

Pedigree and the National Cattle Herd circa 1750–1950

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IT IS not customary for a historical study with a narrow thematic focus to be concerned with an extended period of time. Micro-scale history is usually micro-scale in all respects. The present hybrid approach to a pedigree subject therefore requires explanation. Pedigree stock — that is, stock eligible for inclusion in published genealogies listing ancestral links between animals of a particular breed and those originally improved by the pioneers of that breed — represent a continuing testimony to the aims and beliefs of the master breeders. A diagnosis of the impact of pedigree is relevant to an assessment of the achievements of the pioneers. But only by adopting a long-term view is it possible to evaluate their worth. This study attempts such an evaluation within the context of a wider survey of the development of cattle husbandry since Bakewell. It provides an expansion of the necessarily brief accounts of the standard texts, which for the most part can do little more than outline the principles of selective breeding and their application by Bakewell and others with varying degrees of success. The primary objective is to remove some of the murkiness from the history of livestock improvement in Britain, which one authority has described as 'long, tangled and in many respects obscure'.¹

The essay examines three broad themes. An extended introduction sets the problem in context by outlining the evidence for quantitative change in cattle output since 1750. I then explore the history of pedigree, particularly in relation to its social and economic environment. And the last and

longest section tries to establish how far pedigree contributed to the productivity changes already described. The social context of improvement and the deferential pressures associated with it are important considerations here. But the theme is also placed in the context of late nineteenth- and twentieth-century developments in the emergent science of genetics.

I

It is not easy to reconstruct historical trends in livestock output. The familiar deficiencies of the statistical record before the first June returns of 1866 are compounded by the inherent complexities of the production process. This means that crude estimates of livestock numbers, which are available nationally back to Gregory King, and may be reconstructed regionally from probate inventory samples, are likely to be of limited assistance in establishing the lineaments of change.² The problem reflects the diversity of end products in livestock (meat, milk, hides, wool, manure), and the numerous means available for securing changes in overall levels of output. Besides increases in the numbers of livestock, we also have to be alert to possible improvements in size, quality (for example in the ratio of saleable meat to offal or of lean to fat), yield (annual milk output for example), changes in feed provision, economy of feed conversion, and the length of time needed to attain maturity. In the circumstances, it is often difficult to

¹ G E Mingay, *The Agricultural Revolution: Changes in Agriculture 1650–1880*, 1977, p 29.

² M Overton, 'Agricultural Revolution? Development of the Agrarian Economy in Early Modern England', in A R H Baker and D Gregory (eds), *Explorations in Historical Geography*, Cambridge, 1984, p 131.

secure acceptable estimates for all categories of output.

Nevertheless, certain trends are discernible. Estimates made by Gregory King at the end of the seventeenth century, Arthur Young in 1779, and Mulhall in 1832 offer no evidence of increases in the numbers of British cattle during the period of rapid population growth in the second half of the eighteenth and the early years of the nineteenth century.³ Naval victualling contracts and estimates made by Sir John Sinclair suggest to Deane and Cole that there may have been unit increases in the mean weight of beef carcasses during the eighteenth century, although this conclusion is not supported by Fussell's statistics on cattle weights, which derive mostly from late eighteenth- and early nineteenth-century published estimates.⁴ Both Fussell and Deane and Cole think other qualitative improvement likely. Fussell suggests that a reduction in the number of beef animals which were first expected to earn their keep as plough oxen ensured that a greater proportion of the national herd could be brought to an acceptable slaughter weight at three rather than four years of age.⁵ Deane and Cole also believe that an earlier age of fattening may have been responsible for a 25 per cent improvement in supply, while, they hypothesize, 'the efforts of cattle breeders presumably resulted in some improvement in the quality of stock . . . and in the reduction of bone and offal'.⁶ But these somewhat speculative suggestions do not greatly alter the overall impression derived from both the Smithfield and animal by-product series, which is of small absolute increases and tangible decreases per capita of the population in the supply of beef, to some extent compensated for by improvements in the supply of mutton. 'In the second half of

the eighteenth century, and still more at the beginning of the nineteenth, the supply of beef failed to keep pace with the growth of population.'⁷

In the nineteenth century, the picture becomes clearer and provides better evidence of improvement. The underlying causes are well understood and may be summarized briefly as follows.⁸ First, British agriculture was increasingly exposed to foreign competition, especially after Corn Law repeal. Cereals producers were much more vulnerable to the effects of this competition than were livestock producers, principally, but not exclusively because it took somewhat longer to surmount the inherent problems of transoceanic transport in livestock products. Within the livestock sector, meat producers were more exposed than were dairy producers for much the same reason. Second, increasing real wages, which even pessimists concede were a feature of Britain from the beginning of the third quarter of the nineteenth century, resulted in an accelerated demand for high-cost proteins. These provided an increasing proportion of overall calorific intake. Admittedly, under conditions of rapid population growth, the size of the market for all categories of food increased, but the rate of increase was more rapid for livestock products than in the cereals sector, where it was insufficient to offset the effects of greater import penetration. Third, the cereal producer's loss was the livestock producer's gain to the extent that stagnating or falling prices for cereals and artificial feedstuffs reduced the overall cost of producers' inputs in livestock to a greater

⁷ *Ibid.*, pp 68, 74.

⁸ The following discussion draws upon E L Jones, 'The Changing Basis of English Agricultural Prosperity, 1853-73', *Ag Hist Rev*, X, 1962, pp 102-19; D C Moore, 'The Corn Laws and High Farming', *Econ Hist Rev*, 2nd ser, XVIII, 1965, pp 545-61; S Fairlie, 'The Corn Laws and British Wheat Production', *Econ Hist Rev*, 2nd ser, XXII, 1969, pp 88-116; G Hueckel, 'Relative Prices and Supply Response in English Agriculture during the Napoleonic Wars', *Econ Hist Rev*, 2nd ser, XXIX, 1976, pp 401-14; A J Taylor (ed), *The Standard of Living in Britain in the Industrial Revolution, 1700-1860*, *Econ Hist Rev*, 2nd ser, XXXVIII, 1985, pp 24-41.

³ P Deane and W A Cole, *British Economic Growth 1688-1959*, Cambridge, 2nd edn, 1962, p 69.

⁴ G E Fussell, 'The size of English cattle in the eighteenth century', *Ag Hist*, III, 1929, p 179.

⁵ *Ibid.*, p 179.

⁶ Deane and Cole, *op cit*, p 70.

extent than was possible in the arable sector.

Of course, one might have reservations about the balder assertions of this outline. Collins and Jones, for example, have argued that cereal producers responded to competitive disadvantage by adopting mixed farming systems and treating fatstock rather than cereals as their major saleable commodity.⁹ However, there were obvious limitations to the arable farmers' immunity to depressed cereals prices, as their severe difficulties after the collapse of the cereals sector in 1879 prove.

Some statistical elaboration of the broad general outline is provided by the estimates of Ojala, subsequently modified by Fletcher and Perren, and by those of Venn and Whetham. Ojala's modified figures show that meat rose from almost 30 to almost 35 per cent of total gross English agricultural output between 1867-71 and 1894-8, with milk increasing from 11.9 to 18 per cent. By 1894-8, milk was the most important single component of output, with beef second at 14.3 per cent. While the United Kingdom livestock sector increased by 18 per cent at constant 1867-71 prices between these two dates, arable declined by 9 per cent. The decline was greatest in respect of wheat which fell from 21.9 to 6.8 per cent of gross English output.¹⁰

However, even the rates of increase in the livestock sector could not match the pace of increase in domestic demand. The favourable performance of the livestock sector from the 1890s owed as much to the abysmal showing of arable as to its own achievements. Dairying was the only activity experiencing appreciable growth, while declining numbers of beef cattle and sheep

were an important feature of British agriculture from the 1890s to the 1930s.¹¹

Imports made up the deficiency. Since 1842, when British ports were opened to European livestock, imports of mostly inferior and cheaper stock and meat had steadily increased until domestic sources supplied only 58 per cent of demand by 1905-9.¹² When London's Smithfield reopened as a carcass market in 1869, 75 per cent of its stocks came from the British Isles, but by 1927 this had dropped to 27 per cent. Transoceanic areas took over from Europe as the major source for imported meat after 1880. Perren estimates that throughout the nineteenth century, output of meat from British farms increased at only half the rate of population growth.¹³

The domestic livestock sector showed only a moderately successful response to the new challenges of expanded markets. The factors which may have contributed are numerous and diverse. What follows is not therefore offered as a complete explanation of performance failure, but is concerned with the specific status of pedigree. Let us pose the question, 'Are pedigree breeders to be congratulated for having contributed to such improvement as occurred or to be reprimanded for having squandered their energies on an activity which had little bearing on the needs of the wider market?' The balance of evidence to be presented in the following sections favours the second viewpoint more than the first.

II

To trace the history of livestock pedigree we have to begin at least 150 years earlier than the late nineteenth century. Although heroic

⁹ E J T Collins and E L Jones, 'Sectoral Advance in English Agriculture', *Ag Hist Rev*, XV, 1967, pp 65-81.

¹⁰ E M Ojala, *Agriculture and Economic Progress*, 1952; T W Fletcher, 'The Great Depression of English Agriculture 1875-1896', *Econ Hist Rev*, 2nd ser, XIII, 1960-1, pp 431-2; R Perren, *The Meat Trade in Britain 1840-1914*, 1978, pp 6-9; D Taylor, 'The English Dairy Industry, 1860-1930: the Need for a Reassessment', *Ag Hist Rev*, XXII, 1974, 153.

¹¹ Fletcher, *op cit*, p 419; E H Whetham, 'Beef Cattle and Sheep', Dept of Land Economy, Univ of Cambridge, *Occasional Paper*, 5, 1976, pp 15-16.

¹² Perren, *op cit*, pp 3, 77; Whetham (*ibid*, p 14) estimates that by 1907-8 about 40 per cent of the beef and veal and 44 per cent of the mutton and lamb consumed in the United Kingdom derived from imports.

¹³ R H Green, 'Cattle husbandry', *Live Stock Journal Almanac* 1929, p 52; Perren, *op cit*, pp 176, 3, 4.

accounts of the period tended to regard Bakewell as pedigree's sole author, the most that he can genuinely claim is a more rigid advocacy of adherence to the principles of selective breeding than any of his rivals or predecessors, greater success as a self-publicist, and a keen eye to the commercial main-chance. Rigorous prosecution of his own financial interests and the interests of those who took up Bakewell stock was achieved by the imposition of high stud fees and severe penalties on any whose generosity inclined them to offer their stock for less.¹⁴ Although Bakewell's protectionism may have been more extreme than that later pursued by the breed societies, it can still be regarded as its precursor.

