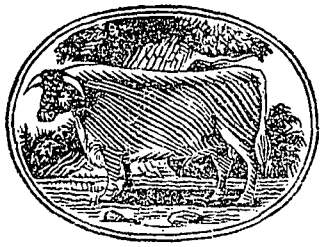
The AGRICULTURAL HISTORY REVIEW



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Bronze Age Agriculture on the Marginal Lands of North-East Yorkshire

By ANDREW FLEMING

The Region and its Prehistory

THE area under study corresponds broadly to the North York Moors National Park.[1] It forms a distinct upland unit, separated from similar areas by the Vale of Pickering to the south and the Vale of York to the west, and bounded by the coast on its other sides (see map, FIGURE I). Its prehistory has been studied intensively by Frank Elgee, whose book, *Early Man in North-East Yorkshire* (1930), is still a classic regional study, and must even today provide a basis for the student of the area.

A point stressed by Elgee was the fundamental difference between the Limestone Hills and the moorland which covers much of the area. The Upper Jurassic Limestone Hills form a narrow strip of country running to the south and south-west of the moors; their southern edge slopes gently down into the Vale of Pickering, while the northern edge is bounded by a steep escarpment. The height of the Limestone Hills varies, but does not usually exceed 1,000 feet (305 metres) except in the west, where the Hambleton Hills rise to over 1,300 feet (396 m.). Much of this higher land is moorland. Nowadays the land under six or seven hundred feet (183–213 m.) is classed as good agricultural land.[2] By contrast, the land to the north of the escarpment, which Elgee re-christened Blackamore, is mainly moorland, apart from the dales which cut down through the plateau at intervals: Eskdale, Farndale, and Rosedale are examples. Geologically older than the Limestone Hills, the moorlands of Blackamore rise from the foot of the escarpment northwards to a maximum height of 1,489 feet (*c.* 455 m.) on the central watershed. North of this, Eskdale runs east and west, and further north still is the plateau of the North Cleveland Moors. Apart from the dales, therefore, most of the land north of the Limestone Hills is heather-dominated moorland—used mostly for sheep-farming, raising grouse, and recreation.

There is no doubt that throughout prehistory and afterwards the Limestone Hills provided by far the more attractive prospects for settlement. Elgee's distribution maps show that there was some Neolithic settlement here during the third millennium, resulting in the presence of long barrows, and that the

[1] I would like to thank the Trustees of the Jones Monmouthshire Scholarship Fund for a generous grant towards the cost of fieldwork.

[2] J. T. Coppock, *An Agricultural Atlas of England and Wales*, 1964, Fig. 10.

round barrows of the second millennium contain abundant Food Vessels and Collared Urns.[1] Both these classes of pottery are believed to have emerged as hybridizations of some kind between native Neolithic pottery and that of the Beaker folk who invaded England during the earlier part of the second millennium. Few of the local barrows have yielded Beaker pottery, however. In the Iron Age, this area came under the influence of the Arras culture, and this resulted in a few vehicle burials and probably the extensive multiple ditch systems which survive in some numbers.[2]

On the other hand, the moorlands, though providing excellent preservation conditions for field monuments, are largely devoid of clear indications of Neolithic settlement. By far the commonest type of monument is the round barrow, known locally as a howe; almost all the excavated examples have produced Collared Urns, normally containing cremation burials.[3] Elgee's view was that the Collared Urns were largely later than the Food Vessels, and that Blackamore was settled late, as a result of population pressure, or because the colonists were expelled from better lands by intrusive groups.[4]

Dimbleby has since shown that at the time of this colonization Blackamore was forested, and that the desolation which we see today is largely man made, a creation of this agricultural activity in the second millennium.[5] Soil which was poor in the first place—and the lateness of the settlement argues that it was recognized as such by prehistoric man—was exploited badly, so that only vast expanses of heather, and a surprisingly large number of burial mounds, remain.

In this paper an attempt will be made to assess the likely nature of this colonization; to make an estimate of the number of people involved and the time taken to reduce the land to waste; and to suggest what may have occurred after this destruction had taken place.

The Nature of the Agricultural Settlement

Little is known directly of the agricultural practices of the people making the pottery which we have come to describe as the Collared Urn tradition. Childe pointed out that they may have played a leading part in colonizing land which earlier prehistoric peoples had regarded as marginal,[6] and our area is obviously a good example of this.

The process of moorland creation in north-east Yorkshire has been docu-

[1] F. Elgee, *Early Man in North-East Yorkshire*, 1930, Figs. 9, 28, 32.

[2] I. Stead, *The La Tène Cultures of Eastern Yorkshire*, 1965, Fig. 1; R. E. M. Wheeler, 'The "Linear Earthworks" of the Scarborough District', Appendix to ch. 1 in A. Rowntree, ed., *The History of Scarborough*, 1931, pp. 34–9.

[3] Elgee, *op. cit.*, p. 82. [4] *Ibid.*, pp. 88–9.

[5] G. W. Dimbleby, 'The Ancient Forest of Blackamore', *Antiquity*, 35, 1961, pp. 123–8; Dimbleby, *The Development of British Heathlands and their Soils*, 1962.

[6] V. G. Childe, *Prehistoric Communities of the British Isles*, 1940, p. 156.

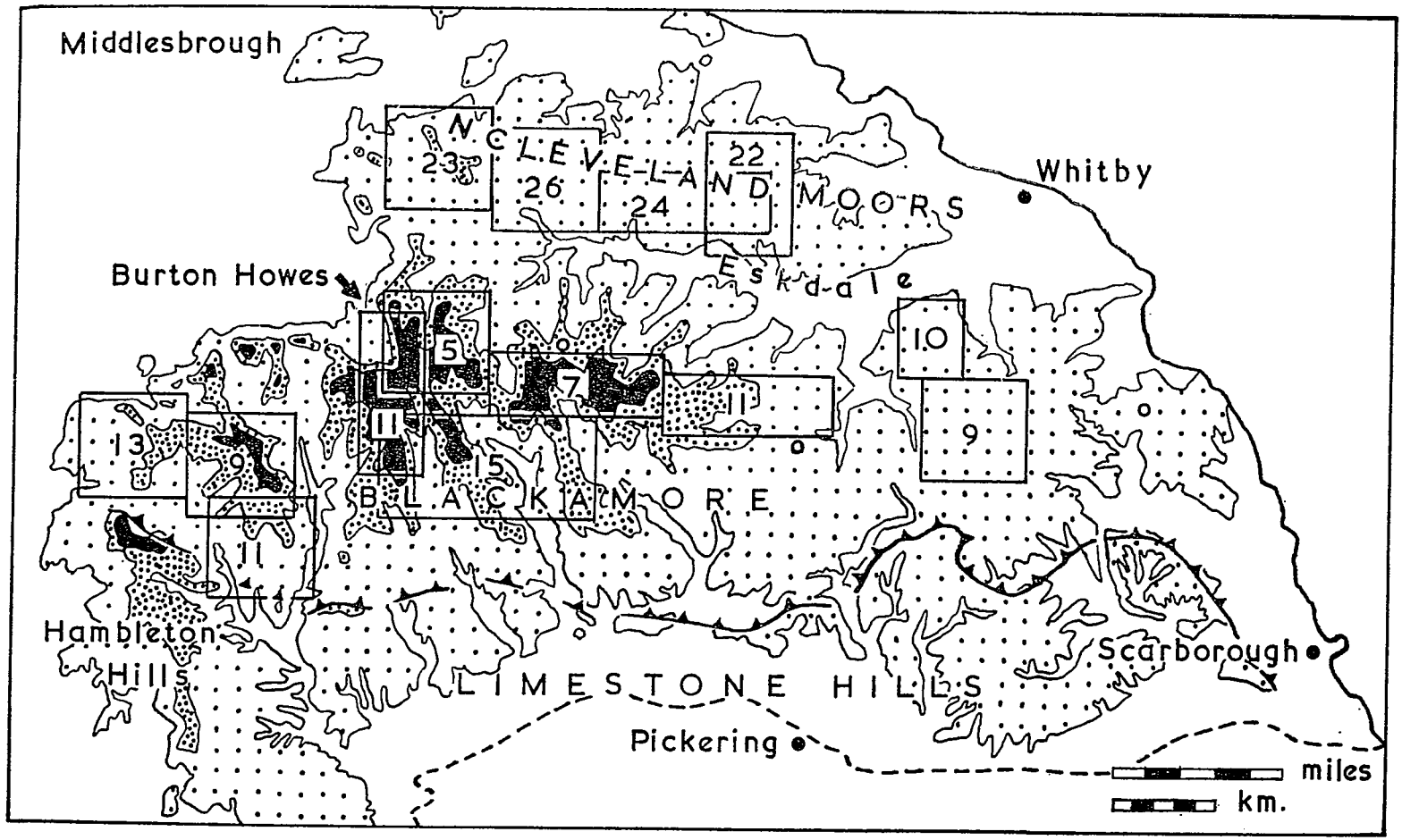


FIG. I

Map of north-east Yorkshire, showing the area studied. The contours are at 500, 1,000, and 1,250 feet O.D. (*c.* 152, 305, and 381 m.). The squares indicate areas for which barrow densities were calculated; small open circles indicate sites where cereal impressions have been preserved on pottery.

mented by Dimbleby.[1] Two barrows called the Burton Howes, at 1,419 feet O.D. (*c.* 433 m.), were sampled for pollen during excavation. It was shown that they were built in succession, in a gradually expanding clearing. The clearance resulted in a great expansion of the light-demanding heather, with some grasses, and hazel appears to have been important on the edges of the clearing. There is no evidence that the original forest recovered from these developments. Similar destructive clearances took place on the higher parts of the Limestone Hills.[2]

Dimbleby goes on to argue that the detailed differences between the pollen in the two areas indicate different bases of subsistence; that the Blackamore barrow builders were pastoralists, while those on the Limestone Hills were probably cereal farmers.[3] It is possible, however, to raise substantial objections to this view.

The statement that the moorland people were pastoralists is based mainly on evidence from two of the Burton Howes. Here the *Plantago* count is low, and cereal pollen apparently non-existent. Dimbleby uses the low *Plantago* count to argue that there was no cereal agriculture at this site, but he later admits that plantain may be found in fair quantity on either arable or pasture land.[4] Turner has shown that a low plantain count can indicate arable land, while high plantain figures should indicate pasture.[5] So the argument based on plantain is not conclusive. Nor is the absence of cereal pollen at the Burton Howes impressive, when one recalls other evidence for cereal farming in Blackamore. Longworth lists three urns which have produced impressions of cereal grains—one from nine miles north of Pickering, one from Stone Rook, Castleton Rigg, and one from Greenwell's barrow 271, Fylingdales (see FIGURE I).[6] Also the cairnfields must be considered. These are groups of small stone cairns which are found in Blackamore between 600 and 1,000 feet (183–305 m.). There are two theories concerning their function. The first is that they were intended for inhumation burials; the absence of bones from the cairns is explained by the acidity of the soil.[7] The second is that they are simply the result of field clearance.[8] It is possible, of course, to accept that both theories may be true, and that the burial rite provided a convenient means of disposing of unwanted stones. Graham has made a brilliant case for this view in respect of some Scottish cairnfields, suggesting that the functions of burial and land clearance are not

[1] Dimbleby, *op. cit.*, 1961. [2] *Ibid.*, 1962, p. 23. [3] *Ibid.*, 1961, p. 27.
[4] *Ibid.*, 1962, p. 31.
[5] J. Turner, 'The Anthropogenic Factor in Vegetational History', *New Phytologist*, 63, 1964, pp. 80–1.
[6] I. H. Longworth, *Collared Urns and Related Vessels in England and Wales*, 1964 (Cambridge Ph.D. thesis), pp. 589, 1024, 1553.
[7] Elgee, *op. cit.*, p. 100.
[8] N. Mitchelson, 'The Bronze Age in Cleveland', *Arch. Newsletter*, 4, 1952, pp. 127–8.

mutually exclusive.[1] Some of these cairns, however, are associated with irregular stone walls. These sometimes incorporate cairns, and can also be broken by long gaps. These must surely indicate surface clearance and enclosure of corn plots, at heights of up to 1,000 feet (305 m.) at least. The dating of these cairnfields needs to be clarified, but some of them must start at this time. Elgee's scanty evidence for their Bronze Age date was based on associations with barrows, and with a ring-cairn on Danby Rigg.[2] These associations with ring-cairns have been multiplied since 1930 and confirmed for other parts of northern Britain.[3]

In any case there are strong common-sense grounds for rejecting the idea that the Blackamore clearances were intended for grazing animals. The colonists from the Limestone Hills already had, in their homeland, the choice of two grazing and browsing zones. Firstly, they could utilize their own abandoned fields for this purpose—the resultant manure, whether they realized it or not, would help to restore fertility. Secondly, the forest would have provided nutritious fodder, in fair quantity, at any rate for cattle and pigs, with little expense of effort. If this forest browsing was well controlled, it could have been achieved without too much permanent damage to the field and shrub layers. Clearing the forest, whatever the purpose, would have been a laborious task. Trees had to be felled or ring-barked, and left to dry thoroughly before being burnt.[4] In one area of Finland, in 1781, this drying process took at least twelve months.[5] Dimbleby has suggested that fire might have been used for clearance, but other writers regard this as unlikely.[6] We are asked to believe that these people undertook these tasks to provide grazing, although they were surrounded by nutritious forest browsing; furthermore that they were content to create small patches of heather, between the tree stumps and the trunks of those trees left standing after ring-barking, without discovering that by grazing at the correct intensity they could create proper grassland pasture for their beasts.

There must be serious doubt whether such a scheme would have been possible, with the labour available. If one may be excused for using African data, some of Allan's figures are instructive.[7] His table shows 5 pastoral peoples, having between 6·5 and 19·6 livestock units per head. The acreage per beast usually varies between 10 and 40.[8] Thus, if a person has 6 livestock units

[1] A. Graham, 'Cairnfields in Scotland', *Proc. Soc. Ant. Scot.*, 90, 1956–7, pp. 21–3.

[2] Elgee, *op. cit.*, p. 100.

[3] R. H. Hayes, 'Archaeology (2)', in J. McDonnell, ed., *A History of Helmsley, Rievaulx and District*, 1963, pp. 36–7. See below, pp. 21–2.

[4] A. Steensberg, 'Some Recent Danish Experiments in Neolithic Agriculture', *Agric. Hist. Rev.*, 5, 1957, p. 69.

[5] W. R. Mead, *Farming in Finland*, 1953, p. 46.

[6] Dimbleby, *op. cit.*, 1962, p. 30; H. L. Edlin, *Trees, Woods and Man*, 1956, pp. 85–6.

[7] W. Allan, *The African Husbandman*, 1965, p. 307. [8] *Ibid.*, pp. 292–3.

(Allan's "basic herd") and 15 acres are needed for each, he must have 90 acres of grazing.[1] Compare this with Allan's statement on forest clearance:[2] "The clearing of secondary forest is a less forbidding but still highly laborious task. A 'good man', I was told, clears about an acre and a quarter every year, but the average is considerably lower and may be rather less than an acre."

It should be noted that Allan is referring only to secondary forest; virgin forest is a tougher proposition. Boserup quotes figures of between 6 and 50–60 man-days per hectare for fairly rudimentary clearing.[3] To clear 90 acres (36 ha.) of grazing would, on these figures, require at best some 216 man-days. Clark and Haswell, quoting other sources, give similar figures for clearing heavy forest in Ghana (50–75 man-days per hectare) and in Nigeria (37 man-days per hectare).[4] Both these figures relate to situations where the stumps or the large trees are left standing, and they also involve the use of iron tools, which were not available to the Collared Urn folk.

It may be thought that these figures are likely to bear little relation to the situation in northern Europe. But it is possible to quote stocking figures for medieval Yorkshire which are comparable to those from Africa: Trow-Smith says that sheep were stocked at one per 7 to 8 acres (*c.* 3 ha.).[5] We can assume that more land per beast would be required on the heather moorland with which we are dealing. Clearance figures, too, may be compared: Clark and Haswell quote a Danish experiment which produced figures of 245 man-hours per hectare (equivalent to about 50 man-days in African terms, or perhaps as low as 30 if one assumes a rather longer working day in the north European climate).[6] The Danes were not clearing heavy forest, and they too had the advantage of iron tools. Further Danish figures quoted by Coles suggest that a hectare takes 2½ weeks for one man to clear using iron implements, and 5 weeks if he uses a stone axe.[7] The extent to which our theoretically 'Bronze Age' cultivators had bronze axes is uncertain, but enough stone examples have turned up on the moors to imply that the older technology survived 'the end of the Neolithic'.

These figures compel the conclusion that if the Blackamore clearances were for pasture, they could only have formed part of a scheme which must have included utilization of the forests to a substantial degree. From a common-sense viewpoint, one is forced to conclude that a pastoral society colonizing a forest area would either turn their animals into the forest, having made small

[1] Allan, *op. cit.*, p. 309. [2] *Ibid.*, p. 220.

[3] E. Boserup, *The Conditions of Agricultural Growth; the economics of agrarian change under population pressure*, 1965, p. 30, note 1.

[4] C. Clark and M. Haswell, *The Economics of Subsistence Agriculture*, 1964, p. 32.

[5] R. Trow-Smith, *A History of British Livestock Husbandry to 1700*, 1957, p. 139.

[6] Clark and Haswell, *op. cit.*, p. 32.

[7] J. M. Coles, 'Experimental Archaeology', *Proc. Soc. Ant. Scot.*, 1966–7, p. 7.

clearings in which to live, or else pursue a proper policy of grassland creation, by grazing their clearances intensively and attempting to stay in one place as long as possible with this aim in mind. The kind of inefficiency postulated by Dimbleby is very hard to believe.

Another strong argument in favour of the idea that the Blackamore barrow-builders were cereal farmers is provided by the material from which the barrows are built. In many cases this is stone, in large quantities;[1] this would normally be available only after the original forest soil had been truncated by agriculture and erosion.

All these arguments support the idea that the first Blackamore clearances were intended for cereal agriculture, however many animals may have browsed in the woods or on abandoned corn land, and whatever happened to the newly created moorland afterwards. To say that the clearances were intended for cereal agriculture is not to say that this was always successful. If the cairnfields may be taken as a rough guide, one may suggest that reasonable returns might have been obtained at altitudes of up to 1,000 feet (305 m.). Above this, cereal growing might well be more difficult; perhaps only one crop was possible before the poor yield and perhaps the first signs of soil erosion forced a move. This would account for the non-existence of cereal pollen at high sites like the Burton Howes. It will be seen later that on the higher land of central Blackamore the barrow density is low, suggesting that exhaustion of fertility here may have been more rapid than elsewhere.

Population Estimates

The suggestion that the clearances in Blackamore were made primarily for raising cereals, and immediately after use became covered in heather, implies that the majority of land in the area was used only once, over a short period, and that thereafter it could usually supply only heather or coppice as fodder. This is a basic assumption for the argument which follows.

A second assumption is that the bulk of the population was buried in the barrows which occur in such numbers on the moors. Elgee thought that they were intended for chieftains,[2] but the numbers involved would then imply a very large population (unlikely, on marginal land) or a very long occupation (also unlikely, in view of the homogeneity of the pottery and the burial rites, and the marginal character of the land again). Usually the grave goods, for what they are worth as evidence, do not suggest high social status, though there are a few exceptions to this rule.[3] Most howes which have been investigated at all thoroughly have yielded more than one cremation, and Elgee, in a

[1] Elgee, *op. cit.*, p. 90. [2] *Ibid.*, p. 100.

[3] E.g. F. and H. W. Elgee, 'Loose Howe: an Early Bronze Age Burial in a Boat-shaped Wooden Coffin', *Proc. Prehist. Soc.*, 15, 1949, pp. 87–106.

section entitled 'Family Mausoleums' recognizes this.[1] It is reasonable to assume that each barrow normally contained between four and ten persons, including secondary burials (those let into the top of the mound after its completion). Far from envisaging the burial of a chieftain in splendid isolation at one brief moment of time, we should envisage a succession of burials, at first in an enclosure within a wall or stake circle, and then, after the raising of a mound, in the mound itself. This is only to be expected; Collared Urns are ultimately derived from Neolithic pottery of Ebbsfleet tradition and thus from a heritage which includes multiple cremation burials within enclosures of the Dorchester type.[2]

Most of the north-east Yorkshire barrows are not scattered casually across the landscape; they fall into recognizable patterns, of which the most common are groups of two or three together, and a series of several strung out within sight of one another, usually along a ridge.[3] The rapidity of the spread of moorland, attested at Burton Howes, suggests that here the groups should probably be considered as cemeteries in use over one stretch of time, the different barrows within a group being used either in succession or by different subgroups within the population—or perhaps in both of these ways.

