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INTRODUCTION

Over the last forty years the study of British West Indian sugar estates during the period of slavery has shown that they achieved significant technical change. This work qualifies older views, best expressed by L.J. Ragatz, according to which planters, constrained by absentee ownership and the inefficiencies of slave labour, proved almost incapable of combatting the sugar monoculture’s tendency towards soil exhaustion, or of responding effectively to the many external pressures which began to work against them in the later eighteenth century (Ragatz 1928). Thus, the argument ran, when slavery came to an end in 1834, most British West Indian plantations had been reduced to virtual bankruptcy, except perhaps in a few of the most recently settled territories where the cane land was still exceptionally fertile.

It now seems that this very pessimistic interpretation was coloured rather too much by the public controversies of the early nineteenth century, originally the main source of information available to historians. In contemporary debate on West Indian issues the two main contending parties both gave a bleak impression of the sugar estates’ fortunes. Proprietors emphasised their commercial distress, and the need for commercial privilege; their critics, arguing for slave emancipation, were pleased to accept evidence that slavery was inefficient and unprofitable as well as inhumane. Since Ragatz, attention has shifted more to the privately-kept records of sugar estates, as they have become available for research (Bennett 1958; Craton & Walvin 1970; Pares 1950; Sheridan 1974). The general drift of this work has been to detect a measure of technical adaptation during the period of slavery, achieved through modified processing equipment, new cane
varieties, and greater attention to manuring, livestock, and fodder supplies. So for British West Indian sugar estates, at least, the “classic” indictment of slave labour as associated with only the most rudimentary techniques and with a tradition-bound master class, can no longer be sustained.

But how far should the revisionist line of argument be pressed? Considerable differences of emphasis and scope for debate remain within the literature. Thus Pares’s investigation of the Pinney family’s Nevis property, the first British West Indian history to make thorough use of estate papers, showed some planters with a concern for improvement and the details of management. Yet, he argued, absenteeism and competition from more recently developed colonies had ruined Nevis before the slaves were freed (Pares 1950: chs. 6, 7, 12). On the other hand, the Barbados estates of the Society for the Propagation of the Gospel, studied by Bennett, enjoyed a striking economic regeneration in the early nineteenth century, even under absentee ownership, with rising profitability and sugar consignments. Also a marked improvement in the slaves’ material condition came through “amelioration” policies, aimed at establishing a self-reproducing labour force. These policies had been encouraged since the 1760s by growing difficulties in acquiring new slaves from Africa, and by the growth of the metropolitan antislavery movement (Bennett 1958: chs. 9-12). Craton and Walvin have identified major innovations undertaken between the 1790s and the 1820s at the Worthy Park estate in Jamaica. They imply, however, that the degree of economic resilience enjoyed by this property was exceptional, perhaps helped by the supplementary financial resources to which its owner had access (Craton & Walvin 1970:168-82, 187-8). Also, Craton’s analysis of Worthy Park’s slave population suggests that increased productivity was achieved at the cost of severe social and demographic stress (Craton 1978: Part I). Watt’s recent study shows that British West Indian planters made some adjustments, mainly in response to environmental changes, but concludes that their general agricultural performance was mediocre, judged by the standards of the mother country (Watts 1987: ch. 9).

From my own work, based mainly on estate papers accumulated by absentee proprietors in Great Britain from the “old” British West Indian colonies (Barbados, the Leeward Islands, and Jamaica), I believe that the slave-based plantation economy showed a substantial capacity for innovation (Ward 1988). The basic pattern of amelioration described by Bennett for the Codrington plantations appears, if only in an attenuated form, on many other properties. Improved maintenance standards and reduced work loads brought a marked fall in slave mortality, so that colonies which
had depended on regular deliveries from Africa to maintain their populations until late in the eighteenth century had achieved, or were approaching, demographic self-sufficiency by the 1820s. I would go further in emphasising the business advantages from this shift in policy. Bennett saw the balance sheet effects of amelioration as essentially neutral: the planter's extra spending on food, clothing, and medical care for his slaves was more or less offset by their reduced depreciation (Bennett 1958: 138-40). It can however be argued that greater benefits accrued to the estate than this comparison implies. Nineteenth-century slaves were not only better able to reproduce themselves than their eighteenth-century predecessors, but also, from the employer's point of view, more useful: likely to be creole rather than African (and thus more experienced in estate work), more tractable, and less likely to be incapacitated by malnutrition or punishment. These effects may be discerned in, for example, the reduced incidence of theft, the reduced employment of white supervisors (one of the largest plantation expenses), and the increasing average stature of Jamaican-born slaves (which presumably brought some corresponding addition to their physical strength). Taking Jamaica as the standard, I estimate the aggregate economic results of amelioration and its associated agricultural reforms on sugar estates in the 'old' British West Indies as an increase in output per slave of about 35 per cent between 1750 and 1834, or about 0.4 per cent per year, a respectable performance by contemporary standards (Ward 1988: 190-208, 261-2).