Not only did Bakewell show how pioneer breeders might profit by creating a demand and then imposing strict controls on supply, he also demonstrated the profit potential of breed in a broader context, non-pedigree as well as pedigree. In essence, breed was nothing more than an ingenious marketing and publicity mechanism. Certain identifiable physical characteristics were imprinted in animals of a particular strain, and prospective purchasers were then encouraged to associate those markers with some attribute or attributes of productivity which, it was claimed, such animals also possessed: rapid weight gain, larger size, high food conversion rates, better distribution of meat, heavier milk yields and so on. The success of a breed depended to some extent on the visual impact of the chosen marker or trade mark, and the ease of its transmission from one generation to the next, to some extent on the degree to which the claims made for the breed's performance were thought to be valid. At the time, the claims simply could not be submitted to acceptable tests of validity. Perhaps paradoxically, Bakewell's Longhorn was successful in neither respect. Its Longhorn trademark made it an impos-

ible candidate for the fold-yard, while its capacity to make fat did not impress those who had a commercial interest in the good milk yields of the old Longhorn.

If Bakewell's immediate achievements were not an unqualified success, there are also doubts about the extent to which they were truly original. Russell has reminded us that other Midland breeders, notably Webster of Canley and Gresley of Drake-low, had started to improve Longhorn stocks taken from Lancashire as early as 1720, while the Lancashire Longhorn had itself acquired a reputation for quality in the seventeenth century. Even at this early date, there were complaints, reminiscent of those later directed at Bakewell, that selection for fat was ruining the breed's milking properties.¹⁵

The more one explores the problem, the more it becomes clear that pedigree was merely an elaboration of old-established principles and practices. Domestication itself amounted to little more than the selection by man of those strains which best suited his purposes, coupled with the neglect and ultimate demise of others.¹⁶ There is no reason to suppose that improvements thus initiated were willingly abandoned in subsequent centuries. As Fraser puts it, 'that [Bakewell] was the first breeder of livestock to pay due attention to a sire's get I simply do not believe, having never met a breeder so supremely foolish as not to do so'.¹⁷ In sheep husbandry, Ryder has suggested that selective breeding for continuous fleece growth occurred in the Middle Ages following the invention of sheep shears.¹⁸ In cattle husbandry, selective castration of bull

¹⁴ H C Pawson, *Robert Bakewell. Pioneer Livestock Breeder*, 1957, pp 68-79; R Trow-Smith, *A History of British Livestock Husbandry 1700-1900*, 1959, pp 45-69, 85-9.

¹⁵ N Russell, 'Who Improved the Eighteenth-Century Longhorn Cow?', in W Minchinton (ed), 'Agricultural Improvement: Medieval and Modern', *Exeter Papers in Economic History* 14, 1981, pp 27-8, 38.

¹⁶ See for example R J Berry, 'The Genetical Implications of Domestication in Animals', in P J Ucko and G W Dimbleby (eds), *The Domestication and Exploitation of Plants and Animals*, 1969, pp 211, 214.

¹⁷ A Fraser, *Animal Husbandry Heresies*, 1960, p 28.

¹⁸ M L Ryder, 'Medieval Sheep and Wool Types', *Ag Hist Rev*, XXXII, 1984, p 21.

calves, or the use of other techniques similar to those documented in contemporary ethnographic studies,¹⁹ provided a simple but effective means of exerting control. The more likely-looking animals could be reserved for breeding (these could probably be identified by a practised eye, or by crude and informal tests to ensure that the beast was capable of performing the tasks demanded of it) while their more docile castrated brethren served out their time as draught oxen until they were fattened and slaughtered. Polygamous mating of the favoured bull then ensured wide dispersal of his genes.

At one level, pedigree may be seen as an extension of long-standing customary practices. But its application to farm livestock during the later eighteenth century had more immediate antecedents within the non-farm sector. Bakewell himself may well have been strongly influenced by these, for his Leicestershire home lay only six miles from the place where Hugo Meynell had established a pack of celebrated foxhounds during the middle years of the eighteenth century.²⁰ Among other more general coincidences in the geographies of improvement for profit and improvement for pleasure we may note the proximity of Newmarket to the great East Anglian centres of pioneering agriculture, and, perhaps even more striking, the appearance of the Improved Shorthorn on the banks of the Tees in close proximity to Cleveland and the North Yorkshire vales which had already become 'the most decided breeding countries in England for coach horses, hunters and hackneys', according to Youatt.²¹ A late eighteenth-century directory entry for the town of Bedale

describes the high esteem accorded the offspring of certain favoured stallions.²²

Horse breeders in general and the breeders of racing stock and hunters in particular were early exponents of selective breeding and the first to recognize the advantages of a formal pedigree record. Keith Thomas believes that selective breeding of horses for the different functions they had to perform dates back to the fourteenth century and was pursued with increasing enthusiasm from the sixteenth century onwards.²³ The importation from the Middle East during the late seventeenth and early eighteenth centuries of the three stallions which were the founders of all thoroughbred racing stock opened an important new chapter in the improvement of non-farm domestic livestock.²⁴ Advertisements in the English provincial press for stallions at stud not only became more frequent from the 1740s, but were also more likely to provide details of pedigree. This interest culminated in the publication of the first thoroughbred stud book in 1791, which pre-dated the first stud book for a farm animal by some thirty years.²⁵

These changes were paralleled elsewhere. By the early eighteenth century not only horses, but dogs, game-cocks, pheasants, cage-birds, and the vegetable kingdom were being accorded the same treatment on a grand scale.²⁶ One contemporary witness to these events saw a clear moral. 'I cannot help thinking,' wrote Thomas Bewick, 'that if the same pains were taken in breeding mankind, that gentlemen have bestowed on

¹⁹ B A L Cranstone, 'Animal Husbandry: the Evidence from Ethnography', in Ucko and Dimbleby, *op cit*, pp 254-5.

²⁰ P Mathias, *The First Industrial Nation. An Economic History of Britain 1700-1914*, 1969, p 80.

²¹ *Ibid*, p 79; W Youatt, *The Horse. A Treatise on Draught*, new edn, 1843, p 96.

²² *Universal British Directory of Trade and Commerce* . . . , II, 1791, p 275. 'Though the pedigree of them is not preserved for a succession of ages . . . yet are their stallions denominated by certain names that never fail to advance the price of a horse according to the repute of the sire he comes from.'

²³ K Thomas, *Man and the Natural World*, 1983, p 59.

²⁴ I M Lerner and H P Donald, *Modern Developments in Animal Breeding*, 1966, p 123.

²⁵ J H Plumb, 'Commercialization and Society', in N McKendrick, J Brewer and J H Plumb, *The Birth of a Consumer Society. The Commercialization of Eighteenth-Century England*, 1983 edn, pp 318-19; E H Whetham, 'The Trade in Pedigree Livestock 1850-1910', *Ag Hist Rev*, XXVII, 1979, p 47.

²⁶ Thomas, *op cit*, p 60; J S Sebright, *The Art of Improving the Breeds of Domestic Animals. A Letter to Sir Joseph Banks*, 1809, p 27; Plumb, *op cit*, pp 317-27.

the breeding of their dogs, horses and game-cocks that human nature might as it were be new modelled, hereditary diseases banished and such a race of mankind might people the country as we can form no true conception of, and instead of a nation of mongrels, there would in time appear a nation of Admirable Crichtons.²⁷ More interesting than the eugenic implications of these remarks is the exclusion of farm animals from Bewick's list of selective breeding successes. Bewick, whose 'sole stimulant . . . was the pleasure derived from imbibing natural objects', had little sympathy for the work of his neighbouring Shorthorn improvers, which he thought a travesty of nature and fraudulent in its claims.²⁸

It has been shown that the application of selective breeding practices to non-farm livestock antedated their use in the agricultural sector. This is important in the context of the following discussion, which tries to assess the contribution of pedigree to productivity improvements in cattle. It will be argued that the potential for improvement using selective breeding techniques was restricted both by the breeders' lack of an appropriate scientific background, and by the general socio-economic context within which pedigree had originated. To grasp this last point demands appreciation of a complex web of interconnections. Much of the early attention devoted to the selective breeding of non-farm livestock arose from an interest in the manipulation of animate raw material for its own sake and not because the animals concerned had a specific utility to man. The most wayward creations of 'the fancy', as it came to be known, were in the realms of pigeon breeding, although few domestic animals or birds escaped its attentions completely. Motivations varied from one group of fanciers to another, but several contemporaneous social and

economic developments are reflected in the growth of 'the fancy'. These include a developing interest in the natural world, shaped by man's continuing perception of himself as standing at the apex of a hierarchy embracing the whole of the animal kingdom and therefore free to interfere; the rise of a prosperous bourgeoisie during the eighteenth century, able and willing to devote time and money to such pursuits, followed by the downward social diffusion of these conditions and inclinations to the respectable working class by the second half of the nineteenth century; and a continuing search for the rural ideal among commercial or industrial interests, fully realized by the few who could afford to buy landed property, partially realized by those who had to rest content with mountain holidays, gardening, or the ownership of pets.²⁹

The significance of 'fancy' or 'ornament' in relation to our present concerns is as follows. The application of selective breeding procedures to farm animals was only likely to enhance their utility if breeders were more interested in the animal's performance than in its potential as a vehicle for 'fancy'. Since the lead in breeding was taken by the richer landed proprietors, these conditions were most likely to be fulfilled in respect of animals like foxhounds, hunters and race-horses, where richer landowners made direct use of the animals' utility functions (albeit success was not guaranteed).³⁰ The same could not be said of cattle, where despite protestations of an interest in utility, many breeders were not concerned about the profitable ends of commercial livestock husbandry in quite the way that, say, the average tenant farmer would be. Breeding farm livestock appealed to many landowners

²⁷ I Bain (ed), *A Memoir of Thomas Bewick Written by Himself*, Oxford, 1979, pp 33.

²⁸ *Ibid.*, pp 140-1, 187.

²⁹ Thomas, *op cit*, p 60; Plumb, *op cit*, p 318; D Elliston Allen, *The Naturalist in Britain. A Social History*, 1976; J A Secord, 'Nature's Fancy: Charles Darwin and the Breeding of Pigeons', *Isis*, 72, 1981, pp 170-4; Sebright, *op cit*, p 13.