If the whole population was entitled to burial, it is possible to calculate how long it would have taken, at a given death-rate, to produce the dead represented by the average barrow or group of barrows. This has been attempted in FIGURE II, using a death rate of 40 per 1,000 and excluding infant mortality.[4] From the graph one may read off that a group of 150 will produce, on average, 30 deaths in 5 years, or that a 4-year occupation by a group of 50 should produce 8 deaths.

It is not possible to know at the moment what exactly is a fair number to assume for the average number of burials per barrow—probably a range of between 4 and 10 would most commonly be found in well-investigated and well-preserved examples. Most cemeteries in this area comprise at most 4 barrows, though 5 and 6 are known occasionally; this may suggest that 30 burials per cemetery is a normal maximum. This maximum is marked on FIGURE II, along with three other guidelines representing other numbers of burials. It shows that in general a group of 150 cannot have stayed more than 5 years and still used the same cemetery, while a group of 75 could have continued to use it for up to 10 years, and so on. These upper limits should be borne in mind, because they become useful at a later stage in the argument.

Looking at this diagram shows also that there are several ways of thinking about these population groups. At the extremes of the diagram are small

[1] Elgee, *op. cit.*, p. 95.

[2] R. J. C. Atkinson, C. M. Piggott, and N. K. Sandars, *Excavations at Dorchester, Oxon.*, 1951.

[3] Elgee, *op. cit.*, Figs. 41 and 42. These maps are misleading because they also include cairnfields.

[4] Following R. J. C. Atkinson, 'Old Mortality: some aspects of burial and population in Neolithic England', in J. M. Coles and D. D. A. Simpson, eds., *Studies in Ancient Europe*, 1968, p. 87.

groups of less than 50, which are using the cemeteries for periods of well over 10 years, and larger groups, each of over 150, which are moving biennially or even more rapidly than that. But if the cemeteries equate with the middle part of the diagram, they are used by groups of perhaps 50 to 125 persons, staying

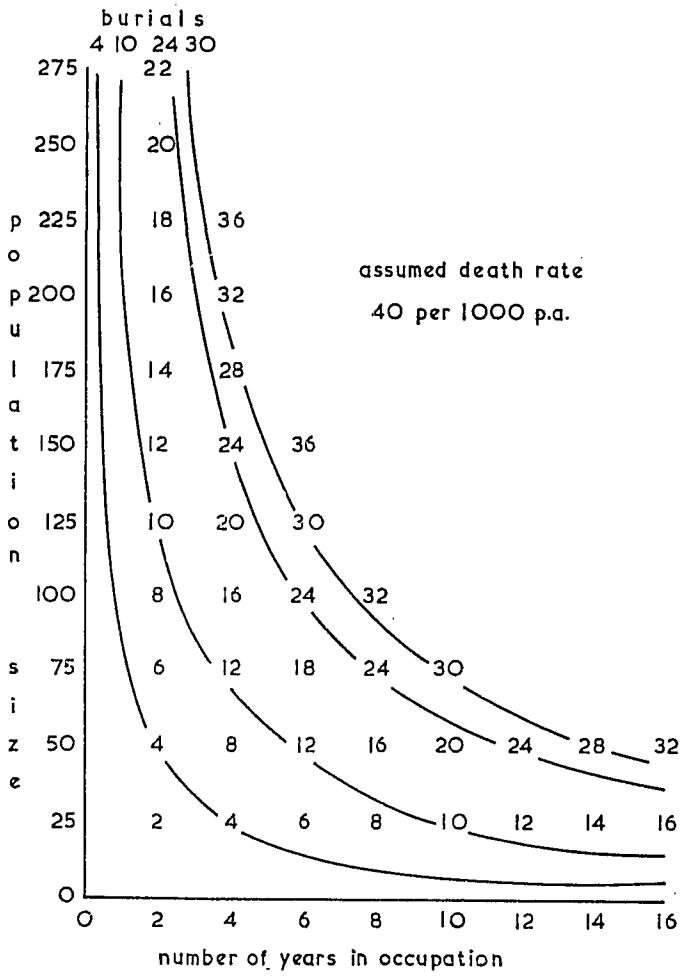


FIG. II

The number of deaths to be expected for a given population size over a given number of years, at an assumed death-rate of 40 per 1,000 per year. The lines are intended for guidance only.

near one cemetery site for up to about 5 years before moving on, and normally burying less than a couple of dozen in this time.

There is another way of approaching the problem of making a population estimate. That is to consider the amount of land under grain which would be needed to feed a given population each year. There is obviously no direct way

of knowing this figure exactly, particularly since the diet was probably made up partially from animal products derived from stock-raising or hunting. Figures for a variety of crops given by Allan suggest that in Africa between ½ and 2 acres per head (less than 1 hectare) are normal.[1] The different crops and techniques of medieval Europe make truly comparative figures hard to come by. Bowen implies that adults who are not obtaining starch from potatoes may consume perhaps 10–15 bushels of grain per year in European conditions.[2] Bennett comes to the conclusion that in medieval England a yield of 8–9 bushels per acre was usual.[3] Each adult, therefore, would need the product of perhaps 1½ acres, and would have to sow rather more than this, to allow for seed corn production. This might mean sowing one-third or one-quarter as much land again, on medieval yield figures of 1:3 or 1:4.[4] Thus about 2 acres would probably be needed per adult, or perhaps per head if one allows for the need to cover for losses of various kinds.

How far the different conditions of Africa or medieval Europe make these figures untrustworthy for use in prehistoric European contexts is uncertain. But it seems safe to suggest, on the basis of the above figures, that the land under cultivation per head per year should have been between 1 and 5 acres (say ½–2 ha.).

It is possible to construct theoretical diagrams to illustrate how much land would be needed by population groups of different sizes; however, some assumptions must be made as to the rate at which this land is being used up. This may be termed the utilization rate. This is the number of years taken by one person to exhaust one hectare. FIGURES IIIa and IIIb are constructed with a utilization rate of 1:2, and the tabular values are in hectares. Using this utilization rate is only another way of saying that one person needs ½ hectare, which is exhausted in 1 year, or 1 hectare, which is exhausted in 2 years, or 2 hectares, which are exhausted in 4 years. Whichever of these figures is most accurate from the point of view of personal consumption, they all involve using up land at the same rate. Thus on both FIGURES IIIa and IIIb, at a utilization rate of 1:2, a group of 75 people will have exhausted 150 hectares after 4 years, and after 6 years 100 people will have used up 300 hectares, and so on.

Other diagrams can be drawn for a medium utilization rate (1:4) (FIGURE IV) and for a slow utilization rate (1:8) (FIGURE V). It is only when the barrow densities are known that it is possible to suggest which of these theoretical diagrams is most likely to be correct for the region.

[1] Atkinson, *loc. cit.*, pp. 55–9.
[2] H. C. Bowen, 'Corn Storage in Antiquity', *Antiquity*, 41, 1967, p. 215.
[3] M. K. Bennett, 'British Wheat Yield Per Acre for Seven Centuries', *Econ. Hist.*, 3, 1935, p. 21.
[4] B. H. Slicher van Bath, *The Agrarian History of Western Europe*, 1963, pp. 18–19.

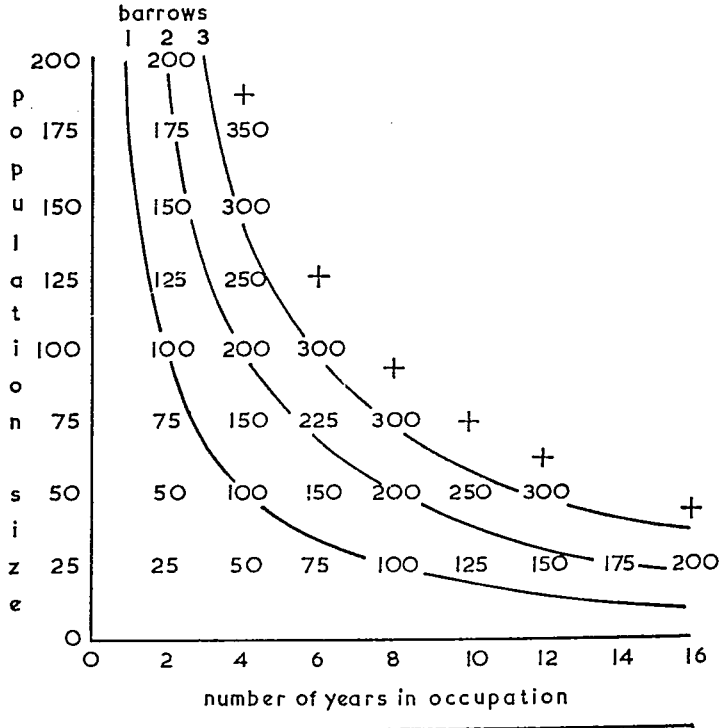


FIG. IIIa

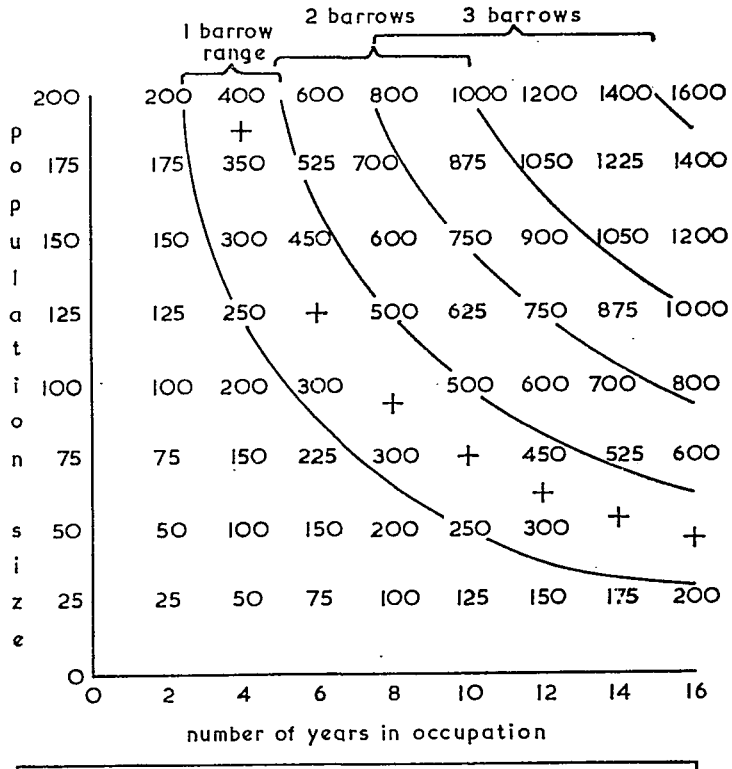


FIG. IIIb

The tabular values are in hectares. For explanation see text.

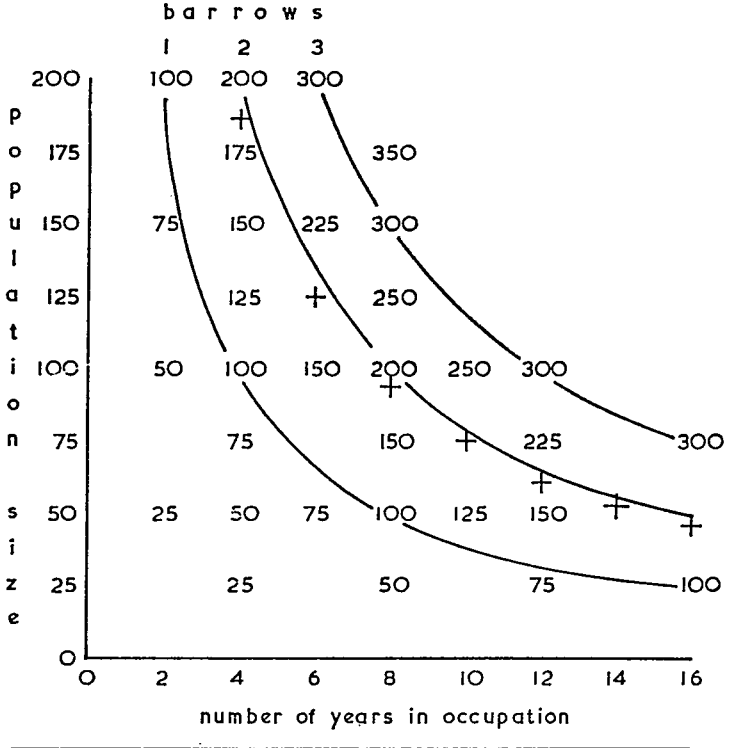
In some parts of north-east Yorkshire the barrow density can be determined with some accuracy. The moorlands have few monuments which suggest intensive later occupation, so that one may be fairly sure that barrows have largely escaped destructive agricultural operations. A few will have been entirely destroyed to build walls—but these are not common features on the moors themselves—and one or two remain to be discovered.

It may be argued that some barrows were built at the upper margins of the dalesides, and were subsequently destroyed by medieval and later farming, but none has survived in this type of position, so this case rests on negative evidence.

The density figures on the map (FIGURE I) are based on fieldwork. Information was supplied by the Ordnance Survey maps and also by Mr Raymond Hayes, whose kindness I should like to acknowledge with gratitude. On the map, the squares for which figures have been counted have been deliberately selected for position, and vary in area between 5×5, 6×4, and 8×3 km., giving a figure which indicates numbers of barrows per 2,400–2,500 hectares. The need for positional selection, and for the slight flexibility of the unit (of the order of 4 per cent) is obvious. A blanket coverage of the region in, say, 5×5 km. squares would include much badly drained land in the dales and many steep and inhospitable slopes. On the central watershed in particular, the barrows occur on relatively narrow strips of plateauland, often with the dale sides falling away very steeply at the edges. The map shows that densities are very regular, and that there is a profound difference between Central Blackamore and the North Cleveland Moors. In Central Blackamore there is one barrow per 250–500 hectares (the figure of 15 refers to an area of 5,000 hectares, double the normal size); the North Cleveland Moors, and Sleights Moor (the figure of 10 here refers to an area of half the normal size) have a regular density of about one barrow per 100 hectares. This is probably to be related to the difference in altitude and its effects on settlement.

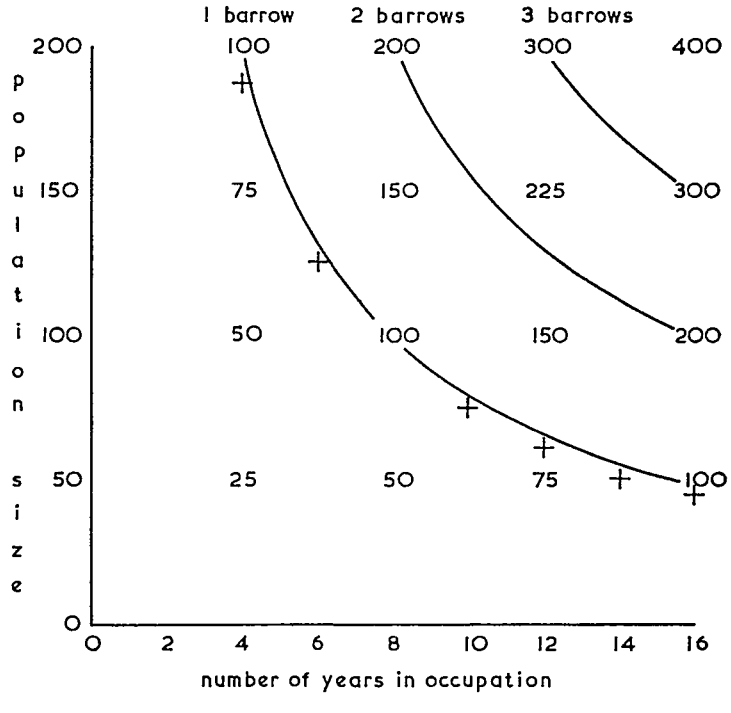
Now that we know how much land goes with each barrow, it is possible to compare this figure with how much land one might expect to be used on theoretical grounds. On the North Cleveland Moors, each continuously used cemetery was using 300 hectares as a maximum (since three is the normal maximum cemetery size), while two-barrow cemeteries were using 200, and a single barrow 100. These actual use figures can now be transferred to the diagrams of theoretical use; they have been drawn as lines on FIGURES IIIa, IV, and V, linking values of 300, 200, and 100 hectares. The same thing has been done for Central Blackamore densities (FIGURE IIIb), only this time the lines express ranges, since the densities themselves can only be expressed in this way.

On diagram IIIb it will be observed that the range lines only just fall within the diagram area. If Central Blackamore diagrams for medium and slow



NORTH CLEVELAND MOORS
medium utilisation rate (1:4)
figures indicate all cleared land

FIG. IV



NORTH CLEVELAND MOORS
slow utilisation rate (1:8)
figures indicate all cleared land

FIG. V

The tabular values are in hectares. For explanation see text.

utilization rates were drawn it would mean postulating much larger population sizes and much longer occupations to make the theoretical framework fit the actual use. So these diagrams, which would obviously be inappropriate, have not been drawn.

If one considers which of the FIGURES IIIa, IV, and V suit the North Cleveland Moors densities best, there is a useful way of reaching a decision. A return to FIGURE II shows that the number of burials in the cemeteries gives a firm maximum for duration of occupation per population size. Thus, for instance, as mentioned before, 150 people cannot use the same cemetery for more than 5 years, or 75 longer than 10, on the evidence of maximum number of burials in cemeteries. On all the diagrams these limits have been marked with crosses. Seen in this light, some of the diagrams are clearly wrong. FIGURE IIIb, for instance, has the limits set well inside the lines showing the quantities of land actually used by the barrow-builders. So for this area—Central Blackamore—we must devise a diagram which will allow land to be used even more rapidly.

For the North Cleveland Moors, only the fast utilization rate (FIGURE IIIa) fits the limits imposed by the cemeteries. The slow rate of FIGURE V does not fit at all well and the medium rate—FIGURE IV—still leaves something to be desired. At this stage it might be thought that the fast rate should be accepted for the North Cleveland Moors, and that the only need is to draw an even faster rate for Blackamore. This latter has been done (FIGURE VI) at a rate of 1:1. But even this diagram will not fit the limits imposed by the cemeteries. And acceptance of FIGURE IIIa for the North Cleveland Moors implies acceptance that here, on a warm 800 foot plateau (244 m.) with land just cleared from virgin forest, one person was exhausting land at the rate of one hectare every two years, which is surely too fast.

The dilemma here is that one is forced to assume a much faster exhaustion rate than is reasonable for forest soil, with every unnecessary move involving more laborious clearance. But the problem can be resolved. The theoretical diagrams are based on the amount of land actually covered in corn-stalks which the individual needs for his subsistence. But the barrow densities are expressed in barrows per unit area—and this includes land of all categories, good, bad, and indifferent. The distinction is important. Allan has explained how in this kind of cultivation the peasant is very selective within the area which he is to sow, and knows by various ecological indicators which land is unsuitable for his crops.[1] In north-east Yorkshire the same kind of behaviour is to be expected; different vegetation types would indicate badly drained land or thin soil cover, while other areas would be palpably too stony or too steep. But even more important in a phase of clearance from virgin forest is the prob-

[1] Slicher van Bath, *op. cit.*, p. 97.

lem created by tree stumps. Whether the larger trees are felled or left to die after ring-barking, their stumps take up a considerable proportion of the surface area. At this stage the stumps are normally left to rot, and planting takes place between them, often at first in the ash patches left after the burning, and in later seasons after hoeing. These processes are admirably illustrated in W. R. Mead's book *Farming in Finland*.[1] Here the removal of decayed stumps takes place after seven years or more—and this with the aid of a horse team.[2]

Once we have taken these factors into account, it will be seen that a barrow from the North Cleveland Moors, although apparently attached to some 100 hectares of land, must in reality relate to a rather smaller area under crops. It is necessary to make an estimate of cultivated, as opposed to cleared, land. For Central Blackamore, on the fast rate diagram (FIGURE IIIb) the lines marking cleared land used could only fit the limits marked if the cultivated land within it was about one-quarter of the whole. This would be extreme, particularly since the original areas on which the densities were measured had already been selected for their low amounts of steep slope or dale land. It is much more reasonable to use the very fast utilization rate (FIGURE VI) and assume a cultivation percentage of about 50, giving a diagram (FIGURE VIIb) which fits the necessary limits. Here the lines have been drawn to show half the land use of FIGURE VI, representing this 50 per cent of land in actual productive use.