Nevertheless, while sugar planting in the 'old' British West Indies clearly made important advances between 1750 and 1834, it might be argued that to show this is to deal with only part of the original critique against slavery as an economic system, that the masters of slaves were by nature negligent and benighted. Another allegation, that the slaves themselves were inferior to free people in their quality as workers might still have weight, if it can be shown that West Indian progress was restricted to innovations which did not require extra skill or commitment from the labour force. For example, during our period, as a result of the British Industrial Revolution, planters had the benefit of improved grinding mills. The task of the slaves who fed in cane between the rollers remained essentially unchanged, but because the mills were braced more tightly, a reasonable proportion of juice could be extracted in just one or two passes, instead of the five or six passes required with older devices. Thus the amount of juice delivered per worker and per hour greatly increased. Similarly, new cane varieties arrived on the islands, and many planters adopted them, together with the increased cultivation of fodder crops, to establish in some cases a 'virtuous circle' of improved livestock, extra manure, enhanced
soil fertility, and better harvests, of the kind which had already transformed grain farming in Great Britain (Ward 1988: ch. 4). Once again, technical change need make little difference to particular tasks – weeding, cane cutting, etc. The productivity of the field gangs could be enhanced simply by changing the proportions into which their work was divided between the cultivation of sugar cane and complementary activities. To this extent labour’s role was merely passive. Black slaves – either in fact, or in the perception of their masters – may have been clumsy, obstructive, and difficult to educate in new skills. However, such characteristics need not, and clearly did not, prevent certain innovations (Boomgaard & Oostindie 1989: 10-2).

But what if there was also at least a potential for raising efficiency by making tasks more sophisticated, perhaps through using new items of equipment – such as steam engines – which might be vulnerable to sabotage, and require higher levels of skill from the workers responsible for their operation and maintenance? It is the compatibility of slavery with the steam engine and the vacuum pan that has provided the focus for debate about the relationship between technical change and labour regimes elsewhere in the nineteenth-century Caribbean (Scott 1984). Yet this is not a very useful theme for the pre-emancipation British West Indies. In fact the components of ‘modern’ sugar processing made very little headway in the British sugar colonies before 1834, but the technologies of steam power and vacuum boiling were as yet so imperfectly developed that their limited diffusion cannot be plausibly attributed to slavery.

Therefore the rest of my paper will concentrate on the plough as a substitute for the hoe in cultivation. I am conscious that this is a narrow and now rather venerable issue, but it seems nevertheless to be worth pursuing. Ploughing entailed new skills for field workers. Also, even though it was a mature technology, perhaps offering significant cost saving over traditional hand methods, many contemporary observers and later historians have alleged that planters were slow to introduce it, at least partly because of the constraints from slave labour. I argue that the extent to which the plough was used in British West Indian sugar estates before emancipation has probably been underestimated, at least for Jamaica (which had half the British Caribbean slave population). Physical geography was much more important than the institution of slavery as an obstacle to ploughing. However, the economics of technical change in plantation agriculture cannot be definitely established, for we must contend with difficult problems of evidence. While it is clear that slavery was compatible with substantial technical advances in the British West Indies between 1750 and 1834, the extent to which the human degradations associated
Ploughing made more progress on Antigua than anywhere else in the British West Indies. The first experiments, undertaken on this island in the mid-eighteenth century, seem to have been abandoned by the 1780s (Ward 1988: 73). After 1800 the practice revived. At the Parham estate, the colony's second largest, the plough was applied in the 1820s to some 70 per cent of the cultivated area, and it had also become widely used on neighbouring properties (Porter 1831: 293-7; Ragatz 1928: 66). However, on the other Leeward Islands and on Barbados all the signs are that ploughing remained rare during the period of slavery (Davy 1854: 113-14; Bennett 1958: 103).

More abundant information survives from Jamaica. Almost every one of the dozen or so estates in the colony for which records have been studied experimented with the plough between the 1760s and the 1780s. Then the practice fell temporarily into disrepute, but with labour in short supply after the closure of the slave trade in 1808, most planters had resumed ploughing by the early 1830s (Ward 1988: 82-3).¹

What was the subsequent course of innovation? Some historians suggest that emancipation greatly intensified planters' concern for field mechanisation, implying also that it had been held back by slavery (Hall 1959: 48; Green 1976: 205-6; Boomgaard & Oostindie 1989: 7-8). Yet while the plough may have come into wider use after 1834, the available evidence does not make clear to what extent, if at all, its rate of diffusion accelerated. Accounts from Antigua during the first years of freedom were rather equivocal about trends in current practice. According to one report, 'great improvements [including ploughing] have long ago been demonstrated to be necessary and practicable'. 'The plough has long been used in the island...' Nevertheless, '...on many estates its judicious use is still a novelty', and 'ploughing was gaining ground, as a consequence of the reduction in labour supply since the ending of slavery'. (Sturge & Harvey 1968: 51, 57, 73).