³⁰ Robin Dunbar, 'The race to breed faster horses', *New Scientist*, 1459, 6 June 1985, pp 44-7 shows how, even at present, stallions which have won one or two key races automatically acquire a high stud value irrespective of their true genetic worth. Winning times for the major Classics have shown only modest improvement in the present century.

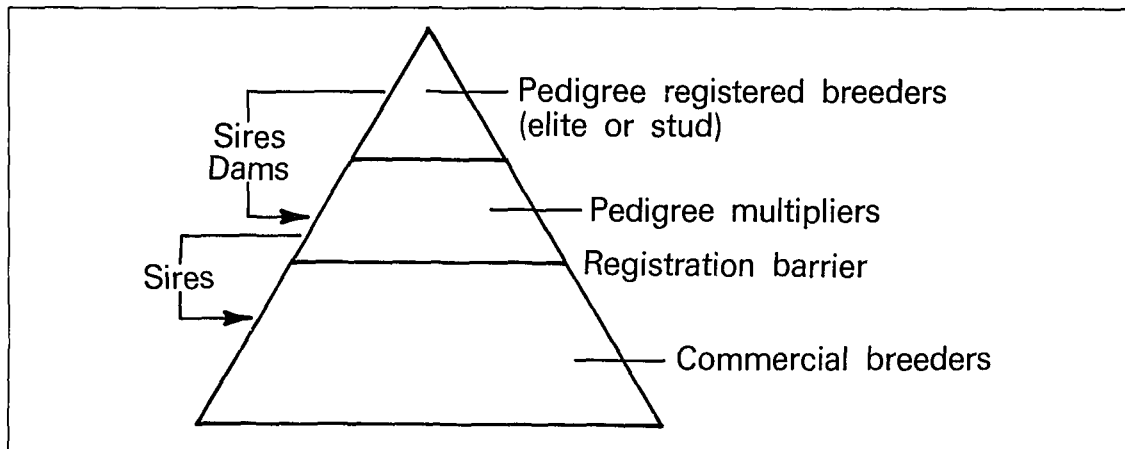


FIGURE 1

Traditional breed structure. After D C Dalton, *An Introduction to Practical Animal Breeding*, 1980, p 128.

because it created an appearance of concerned and enlightened interest in improvement and thus conferred status. Unsupported by performance criteria, it could become as large an indulgence as the breeding of sporting animals. Fashion or fancy gained more than a toehold in the cattle trade because a sufficiently large number of breeders were sufficiently unconcerned about productivity performance to create a substantial market for pedigree stock based on fashion or fancy alone. There was no barrier to profitable trading in fashionable pedigree stock with impaired utility functions as long as a large number of purchasers were persuaded by the claims of fashion and saw no particular virtue in utility.

III

In some textbooks on animal breeding, and several papers on the evolution of specific breeds, breed structure is represented as triangular.³¹ In a traditional breed structure, the apex of the triangle is occupied by the pedigree élite, who breed stock for other members of the élite and for non-élite pedigree breeders who multiply the stock,

partially with a view to making sires available to non-pedigree commercial breeders (Fig 1).

While the model is a useful representation of what should happen in theory, a number of variables and relationships require quantifying if it is also to serve as a basis for understanding what actually happened in practice. Two sets of variables are of particular relevance. First, the achievements of pedigree during the period before the development of artificial insemination are to some extent to be measured by numbers of pedigree stock relative to total stock. Essentially, what we should establish are the numerical values which attach to different subdivisions within the triangle. Second, and more important, we need a clearer idea of the extent to which pedigree strains were transmitted downward to regular breeders, since, in theory at least, there is no reason why the élite should require any market of this kind as long as demand from their own number remained strong. Equally, there is little reason why regular breeders should want pedigree stock if it did not meet their practical needs.

The first question is perhaps the more difficult to answer, though only because herd book volumes, which in any case cover only the later years of pedigree history, are

³¹ Lerner and Donald, *op cit*, p 172; D C Dalton, *An Introduction to Practical Animal Breeding*, 1980, pp 128-9.

not well represented in library collections.³² In the circumstances, the best estimates proved to be those made in 1919 in a Ministry of Agriculture census of pedigree farm livestock. While it was acknowledged that not every pedigree animal was a good specimen, the survey was prompted by the belief that pedigree strains held out the best hope for the improvement of the inferior animals which made up a large proportion of the national stock. The compilers admitted that there might be some under-enumeration, to the extent that members of breed societies (the survey sample) did not own absolutely every animal of pedigree standing. But they were confident that the total given 'should not be far below the actual figure'.³³

Altogether, there were 115,618 pedigree cattle in England and Wales, compared with 6,194,539 cattle enumerated in the June returns that year. The returns do not permit estimates of the importance of pedigrees within specified breeds, but the global figures are illuminating. Pedigrees constituted rather less than 2 per cent of the total national herd (slightly more if we admit the possibility that the pedigree census may have under-enumerated to a greater extent than the June return),³⁴ but as a proportion of the different categories of breeding stock, pedigree strains were rather more important. According to the census, there were 6545 bulls in service (that is bulls of a least one year of age used for breeding) compared with a June return total of 88,978 (7.4 per cent). Comparable figures for cows and heifers in calf and milk suggest that pedigree animals accounted for just over 3 per cent of the national herd. It follows that pedigrees

were poorly represented among cattle not intended for breeding.

The Shorthorn was by far the most important of the pedigree breeds, accounting for 30 per cent of the pedigree herd, or 46 per cent if we add in its Lincoln Red Shorthorn derivative, which was well established as a separate breed by this date. The Shorthorn's nearest rival was the Hereford, accounting for 10.2 per cent of the total herd, although the British Friesian, at 9.7 per cent, was already beginning to make a powerful impression. The next most important breeds were the South Devon (7.3 per cent), the Jersey (5.7 per cent), and the Red Poll (3.7 per cent). The Longhorn, once all-important, was reduced to a mere 316 pedigree animals, or rather less than 0.3 per cent of the total pedigree herd.

The modest contribution of pedigrees to the national herd is reflected not only in small overall totals but in a very uneven geographical distribution. In Fig 2, pedigree census statistics for the counties of England and Wales have been expressed as location quotients (proportion of total pedigree cattle in county divided by proportion of total cattle in county). A quotient greater (or less) than 1 indicates that the county had more (or less) pedigree stock than it would have had were the distribution of pedigrees solely determined by the distribution of cattle as a whole.

Much of the underlying variation may be explained by the persistence of associations between particular breeds and counties. Certainly, this accounts for the relatively strong positions of Lincolnshire (LQ 3.019 and 13,083 pedigree Lincoln Red Shorthorns), Herefordshire (LQ 3.017 and 16,142 pedigree Herefords), and Devon (LQ 1.523 and 2278 pedigree Devons). It is also notable that the all-pervading Shorthorn had no such pronounced county affiliations by this date, being heavily outnumbered by non-pedigree stocks in both Durham (LQ 0.352) and Yorkshire (LQ 0.442), but still with a northern stronghold in Cumberland (LQ

³² E H Whetham, 'The Trade in Pedigree Livestock, 1850-1910', *Ag Hist Rev.* XXVII, 1979, p. 47. Both the Bodleian and British Library holdings of nineteenth-century herd books are fragmentary for all but a few breeds.

³³ Ministry of Agriculture and Fisheries, *Census of Pedigree Live Stock, 1919, 1921*, pp. 3, 4.

³⁴ On the deficiencies of the parish summary agricultural returns see J T Coppock, 'The Cartographic Representation of British Agricultural Statistics', *Geography*, 50, 1965, pp. 101-14; R H Best and J T Coppock, *The Changing Use of Land in Britain, 1962*, pp. 29-71.

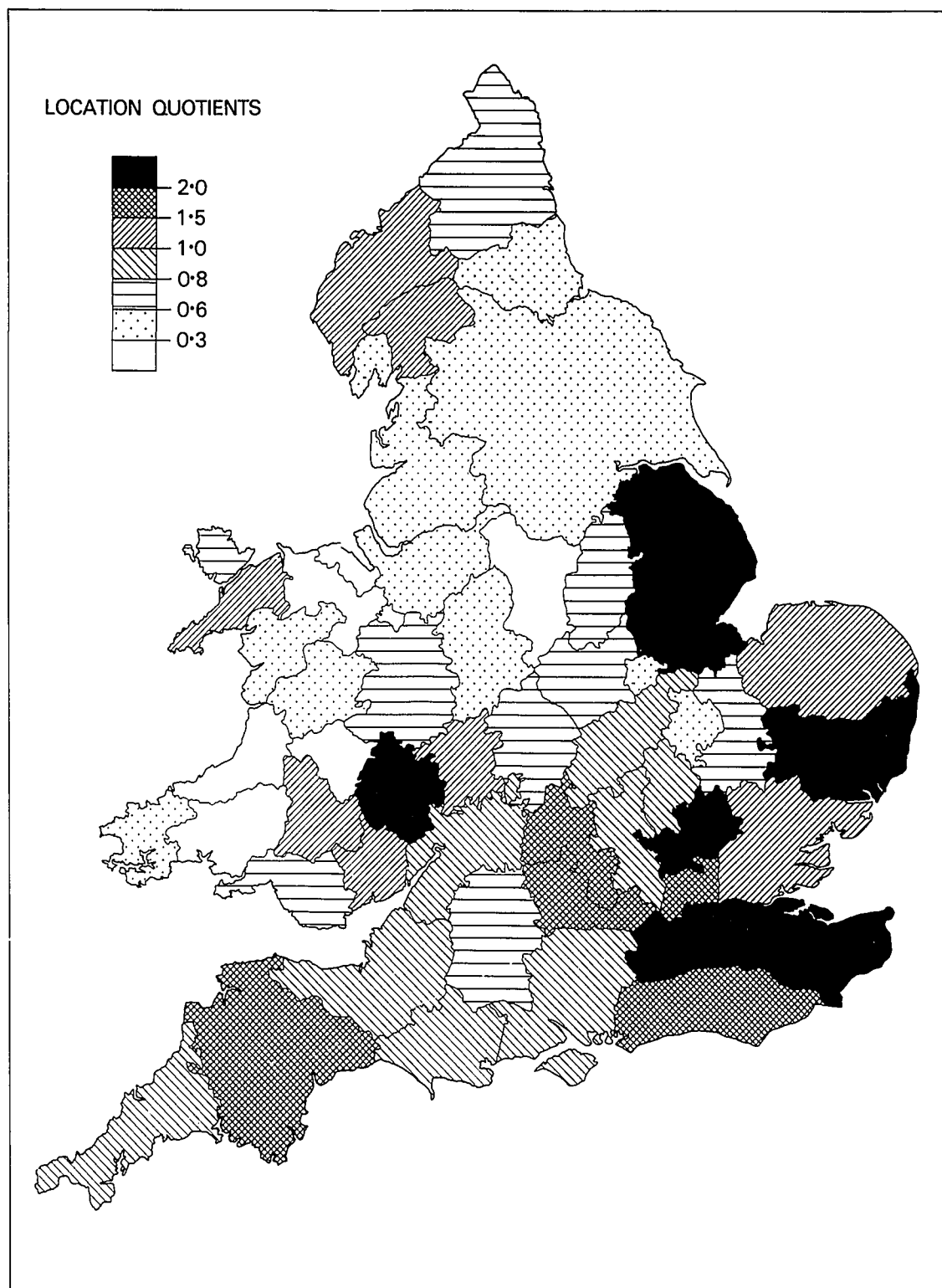


FIGURE 2
Pedigree cattle in England and Wales, 1919: Location quotients.