For the North Cleveland Moors, the same percentage of cultivated land may be assumed; although Central Blackamore would have contained more areas of steep slope and thin soil, the lower plateau would have more flat, badly drained land for the farmers to contend with. But the utilization rate chosen must be different. The lower number of barrows on the central watershed must relate to the lower, less certain yields associated with the greater altitude and higher rainfall, and so on. Land would be both exhausted and abandoned more quickly. With a cultivation percentage of 50, the medium utilization rate fits neatly, and FIGURE VIIa can be produced as the final diagram for the area.

The difference between the North Cleveland Moors and Central Blackamore is the rate at which the land is exhausted. On the lower plateau, 1 hectare per person is being used in 4 years, plus an equal amount which is unusable because of unsuitable soil or tree stumps. On the central watershed, by contrast, 1 hectare per person is exhausted every year, and as much again in waste. In other words, the land of the central part of Blackamore was being exhausted four times as quickly as that of the North Cleveland Moors, a figure which derives ultimately from the relative barrow densities.

From these figures it is possible to make a rough population estimate for the land north of the Limestone Hills. Assuming once again that the dales and the steepest slopes were not utilized for crops, a crude count was made of available

[1] Chapter 3 and Pls. 2 and 3. [2] *Ibid.*, p. 49.

1 km. × 1 km. O.S. grid squares. These are tabulated according to their numbers within the larger 10 km. × 10 km. squares (TABLE I). Each of these small squares is 100 hectares in area. Each square with less than about 50 per cent of suitable land was excluded, and in general an admittedly subjective attempt was made to reflect the kind of land on which barrows occur. It is of interest that in the larger squares between 30 and 45 per cent is normally land

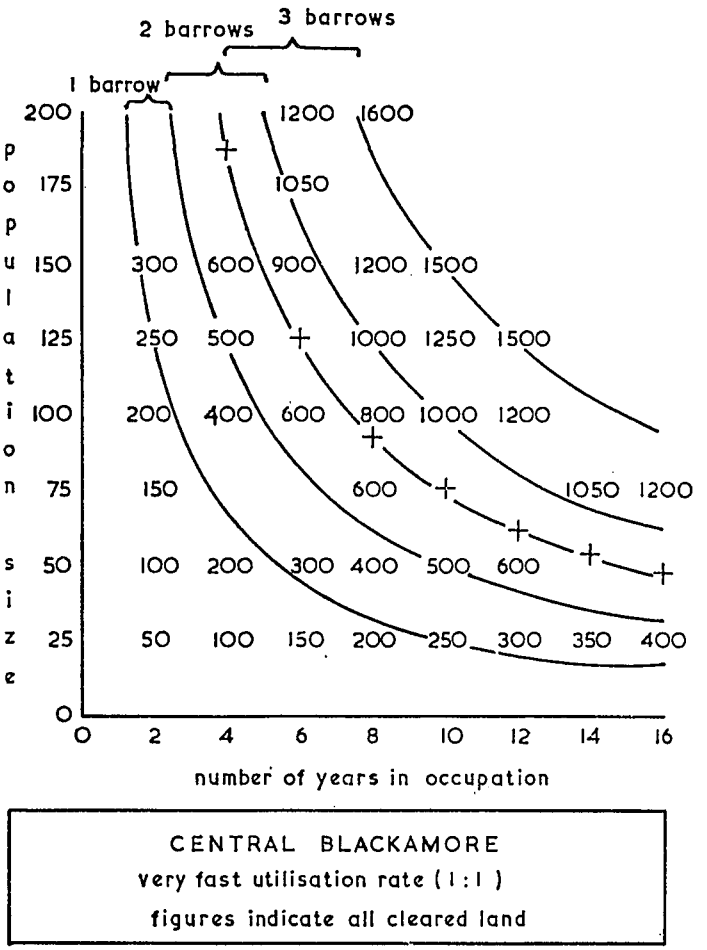


FIG. VI

The tabular values are in hectares. For explanation see text.

of this type. The total area, 43,000 hectares, has been rounded off to 50,000, and this, on a cultivable percentage of 50, gives 25,000 hectares actually used for crops.

At this point it becomes necessary to establish a utilization rate. The medium rate (1:4) has been adopted; it is appropriate for the North Cleveland Moors

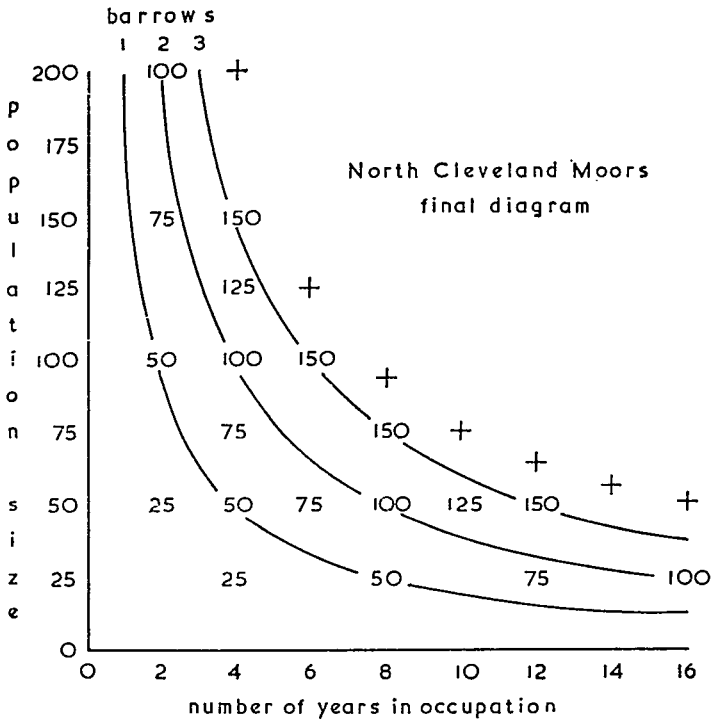


FIG. VIIa

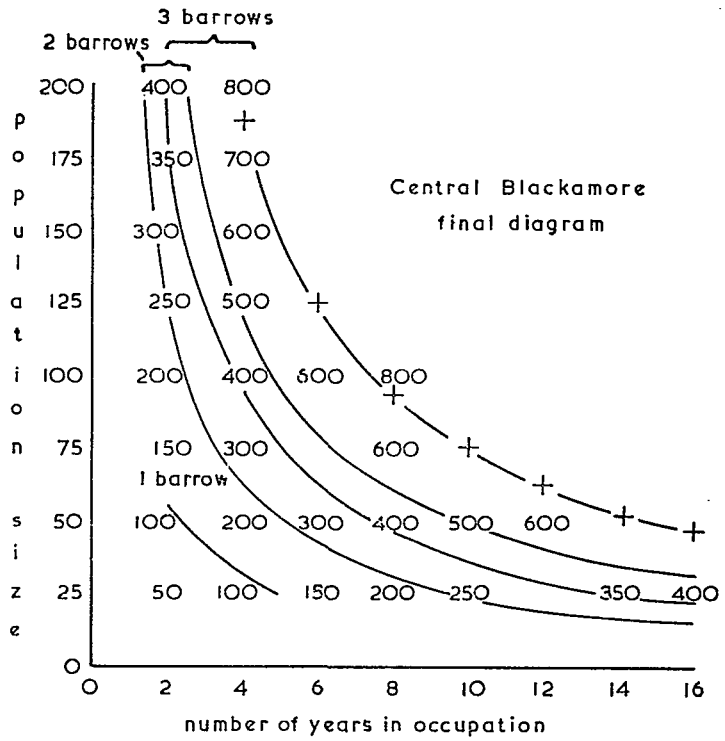


FIG. VIIb

The tabular values are in hectares. For explanation see text.

TABLE I—showing the approximate amount of land in Blackamore available for agriculture. In obtaining this approximation the dales and areas of steep slope have been omitted.

O.S. grid squares	*No. of 1 km. squares*	*O.S. grid squares*	*No. of 1 km. squares*	*O.S. grid squares*	*No. of 1 km. squares*
NZ 40	—	*NZ 70	36	*SE 59	43
NZ 50	17	NZ 71	18	*SE 69	39
NZ 51	3	*NZ 80	31	*SE 79	40
*NZ 60	33	NZ 90	26	*SE 89	46
NZ 61	29	SE 49	22	SE 99	45
* Full 100 sq. km. available				TOTAL=428.	
TOTAL=428 sq. km.—say 430 sq. km.=43,000 hectares.					

and other areas of similar height. If it is too generous for the central watershed, it is probably too grudging for the east coast, with its patches of glacial material and its slightly longer growing season.[1] So it seems a fair average. FIGURE VIII represents on a graph the range of population estimates possible for the area as a whole, with 25,000 hectares under crops and one person exhausting one hectare in four years. The crosses represent the likely limits within which the true figures probably lie. It is difficult, for instance, to believe that the occupation lasted less than 100 years, or more than 600. A really short occupation is ruled out by the size of the area—if it was marginal, it is difficult to imagine the swift and eager colonization, by a large body, which would need to be postulated for such a short space of time; and the pottery, which includes urns both of Longworth's Primary Series and of his Secondary Series,[2] is normally thought of as covering a rather longer period. An extremely long occupation can be disputed by arguing that the pottery and burial rites are too homogeneous to have lasted so long.

It is most likely, then, that the Collared Urn population numbered less than 1,000, and that they were in the area for between 100 and 500 years; a more average figure still would be between 250 and 500, over a period of 200 to 400 years. It is interesting that the figure for duration accords with reasonable estimates made on archaeological grounds, though it was arrived at for other

[1] J. A. Taylor, 'Growing Season as affected by Land Aspect and Soil Texture', in J. A. Taylor, ed., *Weather and Agriculture*, 1967, Figs. 4 and 5.

[2] I. H. Longworth, 'The Origins and Development of the Primary Series in the Collared Urn Tradition in England and Wales', *Proc. Prehist. Soc.*, 27, 1961, pp. 263–306.

reasons; the numerical estimate is totally new. From the archaeological point of view the figures are quite valuable, because they give a time-scale over which typological changes in the pottery can be measured. This may have implications for the same type of pottery in other parts of Britain where this kind of estimate is at present impossible.

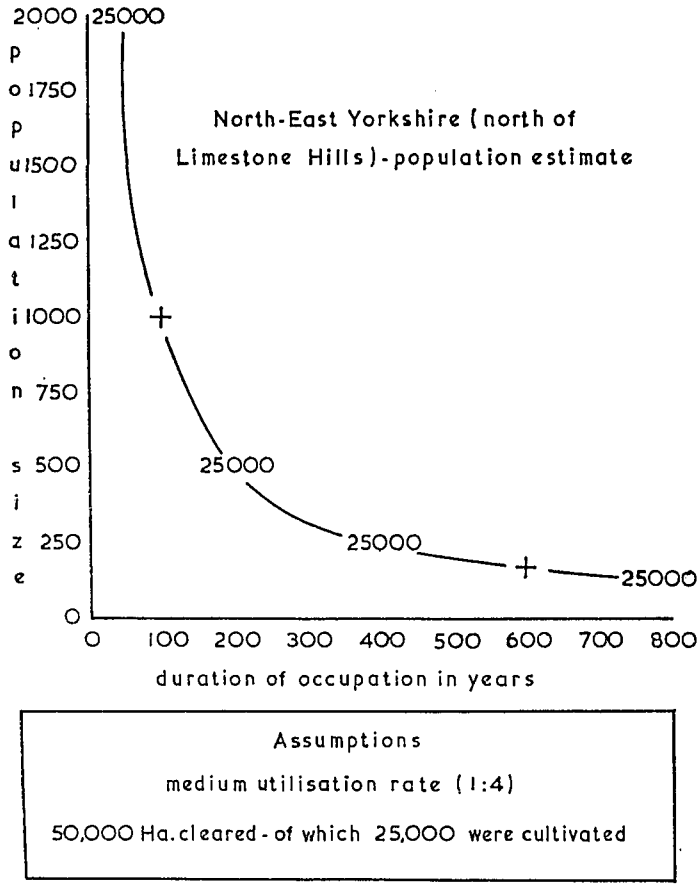


FIG. VIII

Final estimate for population of Blackamore. Crops were raised on about 25,000 hectares, one person, on average, exhausting 1 hectare every 4 years. The crosses indicate the limits within which the true population figure is likely to be: thus the overall population is unlikely to have exceeded 1,000, or to have remained in the area for over 600 years.

It must be clearly realized, though, that this calculation is empirical in nature and its results must therefore be treated as provisional. Further work could mean the changing of some of the assumptions and simplifications made here, with corresponding effect on the figures. For instance, if a proportion of

the adult population was not entitled to barrow burial (a class of slaves, for instance) this would modify the situation. Possibly also grain supplies were imported from the Limestone Hills, though if there was a surplus there it is hard to understand why the uptake of these marginal lands ever became necessary.

These figures are concerned with averages, and take no account of the size of the initial colonizing group or groups, the number of these groups, or overall rises and falls in population numbers over a period of time. They take no account of stock-rearing, in the woods, on the fallow, or on the newly created heather moors; this is impossible to gauge. If there was a substantial grazing phase after the development of moorland, but while barrows were still being built, some of these must be excluded from the density figures, which have been quoted as if they refer to the agricultural phase only. Finally, Burton Howes are, after all, situated near the very highest part of Blackamore. Possibly some forest regeneration took place at lower altitudes, allowing a second or third cropping phase. Certainly the dispositions of barrows on the North Cleveland Moors may suggest this; though in Central Blackamore barrows are not notably more numerous on the lower slopes. In so far as this is true the number of barrows to be considered for the earliest clearance phase must be less.

At any rate, a later grazing phase on the moorlands, and partial forest regeneration on the lower slopes and better ground would allow a proportion of the population to remain in the area after their disastrous progress was over; and it is perhaps in this context that the cairnfields may be seen.

The Cairnfields

A definitive study of the cairnfields of northern Britain has still to appear. For this area, however, some basic facts are known. Cairnfields occur normally between 600 and 1,000 feet (183–305 m.). Sometimes only one or two cairns are found, sometimes several hundred, as on Danby Rigg or at Iron Howe.[1] Iron Howe has been surveyed quite recently, and the plan shows well the irregular walls, sometimes enclosing small fields, which occur quite often in the cairnfields.[2] At Iron Howe the walls are higher and less broken than in most cairnfields, however; frequently, disconnected lengths of walling are found. The Iron Howe plan shows too that the cairns can occur within the fields, and built into the walling.

The cairns themselves are usually ovoid, but can be round or long; they tend to measure between 8 and 15 feet in length (*c.* 3–5 m.) and between 6 and 10 feet in width (*c.* 2–3 m.). The associated walling suggests that they were connected with the growing of cereals in small plots, many of which had first to be cleared of stones. This must be the primary purpose of the walls, which are too

[1] Elgee, *op. cit.*, p. 136; R. H. Hayes, *op. cit.*, p. 39. [2] Hayes, *op. cit.*, Fig. 5.

broken and irregular to represent more than a tidy way of disposing of unwanted stones at the field's edge. The aspect of the cairnfields also argues for agriculture; Elgee[1] was able to show that most slopes on which the cairns occur face south, south-west, or south-east, which should have ensured better conditions for growth;[2] though my own analysis has shown that almost as many are foundon ground which is virtually flat. Fieldwork has confirmed Elgee's statement that they are normally found on dry ground,[3] and it is interesting that the same is true of cairnfields in Dumfriesshire.[4]

As mentioned above, the paucity of finds from excavated cairns has led to a debate between those who view the cairns as for burials, which have since decayed, and those who see them as a product of field clearance. One feature is commonly reported, however—the presence of charcoal and traces of burning in and under them. This was noticed by Ashbee on Kildale Moor, by Hayes on Great Ayton Moor, and by Canon Atkinson on Danby Rigg.[5] Outside the area, traces of burning were found by Canon Greenwell at Eglingham, Northumberland and at Barnscar, near Ravenglass, Cumberland.[6] All this suggests that before the clearing took place scrub had been burnt off from the land surface.

Northern British cairnfields may be dated rather hesitantly from the contents of excavated cairns, where these exist, and the nature of associated monuments. Jobey claims that the cairnfield at Alnham, Northumberland, is basically Bronze Age in date, because of finds within the cairns; and the evidence gathered by Hayes, limited though it is, points in the same direction for the contents of cairns in our region.[7] In the Lake District similar cairns have been ascribed to the Bronze Age on the basis of finds in them.[8]

It can be shown that in several regions there is a fairly regular association with stone-walled enclosures—the so-called ring-cairns or burial circles. These enclosures, which vary in size, tend to produce cremations with or without Collared Urns in the same way as the barrows do. In north-east Yorkshire the most recent publication has been that of two from the cairnfield at Great Ayton Moor to add to the Danby Rigg circle, and those already mentioned by Hayes.[9]

[1] Elgee, *op. cit.*, p. 123. [2] Taylor, *op. cit.*, Fig. 13. [3] Elgee, *op. cit.*, p. 123.

[4] J. Scott-Elliot and I. Rae, 'The small cairn fields of Dumfriesshire', *Trans. Dumfriesshire and Galloway Nat. Hist. and Ant. Soc.*, 44, 1967, p. 100.

[5] P. Ashbee, 'Excavations on Kildale Moor', *Yorks. Arch. Jnl*, 29, 1957, p. 191; R. H. Hayes, *The Chambered Cairn and adjacent monuments on Great Ayton Moor*, 1967, pp. 23–5; Canon Atkinson quoted by Elgee, *op. cit.*, p. 99.

[6] W. Greenwell, *British Barrows*, 1877, p. 420; D. Walker, 'Excavations at Barnscar, 1957–58', *Trans. Cumberland and Westmorland Antiq. and Arch. Soc.*, 2–65, 1965, p. 56.

[7] G. Jobey and J. Tait, 'Excavations on Palisaded Settlements and Cairnfields at Alnham, Northumberland', *Archaeologia Aeliana*, 44, 1966, p. 46; Hayes, *op. cit.*, 1963, p. 39.

[8] C. Fell, 'Some Cairns in High Furness', *Trans. Cumberland and Westmorland Antiq. and Arch. Soc.*, 2–64, 1964, p. 3; Walker, *op. cit.*, p. 62.

[9] Hayes, *op. cit.*. 1967; Elgee, *op. cit.*, p. 104; Hayes, *op. cit.*, 1963, Appendix A, viii.

The association between cairnfields and ring-cairns has been noted elsewhere. In Derbyshire, it occurs on Stanton Moor, Totley Moor, and Ramsley Moor.[1] In the county of Dumfries, ring-cairns are always found close to, or within, fields of small cairns, never by themselves.[2] The ring-cairns in both of these areas have produced Collared Urn material.[3] Longworth finds that there is an association between ring-cairns and a typologically late group of Collared Urns, the north-western style of his Secondary Series, which occurs broadly north and west of the Pennines, as well as in Derbyshire and the West Riding of Yorkshire.[4]

Thus even if some north British cairnfields are late in date, it is hard to avoid the conclusion that they started in the Bronze Age. It may be suggested that in north-east Yorkshire they were being developed at a late stage in the history of the moorland area, when the original forest soil had been truncated by erosion, and surface stones were becoming a problem. As suggested earlier, it is possible that the fertility of the lower slopes could be conserved for rather longer than that of higher ground, and that cereal farming continued here for some time after the reduction of much of the land to heather moor. Perhaps by careful stone clearance and possibly folding the animals on the stubbles to provide manure, it was possible to make a living, though not indefinitely. This would result in the cairnfields, with their restricted altitudinal range, their preference for southerly slopes (noted also in Dumfriesshire[5]), and their walling. This would naturally only provide a solution for some of the previous population; the others would have to emigrate, or perhaps concentrate more on pastoralism.

Some of the cairnfields contain barrows, which may relate to the earlier occupation of the area or else have been the cemeteries of the cairnfield farmers themselves. Other cairnfield builders, though, were using ring-cairns. It is possible that the ring-cairn developed from concentration on an early phase in the ritual which culminated in the erection of a barrow; many old excavation reports from this area, as from elsewhere, mention that the barrows contained internal perimeter walling or orthostatic stone circles, and presumably these formed pre-barrow enclosures which stood while primary and satellite burials were being made.