Among eight respondents to an official inquiry, only three stated that the plough had become more common, and two of these did so in guarded terms: 'I have understood, and on one occasion I saw, more ploughs at work than were formerly used.' 'The increased use of the plough has in some small degree supplied the place of human labour....' Three others were categoric that ploughing had not been extended (British Parliamentary Papers 1836: 274).
There are similar difficulties with the evidence from Jamaica. The visiting philanthropists Sturge and Harvey identified ploughing as an apparent novelty – at least the work was often being managed by white immigrants (Sturge and Harvey 1968: 173, 216, 230). Craton argues that the practice did not become at all common at Worthy Park before the 1830s (Craton 1978: 226). But some planters, testifying to the public inquiries of the 1840s, denied that free labour had brought any decisive change to the rate of innovation. According to a witness from St. Thomas-in-the-Vale parish, ‘the use of the plough was extending itself very much during the period of slavery, and it is now almost entirely used for opening the land’. The plough had ‘not very much increased since the end of slavery -we had carried it to a great extent before.’ A St. Thomas-in-the-East planter, while reporting that the plough ‘is now extending very much’, said that he himself had used it for thirty years. On the Delve estate, Westmoreland, the plough had been used since 1816 (British Parliamentary Papers 1842: QQ 4788, 5050, 5053; British Parliamentary Papers 1847-8: 167). These were of course ex parte statements, by men anxious to show that although real attempts had been made at improvement, the sugar estates still required metropolitan support through immigration schemes and protective duties. But Sturge and Harvey, enthusiasts for free labour, also had a case to argue, and the planters’ assertions about the progress of ploughing before emancipation are at least partly confirmed by estate records.

Establishing the extent to which planters adopted the plough is hard enough. When we come to consider why it was or was not used, and, more particularly, how the choice of technique was affected by the institution of slavery, our difficulties are aggravated. As is well known, contemporary remarks on the subject noticed various problems, including the intractability of the work force, but also physical constraints – stiff soils, hilly terrain, the need to maintain drainage ditches and minimise soil erosion, and the obstacles to maintaining livestock in the West Indian climate. The importance of physical influences is suggested by the obvious differences in practice among slave colonies, for example between Antigua, with its fairly level cane pieces, where ploughing had become quite common by 1834 (even if it is not clear exactly how common), and the more mountainous territories – such as Nevis, Montserrat, or the Windward Islands – where the plough remained almost unknown (British Parliamentary Papers 1842: Q 2729; Green 1973: 449-51; Watts 1987: 430-1; Ward 1988: 60-83). But what was the relative importance of geography and the labour regime in determining whether or not the plough was used? To what extent might physical problems have been coped with more successfully if the estates had been provided with a work force free of the demoralisation
and inflexibilities of slavery? It has been suggested, for example, that masters’ low expectations of their labourers, whether derived from racial prejudice or daily experience of slave sabotage and recalcitrance, had established the conviction that the element of skill in plantation routine should be kept to an absolute minimum. Some of the evidence that has been offered on this point may not be entirely authentic. Thus the report that slaves were not trained as ploughmen because their masters considered them to be incapable of seeing straight enough, came from a stipendiary magistrate, recently arrived on Jamaica in 1835, with no first-hand knowledge of slavery (Bell & Morrell 1928: 397). Nevertheless, statements were made by experienced planters which emphasise a labour problem, in terms that perhaps imply assumptions of racial incapacity, and not just the usual difficulties to be expected when workers were learning a new task. In the 1770s a Jamaican mentioned, among other obstacles to ploughing, ‘the want of care and dexterity in the negroes’, although he still intended to persevere with it.4 Half a century later Thomas Roughley, also of Jamaica, wrote in similar terms about the plough’s unsuitability: ‘...the people in that country ignorant, cattle and negroes hard to be trained for it....’ (Roughley 1823: 269-72).

However, observations of this kind do not always seem credible or representative. It was an Antiguan who declared in 1788 that ‘nothing has yet been found so completely suited to the Disposition of the Slaves’ as the hand hoe (British Parliamentary Papers 1789: Part III, Antigua, No. 42). Nevertheless, the plough would spread more rapidly in this colony than anywhere else in the British West Indies. Mathew Lewis’s account of experiments on his Jamaican estate in 1816-17 is celebrated: ‘...the awkwardness, and still more the obstinacy, of the few negroes, whose services were indispensable, was not to be overcome; they broke plough after plough, and ruined beast after beast, till the attempt was abandoned in despair.’ Yet his qualifying sentence should not be overlooked: ‘However it [the attempt at ploughing] was made without the most essential ingredient for success, the superintendence of an English ploughman; and such of the ploughs as were of cast-iron could not be repaired when once broken, and therefore ought not to have been adopted; but I am told that in several other parts of the island the plough has been introduced, and completely successful.’ (Lewis 1929: 272).5 Some planters asserted roundly that slaves were capable. According to another witness at the 1788 inquiry, on Jamaica ‘the Negroes learn the Use of the Plough very readily.’ (British Parliamentary Papers 1789: Part III, Jamaica, No. 9).

