economical, provided more personal care, and could treat soldiers with less delay. Yet, they were under-used. In Saint Domingue, the main hospital buildings were generally large and well built, unlike in the British islands, but in Port au Prince men were still cramped eighty to a ward with one doctor between them. The government made considerable efforts to send out a sufficient number of medical staff, and medical supplies were usually in abundance. Examinations in surgery had become compulsory for regimental mates. Veteran practitioners, however, like William Wright, complained that doctors and their assistants knew less medicine than those of previous years, being less experienced.⁸⁷ At any rate, metropolitan qualifications, unlike tropical experience, could not prevent doctors and orderlies dying as fast as their patients. Since thirty-three per cent of the European troops and twelve per cent of the local corps were regularly on the sick list, the hospitals were persistently overcrowded and undermanned. Nursing, therefore, was entrusted to invalid soldiers and those considered "the scum of the regiments". As the quality of nursing is vital in yellow fever—there is no other treatment as such—the situation must be accounted extremely deleterious.

Since yellow fever has no specific remedy, it is ironic that the French and British clashed so violently as to the appropriate method of treatment. The army was being sacrificed, so the colonists claimed, to the ignorance of the British doctors. Some French physicians denounced them in the English press and formally complained to the Army Medical Board. Both sides claimed to have had more success than the other, but it is significant that the troops themselves favoured French methods and lost confidence in their own doctors.⁸⁸ Indeed, Hector McLean had to agree that it was absurd to send out to the West Indies doctors with no experience of tropical medicine. Somewhat misguidedly, he attacked the "vanity" and "impudence" of his French colleagues, who "equally oeconomic of medicines and the truth . . . committed their patients to a nurse and left the issue to nature", which was really the best course of action. However, he came to recognize the importance of nursing and agreed that patients needed a special diet in place of the salt meat they continued to receive in hospital. He also adopted from the French their copious use of *tisanes* and lemonade, important in combating dehydration caused by continual vomiting, and their habit of warm baths, "to cleanse the skin of impurities".⁸⁹

British methods were by contrast violent. In the language of the day, they were "inflammatory", designed to excite the pulse and produce perspiration or salivation.

⁸⁵ Letters by Nodes Dickinson, cited note 80 above, letter no. 1.

⁸⁶ On the hospitals, see Hunter, *op. cit.*, note 60 above, pp. 257–258; Lempriere, *op. cit.*, note 8 above, vol. 2, p. 12; Jackson, *op. cit.*, note 4 above, p. 48; McLean, *op. cit.*, note 4 above, pp. 227–235; note 84 above.

⁸⁷ Wright, *op. cit.*, note 6 above, pp. 101–103.

⁸⁸ See note 84 above; McLean, *op. cit.*, note 4 above, pp. 16–19, 111; Lieutenant Howard's journal, cited note 45 above, vol. 1, p. 41.

⁸⁹ McLean, *op. cit.*, note 4 above, pp. 14–15, 146.

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The “anti-phlogistic regime” practised by the French had gone out of fashion in the British islands about thirty years before. Since then, great stress had been laid on drugs (mercury, camphor, arsenic, laudanum, calomel), and on “cordials” (cinnamon water and cinchona bark infusions), as well as on wine. Purgatives, including the infamous James’s Powder, had pride of place. British remedies were not always bad. Where malaria was concerned, the French were, of course, wrong to reject the use of quinine but, as McLean realized, it had no effect in cases of yellow fever. Calomel, then one of the latest fads in West Indian medicine, has been recommended as late as the 1960s⁹⁰ in treating both malaria and yellow fever, but in the latter disease, where the stomach lining is attacked, aperients are positively harmful. McLean came to appreciate the deleterious effects of medicines that irritated the stomach but, nonetheless, came up with a fiendish stimulant of his own—cayenne pepper wrapped in balls of dough!

Yet, he was no quack. Adventurous and eclectic, both he and Jackson represent a new empiricist approach to medicine that heralded the advances of the nineteenth century. One is impressed with his honesty and humility when grappling with forces that he confessed were beyond his comprehension. Neither man was afraid to say he had been wrong, and Jackson’s acuteness of observation demands respect. It is unfortunate that their contributions to the treatment of yellow fever involved as many steps backwards as forwards. Equally critical of the medical establishment and of established medical theory and practice, both men stressed the need for “bold measures” and sought to cure by causing in their patients “a complete change of system”.⁹¹ These were revolutionary times. Both became convinced that dousings with cold water were of the greatest benefit . . . if employed early enough—the usual escape clause. Jackson later wrote a treatise on the subject.⁹² The method was unorthodox but not original. Although explicitly borrowed from the Indians of Asia and North America, it had long been known in British folk and orthodox medicine.⁹³ Cold sponge baths clearly brought patients relief, but the scenes described of buckets of cold water being poured from great height on to feverish and unsuspecting victims partake of both tragedy and farce. The treatment must have added to the already great strains on the patient’s heart.