It looks as if the cairnfield farmers were concerned with building these primary enclosures, and burying within them in the accustomed way. Perhaps the

[1] J. P. Heathcote, 'Further Excavations on Stanton Moor', *Derbyshire Arch. Jnl*, 10, 1936, Fig. 7; J. Radley, 'A Bronze Age Ring-Work on Totley Moor and other Bronze Age Ring-Works in the Pennines', *Arch. Jnl*, 123, 1966, Fig. 1 and pp. 9, 15; D. N. Riley, 'Circles and Barrows on Ramsley Moor', *Trans. Hunter Arch. Soc.*, 8, 1958, fig. 1.

[2] Scott-Elliot and Rae, *op. cit.*, 1967, p. 101.

[3] *Idem.*, 'Whitestanes Moor (sites 1 and 80)—an Enclosed Cremation Cemetery', *Trans. Dumfriesshire and Galloway Nat. Hist. and Ant. Soc.*, 42, 1965, pp. 51–60.

[4] Longworth, *op. cit.*, 1964, pp. 195–6.

[5] Scott-Elliot and Rae, *op. cit.*, 1967, pp. 99–100.

circles were intended not only for burial but for important ritual activities, the need for which would have redoubled at these difficult times of diminishing yields. Certainly some of the circles contain puzzling 'ritual pits', while others, which are rather larger in diameter than the average barrow, suggest that an evolution in their status and function may have occurred.

Perhaps in not converting pre-barrow enclosures into barrows, but leaving them standing as ring-cairns, the farmers were making a virtue of necessity. By this time it is probable that the average size of the social group had decreased, leaving less labour available for building impressive memorials, especially since stone clearance and manure carting may have been consuming by now rather more time and labour than previously.

According to this argument, then, it is most likely that the cairnfields represent the aftermath of the colonization of this most unrewarding area—the inevitable decline and fragmentation of the original population, and the development of a slightly different type of agriculture on these lower slopes. How long this cereal-farming continued we do not know, but probably pastoralism was on the increase. The cross-ridge dykes of the Iron Age, known better from the Limestone Hills and the Wolds, may be associated with cattle-raiding and its prevention, and a few occur in Blackamore. Perhaps too the lapse of any pottery tradition in the region after the Collared Urns is an expression of the redundancy of pottery which would occur with this increased interest in stock-raising.

Conclusions

It has been suggested that the moorlands of north-east Yorkshire were not created by the activities of nomadic pastoralists, but by shifting cultivators. Since the barrow densities for the area have been worked out, it is possible to compare theoretical land needs with land used per barrow, on the assumption that most of the land was not available twice. Thus an estimate of the rate at which land was exhausted has been reached, and this has formed the basis for an estimate of the duration of the occupation and the numbers of people involved. Chronologically this has agreed with what conventional prehistory suggests, but the numerical estimate is new. A final suggestion is that the cairnfields represent clearance by small groups of farmers, who were forced by the depredations of their immediate ancestors to cultivate the lower slopes only.

It should be emphasized that these conclusions apply only to one area. It is not suggested that all Collared Urn users were primarily growing corn, or that this pottery tradition can everywhere be compressed into two or three hundred years, or that all barrow burials represent only one continuous occupation per cemetery, or that in all areas barrows were provided for the majority of the

people. Indeed, there must have been considerable local variation in the economies of the Bronze Age, just as was the case in medieval England, and to some extent the customs and locations of burials must reflect these. In this area the data are relatively complete, local relief is very well defined, and some pollen analysis has been carried out; the same could not be said of many other regions and we must await more information, or devise new ways of looking at distributional evidence, before attempting elsewhere the kind of study presented here.

Notes and Comments

J. D. CHAMBERS, 1898–1970

Professor J. D. Chambers, the distinguished economic and social historian, died suddenly after a short illness on 12 April 1970. He was one of this country's leading scholars in agrarian history and readers of this journal will know him as a frequent contributor of reviews.

David, as he was known to his many friends, was associated throughout his life with the University of Nottingham. The son of a small Nottinghamshire farmer, he was educated at the then University College, and his earliest teaching years were spent in the University Department of Adult Education. In 1947 he was placed in charge of Economic History in the University, and in 1958 he became the first holder of the Chair of Economic History, from which he retired in 1964.

Chambers's reputation was founded on his pioneering study of life and labour under the squirearchy, *Nottinghamshire in the Eighteenth Century* (1932, 2nd ed. 1966). His most prolific period was between 1953 and 1966 when, in addition to his well-known and important papers on 'Enclosure and Labour Supply' and 'The Vale of Trent', and a variety of other articles and pamphlets, he published two major studies, *The Workshop of the World* and *The Agricultural Revolution, 1750–1880*. He continued to work up to the day of his death, and he left an almost completed book on population growth which had occupied him for some years. This, it is hoped, will appear in the near future. In 1967 a group of his former students and colleagues produced for him a *Festschrift*, in the form of a volume of essays based on his life-long interests, *Land, Labour, and Population in the Industrial Revolution*. This includes a full list of his writings up to 1966.

Everything that Chambers produced was carefully considered, thoroughly researched, and beautifully written: he belonged to that sadly unfashionable school who regard history as a form of literature; and in his hands it always was. Although he thought of himself as primarily a regional historian, and much of his work was concerned with Nottingham and its region, his contributions have undoubtedly made a permanent impact on the general history of agrarian change and population growth in this country.

Perhaps his greatest influence, however, was a personal one. He presided over, and inspired a department of Economic and Social History which although never large in numbers has proved one of the most fruitful in the country. His teaching was always vital, his enthusiasm unbounded and infectious. He had the gift of bringing his subject alive and of making it absorbing to even the most casual of listeners.

(*Continued on page* 64)

The Management of the Crown Lands, 1649–60

By IAN GENTLES

THE Act for the sale of Crown lands (16 July 1649) was one of the first fruits of the Cromwellian army's political mastery of England, and represented the first effective measure taken by Parliament to eliminate military pay arrears.[1] The Act stipulated that the debentures which had been issued to the soldiers in lieu of their arrears would be honoured at their face value for purchases of the late king's estates.[2] As a result of overvaluation by the Parliamentary surveyors,[3] the estates in the end realized almost £1½ million.[4] After resales have been taken into account, it appears that a quarter of the estates were acquired by civilians, while the other three-quarters remained in military hands. Four hundred and forty-nine soldiers, drawn almost entirely from the officer class, are known to have acquired Crown land.[5] The purpose of this article is to examine how the new owners looked after the Crown estates during their short period of ownership.

(*i*) *Civilian Purchasers*

During the Interregnum, little was said about the civilian purchasers, which is a likely indication that they did not introduce many spectacular changes. At the Restoration, when the condition of the Crown estates came under the searching scrutiny of the surveyor-general, Sir Charles Harbord, and the county surveyors under him, the behaviour of the soldiers was the subject of severe recriminations, but most of the civilian purchasers escaped without reproach. Only one instance has been discovered where a civilian purchaser presided over the destruction of a royal manor house. It occurred at Langton Herring, Dorset, where the house was torn down and the materials sold. But Viscount William Monson, the purchaser of the manor, charged that the act of destruction had been performed by William and Alice Biles, who had been in unlawful possession of the house.[6] In most other cases about which information

[1] I wish to record my gratitude to Professor F. J. Fisher, who read an early draft of this article and offered many helpful criticisms.

[2] C. H. Firth and R. S. Rait, eds., *Acts and Ordinances of the Interregnum, 1642–1660*, 3 vols., 1911, vol. II, pp. 168 ff.

[3] Ian Gentles, 'The Debentures Market and Military Purchases of Crown Land', University of London, unpublished Ph.D. thesis, 1969, p. 102.

[4] Pipe Office, Declared Accounts (1662), P.R.O., E351/603/87.

[5] Gentles, *op. cit.*, pp. 177, 186. [6] Chancery Proceedings, P.R.O., C5/411/152.

has been found the civilians showed pride in their record as landholders and drew attention to the improvements they had made and the capital expenses they had incurred. Several of them wrote to Sir Charles Harbord rationalizing their co-operation with the 'late usurpers' as springing from a desire to preserve the royal estates from waste and depredation. In most cases Harbord accepted their claims without cavil, and they were permitted to continue as tenants of the king with generous leases. The six men who had bought the manor of Kennington, Surrey, from the two initial purchasers, John Trenchard and William Scott, had, as Harbord confirmed, "bin at great Charges in erecting Howses, makeing wharfes and other things for the Improuement of the Lands they hould. . ."[1] Peter Rosewell, who had bought the farm of the manor of Englishcombe, Somerset, submitted a claim to have preserved the timber "from all violence and spoyle by parliamentary purchasors and alsoe fully [to have] performed all Covenants on his parte in the same letters pattents." Harbord agreed with Rosewell's claim and recommended to the Lord Treasurer, the earl of Southampton, that he be granted a lease on easy terms.[2] Andrew Raddon and David Owen had bought the ditches of the castle of Exeter from Captain John Awbrey in 1655, at which time they noted that the land had lain waste for ten years. They subsequently spent £700, and the ground that had been worth £12 per annum was now worth £30, "and when the plantacions are growne may yeild £50 *per annum*." Harbord accepted the accuracy of their claims as well.[3] John Tracy, a London merchant who had bought the Kensington division of Hyde Park, petitioned the Crown in September 1660 to be allowed to retain the two houses that he had built on the road at Knightsbridge. He justified his petition with a claim never to have cut down any timber in the park, a claim which could have been checked without difficulty.[4] The Middle, Banqueting, and Old Lodge divisions of Hyde Park had been similarly well treated. The purchaser, Anthony Deane, had promptly leased most of them out, and the two lessees had allowed them to continue as they were before, a place where fashionable Londoners resorted for picnics and horseback riding. The only change during the 1650's was the introduction of an admission charge for coaches and horses.[5] The man who had bought part of St John's Wood, Middlesex, a certain John Collins, begged the king at the Restoration to give him a ninety-nine-year lease of the property. In support of his request he pleaded that as a previous lessee of the property he had been compelled to purchase it from the commissioners for sale of Crown lands. He had tried in vain to delay paying the purchase money until he could pay it to his rightful sovereign; nevertheless, he had redeemed himself by spending £6,000 to im-

[1] Crown Estate Office, The Surveyor General's Books of Constats (1660–1), P.R.O., Crest6/2/131.
[2] Crest6/2/302, 303. [3] Crest6/1/45–6. [4] *V.C.H., Middlesex*, II, p. 237.
[5] J. Larwood, *The Story of the London Parks*, 1872, pp. 38, 41.

prove the property. In view of the fact that Collins had only paid £1,791 18s. 0d. for St John's Wood in the first place, his claim was doubtless exaggerated, but it is impossible to know by how much.[1]

(*ii*) *Military Purchasers*

With the notable exception of John Lambert, most of the Parliamentary officers have received a bad press for their stewardship of the Crown lands. The historian of Wimbledon speaks of "the evident gratification which . . . General Lambert felt in the improvement of the house and grounds." The story of how he retired to Wimbledon to cultivate his flower gardens after falling out with Cromwell is well known. The result of his care was that he "had the finest tulips and gilliflowers that could be got for love or money. . ." After the Restoration Queen Henrietta Maria sold the estate, not because it had fallen into decay, but because "it smelt so strong of a rebel." The new owner, George Digby, wrote to his son commending it as the noblest seat in England.[2]

Many of the officers of course did nothing but draw the income from their holdings. The majority of the Crown lands had already been let out on long leases, and frequently the soldiers were content to allow the lessees quiet possession in return for regular payment of rent. Other soldiers, however, were not satisfied to draw a modest income in this fashion, but insisted upon increasing their return. Ready cash could be obtained in several ways. When an estate was rich in woodland the timber could be cut and the deer killed. A park could be 'disparked'—converted to arable or pasture—and let for a higher rent. A large estate could be subdivided into small holdings, whose total yield would be higher than the original unfragmented rent. A large mansion house or lodge could be stripped of its lead, for which there was always a high demand, or it could be completely dismantled and all the materials—stone, glass, and wood in particular—carted off and auctioned. That this was expected to happen was clear from the instructions to the Parliamentary surveyors to assess manor houses, not in terms of their yearly value, but according to the sale value of their materials after the costs of demolition had been deducted.

Before considering the soldiers' motives for engaging in the destruction of royal estates, it must first be established how much destruction they were actually responsible for. It is known that after the Restoration the revenues from Crown lands shrank to a fraction of their former size.[3] It has been implied that some of this shrinkage was due to the depredations which had occurred during the 'usurpation'. However, the extent of these depredations was fre-

[1] *Calendar of the State Papers, Domestic, 1660–1* (subsequently referred to as *CSPD*), p. 290.

[2] W. A. Bartlett, *The History and Antiquities of the Parish of Wimbledon, Surrey*, 1865, pp. 68, 46, 48.

[3] W. A. Shaw, ed., *Calendar of the Treasury Books*, I, p. xli.

quently exaggerated by men who had good reason for doing so. At the same time soldiers were blamed for destruction which had occurred either before they took over the estates or in 1659–60, when their authority was no longer respected by their tenants.

First, let us deal with the exaggerations and defects in the royalist accusations of the 1660's. The surveyors under Sir Charles Harbord often overestimated the amount of timber or deer that had previously existed on an estate, and misleadingly portrayed the former good condition of manor houses, lodges, and other buildings. This is true, for example, of the seat at Berkhamsted, over which bitter tears were shed in 1660. The surveyors of 1650 had noted in a memorandum that ". . . the chimneyes and some other parte of the aforesaid house is much ruyned and out of repaire and there is no water belonginge or neare to the same, the pipes being cutt and carryed away in theise troublesome tymes, and the watermill standinge farr of which conveyeth water to the said house is alsoe broken and carryed away." Five tenements which were part of the capital messuage were also said to be out of repair. One of the two watermills was "very much out of Repaire."[1] Regarding Moat Park, Berkshire, where the Parliamentary purchaser was said to have wantonly killed all the deer, it is interesting to read in the survey of 1649, ". . . in the said parke there is noe deere . . . nor hath not beene for severall yeares past."[2] In 1660 it was reported that there was no timber in the manors of Theobalds, Crossbrookes, and Perriors "fit for the use of his Majesty;" yet in the Parliamentary surveys for Crossbrookes and Perriors there is no mention or valuation of timber at all, suggesting that there cannot have been very much to begin with.[3] In the survey of Theobalds manor timber is occasionally mentioned, but it is not separately valued, indicating that the quantity was negligible.[4]

The second consideration that must modify any conception of soldierly wantonness is that a great deal of destruction occurred before the military purchasers assumed possession of their properties. The surveyors of Berkhamsted, for example, noted that the water pipes had been carried off during the civil wars.[5] The honor of Kenilworth had been leased by King Charles to the earl of Monmouth for his lifetime, but the earl "hath not laid out anie thing about the repayring of the said Castle since the xxiiiith of July last, and but very litle for many yeares last past."[6] King James had appointed George Armstrong the keeper of several buildings in Theobalds manor, but he "hath not beene diligent in his place, but hath suffered much harme and ruine to be committed."[7]

It is hardly surprising that a great deal of spoil and waste occurred on the

[1] Augmentation Office: Parliamentary Surveys, P.R.O., E317 Hertfordshire 7, fols. 4, 5, 6.
[2] E317 Berkshire 39, fol. 3. [3] E317 Hertfordshire 20, 30. [4] *Ibid.*, 24.
[5] *Ibid.*, 7, fol. 4. [6] E317 Warwickshire 22, fol. 9. [7] E317 Hertfordshire 24, fol. 4.

royal estates during the seven years leading up to the execution of the king. The grip of royal authority was shattered in the south and east where most royal estates lay. Yet Parliament was too busy with more pressing matters to ensure that the lands which fell to it were prudently administered. In many estates a complete breakdown of authority took place, and conditions of near anarchy must have prevailed. Not till 1649 did Parliament begin forcefully asserting its authority, and it is from this period that one catches a glimpse of the havoc that had been wreaked. Poaching had been rife, and the soldiers were among the principal offenders.[1] Timber was a much more lucrative commodity than game, and it had been the chief object of plunder for people living in or near the royal parks. In October 1649 the Council of State sent an order to the mayor and justices of the peace of Sarum, Wiltshire, regarding the assaults that had been made upon Clarendon Park with its immense store of timber. "We are informed that there is great waste made of the timber in Clarendon Park, by the poor of Salisbury, which is a very great loss, that timber being so proper for shipping, and the want of it so great. You are to take order with the poor not to make those wastes and spoils, and find some means for their present employment; and if they shall persist in such spoils, to proceed against and punish them."[2]

The Parliamentary surveyors later allowed £500 for the timber that had been wasted and spoiled in Clarendon Park.[3] Reports of destruction of timber were also received in connection with Bowood Park, Wiltshire; Bewdley Park, Worcestershire; Chertsey, Surrey, and Enfield Park, Middlesex.[4] There was also extensive cutting in the manor of Eltham, Kent, but it was carried out with official approval. Between 1644 and 1648 173 acres of woodland were sold there in four parcels for a total of £602. Five acres were given away "in lew and respect of divers wasts and spoyles made therein by the poor people in those parts."[5] The supply of deer at Eltham was also diminished, and in July 1649 Colonel Rich was sent with a troop of horse to put a stop to the poaching. A few months later the Parliamentary surveyors reported that the manor house of Eltham was "much out of repaire and soe not tenentable. . ."[6] It was hardly a choice piece of real estate that the officers of Rich's regiment inherited in September 1650.

Perhaps the most sensational instance of destruction before 1649 occurred

[1] *CSPD, 1649–50*, p. 300. [2] *CSPD, 1649–50*, pp. 347–8.

[3] E317 Wiltshire 26, fols. 7, 14, 18, 21.

[4] *Ibid.* 22; *CSPD, 1649–50*, 188, 526; E317 Middlesex 18.

[5] John Bently, *A List of Woods, Underwoods, Timber and Trees felled, and sold out of the King and Queen, Their Majesties Forrests, Chaies, Parks, Manors and Lands: Within the Counties of Kent, Sussex, Surrey, Hampshire, Berkshire and Middlesex.* . . (1648). The title is misleading. In fact the 6-page pamphlet deals only with the manor of Eltham.

[6] *CSPD, 1649–50*, p. 221; E317 Kent 18, fol. 2.

in the fens of Lincolnshire. Long before the Interregnum the fens had been the scene of violent uprisings by inhabitants who were struggling to defend their way of life against the drainage schemes of the Crown and other great interests.[1] The civil war, however, seems to have brought an added stimulus, since the uprisings reached new extremes of destructiveness after 1642, at which time the royal manor of Epworth was singled out for special attention. In June of 1642 John Allen and sixteen others entered the manor in a tumultuous fashion, broke down the fences, put in their own cattle, destroyed 160 acres of corn and other crops, and continued rioting for many days until they had laid waste 4,000 acres of drained lands and pulled down several houses. The violence was renewed in 1647 and 1651, in which year the two Leveller leaders, John Lilburne and John Wildman, joined the struggle on the inhabitants' side.[2]

One of the provisions of the Act for sale of Crown lands was that timber fit for the use of the navy and standing within fifteen miles of a navigable river was not to be sold. Trees which met this specification were marked out before the Parliamentary surveys were made, and sometimes their number and value were noted in the surveys themselves. The windfall of royal timber came just in time for the rebuilding of the English navy in preparation for Cromwell's expansionist foreign policy. It is important to remember, therefore, that a good proportion of the destruction of Crown timber, about which his Majesty's surveyors were so vocal in 1660, was not the work of soldiers but a consequence of the official policy of the Commonwealth and Protectorate. Exact figures for the amount of timber reserved for the navy are not known, but it is known that on some large estates virtually all the good timber was reserved in this way. Such was the case in Ampthill, Beckering, and Brogborough Parks, Bedfordshire.[3] It was also true of Windsor Great Park, where 2,664 trees were marked for the use of the navy. The rest of the park's woods consisted "... for the most parte [of] old dotterell and decayed trees good for little save the fire."[4] In Theobalds Park 15,608 trees were marked for the use of the navy, having an estimated value of £9,845 9s. 5d. This was greater than the value of the timber left to the military purchasers, which amounted to only £7,259 13s. 2d.[5] It is likely that the Admiralty commissioners caused a good deal of additional waste and spoil on the Crown estates when they came to remove the navy's timber. An example of this spoliation is contained in a complaint to the Admiralty committee from Mr Walter, Major-General Thomas Harrison's agent

[1] See H. C. Darby, *The Draining of the Fens*, 1940, p. 52 *et passim*; Joan Thirsk, 'The Isle of Axholme Before Vermuyden', *Agric. Hist. Rev.*, I, 1953.