1.370) and Westmorland (LQ 1.422). However, just as striking as the variations which can be explained by the regional affiliations of particular breeds are those which can only be attributed to, and which serve to underline, the elevated social context of pedigree breeds. One of the most prominent features of the map is the concentration of pedigrees around London in counties with no native pedigree breeds. The pattern reflects the influence of metropolitan wealth. The distributions of both landscape parks by notable designers and the nineteenth-century squirearchy show loose parallels.³⁵ Surrey, with a location quotient of 4.9 had a very pronounced concentration, although Hertfordshire (3.017), Kent (2.596) and Berkshire (1.966) were also exceptionally high, with Middlesex (1.678) and Essex (1.490) not far behind. Despite the difficulties which had beset landed proprietors from the late 1870s,³⁶ at least some were still prepared to take on the burdens of pedigree breeding.

A third noteworthy feature was the pronounced lack of pedigree stock in certain parts of the country, but above all in upland mid- and north Wales. Location quotients were small in all counties except Caernarvonshire, where many native cattle qualified for entry in the Welsh Black herd book, and Brecon, where the pedigrees of neighbouring Herefordshire were well represented.³⁷ The Celtic aversion to pedigree may be attributed to several factors: the inappropriateness of pure-bred strains in an upland environment of meagre feeding traditionally attuned to a market which until not many years previously had demanded low grade stores capable of the long overland march to English fattening pastures; the

small size and inherent conservatism of the Welsh family farm; and, above all, the relative dearth in upland Wales, especially by this date, of those social groups most likely to find pedigree attractive.³⁸

IV

The question of social context assumes considerable prominence when we turn our attention to the impact of pedigree on the character of the national herd as a whole. Not only was the total pedigree herd small, but a disproportionately large number of pedigree breeders were drawn from the ranks of the landed élite. In the case of the Shorthorn a pioneering phase during which tenant farms were well represented was followed by an extended period during which the proportion of titled breeders steadily declined but their absolute numbers increased greatly.³⁹ The dominant position of the élite among pedigree breeders did not escape the attention of contemporary observers. In 1849, Beesley's report on Lancashire noted that pedigree Shorthorns were 'confined to gentlemen or amateur farmers'.⁴⁰

Further examination of Coates's Herd Book supports these impressionistic observations. Comparison of bulls registered during two periods separated by approximately fifty years (Volume IV covering registrations from 1836 to 1840, and Volumes XXXVI and XXXVII for bulls calved mostly between 1888 and 1890) reveals some tendency towards wider participation in pedigree breeding. At the earlier date, 537 breeders on the British mainland registered 2886 bulls (mean 5.37 bulls per breeder) compared with 752 breeders and 3183 bulls (mean 4.23 bulls per breeder) at the later date. The figures

³⁵ H C Prince, *Parks in England*, Shalfleet, 1967; F M L Thompson, *English Landed Society in the Nineteenth Century*, 1963, p 115.

³⁶ *Ibid.* Chapters 11 and 12; R Perren, 'The Landlord and Agricultural Transformation, 1870-1900', *Ag Hist Rev*, 18, 1970, pp 36-51; C Ó Gráda, 'The Landlord and Agricultural Transformation, 1870-1900: A Comment on Richard Perren's Hypothesis', *Ag Hist Rev*, 27, 1979, pp 40-6.

³⁷ For an account of the development of the pedigree Hereford see E Heath-Agnew, *A History of Hereford Cattle and their Breeders*, 1983.

³⁸ R J Colyer, *The Welsh Cattle Drovers*, Cardiff, 1976, Chapter 2; J Davies, 'The End of the Great Estates and the Rise of Freehold Farming in Wales', *Welsh Hist Rev*, 7, 1975, pp 186-211.

³⁹ J R Walton, 'The Diffusion of the Improved Shorthorn Breed of Cattle in Britain during the Eighteenth and Nineteenth Centuries', *Trans Inst Br Geogr*, new ser, IX, 1984, pp 32-3.

⁴⁰ Quoted in Fletcher, *op cit*, p 79.

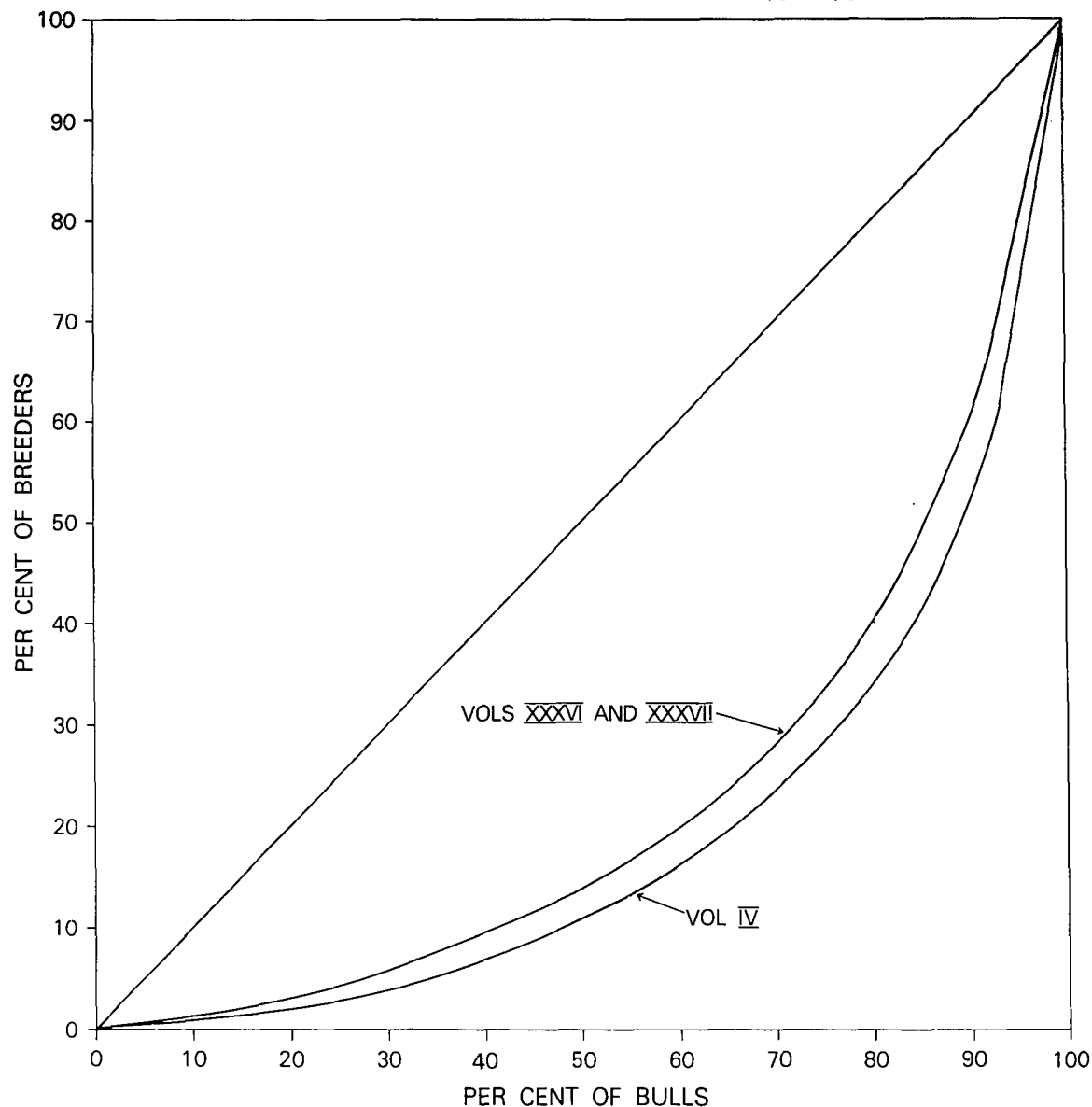


FIGURE 3

Lorenz Curves: Pedigree Shorthorn bulls listed in *Coates's Herd Book* Volume IV, and Volumes XXXVI and XXXVII.

therefore show modest expansion in the numbers responsible for producing roughly equivalent quantities of pedigree breeding stock.

However, the most striking feature was the continuing élitism of pedigree breeding, evidenced in small numbers of pedigree breeders relative to the overall size of the farming community, the relatively large proportion of pedigree breeders registering

only cows (over 43 per cent of those listed in Volume XXXVI), and the fact that a large proportion of total pedigree stock was still produced by a small proportion of total pedigree breeders. At the later date, 55.6 per cent of pedigree breeders producing bulls registered one or two animals only, little different from the figure of 53.6 per cent for the earlier period. The Lorenz curves plotted in Fig 3 reveal the full extent of underlying

inequalities in levels of activity among breeders of pedigree Shorthorn bulls. The later curve is closer than the earlier curve to the 45° diagonal suggesting some tendency towards a more equable pattern of participation in breeding of pedigree bulls. But it is clear from the close coincidence of the two curves that the tendency was not especially pronounced. At the later date, the top 10 per cent of British breeders were still responsible for breeding more than 40 per cent of all pedigree bulls.