But most frequently the slaves’ characteristics as workers are ignored. Sometimes it is implied more or less clearly that physical considerations
were decisive. ‘Although I advise you to give up ploughing, I allow it
may be proper upon some estates, but not upon yours.’ The plough had
been given up by 1795 at New Found River, Jamaica ‘because of the
injury done to the stock from the hilliness of the land and the little advantage
gained in saving of labour.’ The failure of ploughing at Blue Mountain,
Jamaica, was blamed on the need to maintain drainage trenches, obstruction
from the cane trash which lay about the fields, and the over-exposure
of the soil to the sun. ‘...I can assure you that it is not for want of inclination
in many eminent planters in the Island that the Plough has not been
universally adopted wherever the land would admit of it.... The pleasing
idea of easing the severe and fatiguing manual labour of the negroes by
the use of cattle has induced numbers to try the plough & even to persevere
in the use of it for years.’ According to William Taylor, one of the very
few humanitarian critics of Jamaican slavery with personal experience as
an estate manager, although he had made considerable use of the plough,
it was impracticable in some mountain situations. He did not, however,
believe that ploughing had damaging effects on the soil: ‘...I think they
would use the plough wherever they could. I have heard overseers generally
express a great desire for it.’ (British Parliamentary Papers 1831-2, QQ
430-2). Sometimes no grounds at all are given for the policy pursued.
At Mesopotamia and Island, Jamaica, the disappearance of the occupation
‘ploughman’ from the slave listings during the later 1790s is left unex-
plained. 

The evaluation of decisions concerning the choice between alternative
techniques is a common enough historical problem. In such cases the
procedure often followed is to attempt a reconstruction of the economic
costs and benefits entailed, thus showing, it is hoped, how closely the
course eventually taken corresponded to business logic. Any wide departure
from ‘economic rationality’ may indicate defective entrepreneurship, per-
haps including prejudices about the nature of the labour force. However,
these exercises have often been inconclusive, even when conducted with
the abundant data generated by modern industrial economies (Coleman
& Macleod 1986: 598-9). They are much less likely to carry conviction
when applied to the issue of the plough, on the basis of Caribbean slavery’s
relatively sparse documentation.

First, to repeat a point which has already been laboured, it is unclear
what choices were in fact made. Perhaps our knowledge could be extended
by the systematic use of probate inventories to produce a ‘diffusion curve’,
of the kind used by analysts of more recent technical change, indicating
how the proportion of British West Indian estates equipped with ploughs
varied over time. But even with fuller information about the timing of
innovation, what could be said about benefits and costs? One Jamaican planter alleged in 1811 that by ploughing he had reduced expenses in land preparation from £10 to about £2 per acre, implying that the failure of so many others to follow his example was economically ‘irrational’ (Watts 1987: 430). Yet when work schedules were calculated on Jamaica during ‘apprenticeship’ in the mid-1830s, the cultivation of one acre of cane land, from planting until the time when its first crop became ready for cutting, was reckoned to take about 100 apprentice-days labour if the plough was used, and 120 days’ labour otherwise (British Parliamentary Papers 1837-8: 42-82).

Estate accounts may occasionally indicate how much a planter had paid for a plough, but not its maintenance requirements or rate of depreciation. Ploughing was usually introduced by indentured white servants, often imported specially for the purpose, men who from anecdotal evidence soon became martyrs to the West Indian climate, fevers, and rum. In fact we have very little idea how much white instructors cost their employers. The mortality of immigrant Europeans was not systematically recorded, but at least some white ploughmen could survive to be serviceable in other occupations, and when slave ploughmen appear in the estate inventories, the length of time that has been required for their training is not specified. Ploughing made extra demands on livestock, and a ploughed field was more subject to erosion than one left covered by a lattice of unbroken ground under the system of individually-dug cane holes. All other things being equal, no procedure could yield heavier crops than hoe cultivation and ‘treading out’ the manure – carrying the available supplies in baskets to be placed round the plants. But to the extent that livestock was improved by greater success with fodder crops – and during the later decades of slavery there was notable progress on this point in Jamaica, Barbados, and Antigua – the costs of animal traction and manure supplies relative to hand labour were reduced. The economics of ploughing cannot be disentangled from the general process of agricultural innovation (British Parliamentary Papers 1836: 269; Ward 1988: 61-79).

The choice between plough and hoe was also bound up with wider issues of slave management. It has been suggested that planters were reluctant to save labour in soil preparation, because on sugar estates a pronounced maximum in work requirements came at the sugar harvest. So increased efficiency in executing tasks at other times of the year would be of little value, and, by aggravating seasonal underemployment, perhaps also socially disruptive. This theory is unconvincing. All the evidence from the period of slavery shows that digging cane holes was a most stressful phase in the agricultural cycle, one that planters promoting amelioration were anxious to mitigate.
Another and more reasonable idea is that masters had doubts about ploughing because, although they recognized slaves as competent for the task, skilled men, working outside the main field gangs, were seen as a threat to discipline (Craton 1978: 226). It is certainly true that at least by the mid-eighteenth century every British West Indian sugar estate had its complement of slave artisans – boilers, distillers, carpenters, coopers, etc. – but these posts were obviously essential for sugar production. In field cultivation the planter had a real choice between more and less sophisticated methods. Also, craftsmen and sugar factory workers could be employed within a confined space under close supervision, to limit sabotage and ca’canny. For ploughmen, ranging over distant cane pieces with a variety of physical conditions, supervision and the monitoring of performance were more difficult. On Chesapeake tobacco estates, Kulikoff argues (it is not clear on what evidence), masters lost some authority when they introduced ploughs and carts. He states that this equipment was used by its slave operators to establish control over the pace of work. Nevertheless, the problem seems to have been manageable in the North American context: at least the plough was used widely here. But to what extent was this achieved because the region’s slaves – relatively ‘acculturated’ by Caribbean standards, and employed in smaller units – were more easily disciplined (Kulikoff 1986: 406, 408, 412)?