[2] For a full account of the tumults at Epworth during the Interregnum, see *CSPD, 1652–3*, pp. 373–5. This account, which was submitted by the original tenants in 1653, appears to be shot through with hyperbole in several places.

[3] *CSPD, 1655–6*, p. 82. [4] E317 Berkshire 26, fol. 3. [5] E317 Hertfordshire 27, fol. 15.

in Marylebone Park, "that men driving carts laden with timber out of Marylebone Park, go over his grass, break down his pales and hedges, and do other damage."[1] This experience must have been repeated on dozens of other former Crown estates.

A final phase of destruction for which the soldiers cannot be held responsible accompanied the chaos and disorder surrounding the Restoration. Whether motivated by a desire for royalist vengeance or by simple opportunism, many people took the return of Charles II as the signal for an attack upon the property of the hapless soldiers. Thus, in November 1660, John Nelthorp, formerly a captain in Twisleton's regiment and the purchaser of a lodge in Enfield Chase, Middlesex, informed Charles Harbord that "the Inhabitants in and about Endefeild Chace . . . have already committed many trespasses and abuses in breakeing and destroyeing the hedges and fences of his Majesties Lands within the said Chace . . . and doe threaten to committ more trespasses and injuries . . . pretending to be Countenanced therein by persons of Quality."[2] Similar tales flowed in from other parts of the country. George Glyn, who had bought tenements in the manor of Boyton, Cornwall, wrote that he and his servants had been expelled from their homes and his cattle driven off the land.[3] In both cases Harbord ordered the vandalism to be stopped and gave the Parliamentarians permission to continue in possession of their properties for the time being. In Theobalds Park, Hertfordshire, and the manor of Rudfen, Warwickshire, the occupants complained that some of the timber remaining there had been seized "by certaine persons pretending an authority from his Majestie. . ." Again Harbord ordered a stop to the spoil.[4] In Bagshot Park, Surrey, it was related, ". . . one Thomas Fry, a person of noe creditt, hath gotten into possession of his Majesties House . . . and pretends to cutt downe certaine Trees . . . which are not to be fallen or meddled withall without speciall Warrant from his Majestie. . ." He was ordered to be removed from the house, and custody was returned to Thomas Symonds, who had been the tenant under Charles I.[5]

Perhaps the most detailed account of destruction that occurred at the Restoration was left by Captain Adam Baynes. In his correspondence is a paper entitled, 'A Perticular or Estimate of the Losse and Damage which did Accrew to Mr. Baynes . . . in Holdenby . . . 1661'. It itemizes the losses of wood, deer, and fish which were inflicted upon him by his under tenants, to the value of £70. They had also flouted his orders by ploughing up 182 acres of pasture before the last Lady Day. Baynes had lost all the grass that might have grown there at the rate of 2s. an acre, and he had also been "preiudiced in his Stocke for want thereof." In an appended statement Robert Baynes asserted that the

[1] *CSPD, 1651*, p. 509. [2] Crest6/2/123. [3] Crest6/2/177. [4] Crest6/1/228, 33–4.
[5] Crest6/1/38.

under tenants had trampled on the rest of Baynes's pasture when they went every day to plough their 182 acres. The total damage was said to amount to £112. In addition, the under tenants were withholding their rents to the sum of £198 16s. od., "many of them refusinge to pay him upon pretence that they did not enioy theire bargaines."[1] If Baynes's experience is at all typical the Parliamentary purchasers must have had a trying time of it immediately after the overthrow of the Protectorate.

Yet when all these extenuating factors have been taken into account, it remains true that military purchasers wrought great alterations in the Crown estates during their period of tenure. Timber was cut down, deer were killed off, palaces were demolished, and parks enclosed and converted to arable or pasture. During the 1660's Royalists gave horrifying accounts of the sorry decline of certain royal seats from their previous condition of splendour. The surveyor of Hertfordshire, for example, must have wept as he recorded the decay into which the once great honor of Berkhamsted had sunk: "In obedience to your Lordships comand I have bin at Barkhamsted where I finde a noble Seate and Howse left standing but much worse than I have heartofore knowne itt. All the west front thereof under the Gallerie being converted to a barne, and other parts of itt decayed by defects in the tyleing and takeing away the Lead over the gatehowse and other places and much of the Leaden pipes from the walls, and by haveing the Backhowse and Brewhowse [turned in]to a Stable and the Dairy howse to a barne; The great oulde Barne being quite taken away and gone. And the Water that served the howse by a force from the River, all broken up and a new buckett well, made, soe that I thinke to repaire the Howse, and build a new Barne and a Stable will cost 500 li or more, and then itt will want a good Tenant to keepe it in repaire and releeue the poore, wherewith that little markett Towne abownds. And to governe the people much seduced of late by new doctrines preacht unto them by Collonel Axtell and others that haue long prevailed in those partes . . . the Woods are all cutt downe (except about 70 Beech trees and shrubs) to the value of, as I am tould, of [*sic*] aboue 10,000 li and the defaceing of the Seate which was very noble and the Impoverishing of the Land now much worne out with Tyllage. And it is now beleeued that Collonel Axtell hath already Raysed his purchase money by Wood and Corne, and that most of the other purchasers are noe great loosers thereby."[2]

Other accounts of destruction are less vivid. In 1661 Sir Orlando Bridgman, lord chief justice of the Common Pleas, received a lease of Bowood Park, Wiltshire. The yearly value was put at £321 10s. od. and the timber was said to be worth £248. These figures contrast starkly with the 1653 valuation: yearly value £457 11s. od. and timber worth £4,512 10s. 3d. The terse explanation

[1] B.M., Add. MS. 21, 427/291–2. [2] Crest6/1/21.

for the disparity was that "most of the timber [was]... destroyed by purchasers under the late usurped powers."[1] All timber "worthy to bee excepted for his Majesty's use" was also said to have disappeared from the manors of Theobalds, Crossbrookes, and Perriors, Hertfordshire,[2] from New Park, Yorkshire,[3] Bestwood Park, Nottinghamshire,[4] Moat Park, Berkshire,[5] the lordship of Kenilworth, Warwickshire,[6] the manor of Shippon, Berkshire,[7] Wareham Wood in the manor of Stoke Climsland, Cornwall,[8] Grafton and Potterspury Park, Northamptonshire,[9] Clarendon Park, Wiltshire,[10] and Oatlands Park, Surrey.[11] Some ambitious soldiers did more than just cut timber. The men of Fairfax's foot regiment killed the deer and sold the woods in Cheshunt Park and also left the lands "plowed and much worne."[12] The deer also disappeared from New Park, Yorkshire. Robert Lilburne evidently took little care of the park, for the gardens and orchards also decayed, and the hedge was allowed to rot, with the result that "swine did sundry times get into the said gardens and orchards, to the prejudice of the said plants and flowers and herbs."[13] Deer were also killed in Moat Park, Berkshire, where the lands were in part ploughed and subdivided into several enclosures.[14] The purchasers of Old Enfield Park, Middlesex, and the forest of Alice Holt, Hampshire, were also said to have taken the extra step of ploughing the land and wearing it "out of hart."[15]

Faithful to their reputation for iconoclasm, the Parliamentary soldiers showed themselves no respecters of famous fabrics. Richmond Palace, Surrey, had been in good condition in 1649 but when it was returned to the queen as part of her jointure in 1660 it was "in a dismantled condition, having suffered much dilapidation during the Interregnum." In fact it had been pulled down and the stones sold to the value of £1,000. The palace was never rebuilt.[16] The same fate overtook Oatlands Palace, where the surrounding lands were also disparked.[17] Nonsuch Palace was not razed to the ground, but it was allowed to decay. Before the civil war it had been one of the most magnificent royal palaces, having attracted the special praise of both Camden and Fuller: "Indeed, what Sebastianus Cerlius, most skilful in building, spake of the Pantheon at Rome, may be applied to this pile, that it is *ultimum exemplar architecturae*."[18] But in 1665 Evelyn spoke of the gardens around the palace as "ruined" and remarked upon the destruction of the trees.[19] Nonsuch was never

[1] *Calendar of the Treasury Books*, VII, pt III, p. 1531. [2] Crest6/2/100. [3] Crest6/2/110.
[4] Crest6/2/108–9. [5] Crest6/2/114. [6] Crest6/2/337. [7] Crest6/2/512.
[8] Crest6/2/185. [9] *CSPD, 1660–1*, p. 295. [10] *V.C.H., Wiltshire*, IV, p. 431.
[11] *V.C.H., Surrey*, III, p. 478. [12] Crest6/2/104–5.
[13] *V.C.H., Yorkshire, North Riding*, II, p. 197. [14] Crest6/2/114. [15] Crest6/2/106–7.
[16] *V.C.H., Surrey*, III, p. 534. [17] *Surrey Archaeolog. Coll.*, XIII, 1897, p. 45.
[18] Quoted in Thomas Fuller, *The History of the Worthies of England*, ed. P. A. Nuttall, 1840, III, p. 202.
[19] *V.C.H., Surrey*, III, p. 270.

restored to its former magnificence and was finally sold in 1687, apparently for immediate demolition.[1]

Some of the charges against the military landowners occur before the Restoration. In July 1655 the inhabitants of Stoke Bruern, Northamptonshire, accused John Urlin, who had purchased three coppices there, of depriving them of their common rights. Richard Dobson stated that Urlin had bade him kill deer in the winter, and Benjamin Coldwell charged Urlin with committing offences in nearby Whittlewood Forest against the vert and venison; "as felling timber, encroaching on the forest, blocking up highways, hunting and destroying deer, etc." As a consequence Urlin was ordered to appear before the Council of State "to answer to the said charges of destroying the deer, assembling riotously, and affronting and abusing the keepers of the forest."[2]

One of the most celebrated acts of destruction occurred in the manor and park of Holdenby, which Adam Baynes had bought in 1650. Even though it was "something out of Repaire," the Parliamentary surveyors referred glowingly to that "Noble Mansion House," with its "ffoure magnificent Towers," its "many costly and rare Chymney peices and many other spacious Chambers and with-drawing rooms to them belonging, itt being alsoe a House of great Receipt." The materials of the house were given a value of £6,000, more than one-quarter of the whole estate. Timber was valued at £1,010 5s. 0d. The main drawback to Holdenby, as far as Baynes was concerned, was that most of the lands belonging to the manor had been leased in 1647 to Sir Thomas Hatton, and the lease did not expire till 1664.[3] Faced with a fourteen-year wait before he could improve the income from his estate, Baynes did what he could to raise immediate cash: "he began at once to pull the house down, sell materials, cut down a great part of the timber (disparked the park): it may be presumed that he killed or sold the deer and wild cattle."[4] However, Baynes did not benefit as much from these acts as he had hoped. He realized only £3,500 from the materials, instead of the £6,000 that the Parliamentary surveyors had predicted. Timber brought him £500, though it is not clear whether he cut down all the trees on the estate.[5] At the Restoration a suit was brought against him for his destruction of Holdenby. Besides tearing down the house and cutting the timber, he was charged with having sold the livestock and deer. He denied most of the charges, asserting that the cattle which he slew were wild and that the deer were more numerous at the end than when he first took over the estate. He had, he said, constructed a little park especially for them. Baynes also

[1] J. Dent and M. Biddle, *Nonsuch 1960*, Ewell, Surrey, 1960, p. 17.
[2] *CSPD, 1655*, pp. 253, 254. [3] E317 Northamptonshire 35, fols. 1–2, 3, 6.
[4] *Northamptonshire Notes and Queries*, I, 1886, p. 182.
[5] Sir Gyles Isham, 'Adam Baynes of Leeds and Holdenby', *Northamptonshire Past and Present*, II, no. 3, 1956, p. 140.

asserted that he had built "one Barne, two brewing houses, and other outhouses, and diuers Chimneys, a garden Wall, Court Walls, Barne Doores, partitions and other things."[1] The result of the action against Baynes is not known, but he was allowed to continue receiving the rents from Holdenby. Eventually the queen, whose property it had become, let it to Lord Crofts, and he in turn let it to Baynes for one year for £300. After that Baynes was required to surrender possession to Thomas Temple and quit the estate.[2]

At Theobalds in Hertfordshire, not only was the face of the property changed but a small community of republicans was established there, whose unity of social and religious ideas brought them some notoriety. In the sixteenth century the property had been owned by William Cecil who began the construction of a splendid palace. He was spurred on in this enterprise by Elizabeth, who visited him often at Theobalds. A contemporary biographer of Cecil reports that "He greatlie delighted in making gardens, fountaines and walkes; which at Theobalds were perfected most costly, bewtyfully, and pleasantly. Where one might walk twoe myle[s] in the walks, before he came to their ends."[3] But, like Hampton Court, Theobalds had become too magnificent for anyone below the degree of royalty, and so, in 1607, it was surrendered to the Crown.[4]

It was maintained in excellent condition until 1649, in which year the Parliamentary surveyors outdid themselves in fulsome praise of the royal estate. The timber in the park was valued at £7,259 13s. 2d., in addition to £9,845 9s. 5d. worth which had been marked for the use of the navy. The park was surrounded by a brick wall 2,745 poles long, and valued at £1,098.[5] The palace itself was in first-class shape, and the surveyors paid tribute to the many opulent features—the large marble fountain in the courtyard, the lead-covered turrets, the chimney pieces, some of exquisite blue marble, the large collection of paintings, and the "curious workmanship" of the carved timber on every side. Unlike most of the Parliamentary surveys, which are neutral in their language, the survey of Theobalds Palace breathes enthusiastic admiration. The surveyors were reluctant to set a value upon the materials of the palace, and pointedly drew attention to its yearly value of £200, which had been estimated so high "in consideracion that we finde the scite thereof, verrie pleasant, the roomes richlie adorned, and verrie commodious and fitt for present use, the ayre sweete and open: the marketts neere, and the conveniencies and neerenesse of London of noe small advantage, the gardens and orchard richlie planted, and compleatelie ordered, the pleasure of the parke of noe meane delight, beinge a seate of a large prospect, everie wayes usefull to the purchaser." Credit for the

[1] B.M., Add. MS. 21, 427/137–8. [2] B.M., Add. MS. 21, 427/293.
[3] Francis Peck, *Desiderata Curiosa*, I, p. 26, quoted in *V.C.H., Hertfordshire*, III, p. 448.
[4] *V.C.H., Hertfordshire*, III, p. 448. [5] E317 Hertfordshire 27, fols. 15, 5.

excellent condition of the palace was due to the earl of Salisbury, who had been its keeper since the time of King James.[1]

The park and palace were acquired by the officers of Thomas Fairfax's horse regiment, and several of them took up residence there under the leadership of Major William Packer.[2] The result was that Theobalds, "from [being] the seat of a monarch . . . [became] a little commonwealth; so many entire tenements, like splinters, [having] flown out of the materials thereof."[3] The thirty acres belonging to the palace were divided into many small plots, and the palace itself was then demolished and the materials used to build tenement houses upon the plots. The park was similarly subdivided, enclosed, and built upon.[4] Of the occupants, six were army officers, but at least two dozen more were civilians. The community found its focus in a radical Baptist chapel which scandalized some of the local inhabitants, and proved to be a thorn in the side of the government. Packer and five others attended a stormy meeting of the council of officers and heckled Cromwell as he delivered a tirade against the radical republican officers. Cromwell retaliated by dismissing the six officers from their posts.[5] Packer and his friends also created trouble for the Quakers, and threatened to apprehend George Fox if he ever ventured near Theobalds. Fox, however, regarded the threat as an invitation: "I was moved of the Lord God to go down to Theobalds, and appoint a meeting hard by them." But his efforts at evangelization seem to have met with indifferent success.[6]

Thus, great changes were wrought upon the face of Theobalds during the soldiers' period of tenure there. Apart from the division of the land for small holdings, the great brick wall of the park was also completely dismantled and its materials sold. When Anne, countess of Bristol, petitioned in 1660 for a lease of the park she urged that the walls and tenements were so much out of repair that it was not likely to be used again for pleasure.[7] The countess of Bristol was to be disappointed, however, for it was finally decided to give the property to the duke of Albemarle as part of the £7,000 per annum that Charles had promised him. The park was valued by the royal surveyors at £1,749 10s. 0d. per annum, which was almost the same as the annual value set upon it by the surveyors of 1649. However, nothing extra was assessed for materials, woods, and deer, for as Harbord's agent remarked, "The said Parke was in the time of his late Majesties Raigne replenished with Wood and Deer,

[1] E317 Hertfordshire 26, fols. 3, 6, 49, 51.

[2] King's Remembrancer, Crown Lands: Certificates as to the Sale of, P.R.O., E121/5/7/14.

[3] Fuller, *Worthies*, II, p. 38.

[4] Crest6/2/102–3. For an analysis of how the park was subdivided, see Ian Gentles, *op. cit.*, pp. 166–9.

[5] The Correspondence of Colonel Robert Bennett, Folger Shakespeare Library, Add. MS. 494, I, fol. 461; C. H. Firth and G. Davies, *The Regimental History of Cromwell's Army*, 2 vols., Oxford, 1940, I, p. 73.

[6] *V.C.H., Hertfordshire*, III, p. 449.

[7] *CSPD*, 1660–1, p. 289.

which have been shamefully destroyed by the late Usurped Authority, and much of the Land plowed and sowen out of hart... And I find not any Tymber Trees now left upon the premisses worthy to be excepted for his Majesties use."[1]

That the soldiers caused drastic alterations in the appearance and use of the Crown lands is not to be doubted; that this fact demonstrates reckless or wanton exploitation on their part is a different question. It is important to remember that the soldiers' needs were not the same as the king's, and that therefore it was reasonable for them to dismantle and sell things for which they had no use. Only occasionally would there be a soldier like John Lambert, who desired a royal palace. There were few others who could afford to maintain such immense edifices. Accordingly, at Richmond, Oatlands, Berkhamsted, Holdenby, and Theobalds, they tore them down and either sold the materials or used them to build more practical structures. The fate of these fabrics paralleled that of the monasteries in the sixteenth century. In both cases the old buildings disappeared because they did not suit the needs of the new purchasers.

The same argument applies to the cutting of timber and killing of deer. A deer park represented an unproductive use of land. While kings might be expected to set aside thousands of acres to indulge an expensive taste, most private landowners required a more tangible return on their investments. It happened that the 1650's were a propitious time for selling timber and converting parks to arable or pasture. With 207 new vessels being added to the English navy in the space of eleven years, the demand for timber was brisk.[2] At the same time agricultural prices seem to have been higher around 1650 than they had ever been.[3] In a situation like this the disparking of parks and the turning of manor houses into barns and stables became a sound business proposition. What looked like waste and spoil to shocked cavaliers struck the new purchasers simply as a more rational use of the land.