Perhaps more serious was the doctors’ reaffirmation, or resurrection, of the traditional remedies of bloodletting and blistering. As in England, venesection had fallen from favour in the British West Indies, but it had remained standard practice in Saint Domingue. McLean, after two years of failure in the colony, adopted it with a vengeance, while Jackson often took over thirty ounces of blood from his already anaemic patients.⁹⁴ It is therefore easy to understand why they had such difficulty in

⁹⁰ See Manson-Bahr, *op. cit.*, note 81 above, p. 296; A. W. Woodruff and S. Bell, *Synopsis of infectious and tropical diseases*, Bristol, John Wright, 1968, p. 152.

⁹¹ Jackson, *op. cit.*, note 4 above, pp. 263–265, 297–298; McLean, *op. cit.*, note 4 above, pp. 144–148, 312–314.

⁹² McLean, *op. cit.*, note 4 above, pp. 146–167; Jackson, *op. cit.*, note 4 above, pp. 24–26; Robert Jackson, *Exposition of the practice of affusing cold water on the surface of the body . . .*, Edinburgh, Abernethy & Walker, 1808.

⁹³ See Hultin, *op. cit.*, note 79 above, pp. 356–358.

⁹⁴ On bloodletting, see McLean, *op. cit.*, note 4 above, pp. 129–135, 162–171; Jackson, *op. cit.*, note 4 above, pp. 78, 263–281, and *op. cit.*, note 24 above, pp. 227–230. For the contemporary

building up the strength of those who survived into convalescence. Blistering was popular amongst British practitioners, although the French used it only in the last resort. It was meant to stop vomiting. Burst blisters, however, attracted swarms of flies. They then became deep ulcers full of maggots that tortured the patient with their burrowing. These could only be killed, McLean observed, with turpentine, "which almost throws the patient into fits."⁹⁵ Not surprisingly, neither doctor was able to claim much success for his work. Lieutenant Howard of the York Hussars ascribed his survival of an attack of fever to a concoction his black nurse gave him.⁹⁶ Certainly, it is probable that the better results McLean achieved treating officers in private houses owed much to the nursing of the local female population.

V. CONCLUSION

When the best medical minds of the day floundered in this fashion, it might seem that the mortality in Saint Domingue was completely unavoidable. Yet some vital facts were only too well known: that yellow fever only occurred in the towns; that malaria was found near swamps; that in the hills troops only suffered from leg sores and dysentery, and that on the high ridges of the interior they stayed as healthy as in Europe. In Jamaica, the annual death rate in the mountain camps was around two per cent; in the lowland camps it was 8.6 per cent.⁹⁷ Commanders and engineers repeatedly refused to heed medical advice about the siting of camps and outposts. Jackson warned that, as long as new regiments were garrisoned in the ports, two-thirds would die each year. He asked that the European garrison of Port au Prince be camped in a crescent in the mountains around the town, but in vain.⁹⁸ The government, for its part, tried to send out new regiments before the start of the "sickly season", so they had a chance to acclimatize, but in the event only four of the thirty or so sent to Saint Domingue managed to disembark in the healthy period of December through March.

Nevertheless, advances were made. By 1797, more and more British troops were moving into mountain outposts. Mortality was reduced at the Mole by building new barracks in the hills above the port. The swamp at Les Irois was partly filled in. Believing inactivity to be harmful, General Simcoe got troops out of their barracks on exercises and in some posts he replaced British with colonials. When a new regiment arrived, it was sent to salubrious Jérémie. Along with improvements in hospital organization and restrictions on the drinking of rum, these changes clearly had, as already seen, some impact.

By then, however, the government had abandoned its hopes of conquest and was ready to pull out of Saint Domingue altogether, if necessary. Britain was threatened with a French invasion, but men would not enlist for fear of being sent to the West Indies. "The name of St. Domingo is execrated and dreaded by all descriptions,"

debate in Jamaica, see *Royal Gazette*, 1794, nos. 32–35.

⁹⁵ McLean, *op. cit.*, note 4 above, p. 171.

⁹⁶ Lieutenant Howard's journal, cited note 45 above, vol. 3, p. 35.

⁹⁷ See Lempriere, *op. cit.*, note 8 above, vol. 1, pp. 220–223, 231; Jackson, *op. cit.*, note 4 above, pp. 88–98; McLean, *op. cit.*, note 4 above, pp. 205, 217.

⁹⁸ See Jackson, *op. cit.*, note 4 above, p. 98; McLean, *op. cit.*, note 4 above, p. 217.