The significance of the slaves’ skills for their masters’ authority has also been raised as an issue by work on British West Indian slave revolts and conspiracies. In the early stage of settlement recently imported Africans were the most conspicuous as rebels. Then as time passed the leadership of popular uprising came to be taken by Creoles with special status, as drivers, craftsmen, and domestics. The tendency alarmed many white colonists, who complained that their trust had been betrayed (Gaspar 1978; Craton 1982). So how was the phenomenon seen as a problem of estate management? Were planters discouraged from employing their slaves in skilled occupations? Such a restrictive course was officially recommended after the Antiguan conspiracy scare of 1736 (Gaspar 1978: 312), but there is no evidence of it being followed.

On sugar estates in Barbados, the Leewards, and Jamaica, a steady increase occurred in the proportion of skilled slaves, from about 25 per cent of adult males in the mid-eighteenth century to about 40 per cent on the eve of emancipation (Ward 1988: 228). Were planters perhaps forced reluctantly along this path by the need to raise efficiency and cut costs, yet slowed down at every step by anxieties about indiscipline? There is no doubt that the tendency had economic causes: more craftsmen were
required as the volume of sugar output per worker increased and as equipment became more elaborate; and trained slaves were much cheaper to employ as specialists than hired whites. However, it seems unlikely that planters were seriously inhibited by security considerations.

First, skills were not seen as likely in themselves to be a source of danger or insubordination. Even if they gave their holders pride and self-confidence, they also brought privileges, however modest, which might be conferred or withheld as instruments of control. On early nineteenth-century Barbados it was reported that instruction of slave children in skilled trades ‘is usually done to gratify the well conducted Parents and reward them for their good conduct....’ (Taylor 1976-7: 71) Thomas Thistlewood’s Jamaican diaries, from an earlier and darker age, give a more brutal dimension to the management process. They show how among the slaves on Egypt sugar estate, where he served as overseer between 1754 and 1767, men with special skills – for example carpenters or sugar boilers – were much less likely to suffer punishment, and, to judge by the relative infrequency with which they ran away, much more reconciled to plantation life. The craftsmen were also regularly employed to guard the growing crops against theft and to hunt down runaways (Ward 1979; Ward 1988: 27-9).

Equally detailed information is not available for other properties, but estate population listings imply a similar pattern of behaviour. When masters commented on their slaves’ ‘disposition’, derogatory epithets – for example ‘runaway’, ‘skulker’, or ‘thief’ – were applied disproportionately to field labourers. Most compliments went to men with special responsibilities or skills. This pattern persisted up to the time of emancipation, despite the conspicuous part taken in rebellion by members of the slave elite. In the planter’s view the primary causes of unrest were material deprivation and, increasingly, radical ideas from overseas, not the presumptions of skilled workers, even if some of them did appear as leaders when revolt broke out. (We need not consider here whether these perceptions were accurate or logical, merely that they provided the basis for policy.) The best safeguards of good order seemed to be reasonable treatment, close supervision and, above all, the curtailment of the anti-slavery agitation in Great Britain. The only way by which training slaves could be construed as a source of insecurity came in so far as the process displaced white workers. This was clearly the concern in Antigua in the 1730s, but subsequently it had little effect. By the later eighteenth century there were few white craftsmen left to displace on British West Indian sugar estates: the whites who remained were almost entirely supervisors. So instruction for slaves, particularly in a quite new task like ploughing, made a net addition to the proportion of skilled workers.
CONCLUSION

I conclude, therefore, that slavery as an institution was not a major obstacle to the adoption of the plough in the British West Indies between 1750 and 1834. Physical conditions were the decisive influence on the rate of field mechanisation. Planters as a class had no particular fear of trained slaves, nor were they restrained by strong prejudices that slaves were incapable of acquiring new skills. Ploughing did not seem likely to cause major problems of seasonal underemployment. The use of ploughs was discouraged by slavery only in so far as it had the effect of making hand labour seem relatively abundant. The significance of concerns for labour saving is shown by the renewed interest taken by planters in ploughing after the closure of the slave trade from Africa in 1808, an interest which was confirmed and perhaps strengthened by emancipation in the 1830s. However, it must be stressed that British West Indian sugar planting between 1750 and 1834 was not by contemporary standards a 'cheap labour' economy. During this period the cost of acquiring and reproducing a work force rose more rapidly here than perhaps anywhere else in the world. This tendency resulted partly from market forces in the transatlantic slave trade, and partly from the political constraints imposed by the growing metropolitan anti-slavery movement. As a result, by the time of emancipation the material consumption levels reached by slaves in the British Caribbean roughly matched those of manual workers in industrialising Great Britain (Ward 1988: 261-3, 286-8). Under these conditions the sugar estates could be maintained only by making their labour force more productive, and to this challenge many planters proved capable of developing an effective response.