Nominal linkage techniques allow closer examination of the status of pedigree breeders, although the approach can only be applied to a relatively small sample, in this case breeders resident in Oxfordshire. Altogether, forty different Oxfordshire residents were entered as having bred pedigree Shorthorns prior to 1880. Many of these were traced to the Census enumerators' books, which provide details of certain economic and social variables, including farm size and place of birth. Of the forty original pedigree breeders, the first (Attenbrow of Stratton Audley) pre-dated the available census evidence, although the Land Tax indicates that he had been resident on his farm for at least twenty-five years, and that he was one of ten tenants on an estate totalling approximately 1500 acres.⁴¹ Most of the others operated on a much grander scale. Sixteen of the remaining thirty-nine were either omitted from the census or were enumerated as something other than 'farmer'. Six of these sixteen were traced to the *Return of Owners of Land, 1873* (1875) where they were recorded as owners of estates ranging in size from 21,945 acres (the Duke of Marlborough) to 1692 acres (Mrs Strickland of Cokethorpe Park). Of the twenty-three traced to the census, sixteen farmed more than 400 acres, twenty more than 300 acres, twenty-one more than 200 acres. The mean size of the twenty-three farms was 483 acres, compared with county means derived from the census enumer-

ations of 173 acres in 1851 and 201 acres in 1871. If the estate owners are added, then mean holding size for all pedigree breeders increases to 1527 acres. Only two individuals farmed less than the 1871 county average: Henry Middleton of Cutteslowe, a lessee of Christ Church, Oxford, specializing in the supply of pedigree stock, with 150 acres;⁴² and John Widdows of Standlake, farming a mere 40 acres, but described in the census enumeration as 'farmer and cattle dealer'. Presumably, it was as a consequence of his dealing that he came to be listed as a pedigree breeder.

Aristocratic interest in pedigree breeding is exemplified by the inclusion of the Duke of Marlborough in the list. But as Oxfordshire was not a county of great estates, ranking only thirty-three of thirty-nine English counties in respect of proportion of total area occupied by estates exceeding 10,000 acres,⁴³ it is only to be expected that the squirearchy and greater gentry would be better represented. They included some of the 'new' gentry, notably Albert Brassey of Heythrop, the great railway contractor, or Hall of Barton, whose wealth derived from an Oxford brewing concern, as well as other more established men of middling rank: Colonel North of Wroxton, J H Langston MP of Sarsden, whose model farming activities were accorded full recognition in both the local newspaper and the national agricultural press, and C C Dormer whose unpretentious ancestral home at Rousham now boasts not only the rarest of endangered species, an unmodified landscape garden by Kent, but, perhaps paradoxically, a major herd of Longhorn cattle.⁴⁴

Most of the others were among the county's leading practising farmers. They

⁴² Middleton was better known for his Channel Islands stock. See *Jackson's Oxford Journal*, 10 July 1869, advertisement for 'Alderney bulls at stud at Cutteslowe'; *Jackson's Oxford Journal*, 5 August 1871, extract from an article originally published in the *Farmers' Magazine* on Middleton's Jersey heifers.

⁴³ F M L Thompson, *op cit.* pp 32, 113.

⁴⁴ *Ibid.* p 119; *Jackson's Oxford Journal*, 15 February 1862, report on the farming activities of J H Langston, reprinted from the *Mark Lane Express*.

⁴¹ Oxfordshire County Record Office, QSID/L/269.

included Matthew Savidge of Churchill, who had served for some time as Langston's bailiff. It is of interest to note that, as a Lincolnshire man, he was one of the few farming pedigree breeders traced to the Census who was not local by origin. Almost half the breeders had been born in their enumerated parish of residence, and a further 30 per cent no further than five miles from it.

The farmer-breeders also numbered many who were prominent as or were related to specialist breeders of sheep. These included J P King of North Stoke, better known for his Hampshire Downs than for his Shorthorns, Joseph Gillett of Hazeley, related to the Gilletts of Cote, Brize Norton and Southleigh, who were prominent Oxford Down breeders, and George and John Garne of Churchill and Filkins respectively, who were members of the Gloucestershire family whose Improved Cotswold sheep were in great demand among west Oxfordshire farmers.⁴⁵

All in all, we gain an impression that breeders were known to one another through various social networks. Whether landowners or farmers, they represented the more substantial members of the Oxfordshire agricultural community, their status as leaders being enshrined not only in their patronage of pedigree itself, but in support for agricultural societies, farmers' clubs and other local organizations.

It is clear enough that the élite took the initiative in pedigree breeding, but it is less clear that those whom their activities were ostensibly intended to influence followed their example. There are two important considerations here. First, there is little evidence — at least in the Shorthorn records — to suggest that the breeding of registered pedigrees ever interested anyone other than the élite to any great extent. It has to be admitted that the social status of registered breeders was rather more plebeian in areas

closer to the origin of the breed than was the case in Oxfordshire, but even in the North Riding in the late 1840s, 'excellent landlords' were still seen as leading pedigree enthusiasts.⁴⁶ Second, it is not self-evident that the dissemination of pedigree strains throughout the breed by multiplication and cross-breeding ever took place to the extent suggested by conventional breed-structure models. The question of status is central partly because, as we have already seen, there was no good economic reason for the élite to breed stock which fulfilled the requirements of practising farmers as long as their fellow élite provided a market which demanded no more than a proven genealogical connection with a particularly favoured lineage, not performance; partly because awe-struck deference informs the enormous mass of eighteenth- and nineteenth-century writing on livestock husbandry, thereby providing severe interpretative difficulties for those who draw upon this obvious source to try to understand exactly what was happening. Indeed, a large amount of this material was the work of pedigree breeders. Two recent writers on animal breeding have noted 'remarkably little evidence of improvement of stock by élite breeders which does not emanate from them'.⁴⁷

Where deference exerted an overpowering influence on a writer's capacity for analysis, this may often be detected, particularly if overt plagiarism or borrowing is also involved. For example, Lawrence's *Treatise on Cattle*, published in 1805, gave rather more prominence and rather more praise to the Devon breed than was usual. However, Lawrence took no fewer than seven of the eleven pages on the breed from an article in the *Annals of Agriculture* by Lord Savernake, 'an exquisite judge and a native and resident of the country in which these cattle are bred', Lawrence noted. Savernake was also the book's dedicatee.⁴⁸

⁴⁵ For additional information on these individuals as sheep farmers see J R Walton, 'Aspects of Agrarian Change in Oxfordshire, 1750-1880', unpub DPhil thesis, Univ of Oxford, 1976, pp 287-319.

⁴⁶ M M Milburn, 'On the Farming of the North Riding of Yorkshire. Prize Report', *J Roy Agric Soc*, 9, 1849, p 518.

⁴⁷ Lerner and Donald, *op cit*, pp 178-9.

⁴⁸ J Lawrence, *A General Treatise on Cattle*, 1805, p 35.

It is more difficult to estimate the extent to which qualitative assessments of pedigree's influence on the national herd may have been amplified by such deferential attitudes. Oxfordshire evidence may again be used to illustrate the point. Fig 4, which derives from advertisements for dispersal sales of farm stock appearing in two local newspapers, provides an outline of the main characteristics of chronological change in the county's cattle breeds. The increasing dominance of the Shorthorn is striking, but equally so is the fact that breed was never specified for more than a minority of the cattle advertised in sales notices. It is not implausible that this may have happened because the cattle concerned were of no recognized breed (although there are other possible explanations).⁴⁹ It is difficult to reconcile the state of affairs revealed by this evidence with descriptive accounts which acknowledge some lack of commitment to breed during the 1830s and 1840s but see Shorthorn pedigrees as exerting a powerful ameliorating influence within increasingly Shorthorn-dominated stocks by the 1870s. In 1878, Darby noted that the Shorthorn was the prevalent breed and 'excellent cattle [were] to be found almost everywhere owing to the very general employment of pure-bred bulls, which are easily procurable from the half dozen or more pedigree Shorthorn herds of which Oxfordshire can boast'.⁵⁰ If upgrading of non-pedigree stock by the use of pedigree bulls was as widespread and as desirable as Darby claimed, then it is reasonable to suppose that farm sales notices might have made some

mention of these influences. Yet, from 1808, when Shorthorns first started appearing in Oxfordshire sales notices, up to 1880, descent from pedigree Shorthorn stock was referred to in only twenty-eight of a total sample of over 2700 sales notices listing cattle. These included some 276 which specifically mentioned Shorthorns.

Although it must be admitted that statistics such as these are suggestive rather than conclusive, an array of other evidence indicates that they point in the right direction. First, we may note the admission, even by authors susceptible to the pressure of deference, that the use of pedigrees as a means of upgrading non-pedigree stock was strenuously resisted by many farmers. For example, the agent to Lord Fitzwilliam made the following observations in his contribution to the 1834 edition of Youatt's treatise.

The breed of cattle in the greatest esteem in the vicinity of Wentworth [seat of Lord Fitzwilliam] and throughout all the southern part of the West Riding is the pure short-horn. [However] . . . a traveller passing through this district will observe many deviations from that breed and will meet with crosses which he will have much difficulty to identify. The farms are small and the farmer has a mixed employment, part agricultural and part mercantile: hence his attention is not so much directed to his farm as it should be and here arises a certain degree of carelessness as to the selection of his cattle; added to this, the idea, though an erroneous one, that pure Shorthorns are not good milkers.

Likewise, Youatt himself, writing of the East Riding in the same volume noted that the Shorthorns 'prevail universally . . . except among the cottagers and little farmers who still obstinately cling to many varieties of half-horns'.⁵¹

While these extracts treat the smaller man's resistance to the Shorthorn (and by implication to Shorthorn pedigree also) as an unfortunate but inevitable outcome of his ignorance and conservatism, when we survey the entire body of nineteenth-century writing on livestock husbandry, especially by authors less influenced by the pressures of

⁴⁹ For example, it is possible that uniformity of breed has reached such a level that cattle were naturally assumed to be of the dominant breed unless specifically stated to be different. It is also possible, and on the whole more likely, that most potential purchasers at sales were simply not interested in breed, and that auctioneers were therefore only showing an acute appreciation of their market when they failed to mention it in advertisements.

⁵⁰ J Darby, 'Oxfordshire Agriculture and Stock Farming', *Jnl Bath and West of England Society*, 3rd ser. X, 1878, pp 131-2, 147. See also J Coleman (ed), *The Cattle of Great Britain*, 1875, p 4, on a report 'from a successful breeder in Gloucestershire that 25 years since, when he commenced breeding, there was not a Shorthorn within many miles; now it would be an exception to find a herd that is not three parts pure'.