These alterations in land use sometimes entailed sizeable capital investments. Such investments were frequently mentioned in the petitions of soldiers who sought permission at the Restoration to continue in possession of their estates. They nearly always claimed to have introduced many improvements at great personal cost. Elizabeth, the widow of Captain Thomas Malyn, begged to become a tenant of 190 acres in Theobalds Park which her husband had purchased, and upon which, she asserted, he had constructed buildings at a cost of £1,000.[4] In 1661 Captain Godfrey Ellis asked for a lease of the castle garden of Gloucester, for which he had originally paid £380.[5] In support of his

[1] Crest6/2/102.
[2] M. Oppenheim, *A History of the Administration of the Royal Navy, 1509–1660*, 1896, p. 338.
[3] Joan Thirsk, ed., *The Agrarian History of England and Wales*, IV, 1967, p. 862.
[4] *CSPD, 1660–1*, p. 292. [5] E121/2/6/42.

plea he referred to his expenditure of over £1,200 on several tenements that he had built upon the property. Charles Harbord accepted Ellis's claim without qualification, and recommended a lease carrying a rent of £12 10s. 0d., which was only half the improved value of the property, as well as a very modest entry fine, "in respect of your Petitioners charges which seeme to have bin much more than the premisses are Worth. . ."[1] John Barry pleaded for royal consideration regarding Bagshot Park, which he had purchased from his brother, Lieutenant-Colonel Samuel Barry, and Captain John Peck. Both these men were Presbyterians who had quit the army when Cornet Joyce seized the king, but they argued that they had been "obliged" to purchase Bagshot for £4,000 in lieu of their arrears of pay. John claimed that he had sunk £2,000 into improvements in the park. He also had a stake in part of Windsor Great Park, which had belonged to Captain Byfield. Barry had married Byfield's widow and spent over £5,000 on improvements in his portion of the park. He declared that he would be ruined if he were allowed neither the lands nor recompense.[2]

Windsor Great Park was the subject of another petition in 1660 from Captain Edward Scotton, Captain Robert Aldridge, Richard Southwood, and John Scotton, who were in possession of part of the park. They declared that they had expended "great somes of mony in improveing the same;" yet that autumn their corn and hay had been seized for his Majesty's use. Accompanying the petition was a "supplicacion . . . of the purchasers and possessors," outlining the improvements they had undertaken. They had paid fifteen years' purchase for the park, and had then subdivided it into about 100 parcels which they had enclosed with hedges and ditches "att the great charge of the said purchasers and possessors." They also demanded consideration for the fact "that the said Parke being of a wett and cold soyle and for the most parte cumbred with bushes, thornes, ferne, rushes, and old trees, (the tymber generally reserved and taken off for the navyes use), for the first fower or five yeares was rather a charge then profitt to the said purchasers. That the said parke hath bene for the most parte grubbed, ploughed, and manured with chalke lyme and other husbandry att a very greate charge, which togeither with ten or twelve newe howses with barnes, stables, and other necessaryes for husbandry built thereuppon, some of them of considerable value, hath stood divers of the present purchasers and possessors in more then the said lands first cost them. That the said purchasers and possessors being necessitated to take the premisses for satisfaccion of publique debts, have managed the same in husbandlike manner, and converted it into farmes, which affordeth a great supply of corne to Windsore markett; and partes adjacent, The pale and covert being taken away rendes it utterly unserviceable for the keeping of deere, nere twenty familyes setled

[1] Crest6/2/509–10. [2] *CSP.D, 1660–1*, p. 286.

uppon it, and many of their whole estates involved therein." The supplication ended with a plea to be allowed to become his Majesty's tenants at a reasonable rent and to enjoy the present year's rent without molestation.[1]

The purchasers of Windsor Little Park made similar claims to have effected improvements during their period of tenure. In 1654, when the Council of State entered into negotiations to buy back the park from Captain Henry Cannon and Francis Thomson, these two men declared that "[we] have been at much charge in fencing, grubbing, molehill cutting, and tilling the ground; also we had to sell other estates at under value to complete our purchase, so that our damages amount to £400."[2]

There were many other estates where the soldiers pursued the same policy of enclosing parks and commons and "improving" their rents. John Dove, John Ireton, and George Cooper helped to ruin a great deer park at Clarendon, Wiltshire, but as the royal commissioners pointed out in 1660, the new uses to which the land was being put had improved the revenue by £1,200 a year, all of which would be lost if Clarendon were re-imparked as Charles desired.[3] The officers of Harrison's regiment ploughed up the roots of the trees they had cut down in Marylebone Park and let out the land in small holdings to tenants who used it for dairy farming. The rents were racked to produce £40 more than had been reckoned possible by the surveyors in 1649.[4] It is likely that Richard Deane, who "unmercifully demolished" Havering Park, Essex,[5] and Richard Watson and William Peverell, who disparked Oatlands Park,[6] had the like object of increasing their revenue by converting parks to farmland.

It is worth noting that such measures enjoyed the enthusiastic support of many writers on agriculture in the seventeenth century. With scant regard for social consequences, these writers, like their predecessors in the sixteenth century, advocated such measures as enclosure, fen drainage, ley farming, and the use of a wide range of fertilizers to improve agricultural efficiency.[7] They were hostile to the common lands because in their view they encouraged idleness and lawlessness, allowed thousands of acres to go to waste, and produced a degenerate breed of livestock.[8] Walter Blith, a Cromwellian captain (and a "Lover of Ingenuity"), who bought Crown land in Grafton and Potterspury, Northamptonshire,[9] was the author of *The English Improver Improved* (1652), probably the best book on husbandry published during the Interregnum.[10] In the preface he addressed a special message to his fellow soldiers, ". . . because

[1] State Papers Domestic: Charles II, P.R.O., SP29/22/263–4. [2] *CSPD, 1654*, p. 129.
[3] *CSPD, 1660–1*, pp. 285–6.
[4] Ann Saunders, 'The Manor of Tyburn and the Regent's Park, 1086–1965', Leicester University, unpublished Ph.D. thesis, 1965, chap. 3.
[5] *The Mystery of the Good Old Cause* (1660), p. 22. [6] *V.C.H., Surrey*, II, p. 478.
[7] G. E. Fussell, *The Old English Farming Books*, 1947, *passim*.
[8] *Ibid.*, p. 85. [9] E121/4/1/62, 48. [10] Fussell, *op. cit.*, p. 51.

yourselves are interested and possessed of many lands, and those such as will admit of great Improvement by wise mannagement." Blith was imbued with a very puritan contempt for ignorance and laziness, as well as a restless puritan desire to improve the human condition. He mocked traditional agricultural practices which, he said, had encouraged sloth and drunkenness and had resulted in "streets filled with Idle Persons, the Countrey with Drones, the Roades with Hackers and Cutthroats, all Townes with Barrettors, Pamphlettors, Ballad Singers, Students of Mischief." In addition to those improvements advocated by other writers, Blith devoted much space to recommending a variety of new or unusual crops like clover, woad, saffron, 'liquorish', parsnips, artichokes, turnips, etc., and made the point that some of them could be grown in very indifferent soil.

Andrew Yarranton, the Worcestershire worthy, was another Parliamentary soldier who wrote on agricultural improvements. A lieutenant in Major-General Mitton's regiment, he bought Crown land in Worcestershire, Staffordshire, and Warwickshire, for which he paid over £3,000.[1] In 1677 he published *England's Improvement by Sea and Land.* Like other writers he supported enclosure for the expansion of sheep farming, pointed out that while it made husbandmen jobless it vastly increased employment in the woollen industry.[2] He also advocated the cultivation of flax, on the grounds that the resulting linen industry would put the poor to work.[3] Ironworks, constructed in various parts of the country, would perform the same function, without posing any threat to the nation's timber supply.[4] Two of Yarranton's favourite improvements were windmills and granaries. On the benefits of granaries he was insistent, alleging that through lack of them vermin were devouring 25 per cent of England's corn harvest every year. There were financial benefits too: the farmer would no longer have to sell his crop as soon as he harvested it; moreover, in a safe dry granary the crop would be as negotiable as cash.[5]

The fact that two of the most important works on agriculture in the seventeenth century were written by Parliamentary officers who bought Crown land contributes to the general argument that in their management of the Crown lands the soldiers were in accord with the mainstream of progressive agricultural thinking of the previous century and a half. To be sure, not all the soldiers were improvers; nor did those who were attempt to implement the more grandiose schemes of the theorists. But it is still fair to say that by and large they were rational and often progressive land managers.

At the same time their policies exhibited little concern for the people whose

[1] E121/5/4/11; E121/5/7/7. [2] *England's Improvement by Sea and Land,* p. 50.
[3] *Ibid.,* p. 48.
[4] *Ibid,* pp. 60–1, 193. Yarranton asserted that he had himself managed an ironworks during the 1650's.
[5] *Ibid.,* pp. 124, 130, 167.

lives were radically affected by them. It is no surprise therefore that the soldiers were often hated by their tenants when they tried to effect such improvements as the enclosure of common land. This particular 'improvement' had provoked riots since the fifteenth century, and so the people of north Middlesex were only continuing a venerable tradition when they fought the soldiers enclosing their common in Enfield Chase.[1] The inhabitants of the Lincolnshire fens who caused so much trouble to the purchasers of the manor of Epworth had been resisting the destruction of their way of life for many years before the new owners arrived on the scene.[2] In Huntingdonshire, Colonel Valentine Walton provoked riots when he decided to 'improve' the manor of Somersham.[3]

In conclusion, it may be observed how the soldiers' conduct paralleled that of the purchasers of the monastic lands a century earlier. In both instances the unsentimental attitude of the new purchasers aroused consternation among adherents of the old order, just as their determination to enclose common land and rack rents enraged local inhabitants. But the soldiers' behaviour makes good economic sense when it is remembered that the prices they had paid for their estates were reasonable only on the assumption that the lands would be used for purposes different from those which the king had favoured. One can therefore dismiss the traditional view of Cromwell's soldiers as the wanton destroyers of the Crown estates and judge them instead as energetic, if often ruthless, agrarian developers.

[1] *A Relation of the Cruelties and Barbarous Murthers, and Other Misdemeanours, done and committed by some Foot-Souldiers, and others, without Command, upon some of the Inhabitants of Enfield, Edmonton, Southmyms, and Hadley* (1659).

[2] Darby, *op. cit.*, p. 52 *et passim*. [3] *The Mystery of the Good Old Cause*, p. 36.

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An Indian Governor in the Norfolk Marshland: Lord William Bentinck as Improver, 1809–27

By JOHN ROSSELLI

I

THE younger sons of the English landed aristocracy have by custom been allowed only the most modest share in the family fortune. In the nineteenth century a few lived idly on an allowance or portion from the estate; many more went into the Army; some undertook other kinds of public service. What is seldom clear is how their financial needs as younger sons directed the successive steps in their careers. The career of Lord William Bentinck (1774–1839), which culminated in his Governorship of Bengal (later Governor-Generalship of India) in 1828–35, helps to show how a younger son could be led, partly by his own leanings but above all by his needs and by the economic pressures of the time, into a lifelong activity as improver and entrepreneur.[1]

Bentinck, the second son of the Duke of Portland, took his commission at eighteen and served in the revolutionary wars. He is, however, best known for his service in India, first as Governor of Madras (1803–7) and then, after a twenty-one-year interval, in the Supreme Government. In between he served as Minister to Sicily and Commander-in-Chief in the Mediterranean (1811–15). Both in Sicily and in Bengal Bentinck showed a stout reforming spirit: the best-known instance is his abolition of *sati*, the most important his work on the 1833 revenue settlement of the North-West Provinces and his encouragement of capitalist enterprise in India. Much of this work has previously been put down to Benthamite influence. It is probably at least as true to say that Bentinck's public service overseas and his private enterprise at home informed one another.

[1] Cf. F. M. L. Thompson, *English Landed Society in the Nineteenth Century*, 1963, pp. 65–75. The present article rests chiefly on the collection of Bentinck Papers at Nottingham University, Department of MSS; these (subsequently referred to as BP) are quoted by kind permission of the Duke of Portland. Some of these papers are catalogued, some not. Those dealing with Bentinck's finances and his activities as landowner and entrepreneur are nearly all uncatalogued: it seems unnecessary in most cases to give precise references to them. References are, however, given to catalogued documents, and on occasion to uncatalogued papers where this seems suitable. I am grateful for help with my researches in Norfolk to Miss Sophia Mottram, Mr R. W. Ketton-Cremer, Mr G. Wilson, Mr R. K. Kerkham, and Messrs E. A. Lane Ltd. I am also grateful to Professor Asa Briggs and Professor F. M. L. Thompson for having read an earlier draft of this article.

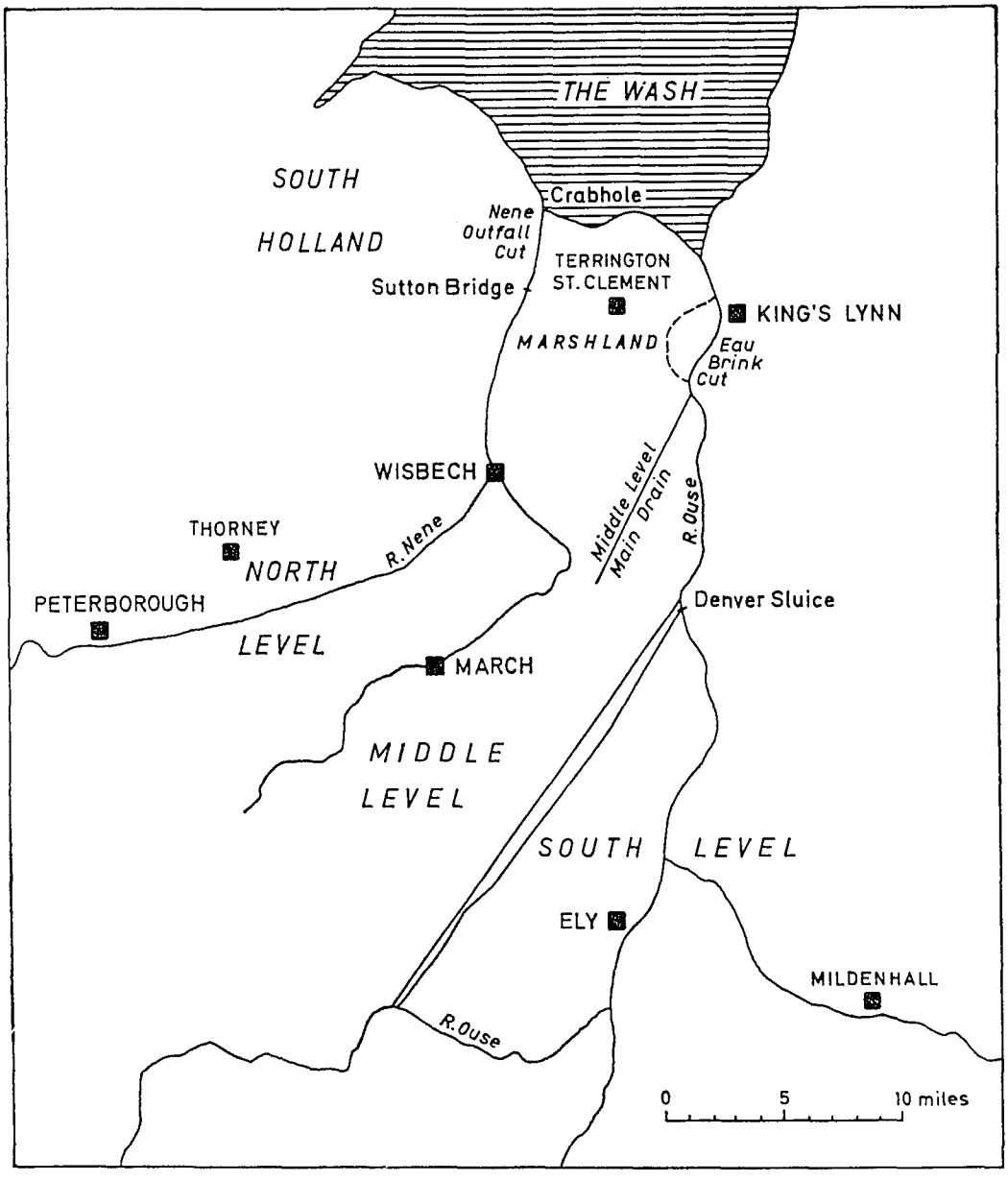

FIG. I: THE NORFOLK MARSHLAND

Because an early recall from Madras in 1807 disappointed his expectations of making a fortune, Bentinck plunged into speculative enterprise in agriculture and agriculture-based industry in the Marshland district of Norfolk. Because this venture in turn proved ill-timed it gave Bentinck one strong motive among others for going out to Bengal in 1828. Meanwhile, however, he had been drawn closely into the affairs of Marshland and the Fens, in particular into the

long effort to improve fen drainage, navigation, and communications and to reclaim land from the Wash. He had in fact become a leading local improver; his Norfolk experience was to influence his later work in India.

The key to a good deal in Bentinck's career was the tangled fortunes of his father, the third Duke of Portland, Prime Minister in 1783 and again in 1807–9. Portland, one of the greatest landowners in England, was heavily in debt for most of his life; at his death in 1809 the debts totalled £512,000. As a young man he had incautiously agreed to pay his mother £16,000 a year in exchange for entering upon her estates: this, together with his political preoccupations—above all his ruinous electoral struggles against Sir James Lowther—and some procrastination and muddle, kept the duke from ever getting over his indebtedness. It touched bottom about 1780, when the servants' pay was years in arrears and the duchess, whose husband owned Welbeck, Bulstrode, and a large part of Marylebone, and tenanted Burlington House, could not think how to pay the coalman; possibly only the death of the duke's mother in 1785 saved him from bankruptcy.[1]

The duke's troubles owed nothing to gambling or extravagance: at Welbeck and Bulstrode all was "moderation and innocence—sixpenny cribbage and dancing with the children the evening amusement."[2] They seem none the less to have impressed his two elder sons in their formative years. The eldest, when he succeeded as fourth duke, kept aloof from politics as far as he could and devoted himself to restoring the family fortunes. The second son, Lord William, as a newly married man of twenty-nine thought it "absolutely necessary for our future comfort that I should make a sufficient fortune. . ."[3]

A younger son with a colonelcy in the Dragoons was not likely to do this unaided even if, like Bentinck, he shared his father's simple tastes. Bentinck in 1800 had an allowance of £600 a year from the duke; by 1811 it had turned into an annuity of £900. He had a sinecure as Clerk of the Pipe: about 1821 this was bringing in not far from £1,000 a year in fees; by 1835 it had been converted into a pension of £187 14s. 4d. a year. His father had presumably bought him his commission. What other capital he may have had, whether from his family or from his marriage to a daughter of the Earl of Gosford, is not clear. But there is no sign that it amounted to much. This may explain why Bentinck kept

[1] A. S. Turberville, *A History of Welbeck Abbey and its Owners*, 1938–9, II, pp. 154–6, 307–10, 317–19, 345–6; Duchess of Portland to Portland, 11 Sep. 1780, BP/PwF/10743. In 1808, when matters had improved, Portland's net revenue was £52,000; after deducting income tax at 10 per cent and debt interest of about £20,000 his clear income was £25,997.—BP, Bentinck's journal, 20 Feb. 1808.

[2] William Adam to John Adam, 1 Sept. 1785, quoted in D. E. Ginter, 'The Whig Party, 1783–1793: a Study in the Rise of the Modern Party System', Ph.D. thesis, Univ. of California, Berkeley, 1964, p. 12.

[3] Turberville, *Welbeck Abbey*, II, pp. 332–6, 345 ff; Bentinck to A. Obins, 16 March 1804.—BP/PwJb/723.

buying lottery tickets, a habit that stayed with him most of his life even though he was not a gambler (his highest, even then quite exceptional, bet on record was for £58).

Portland, however, set about advancing the career of his ablest son. In 1802 he secured Bentinck's appointment as Governor of Madras. This was due simply to Portland's personal standing and "parliamentary interest:" Bentinck at that point had done nothing more notable than to serve as liaison officer with the Austro-Russian forces in Italy in 1799–1801.[1]

Portland seems to have had in mind not just money but distinction, not just Madras but Bengal: it was his "anxious wish" that Bentinck should eventually have the reversion of the Supreme Government. Bentinck, whose heart was in soldiering, owned that "my first inducement in going to India is pecuniary consideration." Though he claimed higher motives as well, he might not have gone if his "second parent," the rich old Whig M.P. William Plumer, had come through sooner with an offer of financial help to keep him in England.[2]

There was nothing unusual in Bentinck's regarding the Madras appointment chiefly as a means to fortune. The eighteenth-century notion that India with its high death-rate was a place to make a "competency" in and get out of as soon as possible was common well into the nineteenth; among those who advanced or assumed it without any sense of impropriety were not just the improvident like Lord Hastings or Sir James Mackintosh but such thoroughly respectable characters as Sir Thomas Munro and Sir Thomas Strange, the Chief Justice of Madras.[3] At most Bentinck's family circumstances may have driven him on a little harder.

In September 1805, when he had been in Madras for two years, the young and confident Bentinck explained to his elder brother his "most inmost thoughts." His annual saving on his salary as governor, exclusive of Indian interest at 8 per cent, he reckoned at £9,000 a year; after paying a debt of £4,000 to his brothers, £2,000 for his passage, and some other heavy initial expenses, he had already saved some £11,000 (later amended to £10,000). What would happen next depended on two things: Lady William's health and his chances of getting the Supreme Government. If, as then seemed likely, he

[1] C. H. Philips, *The East India Company, 1784–1834*, Manchester, 1940, p. 121; BP, E. Monckton to Bentinck, 7 July 1802.