NOTES

1. Watts 1987: 423-47, while recognizing that some adaptation did occur, takes a more pessimistic view of British West Indian economic trends after 1720. I think that he does not give sufficient weight to the planters' capacity for technical innovation. His account relies too much on printed sources, and is not supported by quantitative measures of productivity.

2. Tudway MSS, Somerset Record Office, Taunton, Box 14, Monthly Journals of Plantation Works 1823-9.

3. For an alternative recent view, that the use of the plough was declining in early 19th-century Jamaica, see Watts 1987: 431-2.
4. Vassall MSS, Sheffield City Libraries, Sheffield Record Office, MD 2047 (1), Letter Book of William Vassall 1769-86, J. Wedderburn to W. Vassall, 2 Aug. 1777.

5. Most attempts to introduce the plough were made with white immigrants, but it was clearly expected that these men would train slave successors: Vassall MSS, J. Wedderburn to W. Vassall, 2 Aug. 1777.

6. Institute of Jamaica, Kingston, Jamaica, MS 1069/3, J. Kerr to T. Hall, 24 Sept. 1777, concerning Irwin estate, Hanover parish, Jamaica.

7. Vassall MSS, W. Vassall to J. Graham, 4 Mar. 1795.

8. Fitzherbert MSS, Derbyshire Record Office, Matlock, Wl/9, W. Sutherland to W.P. Perrin, 8 Feb. 1801. See also Edwards 1819: ii, 245.

9. Clarendon MSS, Bodleian Library, Oxford, Dep b 36, listings of slaves on Mesopotamia and Island plantations 1780-1802.

10. See, for example, Grilliches 1971: 208. Kulikoff 1986: 408, uses probate inventories to measure the increasing ownership of ploughs and carts by North American tobacco planters between the 1730s and 1770s. Similar sources are available for some of the British West Indies, but it is doubtful whether they provide sufficient detail to help with this problem. Many inventories held among estate archives do not specify individual items of equipment. Hall 1959: 96, presents statistics for imports of agricultural machinery in the 1840s. But official statements of colonial trade for our period do not in general define categories closely enough to identify deliveries of particular implements. A further problem is that plantations recorded as having ploughs might use them on varying proportions of their cane land. Thus in July 1834 it was hoped soon to completely replace cane holing with ploughing on Holland estate, St. Elizabeth parish, Jamaica. At the time the property held only one plough 'and it answers extremely well': Gladstone MSS, Clwyd Record Office, Hawarden, Ch 81, R. Gladstone to J. Gladstone, 28 July 1834. I suspect that the impression of increased ploughing after emancipation comes partly from the fuller use of implements that were already on hand. But to confirm this we would need much fuller accounts of cultivation schedules than usually survive.

11. For alternative estimates, see Green 1973: 458.

12. Thus the 'Inventory of Plantation Utensils, Stores, &c on Parham New Work Estate 1st Jany. 1824', fos. 6, 9 (Tudway MSS, Box 53), lists 5 plough animals, all imported since 1820, and 6 ploughs, 4 of them broken. But this exceptionally full archive seems to give no further information about costs. Correspondence may report that a plough has been broken, if the overseer wants a replacement: e.g. Clarendon MSS, Dep c 360, Bundle 8, W. Ridgard to J.F. Barham, 9 Oct. 1828. But if the matter is not mentioned, does this mean that the plough is still intact and in use, that it has been repaired on the estate, or that it has been given up altogether?

13. Thus while the Vassall MSS mentions the death of one white ploughman, and the interception of a second by a press gang, others, including a 'clever, useful man', appear and disappear without explanation: Vassall correspondence, 17 Oct. 1778, 26 June, 8 Dec.
1779, 4 Oct. 1780, 3 Jan. 1782, 4 Nov. 1783. However, on 2 Aug. 1777 Vassall's Jamaican
attorney did regard the mortality of white men from fever as an obstacle to ploughing.

14. For slave ploughmen see Gale-Morant MSS, Exeter University Library, 3/c (York,
Jamaica, 1778, 1782); Craton 1978: 226, 423, n. 8 (Worthy Park, Jamaica, 1784, 1794);
Penrhyn MSS, The Library, University College of North Wales, Bangor, R.W. Fearon to
Lord Penrhyn, 4 Oct. 1806 (Denbigh, Jamaica); Public Record Office, London, T. 71/1542
(Martin Byams, Antigua, 1830); Gale-Morant MSS, 4/c (Mount Hindmost, Jamaica, 1833);
and the example cited above, n. 9.