⁵¹ W Youatt, *Cattle: Their Breeds, Management and Diseases*, 1834, p 250.

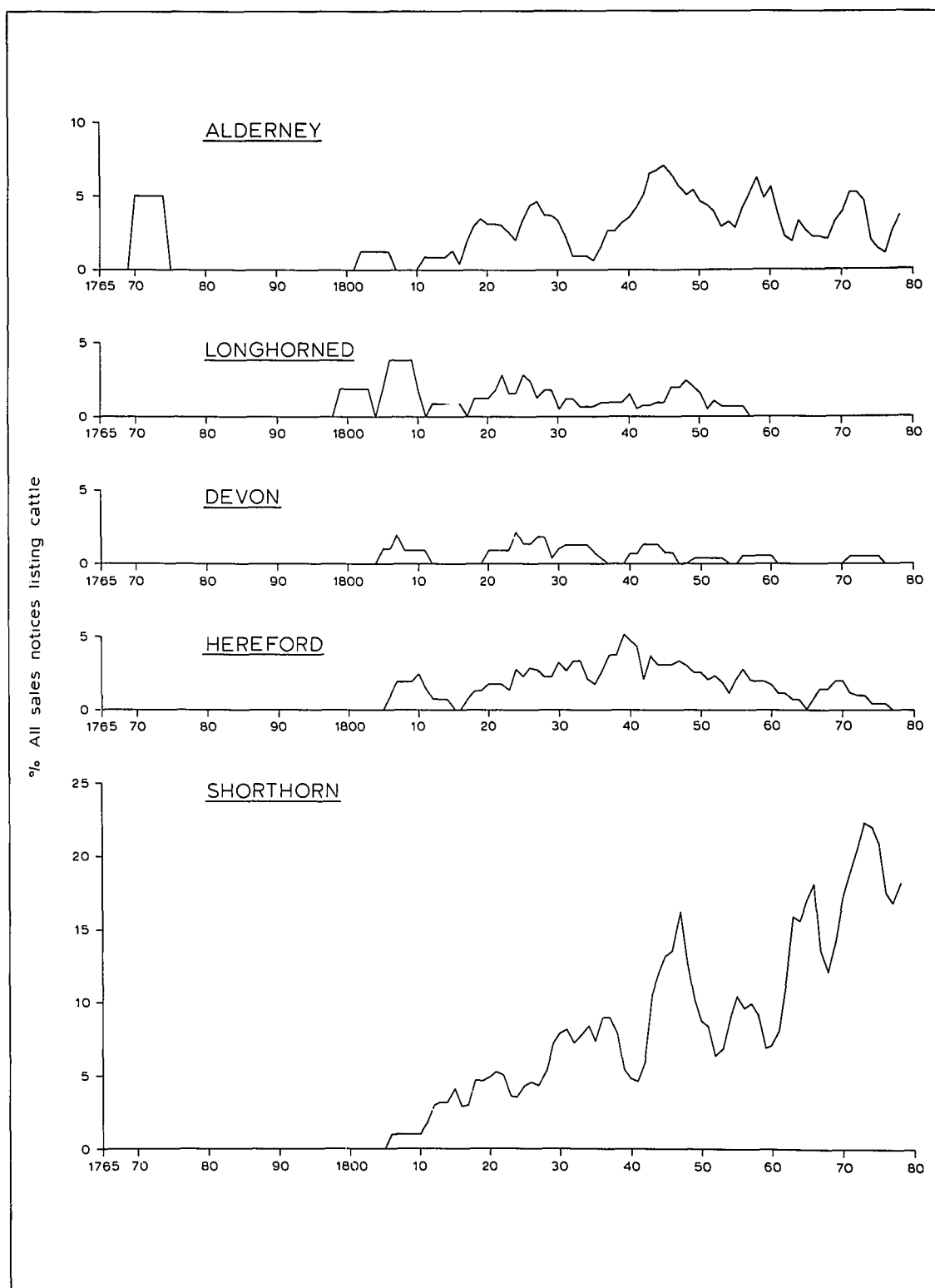


FIGURE 4
Cattle breeds in farm sales notices: Oxfordshire (five-year moving means).

deference, it becomes clear that those who resisted pedigree may have done so because of ignorance or conservatism, but their action or inaction also had a basis in reason. Authors as far back as Culley, writing in 1794, or Parkinson in 1810 condemned at least some aspects of Bakewell's methods and presaged many criticisms later directed at the advocates of non-productive fashionable traits in pedigree cattle. Culley, for example, speculated as follows: 'Could any of these people [Bakewell and other pioneers] be prevailed upon to make an experiment they would most probably find that excellence does not depend on the situation or size of horns or on the colour of faces and legs, but on other more essential properties.'⁵² Parkinson records how his father, 'a breeder and grazier for a good many years', attained his objectives of 'good milking heifers with an aptitude to fatten when old' by using 'a bull from Warwickshire which did not appear to be either of the long or shorthorned but of a mixed breed'⁵³ — in other words a solution which was directly contradictory to the advice later offered by pedigree enthusiasts.

In agricultural journals throughout the early and middle years of the nineteenth century, expressions of dissatisfaction may be found, though all but swamped by adulation. Questioning criticism became rather more insistent from the 1870s, as more difficult economic circumstances helped emphasize the need for stock which could perform rather than adorn.⁵⁴ 'It is more important to the true farmer,' noted Cadwallader J Bates in 1879, 'to have cattle of uniform average excellence, giving plenty of rich milk, thriving well and feeding rapidly than to have them eligible for the Herd Book and winning occasional prizes. It says little for the science of breeding if the two aims are

incompatible.'⁵⁵ Sceptics or agnostics increasingly drew attention to several incompatibilities of aim. It was argued, for one, that the show and auction system by which the leading pedigree stocks (and especially pedigree Shorthorns) established their reputation among pedigree breeders could only serve to increase the aversion of those who were not pedigree breeders. 'When Shorthorns are lauded to the skies for every conceivable point except those which serve some useful purpose . . . more are discouraged from breeding them than are won for the pursuit,' noted one commentator in 1877.⁵⁶ Others went even further in their condemnation. 'Pedigree for and by itself alone is no more use to a dairy herd than headache powders are to a drowning man,' wrote Harmsworth in 1919. 'It would be just as sensible to go in for breeding Gloucester Old Spot pigs because you are fond of *noir et blanc* whisky as to keep many of the anti-milk and anti-beef creatures that one sees so often fetching large prices at the leading auctions solely because they have pedigrees as long as the Trans-Siberian railway.'⁵⁷ By 1946, Cochrane could regard showing as little more than a competition between irrelevancies resulting in the award of prizes to useless animals.⁵⁸

Although some of the statements quoted above show stylistic inclinations towards rhetoric and ornament, these tendencies were much more pronounced among those who favoured pedigree. This in itself was a major source of difficulty. Shorthorn publicists in particular were guilty of an attachment to a style of writing, likened by one critic to a gushing schoolgirl describing a favoured lap dog,⁵⁹ which can have done little to win over doubters. The contrast between, say, the annual Shorthorn reports in the *Livestock Journal Almanac* and those for

⁵² Quoted in Lerner and Donald, *op cit*, p 124.

⁵³ R Parkinson, *Treatise on the Breeding and Management of Livestock*, 1810, p 12. See also Sebright, *op cit*, pp 8–9, 14.

⁵⁴ R Bruce, 'Shorthorn Cattle', in C Brynner Jones (ed), *Livestock of the Farm*, I, Cattle, nd, p 143.

⁵⁵ Quoted in E R Cochrane, *The Milch Cow in England. A Plea for Constructive Breeding*, 1946, p 13.

⁵⁶ *Live Stock Journal*, 5 January 1877, p 2.

⁵⁷ H Harmsworth, 'The 2,500 Gallon Dairy Shorthorn', *Live Stock Journal Almanac* 1919, pp 56–7.

⁵⁸ Cochrane, *op cit*, pp 68–9.

⁵⁹ *Live Stock Journal*, 5 January 1877, p 2.

some other breeds is quite striking. Whereas Thornton's 1896 account stands as a monument to deference ('The year 1896 will go down to agricultural posterity as the Prince's year. Both Persimmon and Celt were bred on the Sandringham estate — the former won the Derby; and though Celt did not win the championship of the Royal at Leicester, yet he was first in his class.') others, like 'J.B.'s report on Devon cattle were more concerned, if slightly apologetically, with the breed's performance merits ('meat of the finest quality and most excellent flavour is put on very rapidly . . . with a consumption of less food than most cattle . . . require').⁶⁰ It is also particularly telling that the twentieth-century success of the British Friesian was secured not only because it enjoyed specific performance advantages but because the breed society quickly adopted a sensible publicity policy. 'Verbosity was to be avoided at all costs', and the 'average farmer' helped to 'a better appreciation of the unrecognized possibilities of good dairy cattle'.⁶¹

It might be argued that the alienating force of much pedigree Shorthorn publicity was simply a symptom of the breed's problems. Writers focused on irrelevancies merely because to have done otherwise would soon have necessitated exposing performance deficiencies. Certainly, by the later years of the century it was becoming more and more apparent that these deficiencies existed. Complaints were too numerous to be either stifled or ignored.

Of course, there were those who still continued to argue in the same vein as writers on pedigree had always done, upholding traditional desiderata.⁶² 'Cumbrian', writing in 1927, regretted the vigorous emphasis on productivity among breeders of Dairy

Shorthorns (itself a reaction to the performance limitations of the old Shorthorn) which, he argued, was undermining the traditional character of the breed, 'especially the graceful downward curl of the horns'.⁶³ But much more striking was mounting dissatisfaction with pedigree, articulated as several distinct areas of complaint.