[2] Bentinck to Minto (private and confidential), 1 Oct. 1806, BP/PwJb/726; to Plumer, 7 Jan. 1803, in R. W. Goulding, ed., *Letters written to Charles Lamb's 'princely woman'. . .*, 1909, pp. 76–8. The reversion of Bengal, linked with the Madras appointment, had already been offered to Charles Yorke and suggested for Sir George Barlow.—Philips, *op. cit.*, p. 121.

[3] Philips, *op. cit.*, p. 228; R. J. Mackintosh, *Memoirs of the life of . . . Sir James Mackintosh*, 1835, 1, p. 188; G. R. Gleig, *Life of Major-General Sir Thomas Munro*, 1830, 1, pp. 227–9; BP, Sir T. Strange to Bentinck, 28 Feb. 1812. As late as 1839 "the less thoughtful" Balliol undergraduates thought anyone going to India would "come back a nabob."—F. C. Danvers, M. Monier-Williams, and others, *Memorials of Old Haileybury College*, 1894, p. 36.

did not get Bengal, "it is my resolution to remain [at Madras] if I am permitted four years from the 1st January 1806 . . . which will give me a fortune of between £50,000 and £60,000." The only grounds for limiting himself to four more years were his wife's health and the age of both their parents; he himself "never was better in my life. I like the situation and am exceedingly interested in it. . . I am quite at my ease and I believe the country is doing well under my government." Or, as he put it a little later: "My weight has increased considerably. I hope my property will increase also."

If, on the other hand, Bentinck were shortly to succeed the aged Cornwallis in the Supreme Government, "the greatness of the situation and the vast benefits which would accrue to myself and to my family" would induce him to stay on rather longer: "I should not wish to stay less than three years in Bengal and supposing Lord Cornwallis to leave India in three years, my stay would be six years or till 1812. . . The saving in Bengal is I believe £20,000 per annum—I am not sure of this—but say £16,000. My fortune at the expiration of that term would be £100,000 which would make us very much at our ease and would prevent any great descent from the style and comfort in which we have both lived, and which becomes of importance when occupation ceases, and where an economy approaching parsimony does not exist."[1]

These speculations came to a rude end. Not only did Bentinck not get Bengal: the 1806 Vellore mutiny led to his recall before he could serve out the term he had looked for in Madras. In June 1807, three months before sailing home, Bentinck reckoned that his net savings amounted (give or take £1,000) to no more than £20,000, or half the minimum he had hoped for.[2]

II

Much of Bentinck's energy on his return home went into justifying himself against what he considered the unfair terms of his recall. Partly for this reason he went to Portugal with the 1808 expeditionary force and served with distinction as far as Corunna. After the evacuation he set about repairing his fortunes.

As he was to say more than once in after years, he was interested not in honours or in a peerage but in an "independence:" this he tried to achieve in one way or another. The true reward of public service, he said in 1813 when he was battling through his difficult Sicilian mission, was "the public respect which you will enjoy if you deserve it . . . this depends wholly . . . upon my own conduct. But the Government can give me what the public cannot, which is income and comfort. Respect is very good food for the mind, but not for the

[1] Bentinck to Titchfield, 6 Sep. 1805, 11 Jan. 1806, BP/PwH/249, PwJb/723. Lord Minto, who did get the governorship of Bengal, found that he could "depend on laying by £1,500 *a month* or rather more. It will be more as I get a larger sum to bear interest."—to Lady Minto, 20 Nov. 1807, National Library of Scotland, Minto Papers, vol. M36.

[2] To W. Petrie, 2 June 1807, BP/PwJb/343–584.

body." In 1827 he advised Canning's widow to take an income rather than a title—"I do not set the value of a rush upon the peerage."[1] He himself was to refuse a title in 1835. Meanwhile, in 1809, Bentinck set about gaining an "independence" by investing heavily in agricultural enterprise in the Marshland district of Norfolk.

He was not alone. In the years of peak agricultural prices from 1809 to 1812, Marshland—the rich silt area between Wisbech and King's Lynn—saw a markedly speculative land boom that drew a number of eminent men from London. According to a Radical contemporary, the district "has of late experienced an unexpected and most striking change in the sudden resort thither and settlement of a number of characters in high life . . . peers, courtiers, statesmen, nabobs, royal physicians, naval and military commanders, etc. This . . . has filled all Marshland with astonishment, so as to make its homely and unlettered inhabitants ready to lift up their voices and cry out with the ancient Lycaonians, 'The gods are come down to us in the likeness of men!'. . . The enormous price given by these newcomers for the estates they have purchased has greatly astonished the whole country, being about double the current valuation, or what lands usually fetched here before. . ."[2]

One of those chiefly concerned with helping along the boom was Vice-Admiral William Bentinck, son and heir to the Count Bentinck (a member of the family's Dutch branch) who, as lord of the manor of Terrington St Clement, had in 1773–4 enclosed several hundred acres from the sea. The admiral continued his father's work and, according to Young, "far exceeded it," though at a rate of return not really economic for what amounted to enclosure from the waste.[3] By 1809–10, a few years after Young's enthusiastic report on the fertility of Marshland, the admiral was buying himself and was acting as a promoter urging on such potential investors as Huskisson, Canning, Charles Arbuthnot (then Secretary to the Treasury), and the Hon. Berkeley Paget. Of these, Arbuthnot and Paget in the end took up some 200 and 400 acres apiece. Canning wholly, and Huskisson partly, backed out of agreements under which they would have bought estates of 200-odd acres each; their reasons for withdrawing—defective titles, and the presence as seller of an undischarged bankrupt—are themselves evidence of speculative fever. Most of this land seems to have sold at just over £50 an acre; for specially rich land at Long Sutton Canning had been prepared to pay nearly 80 gns an acre exclusive of buildings

[1] To Charles Greville, 7 April 1813, BP/PwJd/6250; to Mrs Canning, 26 Dec. 1827, Canning Papers, Sheepscar Library, Leeds, bundle 147 (quoted by kind permission of the Earl of Harewood).

[2] W. Richards, *The History of Lynn . . .*, King's Lynn, 1812, II, pp. 1084–5.

[3] F. Blomefield and C. Parkin, *An Essay towards a Topographical History of . . . Norfolk*, new ed., 1805–10, IX, p. 91; W. White, *History, Gazetteer, and Directory of Norfolk . . .*, Sheffield, 1836, pp. 469, 473–5; A. Young, *General View of the Agriculture of the County of Norfolk*, 1804, pp. 435–43.

and timber: "It is very dear after all," he told Huskisson, ". . . but I think we cannot do much amiss with it."[1]

One of the first "characters in high life" to be brought in as a purchaser was the admiral's distant cousin Lord William Bentinck. In 1809 he bought North Lynn, an estate of some 914 acres, then on the west bank of the Ouse facing King's Lynn. For this Bentinck seems to have paid about or just below £50 an acre: the total purchase price came to at least £36,500, possibly something nearer £40,000. Eight years later, in circumstances which are still obscure, he was to buy Orange Farm—some 185 acres with a cottage residence and a windmill "after the German fashion" at Terrington St Clement, four miles west of North Lynn. A "*very* moderate price" for Orange Farm was reckoned in 1824 at £11,000; a little earlier, when prices were still depressed, Bentinck had been prepared to take £10,000. Altogether he sank not far from £50,000 into land purchase alone.

Much of this land came from people who, like Bentinck himself, had only a recent or an entrepreneurial stake in Marshland. The nucleus of North Lynn—for which he paid £17,000—came from the heir of Governor Thomas Pownall of Massachusetts, the Fellow of the Royal Society and member of a Cheshire landed family, who had acquired it in the mid-eighteenth century: the seller, Pownall's nephew Sir George, had himself served overseas as a colonial official. Additional parcels came from Sir Martin Folkes, M.P., of Hillington Hall (£9,000)—a member of a long-established local gentry family, a Mrs Elizabeth Sansom or Sampson (about £2,000), and perhaps others yet. The seller of Orange Farm was Baron Fagel, a Dutchman who had played host to the Prince of Orange after his flight to England in 1795: hence the name of the farm. Whatever Fagel's interests as a landowner, his brother, also a Marshland proprietor, was a declared speculator, and, by 1812, an unsuccessful one.[2]

Bentinck's own ventures were clearly entrepreneurial. He seems to have had no thought of settling down in Marshland. His visits, though frequent, lasted as a rule no more than two or three days—just long enough to do business with stewards and neighbours. In 1817 he and his wife spent six weeks at the newly bought Orange Farm, apparently to oversee the first harvest; they never stayed

[1] Arbuthnot to Bentinck, 30 Aug. 1810, BP; Admiral Bentinck to Arbuthnot, 7 Dec. 1810, B.M. Add. MSS. 38, 738, fol. 46; Canning–Huskisson correspondence, 1811, *ibid.*, fols. 75, 107, 109, 192; Huskisson to Canning, 4, 17 Sep. 1811, Canning Papers, Sheepscar Library, Leeds, bundle 67. As early as 1802 Young alleged that some land in Marshland belonging to Thomas Bagge of Lynn "would now sell at £70 an acre".—Young, *op. cit.*, pp. 18, 39. Cf. 1805 Fenland prices of £53–£60 an acre, quoted in A. H. John, 'Farming in Wartime: 1793–1815', in E. L. Jones and G. E. Mingay, eds., *Land, Labour and Population in the Industrial Revolution*, 1967, p. 45.

[2] The cutting of the Lynn Outfall Cut or Marshland Cut in 1852 transferred most of North Lynn to the east bank of the Ouse. White, *op. cit.*, 1836 ed., pp. 472–5, gives North Lynn 914 acres, Orange Farm 185. Documents of 1824 give Orange Farm 190 acres; the larger figure may include some rented land. For Pownall, see *Burke's Landed Gentry*, 1846 edn.

anything like so long again. Marshland, in fact, was "adventurer's land" even though it was outside the old fenlands that bore that name. "Frontage" on the Wash in particular was recognized as highly speculative—too much so, Arbuthnot thought in 1810, to risk trust capital upon; and North Lynn had plenty of frontage. This made for the chance of lucrative conquests from "the enemy", as Bentinck, in correspondence with his military colleague Sir Home Popham, called the sea; it made for heavy expenditure on banks and drains and for damaging floods, and perhaps also for the disappointing returns common among nineteenth-century landlords who enclosed salt marsh too fast.[1]

Bentinck frankly wished to make money. But he was not a pure speculator on capital gains. When he thought of reselling some land it was—as will be seen—a desperate measure. The quick returns he optimistically looked for were returns of income. By the 1810's he was a dedicated improver. To his favourite niece (later Duchess of Manchester), who had acquired a farm, he wrote that it would make her "useful in your generation. I trust you will get a good steward, who will be a good agriculturist and who by his authority and good sense will be able to make the tenants follow your example."[2] In 1824, even after years of adverse fortunes, he could write that the heavy silt of North Lynn was "capable of being greatly improved by draining, but not without considerable expense. . . Both for pleasure and profit I cannot refrain from making these improvements; but as they cannot but be progressive slowly, it is probable that not I, but my successor, will reap the harvest. . ."

In fact his belief in improvement could get in the way of his desire to make money. So at least thought his friend Lord Exmouth, the retired admiral who farmed in Devon. "Your mind is too liberal to farm profitably," he told Bentinck in 1818. "You must improve and invent, which are the expensive articles in farming."

The truth was perhaps rather that Bentinck set about improving at the wrong time. He had bought near the top of the market during the wartime boom, and had borrowed heavily to do so. He then set about improving his estates and launching other enterprises—in particular an oil mill—during the years of falling prices and agricultural distress. This, together with repayments of existing debt, called for repeated injections of capital that were increasingly hard to come by, so that by the early 1820's Bentinck—like many others—was in serious trouble; he kept going largely thanks to his family connections.

Both as a convinced improver and as a rare Marshland representative of the great landed aristocracy Bentinck, however, had meanwhile come to take the lead in several co-operative ventures, notably the making of the Eau Brink Cut

[1] J. A. Steers, *The Coastline of England and Wales*, Cambridge, 1946, p. 436.

[2] Bentinck to Millicent Sparrow, 6 Jan. 1822, Huntingdonshire County Record Office, Dd M 10 A/8.

above Lynn and the building of Sutton Bridge across the river Nene. After some initial opposition he had won the trust of the merchants who ran most of the economic and political life of King's Lynn; with it he had in effect been given control of one of the borough's two parliamentary seats. Bentinck's influence, ultimately based on his possession of North Lynn, enabled him on his departure for India in 1828 to hand on the parliamentary seat to his nephew Lord George Bentinck: so it was that Lord George, at his death twenty years later, was still member for Lynn, and that Lynn today perpetuates his name in its Bentinck Dock.

Almost as soon as he had bought North Lynn Lord William set going various costly improvements. In 1810–11 he started spending at least £3,000—possibly much more—on a new sea-bank at North Lynn to enclose part of the salt marsh, and on repairs to the river bank; the plans were drawn up by John Rennie, who, together with Telford and the younger Rennie, was to work with Bentinck on the Eau Brink Cut and Sutton Bridge projects. At the same time Bentinck built a new great sluice at "heavy expense" (and then probably had to spend about £800 more on "casting back the banks" in consequence); he bought a threshing mill; he set about building cottages and stables as well as—with the aim of exploiting the increasing seaborne trade—a jetty on the west bank of the Ouse at North Lynn.

In 1811 Bentinck went to Sicily as Minister and Commander-in-Chief; we hear little of further improvement until the post-war period. In 1816 he was in correspondence with Portland's bailiff at Chillingham, Northumberland, about having cast-iron stack stands made at Newcastle. His biggest venture was the oil mill he set up at North Lynn in 1818 for the commercial manufacture of cattle cake and oil—a long-standing local industry, based from the fourteenth century on rapeseed, which in the eighteenth century had shifted to the milling of eastern European linseed in wind-driven "stamper" mills.

Bentinck's transactions over the oil mill suggest the uncertainty that attended the carrying into effect of new techniques even when these were available. At first he wished to be able to use the mill for other purposes as well—either threshing or corn grinding; at one point in 1817 he thought of getting a steam engine capable of grinding "a considerable quantity of corn in a short time" (i.e. about 150 to 200 quarters a week) "for the purpose of taking a favourable state of the market." Yet he also considered an old-fashioned wind-driven mill. Meanwhile he was taking estimates and advice from several engineers, among them William Tierney Clark, then at Hammersmith, and Thomas Waters of Gateshead. Clark, who finally undertook the work, came up with several proposals; the most expensive would have involved a 20 h.p. engine and a total cost of about £4,850—which, Clark reckoned, if worked eighteen hours a day all the year round would bring in a net profit of nearly 20 per cent. This was

modest compared with the notions of an East Yorkshire tenant farmer who upheld Newcastle "mechanics" against "your London engineer" and estimated that—for a domestic rather than commercial mill, suited to a farm with 440 acres of tillage—a capital outlay of £700 to £800 would bring in a profit of £500 a year regardless of market fluctuations.[1]

Bentinck in the end settled for a second-hand Gospel engine which Clark supplied at a cost, including reinstatement, of about £400. Clark, however, leading engineer though he was, contented himself with specifying the stamper presses then widely used; it was left to another of Bentinck's advisers to denounce the stamper press as "a barbarous kind of process in this scientific age," and to uphold against it Joseph Bramah's hydraulic press (1795), which was more productive and made for less wear and tear.[2] This advice, offered in September 1818, came too late. By then the mill was built; worse still, the Gospel engine had in the previous month been wrecked on its way to Lynn by sea, just before the harvest which Bentinck had intended to make a start on. On top of the loss and delay he had on his hands the seed he had ordered. To face immediate expenses Bentinck had to sell £3,500 (market value) in Consols and raise a bank loan of £3,000.

The oil mill, set up just before the worst years of agricultural distress, had a fitful career. In 1819, 1821, and 1825 Bentinck imported linseed from Memel or inquired the price (which turned out to be non-competitive) of Italian seed. Even then, the evidence for 1825 shows only five weeks' work on crushing for outsiders; when, in 1819, Bentinck made a profit on his seed purchases it still did not cover interest charges. In 1824 the mill seems to have been idle; Bentinck's political associate, the Lynn merchant J. P. Blencowe, was advising him to convert it into a flour mill. This advice was still being offered in 1835 by Bentinck's under-steward: the oil trade was so bad that "its working again as crushing is totally out of the question." A year later the mill was described as "unemployed during the last eight years"—though the pluralist incumbent of the "decayed" North Lynn parish "*sometimes* performs divine service" in part of it.[3]

This was almost certainly the most burdensome of Bentinck's investments. There were other losses to be faced. In 1810 and again in 1820 and 1836 severe gales and tides broke banks and flooded fields with salt water. "A large brig is lying in the middle of a wheatfield in Terrington Marsh," his steward reported in 1820: the sea had overrun some 350 acres, of which all but 80 were probably sterilized for that season. The 1836 flood overran 90 acres of grassland, 20 acres

[1] BP, Digby Leyard of Elton, E. Yorks, to Bentinck, 13 Sep. 1817.

[2] BP, G. Taylor to Bentinck, 1 Sep. 1818; H. W. Brace, *History of Seed Crushing in Great Britain*, 1960, pp. 37–50, quoting an 1858 report by the engineer Alexander Samuelson, gives as its earliest examples of oil mills based on hydraulic presses two (both at Hull) dating from 1822 and 1824.

[3] White, *op. cit.*, 1836 edn, p. 472.

of wheat, and 5 acres of trefoil, in some places three feet deep; raising banks in consequence was reckoned to cost perhaps as much as £600.

Bentinck, however, went on pursuing scientific improvement. What evidence there is of his farming practice suggests that he at least kept up with contemporary Marshland ideas about crop rotations. The main business of North Lynn was sheep and cattle fattening and, on the arable, wheat rotated with beans or oats; Orange Farm was largely arable under a similar rotation, though some cattle attached to it were kept at North Lynn—presumably because of the lack of fresh water characteristic of the Marshland silt, which prevented cattle rearing until the coming of mains water.[1] Bentinck urged his friends elsewhere to drain and irrigate, continually noted on his travels local practices of clay burning, Swedish turnip cultivation, or the feeding of cattle on cake; he inspected new kinds of agricultural implements; he had forms printed for his farms to show in detail—rather as on an Army return—the weekly state of labour, tasks performed, numbers of cattle, cereal crops disposed of or bought, and receipts and expenditure. All the same, much of the time his agents and stewards were in practice left to get on with the job. When he was in England Bentinck visited Marshland as a rule once or twice a month, but his long absences on the Continent meant that he could not supervise the farms in detail.

To begin with part at least of North Lynn had been let. By 1825 all of it seems to have been under direct management, and so does most of Orange Farm: this suggests that in the bad years Bentinck and the tenants may have been unable to agree on lowered rents. In 1809–10 Bentinck used as agent a neighbouring gentleman farmer (N. L. Fenwick, who for a time tenanted Brunnage Farm, now Pierrepont Farm, Terrington Marsh), followed in 1811 by a clergyman (the Rev. J. Heckford, vicar of Bircham). He also had a steward for North Lynn, where J. H. Savigny, apparently a professional farmer between tenancies, gave way in 1810 to one Sanderson. By 1818 Bentinck had brought in a professional Scottish steward, Robert Anderson: in this he acted like other enlightened landowners of his day, but comments by his neighbours suggest that a Scots steward was still something of an exotic novelty in Marshland. Bentinck thought highly of his Scotsman, but when he became Governor of Bengal, Anderson went off to work for the Bagges of Stradsett—Lynn merchants turned landed gentry. The farms remained under the management of John Sculthorpe, a gentleman who had had a son at Rugby but who in consequence of "recent misfortunes" had had his own estate sold at auction at Wisbech in 1826; a retired officer of Bentinck's regiment, G. Sicker, worked under him at North Lynn. Sculthorpe seems to have been an unfortunate choice. Sicker later described him as a "castle builder;" in 1836 Sculthorpe

[1] Information from Mr R. K. Kerkham, Banklands, Clenchwarton.

was still heavily in debt and was asking Bentinck for loans. Perhaps because of his mismanagement, the farms were let by 1835.