15. I share the scepticism expressed on this point by Boomgaard & Oostindie (1989). For
the stresses on slaves in the cane-holing and planting season, and for the particular concern
of masters during the amelioration period to ease this part of the annual cycle, see Ward
1988: 15-29, 92-3, 215; Edwards 1819: ii, 248. Hall 1971: 22, quotes an Antiguan planter
who had given up ploughing, because of the need to keep a slave holding occupied through
the year. Hall's quotation is repeated (and attributed to Jamaica) by Aufhauser 1973: 817.
It is just possible that on Antigua, the only one of the British sugar colonies to forgo
'apprenticeship' in 1834, planters felt themselves to be more encumbered with surplus labour
than did their counterparts on other islands. But the case cited by Hall seems to be quite
exceptional even for Antigua. The colonist quoted was the only one of eight local men
examined about the possibilities for the use of machinery to reply in these terms (British
Parliamentary Papers 1836: 274). Craton (1978: 226) mentions the fear of idleness out of
crop as a reason against ploughing. But he acknowledges also that some authors, reading
back from later practice, have exaggerated the 'five-month fury of the sugar crop' in the
slavery period. Ploughing with free labour at Worthy Park during the early 1840s did not
produce marked seasonal variations in employment (Craton 1978: 276-8, 295). Neither did
it do so on the Parham plantations, Antigua (Tudway MSS, Box 53, wage sheets). Dunn
(1984: 174-5) offers Mesopotamia estate, Jamaica, as representative of British West Indian
conditions. He suggests that 'the slaves were given simple hand tools and no labor-saving
devices. Much of their work would have been performed by draft animals in English or
North American agriculture. Sugar was then as it is now, a seasonal crop, but the overseers
stretched out the tasks to keep the slaves fully occupied at all times.' In my own reading
of the records from Mesopotamia I have not found any support for this suggestion. The
plough was used on the estate from the 1760s until at least the 1790s (Clarendon MSS,
Dep c 357, D. Barnjum to J.F. Barham, 14 Sept. 1765; above, n. 9). If ploughing was
subsequently given up here it is more likely to have been because of the stiffness of the
local soils than any desire to spread employment through the year. In the 1820s attempts
were made at Mesopotamia to reduce the labour of holing and replanting by extending
the ratoons (Ward 1988: 92-3). In the 1840s, although the estate's manager claimed that
he used the plough wherever possible, he could still quote rates of pay for digging cane
holes in unploughed land (British Parliamentary Papers 1847-8: 192-3).

16. Green (1976: 51-2) emphasises how slave resistance to new implements confirmed
planters' attachment to customary hand methods. An unusually detailed impression is given
of the experience and attitudes of one planter through the diaries kept by Thomas Thistlewood,
who worked as an overseer on sugar estates in western Jamaica for most of the period
1751-67 (Monson MSS, Lincolnshire Archives Office, Lincoln, Mon. 31/1-37). Thistlewood
noted (18 Mar. 1751) 'That some negroe sugar Boilers purposely will make no sugar
to get the overseer turn'd out when they don't like him', but apparently never thought
that he himself had been the object of such an attempt. In his 16 years as a sugar planter he only recorded one suspected act of sabotage. On 7 Mar. 1767 the mill had broken down and he found a walking stick or cudgel lying nearby, after having been passed through the rollers. Thistlewood took a close interest in possibilities for technical improvement, although he never tried ploughing. He seems to have entertained no doubts about slaves’ capacity for skilled work. On 25 Jan. 1762 he had the temporary loan from a neighbouring estate of the ‘famous Boiler named Wille’, who departed five days later with presents of money and two bottles of rum, and the diary comment: ‘he certainly is a very good boiler.’ On 9 Feb. 1762, while the mill was being repaired, Thistlewood remarked: ‘Mason Quashie very handy about such things.’

17. Kulikoff notes that Chesapeake planters did not trust African slaves with any but the most rudimentary tools, and that ploughs were adopted as the proportion of creole slaves increased. I am not sure how significant creolisation was as an influence on the rate of technical progress in the British West Indies. Planters there gave a perceptible but not in overwhelming preference to Creoles over Africans in selecting for skilled assignments (Ward 1988: 228). Thus at York, Jamaica, in 1782 one of the three ploughmen was a 21 year old Eboe called Dennis (Gale-Morant MSS, 3/c). In the later 18th century the proportion of creole slaves stood at about 70% in North America but only 35% in Jamaica (Klein & Engerman 1978: 372; Ward 1988: 129). However, physical conditions were also more favourable to ploughing in North America. Some useful comparative perspectives might be gained from the experience of Europeans employing ‘native labour’ with the plough in colonial South Africa and Spanish America. I do not have the impression that adaptation in these areas was thought to be particularly difficult.

18. Monson MSS, Thistlewood Diaries.

19. This conclusion is based on an examination of the slave listings detailed in Ward 1988: 280-1.

20. Thus in the discussion of Jamaican slave revolts and the means to prevent them by Long (1774: ii, 404-504), stress is put on the need to encourage ‘minor staples’, grown by white smallholders, rather than the employment of white craftsmen on the sugar estates.

References

Aufhauser, R. Keith, 1973. Slavery and scientific management. Journal of Economic History 33: 811-24.

Bell, K.N. & Morrell, W.P. (eds), 1928. Select documents on British colonial policy 1830-1860. Oxford, Oxford University Press.

Bennett, J.H., 1958. Bondsmen and bishops: slavery and apprenticeship on the Codrington plantations of Barbados, 1710-1838. Berkeley, University of California Press.

Boomgaard, Peter & Oostindie, Gert J., 1989, this issue of NWIG.