In addition to the objections to exhibition prompted by the general social milieu of the showyard, there were more specific grievances, with Shorthorn pedigrees attracting much of the attention. Although this partly reflects the breed's dominance in the national herd, it also underlines its real problems. A dual-purpose breed, like the Shorthorn, was in tune with nineteenth-century market demand to the extent that increasing numbers of producers required cows which would milk well yet produce calves capable of making fat quickly, while themselves fattening to killing weight rapidly once dried off. Unfortunately, these qualities do not combine well. To achieve them would pose considerable problems even for breeders conversant with recent developments in animal breeding science and having the full array of present-day techniques at their disposal. 'If there is or could be,' Lerner and Donald have noted, 'an effective physiological mechanism for switching food energy to meat in males and milk in females, there would seem to be no reason to prevent a high performance dual-purpose type'.⁶⁴

Regrettably, too many pedigree breeders turned their back on such rudimentary performance evidence as was available and as might have assisted them, and produced not dual-purpose rent payers but what one commentator has described as 'no-purpose parasites'.⁶⁵ Several criticisms recur,

⁶⁰ J Thornton, 'Shorthorns in 1896', *Live Stock Journal Almanac* 1897, p 109; 'J.B.', 'Devon Cattle in 1896', *Live Stock Journal Almanac* 1897, p 123.

⁶¹ G Hobson, 'Breed Propaganda', *Live Stock Journal Annual* 1927, pp 43-4.

⁶² See, for example, WFM Laren, 'Cattle Breeding Problems', in G F Finlay (ed), *Cattle Breeding: Proceedings of the Scottish Cattle Breeding Conference*, Edinburgh, 1925, pp 110-11.

⁶³ 'Cumbrian', 'Upturned Horns in Dairy Shorthorns', *Live Stock Journal Annual* 1927, pp 51-2; G T Burrows, *History of Dairy Shorthorn Cattle*, 1950, Chapter 7. See also F P Matthews, 'Shorthorns in 1916', *Live Stock Journal Almanac* 1917, p 89; 'True Value of Show Points. Spirited Defence by T J Eady of a Much-Criticised System', *Live Stock Journal*, 17 March 1933, p 244; Earl of Coventry, 'Maintaining Our Breeding Stocks', *Livestock Journal Almanac* 1916, p 47.

⁶⁴ Lerner and Donald, *op cit*, p 165.

⁶⁵ Cochrane, *op cit*, p 60.

emphasizing and re-emphasizing both the adverse consequences of concentrating breeding at this level in the hands of those who had little direct interest in performance, and the deficiencies of the show system. Encouraged by the conventions and expectations of their particular social milieu, pedigree breeders, it was argued, had focused on meat to the detriment of milk, on fat to the detriment of lean, and on what was fashionable to the detriment of what was productive. 'The bulk of pedigree cattle,' wrote Sheldon in 1880, 'have been bred away from milk, and purposely so, because by milking copiously they could not carry the load of fat and flesh which has so long and so unwisely been regarded as a *sine qua non* in the showyard.'⁶⁶ 'The milk vessels of our prize cows are frequently mere contortions,' observed Stratton some years later. The show system, it was noted, condoned the retention of 'good looking passengers' merely because they matched the prejudices of the judges.⁶⁷ An animal with an impressive pedigree was worth keeping for breeding no matter what its other deficiencies.

Reservations among meat producers about the emphasis on fat (itself often as much a result of the over-generous feeding regimes of showyard stock as of the ancestral properties claimed for that particular line) began to be more vociferously expressed as demand switched towards younger and leaner meat during the early decades of this century.⁶⁸ One writer, noting the unsuit-

ability of pedigree Shorthorns for the new purpose, recalled the saying, 'The way to ruin your most bitter enemy is to make him a present of a couple of Shorthorns.'⁶⁹

The real barrier to reform from within, for those pedigree breeders who might otherwise have been persuaded by their critics' arguments, was that when traditional mechanisms of improvement failed they knew no others. Admittedly, where a pedigree breeder selected his stock as much on the basis of observation and tests of performance as on the basis of what the pedigree suggested performance ought to be (which was the case with some pedigree Shorthorn dairy herds),⁷⁰ then the claims made for pedigree might well prove to be justified. Much was also made of the emphasis on performance at the annual bull show and sale at Bingley Hall, Birmingham, which, it was claimed, attracted purchasers from the ranks of fatstock-producing tenant farmers (unlike the shows of the Royal Agricultural Society, where sales were largely to 'foreigners, colonists or breeders of prize stock at home').⁷¹ But these developments amounted to little more than straws in the wind.

Without the proof of extended performance records, pedigree counted for very little. The root of the problem was the genetic diversity of the stock which made up

Period in Stock Must be Eliminated, Such is the Only Way to Produce a Greater Volume of British Meats', 28 April, p 387; 'Inadequate Supply of Quality Stores. The L.S.D. Considerations of Summer Beef Production', 23 May, p 483.

⁶⁹ *Live Stock Journal*, 27 January 1933, p 77.

⁷⁰ Note the emphasis on production in some of the specialist dairy producers' breeding cards and advertisements. For example, *Live Stock Journal*, 21 August 1912, breeding card of Miss E D Coats, Brenchley, Kent. 'Heavy milking herd of Dairy Shorthorns, 48 cows milked daily. Milk registers kept. Average 1911, 796 gallons per cow.' Advertisement of R W Hobbs's Kelmscott Dairy Shorthorn Herd, *Livestock Journal Almanac* 1916, p 214. 'Herd of 500 Dairy Shorthorns, milk records kept. Over 60 cups, medals, champion and other prizes won 1914-15 for inspection, butter and milking tests.' However, Harmsworth, *op cit*, p 56 noted that few breeders were prepared to rely, like Hobbs, on the animal itself and not its pedigree.

⁷¹ H Biddell, 'Our Showyards and What They Have Done for Us', *Live Stock Journal Almanac* 1884, p 64. It has to be said that widespread use of pedigrees by overseas meat producers helped enhance the reputation of their products in Britain. See, for example, Perren, *op cit*, 1978, p 157; Whetham, *op cit*, 1979, pp 48-50.

⁶⁶ J P Sheldon, 'The Milk-Pail and the Cows that Fill It; or the Relative Merits of Dairy Cattle', *Live Stock Journal Almanac* 1880, p 46.

⁶⁷ R Stratton, 'Shorthorns and the Show System', *Live Stock Journal Almanac* 1897, p 155. See also A Fraser, *Breeder and Boffin*, 1962, pp 30-1; Cochrane, *op cit*, pp 66-7; W S Dixon, 'Future Organization of our Shows', *Live Stock Journal Almanac* 1919, p 63; G Greenall, 'Single Judging', *Live Stock Journal Annual* 1921, pp 4-5; R B Brassey, 'Over-Fattened Show Exhibits', *Live Stock Journal Annual* 1921, pp 43-4; 'Salopian', 'Dangers of Pursuing Fashion in Breeding', *Live Stock Journal Annual* 1924, p 42.

⁶⁸ Whetham, *op cit*, 1976, pp 25-6; Stratton, *op cit*, p 157; T B Goucher, 'New Thoughts on Baby Beef Production', *Live Stock Journal Annual* 1926, pp 47-50; A D Buchanan Smith, 'Livestock Breeding Research. Practical Points', *Live Stock Journal Annual* 1929, p 47. See also the following short items in *Live Stock Journal*, 1933: 'Shorthorns or "Blubber Bags": a Few Plain Words from "Field Marshall" to Those in the Breed', 27 January, p 77; 'Store

the pedigree Shorthorn population, allied with a system of Herd Book registration which was merely intended to serve as a means of demonstrating genealogical links (in most cases extremely remote ones) with favoured or fashionable lineages, and therefore provided in itself no basis for improvement. Suggestions that the Herd Book should record performance, which had been heard as early as 1880, were regarded with justification as too utopian to be practical.⁷²

The problem was quite the reverse of that diagnosed by those who regard Bakewell as the initiator of a sort of grand programme of bovine genocide, which reduced the genetic diversity of the national cattle herd to a point where inbreeding depression was a real threat.⁷³ Even after adopting the extremely implausible assumption that all the genealogies it contains are genuine, analysis of Coates's Herd Book suggests an inbreeding coefficient for the pedigree Shorthorn of 20 to 25 per cent in 1825 increasing to only 26 per cent by 1920 — well below the level of 3 to 5 per cent per generation which produces inbreeding depression.⁷⁴ The disclosure that 55 per cent of the pedigree breed in 1920 were descended from the Collings brothers' Favourite⁷⁵ may appear disturbing, but we have to bear in mind Coates's thoroughly cavalier attitude to early pedigrees (if the task of reconstruction was too difficult or the price right, descent from one of the favoured foundation animals was simply invented) and the immense contribution over upwards

of fifty generations of ancestors other than Favourite.⁷⁶

In any event, by the second or third decade of the present century, it was beginning to be recognized that culling, far from being excessive, had not proceeded far enough.⁷⁷ 'It is said that like begets like,' wrote Harmsworth in 1919. 'But it is hardly ever admitted that as often as not like begets unlike, and very different unlikes at that.'⁷⁸ As if to emphasize the problems of heterozygosity the breed possessed in abundance, Shorthorn breed markers simply refused to breed true. Nor is this to be wondered at since some, like roan colouring, are hybrid traits.⁷⁹ Even if nothing else is predictable in a breed, at least the breeder should have reasonable confidence that recognized markers will appear in the next generation, if only because in non-pedigree stock this is all that defines breed. An animal that *looks* as if it belongs to a known breed raises fewer awkward questions about the true nature of its genetic composition. The Shorthorn is therefore quite unlike the Hereford, which owes much of its long advance to the conspicuous success of its eventual breed marker. As a separate dominant allele, the white face colour is transmitted to all first generation offspring of a Hereford bull, no matter what the maternal parentage.⁸⁰

V

Developments in genetics provided both increasing support for critics of the conventional pedigree system and sound scientific foundations for new breeding practices. These ultimately succeeded both in exposing

⁷² R B Becker and P C McGilliard, 'A Suggested Simplification of the Present System of Official Testing with the Dairy Breeds of Cattle', *Journal of Dairy Science*, 12, 1929, pp 337-348; M'Laren, *op cit*, p 113.

⁷³ H W Keary, 'Management of Cattle', *J Roy Ag Soc*, 9, 1849, p 427; J E Nicholls, *Livestock Improvement in Relation to Heredity and Environment*, Edinburgh, 1957, p 150; J Hutchinson, *Farming and Food Supply: The Interdependence of Country and Town*, Cambridge, 1972, p 32; E L Jones, *Agriculture and the Industrial Revolution*, Oxford, 1974, p 12.

⁷⁴ Fraser, *op cit*, pp 45-7; Dalton, *op cit*, p 95; H C McPhee and S Wright, 'Mendelian Analysis of the Pure Breeds of Livestock: III, the Shorthorns', *J Heredity*, XVI, 1925, pp 208, 213.

⁷⁵ *Ibid*, p 211.