Yellow fever in the 1790s

wrote McLean in June 1797. Earlier in the year, the ministry had been forced to reveal the cost of the Caribbean campaigns, and the public imagination was caught by tales of “the Yellow Pest that stalks, gigantic, through the Western Isles”. Nonetheless, although losses were greater than the government disclosed, the cost of the West India expeditions and their deleterious effects on the British war effort have been greatly exaggerated by Sir John Fortescue, who in his *History of the British army* claimed that “the two fatal words, St. Domingo” were “the secret of England’s impotence for the first six years of the war”. This was to overrate, and not simply in terms of casualties, the position of both Saint Domingue within Britain’s West India policy and of the West Indies within the government’s overall strategy.⁹⁹

On the other hand, it is difficult to see that any good, political or medical, resulted from the five years of occupation. The fall in mortality that occurred towards its end seems to have lent a favourable appearance to the “bold measures” then being adopted by Jackson and McLean, and it is probable that the yellow fever pandemic of the 1790s thereby helped to stimulate the “bloodletting revolution” of the early nineteenth century.¹⁰⁰ It is true that the symptoms and epidemiology of the disease were now accurately delineated, and its identification with the “common” or “endemic” remittent was probably, in part, correct. Paradoxically, however, this linking of the endemic and epidemic forms of yellow fever abetted that blurring of the boundaries between all fevers that Niebyl has noted in writers of the following decades.¹⁰¹ The vexed question of contagion seemed settled for the moment, but the new stress on “places not people” also undermined quarantine regulations that hindered the importation of infected mosquitoes. Besides, the dispute was quickly revived, and forty years later most European medical schools were still teaching that yellow fever was contagious.¹⁰² One might conclude that medical practice emerged from the holocaust little advanced.

Attention, however, had been focused on the Army Medical Department and the position of reformers like Jackson was strengthened. The movement to replace the general hospitals with treatment within regiments gained momentum, and in 1798 the rank of Army Physician was made open, by order of the Commander in Chief, to practitioners outside the charmed circle of Oxbridge graduates and L.R.C.P.s. Doctors of experience who had graduated from other universities, men like Jackson and McLean, could now expect the promotion they merited. The actual enforcement of these changes was to take another decade, but it may be relevant that one of their most influential supporters, as under-secretary for war and then financial secretary to the Treasury, was William Huskisson,¹⁰³ whose younger brother Richard, a surgeon, had died in Saint Domingue.

The reform of the Army Medical Department, nevertheless, apparently had little

⁹⁹ See Geggus, *op. cit.*, note 39 above, chapters 4, 8, 9 and 15.

¹⁰⁰ See Peter H. Niebyl, ‘The English bloodletting revolution’, *Bull. Hist. Med.*, 1977, 51: 464–483, pp. 474–478. Niebyl, however, implies that the West Indies was the permanent bastion of bloodletting, apparently not realizing that it also underwent its own, earlier, revolution.

¹⁰¹ *Ibid.*, pp. 476–477.

¹⁰² Fergusson, *op. cit.*, note 4 above, pp. 153–158.

¹⁰³ See K. E. Crowe, ‘The Walcheren expedition and the Army Medical Board’, *Eng. Hist. Rev.*, 1973, 770–785.

effect on the soldier in the West Indies. The Jamaican garrison actually suffered more during the first thirty years of the nineteenth century than it had in the preceding three decades. Between 1803 and 1836, the mortality rate among white troops averaged about thirteen per cent per annum and never fell in any year below six per cent.¹⁰⁴ Yellow fever was still lumped together with other fevers (which recurred) under the heading “remittent” but seems to have been responsible for the five epidemic years of 1808, 1819, 1822, 1825, and 1827, when the death rate rose to between seventeen and thirty per cent. Although the value of black troops had been well proven in Saint Domingue, the Jamaican planters had insisted at the end of the war on increasing the proportion of white troops in the island garrison—with predictable results. However, but for the establishment of a number of barracks in the mountains (at Stony Hill, Maroon Town, etc.) the death toll would assuredly have been higher.

SUMMARY

Although epidemics of yellow fever became suddenly rare in the Caribbean in the 1770s and 1780s, it did not disappear from the region, as some have supposed, but assumed the less virulent guise usual in endemic situations, albeit for reasons that remain debatable. The white population in that period undoubtedly contained a greater proportion of locally-born or long-resident immunes than ever before—a situation that was probably reversed in the nineteenth century, when the abolition of the slave trade ended regular contact with West Africa. This explains both the dramatic impact made by the pandemic of the 1790s and why it left the civilian population largely untouched, though in the Greater Antilles climatic change may also have been a significant influence. In West Indian garrisons, rates of death from disease similarly varied dramatically, though not so much from one decade to another as between times of war and peace. Wartime expeditions recreated the dense concentrations of non-immunes known earlier in the colonial period, but were also attended by other circumstances that combined to increase the soldier’s exposure to infection and greatly impair his chances of survival. These concerned the siting of camps, the consumption of alcohol, standards of medical care and nutrition, and perhaps also of hygiene. Multiple infection, sequential if not simultaneous, was an important factor. Britain’s military losses in the colony of Saint Domingue from 1793 to 1798 have been much exaggerated but, by any criterion, they remain among the worst suffered in the Caribbean. As a result, the movement to reform the Army Medical Department gained impetus but medical science, on balance, benefited little from the catastrophe.

¹⁰⁴ A. M. Tulloch and H. Marshall, *Statistical report on the sickness, mortality and invaliding among the troops in the West Indies*, London, for H.M.S.O., 1838, pp. 44–47, and *passim*.