British Parliamentary Papers, 1789. xxvi (646a), Report of the Lords of the Committee of Council...concerning...the trade in slaves.... London, House of Commons.
BRITISH PARLIAMENTARY PAPERS, 1831-2. xx (721), Report from the Select Committee...upon...the extinction of slavery.... London, House of Commons.

BRITISH PARLIAMENTARY PAPERS, xlix (166), Papers in explanation of measures adopted for giving effect to Abolition of Slavery Act (pts. III. 1-2). London, House of Commons.

BRITISH PARLIAMENTARY PAPERS, 1837-8. xlix (154.1), Papers in explanation of the measures...for giving effect to the Act for the Abolition of Slavery. London, House of Commons.

BRITISH PARLIAMENTARY PAPERS, 1842. xiii (479), Report from the Select Committee on West India Colonies. London, House of Commons.

BRITISH PARLIAMENTARY PAPERS, 1847-8. xxiii, Part III (245), Seventh Report from the Select Committee on sugar and coffee planting. London, House of Commons.

COLEMAN, D. & MACLEOD, C., 1986. Attitudes to new techniques: British businessmen, 1800-1950. Economic History Review 2nd Ser. 39: 588-611.

CRATON, MICHAEL, 1978. Searching for the invisible man: slaves and plantation life in Jamaica. Cambridge, Mass., Harvard University Press.

———, 1982. Testing the chains: resistance to slavery in the British West Indies. Ithaca, N.Y., Cornell University Press.

CRATON, MICHAEL & WALVIN, J., A Jamaican plantation: the history of Worthy Park 1670-1970. London, W.H. Allen.

DAVY, J., 1854. The West Indies before and since slave emancipation. London, W. & F.G. Cash.

DUNN, RICHARD S., 1984. Servants and slaves: The recruitment and employment of labor, In J.P. Greene & J.R. Pole (eds), Colonial British America: essays in the New History of the Early Modern Era. Baltimore, Johns Hopkins University Press, pp. 157-94.

EDWARDS, BRYAN, 1819. The history, civil and commercial, of the British colonies in the West Indies. 5th edn., 5 vols, London, T. Miller.

GASPAR, D. BARRY, 1978. The Antigua slave conspiracy of 1736: a case study of the origins of collective resistance. William and Mary Quarterly 3rd Ser. 35: 308-23.

GREEN, WILLIAM A., 1973. The planter class and British West Indian sugar production, before and after Emancipation. Economic History Review 2nd Ser. 26: 448-63.

———, 1976. British slave Emancipation: the sugar colonies and the great experiment 1830-1865. Oxford, Oxford University Press.

GRILICHES, Z., 1971. Hybrid corn and the economics of innovation. In R.W. Fogel & S.L. Engerman (eds), The reinterpretation of American economic history. New York, Harper & Row, pp. 207-13.
HALL, DOUGLAS, 1959. Free Jamaica 1838-1865: an economic history. New Haven, Conn., Yale University Press.

———, 1971. Five of the Leewards, 1834-1870. St. Lawrence, Barbados, Caribbean University Press.

KLEIN, HERBERT S. & ENGERMAN, STANLEY L., 1978. Fertility differentials between slaves in the United States and the British West Indies: a note on lactation practices and their possible implications. William and Mary Quarterly 3rd Ser. 35: 357-74.

KULIKOFF, A., 1986. Tobacco and slaves: the development of Southern cultures in the Chesapeake, 1680-1800. Chapel Hill, North Carolina University Press.

LEWIS, M.G., 1929. Journal of a West India proprietor, kept during a residence in the Island of Jamaica, ed. M. Wilson. London, Routledge.

LONG, EDWARD, 1774. The history of Jamaica. 3 vols, London, T. Lowndes.

PARES, RICHARD, 1950. A West-India fortune. London, Longmans.

PORTER, G.R., 1831. The nature and properties of the sugar cane. London, Smith, Elder & Co.

ROUGHLEY, T., 1823. The Jamaica planter's guide. London, Longman & Co.

RAGATZ, L.J., 1928. The fall of the planter class in the British Caribbean, 1763-1833. New York, The Century Co.

SCOTT, REBECCA J., 1984. Explaining Abolition: contradiction, adaptation and challenge in Cuban slave society, 1860-1886. Comparative Studies in Society and History 26: 83-111.

SHERIDAN, RICHARD B., 1974. Sugar and slavery: an economic history of the British West Indies 1623-1775. Baltimore, The Johns Hopkins University Press.

STURGE, J. & HARVEY, T., 1968. The West Indies in 1837. London, Dawsons.

TAYLOR, B.M., 1976-7. Our man in London: John Pollard Mayers, Agent for Barbados, and the British Abolition Act, 1832-1834. Caribbean Studies 16, Nos. 3 and 4: 60-84.

WATTS, DAVID, 1987. The West Indies: patterns of development, culture and environmental change since 1492. Cambridge, Cambridge University Press.

WARD, J.R., 1979. A planter and his slaves in eighteenth-century Jamaica. In T.C. Smout (ed.), The search for wealth and stability. London, Macmillan, pp. 1-20.
WARD, J.R., 1988. *British West Indian slavery, 1750-1834: The process of Amelioration*. Oxford, Oxford University Press.

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