⁷⁶ T Bell, *The History of the Improved Shorthorn or Durham Cattle from the Notes of the Late Mr Thomas Bates*, Newcastle, 1871, pp 10-11, 37-8, 97, 210-11.

⁷⁷ W Graham, 'Shorthorn Interests and Reflections in 1916', *Livestock Journal Almanac* 1917, p 48; *Live Stock Journal*, 31 March 1933, p 291; Cochrane, *op cit*, p 28.

⁷⁸ Harmsworth, *op cit*, p 57.

⁷⁹ I C Jones, 'The Inheritance of Red, Roan and White Coat Colour in Dairy Shorthorn Cattle', *Jnl Genetics*, 48, 1947, pp 155-63; Lerner and Donald, *op cit*, p 124.

⁸⁰ Dalton, *op cit*, p 31; Heath-Agnew, *op cit*, p 45.

the deficiencies of a simple-minded faith in pedigree alone and in securing that level of improvement in the national herd which pedigree had long claimed but failed to provide. It was not until 1934 when Hammond and Walton gave the first public demonstrations in Britain of the technique of artificial insemination that there was any prospect of reduced genetic diversity ever becoming the problem which Hutchinson feared.⁸¹ It has been estimated that by 1950 each bull on the AI rota was inseminating approximately 1000 cows a year, compared with an average of fifty inseminations by pedigree prize bulls, and seven by non-pedigree bulls.⁸² To date, thanks largely to parallel developments in performance and progeny testing, which ensure the suitability of donor bulls, problems of genetic impoverishment remain little more than hypothetical, far outweighed by the benefits of predictable performance characteristics in the offspring.⁸³

What is perhaps more striking in all this is how very recent most important developments in scientific livestock breeding have been. Of course, they occurred as the culmination of a long period during which a scientific understanding of genetic processes was acquired and refined. We may note the interesting influence of early achievements and claimed achievements in livestock breeding on the intellectual development of Darwin (interesting given the way the debate thereby initiated ultimately reflected back on biology through, for example, Social Darwinism and eugenics).⁸⁴ The beginnings of genetics following the publication of Galton's *Natural Inheritance* in 1889 and the rediscovery of Mendel's work in

1900,⁸⁵ and the developing conflict during the period 1900–1918 between the Mendelians, led by Bateson, and the population geneticists like Pearson and Weldon, whose application of probability concepts to patterns of inheritance was of particular relevance to practising agriculturalists, were other important milestones.⁸⁶ We may also note the influence of nineteenth-century developments in veterinary science, and the attempts to acquire empirical estimates of the effects of different feeding regimes, both by Lawes in Britain, and by others in Germany.⁸⁷ And, of course, there were the beginnings of a concerted attempt to encourage higher standards in the livestock sector when milk recording was promoted under the Ministry of Agriculture's Livestock Improvement Scheme during the 1920s, and under the Bull Licensing Act, which came into force in 1934, both in the face of strong resistance from breeders. The pedigree breed societies played a conspicuously inactive role throughout all these developments.⁸⁸

However, it was the late thirties before an attempt was made to bring together both theoretical and empirical discoveries to try and shape a better practical understanding of livestock husbandry in all its aspects (the balance between nature and nurture, the heritability of different traits, and so on). It was not until workers like Johannsen refined and developed the concept of heritability

⁸¹ Fraser, *op cit*, pp 55–6.

⁸² R A Pepperall, *The Milk Marketing Board*, Wells, nd, pp 90–5; C D Darlington, *Genetics and Man*, 1964, p 307.

⁸³ Lerner and Donald, *op cit*, pp 139–41.

⁸⁴ S S Schwab, 'The Origin of the Origin Revisited', *J Hist Biol*, X, 1977, pp 236, 257, 293; J A Secord, *op cit*, pp 163–5, 184–6; L T Evans, 'Darwin's Use of the Analogy Between Artificial and Natural Selection', *J Hist Biol*, XVII, 1984, pp 113–14, 124, 133–4; P J Vorzimmer, 'The Darwin Reading Notebooks (1838–1860)', *J Hist Biol*, X, 1977, pp 107, 114, 119–40; M Ruse, 'Charles Darwin and Artificial Selection', *J Hist Ideas*, XXXVI, 1975, pp 339–50.

⁸⁵ R S Cowan, 'Francis Galton's Contribution to Genetics', *J Hist Biol*, V, 1972, pp 389–412.

⁸⁶ C H Waddington, 'Applied Animal Genetics During the Last Quarter of a Century', *Animal Breeding Abstracts*, XXV, 1957, p 1; Dalton, *op cit*, pp 37, 42; L Darden, 'William Bateson and the Promise of Mendelism', *J Hist Biol*, X, 1977, p 87; Lush, *op cit*, pp 125, 257–63.

⁸⁷ See, for example, J B Lawes, *Observations on the Recently Introduced Manufactured Foods for Agricultural Stock*, 1858, pp 3–6; *Idem*, *Experiments on the Question Whether the Use of Condiments Increases the Assimilation of Food by Fattening Animals*, 1862, p 3; Mingay, *op cit*, p 16; J Cooke Hurle, 'Some Lessons of the Weighbridge', *J Bath and West Soc*, 4th ser, 12, 1901, pp 52–61; C Tyler, 'The Development of Feeding Standards for Livestock', *Ag Hist Rev*, IV, 1956, pp 97–107.

⁸⁸ Cochrane, *op cit*, pp 19, 43, 100, 120–1, 131–3; 'Recent Livestock Improvement', *Live Stock Journal Annual* 1926, pp 48–9; *Live Stock Journal*, 19 May 1933, p 460; Green, *op cit*, p 52; 'Britain's Improving Live Stock', *Live Stock Journal Annual*, 1923, p 41; Lerner and Donald, *op cit*, pp 169–70.

(that is, the relative importance of hereditary and environmental sources of variance) during the 1910s and 1920s that it could be applied to practical animal breeding.⁸⁹ The publication of Lush's *Animal Breeding Plans* and Lerner's *Population Genetics and Animal Improvement*, both major milestones, followed in 1937 and 1950 respectively. During the war years, it was increasingly accepted that dual-purpose herds could never hope to produce satisfactory quantities of both milk and beef. War Agricultural Executive Committees played an active part by compiling registers of good breeding stock in milk recorded herds.⁹⁰ The inexorable growth of AI after the first British centre had been established in 1942 paved the way for widespread implementation of new attitudes and understanding.⁹¹

Throughout all this not only has breed remained intact (a striking contrast to the situation in the poultry industry where performance has displaced any concern with external appearance)⁹² but pedigree continues to function. Indeed most AI bulls are pedigreed, although pedigree counts for a great deal less than performance tests. An impressive pedigree is no compensation for indifferent performance. It is likely that in future the importance of pedigree will diminish further as grade stock and cross-breeds are gradually brought up to the uniform quality and performance characteristics of AI donors.⁹³

The true achievements of AI and performance testing are epitomized in the successful introduction to Britain of Charolais stock. Bred to serve as draught animals in a relatively 'backward' farming environment and therefore largely spared the ruinous attentions of fancy breeders tempted to load them with fat, these breeds provide beef producers with the lean carcasses demanded by modern markets. Brought to Britain only in 1961, when they were given extensive trials by the Milk Marketing Board, and then disseminated by AI, Charolais and Charolais/Friesian crosses attained a dominant position nationally within twenty years.⁹⁴ Before such techniques were available, this simply could not have happened.

VI

On balance, it seems that whatever the merits of Shorthorn and other breeds as a whole, the endeavours of pedigree cattle breeders during the eighteenth and nineteenth centuries were substantially unhelpful in the long term, though not in the way that some of their critics have suggested. Reports of a national herd crippled by depleted genetic diversity have been greatly exaggerated. The limitations of the breeders' achievements are perhaps most clearly demonstrated by the considerable potential for improvement which still remained during the early decades of this century. Dramatic change has taken place since then as critical thresholds of theoretical and empirical understanding have been crossed. To expect similar changes to have occurred in a society lacking such levels of understanding would be misguided. Even so, it will be clear from the evidence presented above that the milieu of nineteenth-century pedigree breeding offered little encouragement to rational appraisals of performance. 'Improvement' served as a means of

⁸⁹ A E Bell, 'Heritability in Retrospect', *J Heredity*, 68, 1979, pp 297-8.

⁹⁰ See, for example, the following contributions to *Agriculture*, 50, 1943-4: John Hammond, 'Improved breeding for milk production', pp 242-5; W S Mansfield and W A Stewart, 'Cattle at the cross-roads', pp 487-9; John Hammond, 'Scientific aspects of breeding dairy cattle', pp 489-92; W S Abbott, 'Our cattle', pp 535-7.

⁹¹ Waddington, *op cit*, pp 2-3; Lerner and Donald, *op cit*, pp 126, 137-9; S L Huthnance, 'Farming in Berkshire and Oxfordshire', *J Roy Ag Soc*, 110, 1949, pp 3-4; A Fraser, *op cit* 1962, p 50; E S Simpson, 'The Cattle Population of England and Wales: Its Breed Structure and Distribution', *Geogr Studs*, V, 1958, pp 50-3.

⁹² Dalton, *op cit*, p 15.

⁹³ Milk Marketing Board, *In 21 Years 25 Million Cattle Have Been Bred by A.I. in Great Britain*, nd; Lerner and Donald, *op cit*, pp 107, 174. For illuminating remarks about progeny testing during the early years of the British AI programme see Joseph Edwards, *The Development of Ideas in Cattle Breeding*, The George Scott Robertson Memorial Lecture, Queen's University, Belfast, 1961, pp 11-21.

⁹⁴ *Ibid*, p 120; Dalton, *op cit*, p 13; Milk Marketing Board, *The Charolais Report*, Thames Ditton, nd.

asserting or acquiring status and influence. It also often involved identifying and disseminating materials and methods which would genuinely enhance practice and profit among smaller-scale producers. However, in the case of pedigree, the first objective could be attained even though the second might be quite neglected.

Previously, herd books have been used as a means of exploring both spatial patterns of agricultural change during the eighteenth and nineteenth centuries and the processes of

communication which shaped them.⁹⁵ In this context, their value is considerable. The patterns revealed by these studies provide, among other things, a uniquely exact illustration of the uneven geographical incidence and slow pace of agricultural innovation in the past. However, it is less certain that this particular innovation itself contributed a great deal to agricultural progress.

⁹⁵ Walton, *op cit*, 1984.