The farms lost money in the distressed years around 1820. "Sad and gloomy beyond any period in my memory is our agricultural prospect," Bentinck wrote in 1821.[1] In 1835 they had had further losses, presumably because of low prices, and were still a "dead weight." In between they saw an interval of prosperity, partly no doubt because of the general upturn in agricultural incomes from 1824, perhaps also thanks to Anderson's professional management. In 1825–6 and 1826–7, anyhow—the only years for which we have full accounts—they made a profit of sorts. North Lynn showed a profit of £2,990 in 1825–6 (against total expenditure of £8,969) and £1,697 in 1826–7 (against expenditure of £7,143); Orange Farm, a profit of £407 in 1825–6 (against £1,156 expenditure) and £355 in 1826–7 (against £1,019). Even then Bentinck would have done no better than break even if he had charged against himself the rent he thought the farms could fetch.[2] Capital expenditure at North Lynn was significantly high: in 1825–6 £841 went on tile drainage and, in the two years 1825–7, £290 on banks; in those good years fixed capital expenditure was running at about 13 per cent of receipts. (Banks seem to have been an inescapable recurrent item; drainage had been put off during at least some of the bad years). Orange Farm, on the other hand, could carry on with little capital investment: according to Sicker, it "ought to have paid its way" in the early 1830's; presumably it would have but for Sculthorpe's mismanagement.

III

Right from the start, in 1809–10, Bentinck had borrowed £36,500 to buy North Lynn and pay for capital works—£14,500 on mortgage from the sellers and £22,000 on loan from bankers and relatives. To this was added, by the end of 1812, a further £2,500 loan from the Lynn country bank Gurney, Birkbeck, & Co. In the heady atmosphere of 1809–10 Bentinck, it seems clear, had counted on returns so quick as to enable him to pay off within a few years most of the non-mortgage debt. By 1812–13 he had run into unexpectedly heavy capital charges, above all for banks and drainage. This came on top of running interest charges of at least £2,000 a year: in 1813 his total indebtedness to Drummonds, his chief bankers, was (including overdrafts) £40,000. At this point Bentinck—then in Sicily—panicked: "I am quite frightened by the amount of my debt—and I must diminish it greatly at whatever sacrifice." Because of "the extraordinary demands from Norfolk at a moment when I

[1] To Millicent Sparrow, 5 Feb. 1821, Huntingdonshire County Record Office Dd M 10 A/8.

[2] Bentinck in 1824 had estimated the rent of North Lynn at £2,500, of Orange Farm at £400. In the two years 1825–7 he received £63 12s. 0d. in rents at Orange Farm and himself paid £40 rent to a neighbouring landlord (these amounts were included in the accounts); and he was himself paying £1,500 a year rent on North Lynn (see p. 58, n. 2).

expected that my debt would be rather diminished than increasing" he decided to sell his Bruton Street house and £10,000 worth of North Lynn land: this would clear the bulk of the loans (not the mortgages) incurred in 1809–10.[1]

What happened next is unclear. There is no sign that any of North Lynn was sold; possibly the break in the land boom forestalled any chance of carrying out Bentinck's instructions (which had assumed its continuance: he had expected to get £80 an acre and even, for some fields near a road, £100). Bentinck did not even vacate the Bruton Street house until 1817, though he may have sold the lease sooner. Instead what he did was to buy: in 1817 he bought Orange Farm for a sum that cannot have been much under £10,000.

In Sicily Bentinck had been able to live wholly within his official salary. This may have influenced him to take on the mission after he had twice refused offers of a Government job or a Peninsula command; "the temporary embarrassment of his Norfolk estate" certainly induced him to try to hang on to the mission in 1814.[2] After Napoleon's fall Bentinck resigned his Parliamentary seat and, with two short summer breaks, spent the years 1814–16 in Italy: it is tolerably clear that—as he was to do at intervals later on—he was recouping himself. The purchase of Orange Farm in 1817 and the setting up of the oil mill in the following year seem to have amounted to that classic speculator's move, throwing good money after bad: Bentinck entered the years of deepest agricultural distress with his commitments increased.

He touched bottom, not surprisingly, in 1819–22: more than once he borrowed hurriedly from one country bank or relative to pay off another; Gurney, Birkbeck, & Co. were sending him increasingly stiff (though Quakerly) demands for repayment of loans and "liquidation of thy accounts current." This, as well as Bentinck's desire to clear himself from the slur of his recall from Madras, may help to explain the urgency with which he tried to secure the governorship of Bengal in 1822—an attempt thwarted by Canning and Liverpool, to whom Bentinck's record just then seemed awkwardly radical.

These accounts, incomplete as they are, make several things clear about Bentinck's affairs. One is their bad set around 1820–1 and the beginnings of recovery in the later twenties. In 1824, a better year for agriculture, he paid off six years' arrears of interest due to Lady Olivia Sparrow. In 1827 he repaid not only the amounts shown here but at least £2,725 owed to tradesmen; by then he was beginning to draw his salary as Governor of Bengal. The governorship, though perhaps not so desperately needed as in 1822, clearly helped to lighten

[1] Bentinck to Heckford, 20 Jan. 1813, to John Heaton, 20 Jan., 21 May, 16 July 1813, BP/PwJd/6250.

[2] J. Rosselli, *Lord William Bentinck and the British Occupation of Sicily, 1811–14*, Cambridge, 1956, p. 113; C. A. A'Court to Lady William Bentinck, 5 May 1814, in G. Gallavresi, 'La Rivoluzione lombarda del 1814 e la politica inglese', *Archivio Storico lombardo*, ser. 4, XI, 1909, pp. 130–2.

TABLE I

LOANS, MORTGAGES, AND REPAYMENTS

(*=banks) (†=mortgages) (‡=relatives)

Creditor	*Amount*	*Date incurred*	*Approx. total debt*[1]	*Date of repayment*	*Amount*
Drummonds*	6,000	1809–10		1817	2,000
Sir George Pownall†	8,500	,,		1819	8,500
Sir Martin Folkes†	5,000	,,			
Mrs Eliz. Sansom†	1,000	,,		1817	1,000
Duke of Portland‡	3,000	,,			
Lord George Cavendish‡	9,000	,,			
Lady Mary Bentinck‡	3,000	,,		1836	2,400
Lord Fred. Bentinck‡	1,000	,,	36,500		
Collyers*	1,000	1811	37,500		
Gurney, Birkbeck*	2,500	before 1813	40,000	1822	1,000
,, ,,				1826	1,000
,, ,,	500	? 1817			
Major R. Smyth	2,000	1817	39,500	1824	700
Bagge & Bacon*	3,000	1818		1820	1,000
,, ,,				1824	1,000
Lady Olivia Sparrow‡	4,000	1818	46,500	1827	3,000
A. R. Balfour's Exrs.	30,000	1819	68,000		
Snow & Co.*	1,000	1820	68,000		
A. Obins‡	4,000	1821			
Lord Gosford‡	1,000	,,		1821	1,000
Sir Andrew Hamond	3,000	,,			
Charles Heaton‡	1,000	,,			
George Strachey	2,000	,,	78,000	1836	1,000
Collyers*	1,000	1822	78,000		
Snow & Co.*	500	before 1823	78,500	1826	1,200
Lady Olivia Sparrow‡	5,000	182?			
Everard & Co.*	530	,,		1827	530
Lord Gosford‡	500	,,		1825	500
Sir Edward Banks	800	,,		1827	800
Drummonds*	4,000	,,	89,330	1836	10,000
Duke of Portland‡	1,000	1824	88,630		
		1825	88,130		
		1826	85,930		
		1827	81,600		
		1836	under 68,300		

[1] Figures for total debt are approximate because (a) the evidence is incomplete, (b) overdrafts are not included (unless the £30,000 borrowed from A. R. Balfour's executors includes a consolidated overdraft), (c) it is not always possible to match debts with repayments. In particular there must have been a number of repayments in 1828–35 (when Bentinck was remitting large sums home from India) for which there is no surviving evidence.

Sources: Bentinck Papers; Bagge & Bacon account books; abstract of title to North Lynn advowson, Bradfer-Lawrence Papers, Norwich and Norfolk Record Office, Norwich.

his financial burden. While in India he remitted money home—at least in 1829–31—at the rate of about £10,000 a year; both before and after his return in 1835 he paid off part—most likely all—of the accumulated debt.[1]

Among Bentinck's creditors by far the most important were his friends and relations—chief among them his brother the duke. Banks, with one exception—Drummonds—provided only modest amounts of capital; and Drummonds had a kind of security in the custom of Portland and other members of the Bentinck family. The rest, as one would expect, proved short-winded in the bad years. Collyers in 1821 refused to discount Bentinck's bills at longer than two months. Among the country banks, Bagge and Bacon were apparently able to stomach in 1819 an overdraft that fluctuated between £6,000 and £8,600; more typically, Gurney, Birkbeck, & Co., though the Gurney banks had advanced £1¼ million to East Anglian customers in the years up to 1816, insisted in April 1821 that they could not leave so much as £3,000 locked up in a loan, and that it went against all their habits to make more than short-term occasional advances.[2]

Of the other creditors the mortgagees were all Marshland proprietors. A. R. Balfour's executors, who took over Pownall's mortgage in 1819 (at Bentinck's wish, not at Pownall's), seem to have provided bridging finance: the evidence suggests that they took over at least part of Bentinck's debt to Drummonds but later handed over, as both mortgagees and lenders, to the duke. Major Smyth was a prize money agent with whom Bentinck had only a business relationship. Several creditors were friends of Bentinck. Sir Andrew Hamond, of Hamond Lodge (now Terrington Court), Terrington St Clement, a former Comptroller of the Navy, was a Marshland neighbour and fellow admirer of Canning who worked closely with Bentinck on local improvement projects. Sir Edward Banks was the well-known contractor whose men dug the Eau Brink Cut. George Strachey was a retired Indian civil servant who had worked under Bentinck at Madras.

Among the relatives, Lord Gosford and Lady Olivia Sparrow were Lady William's brother and sister; Lady Olivia, a widow and a formidable Huntingdonshire landowner, was supposed to have an income of £14,000 a year.[3] Obins,

[1] Bentinck's need to remit money home to pay off the debt saved him from losing it in the great crash of the Calcutta Houses of Agency, where many servants of the East India Company invested their savings at high interest rates. Bentinck lost only about £800 in the crash; Lord Combermere, the former Commander-in-Chief—he reported—lost £40,000.—To Portland, 27 Feb. 1833, BP/PwH/293. He had written on 5 Nov. 1829, "debt diminishes and in six months more will I trust completely disappear;" but either this was a nominal calculation or he had in mind only a particular kind of debt, for he was still repaying debt in 1836.—To F. Lamb, Royal Archives, Windsor, Beauvale Papers, box 8 (quoted by gracious permission of H.M. the Queen).

[2] W. H. Bidwell, *Annals of an East Anglian Bank*, Norwich, 1900, p. 110; cf. L. S. Pressnell, *Country Banking in the Industrial Revolution*, Oxford, 1956, pp. 304–5, 344–9.

[3] *V.C.H.*, *Huntingdonshire*, III, pp. 13, 16.

a clergyman, was Lady William's cousin; he had acted as Bentinck's private secretary at Madras and again in Sicily, and he was the only one of the relatives to take less than 5 per cent interest (he insisted on 4). Lord George Cavendish, the Whig politician, was Bentinck's maternal uncle; Lord Frederick and Lady Mary Bentinck were his brother and his unmarried sister. By the mid-twenties much the biggest creditor was Portland, whether in his own name or in that of his agent, Charles Heaton.

Portland was already from 1812 one of his brother's mortgagees. He became heavily involved from 1819 on. In that year Bentinck—with the wreck of the mill engine behind him and loan repayments of at least £4,000 due in the following year—began a series of complex negotiations that went on until 1825. His aim, through many shifts, was always the same: to raise capital, if necessary by selling the freehold of one or other farm or both, without losing the chance of carrying on his agricultural enterprise as a tenant on a long lease. As he told Portland in 1820, "My great want is capital . . . my own means would suffice, if I could convert them into money." "My wants" (he added a few days later) "are very urgent and without your aid I cannot without much sacrifice meet them." His income apart from farm and mill was "perfectly adequate to the same establishment I have hitherto had:" the problem was not penury but how to find disposable resources to keep going "a concern which carries with it every fair prospect of success," and which might ensure for Lady William a comfortable old age.[1]

Four years later, when Portland had already put large sums into the enterprise, Bentinck pressed for still more. He advanced two main reasons. First, "the possession of the [North Lynn] estate establishes in its proprietor a great identity of interest with the town of Lynn;" since 1821 Bentinck had been able to control one of the Lynn seats without calling on his brother's money for electoral purposes—the seat was at this time occupied by Portland's son Lord Titchfield—and "it would give me pleasure to transmit it as my legacy to the family." Secondly, Bentinck's efforts to improve the estate by draining it would no doubt benefit his successor rather than himself, but "my pleasure would be greatly diminished if I felt that I was working for the benefit of a stranger." For Portland to bail Bentinck out yet again would therefore "be very useful, *politically*, and very satisfactory, *feelingly*, to me."[2]

Late in 1819 Bentinck sold the title to Orange Farm—part freehold, part copyhold—to Portland; he took part of the purchase price in the form of a lease for three lives, worth £5,000. By April 1820, however, Bentinck was trying to get Portland to underwrite a loan from Drummonds of £4,000, with Bentinck's long lease of Orange Farm as security. This seems not to have gone

[1] Bentinck to Portland, 19, 25 April 1820, BP/PwH/251–2.
[2] BP, Bentinck to Charles Heaton, 22 Oct. 1824.

through; instead, after a further flurry of negotiations, Bentinck raised the £4,000 by selling the advowson of North Lynn, nominally to his Marshland neighbour and former Madras acquaintance, Thomas Hoseason of Banklands, Clenchwarton, but in effect to Portland.[1]

Even this was not enough. On top of agricultural distress and its effects there are hints that in the early 'twenties Portland wanted some of his capital back and had lost faith in Marshland as an investment. At least from December 1820 Bentinck was thinking of selling the freehold of North Lynn as well as, on his brother's behalf, that of Orange Farm. In the next few years he negotiated with potential local purchasers, to no avail. In July 1821 the aged Sir Andrew Hamond agreed to buy Orange Farm; he then took fright, was quickly released by Bentinck from his engagement, and instead lent Bentinck £3,000 on the security of the lease. In 1824 Bentinck proposed that Portland should resell Orange Farm to him as part of a complex bargain whereby Portland would also buy North Lynn and give him a lease of it for life; the difference, "after deducting all [my brother's] advances to me upon different occasions," would have produced nearly £20,000 more capital to pay for drainage and other improvements. (By this time Portland had probably taken over from A. R. Balfour's executors the chief mortgage on North Lynn and some of the accumulated debt.) In the end Portland did at North Lynn as he had done at Orange Farm: in 1825 he bought the freehold and gave Bentinck a lease for three lives; he kept an option to buy back the lease at Bentinck's death.[2]

During Bentinck's absence in India in 1828–35 the relationship between Portland as owner and Bentinck as leaseholder seems to have remained unchanged. Orange Farm was at length sold some time in the late 1830's or early 1840's to William Whisler, who by 1864 had given way to Richard Walker, one of a local landowning family, the Walkers of Alma Lodge, Terrington St Clement.[3] The North Lynn freehold belonged to the dukes of Portland until 1932. The estates have since changed hands again; they now belong to farming companies run on modern business lines. North Lynn, already much changed

[1] Portland took a mortgage of £4,000 on Hoseason's land, thus enabling him to buy the advowson from Bentinck. Hoseason for his part was anxious to prevent the advowson from being sold to one of the local clergy, who would be sure to raise the tithes. A. R. Balfour's executors, who held the chief mortgage on North Lynn, had previously agreed to separate the advowson from the freehold so that it could be sold. The advowson was later (1831) sold at auction; its value was then estimated at £650 a year to the incumbent.—Abstract of title to advowson, bill of sale, Bradfer-Lawrence papers, Norwich and Norfolk Record Office, Norwich.

[2] Bentinck undertook to pay Portland £1,500 a year rent for North Lynn; the Portland estate did not buy back the remnant of the lease until 1880.—Supplemental abstract of title to North Lynn, in the possession of Messrs E. A. Lane (North Lynn) Ltd. During Bentinck's absence in India in 1828–35 the £1,500 rent was paid to Lord George Bentinck, Portland's younger son, who had succeeded Bentinck as member for Lynn. That Portland by the mid-1820's had taken over as creditor from A. R. Balfour's executors is a matter of inference only.

[3] White, *op. cit.*, 1845 edn, p. 570; 1864 edn, pp. 808, 811.

by the diversion of the Ouse, has since 1959 been partly sold off to the Dow Chemical Company for a weedkiller plant; it is flanked by petrol storage tanks. The hall has been pulled down and little remains from Bentinck's day other than a magnificent seventeenth-century barn. The frontage on the Wash that gave him so much trouble is greatly changed as well. At Orange Farm the plain Georgian cottage became increasingly decayed in the latter nineteenth century. It was given a mock-Tudor addition at the back in the 1930's; after the post-war agricultural boom the present owners built on new wings and largely rebuilt the interior in lavish style. At the same time the farm buildings that used to march up to the house were banished out of sight; a large greenhouse now houses a swimming pool. Never, it seems safe to say, has Orange Farm been so prosperous as it is now.

IV

As a Marshland farmer Bentinck may be seen as one among a number of passing figures who strove with varying success to make agriculture a business proposition. As a leading improver he left a more permanent mark. At Terrington St Clement in 1818 he set up a dispensary,[1] and he paid his under-steward's daughter £20 a year to run some kind of school. His notable work, however, had to do with three main undertakings: the Eau Brink Cut; the new road over the Nene at what is now Sutton Bridge, together with the improvement of the Nene outfall; and the improvement of Lynn harbour. When he left for India he was contemplating a fourth: no less than the reclamation of the Wash on the lines since followed by the Dutch in the Zuyder Zee.

Bentinck had bought land as an investment; but his rank was bound to make him a local notable. On his return after the wars he was in demand to take the chair at meetings and pilot legislation through Parliament. His own passion for improvement combined with the pressures of local affairs to make him take the lead, now of this "interest," now of that.

Of the two ventures that chiefly took up Bentinck's time, the making of the Eau Brink Cut to channel the silted and meandering Ouse above King's Lynn concerned most of the "interests" in the area: Lynn itself; the South and Middle Levels of the Fens upriver; and Marshland. In economic terms, it set the Lynn navigation interest at odds with the Fen landowning interest, since Lynn's trade in corn and coal was thought to depend on keeping the rivers navigable as far upstream as possible, while the Fen landowners on their readily flooded peatlands wished to see the waters drained out to sea as fast as possible. The making of the road bridge over Cross Keys Wash at Sutton—involving as it did the channelling of the lower Nene—also set the town of Wisbech at odds with its hinterland in the North Level; it affected

[1] *Ibid.*, 1836 edn, p. 474.

Marshland as well as the equivalent silt area of Lincolnshire, South Holland.[1]

In the making of the Eau Brink Cut Bentinck was at all times identified with Marshland by his landholdings there: he worked closely together with his neighbours Hamond and Hoseason, both of them former naval persons (Hoseason, a Scotsman, had been naval storekeeper at Madras in the early days of Bentinck's governorship). He also had many dealings with the engineers—Thomas Telford and the two John Rennies, father and son—who were retained by the conflicting navigation and drainage interests.

After an initial clash in 1810–11 with the old close corporation of Lynn—a body swayed by a few interrelated merchant families—Bentinck in 1819 sealed an alliance between the Marshland landowners and the Lynn navigation interest. So successful was he in this that two years later he was offered one of the Lynn parliamentary seats all expenses paid (and was allowed to place his nephew in it); two years later he was made a freeman.[2] By the time he left for Bengal it was a matter of course that he should offer the East India writership in his gift, first to one aldermanic Lynn family (the Blencowes), then to another (the Bagges).

The Eau Brink Cut, only one among many attempts at improved drainage of the fens in a long unending succession, was first proposed in 1751, legislated upon in 1795, begun in 1817, opened in 1821; it proved inadequate almost at once and, after many wrangles, had to be widened in the late 'twenties.[3] Bentinck's share in the business at first consisted in reconciling Lynn and then —with the help of his old military friend Sir Henry Bunbury of Mildenhall— the South Level to the proposed cut. In the disputes over the widening of the cut in the 1820's he and the other Marshland proprietors were increasingly drawn into identifying their interests with those of the Lynn merchants against those of the upriver landowners and especially of the Bedford Level Corporation. Much of the struggle—fought out in the courts and through the promotion of local Bills—turned on the Lynn–Marshland proposal to pull down Denver Sluice, where the Old and New Bedford Rivers join the Ouse. It ended in 1825 in a compromise, largely the work of Bentinck and of the Bedford Level agent Samuel Wells: the cut was to be widened and a decision on Denver Sluice put off (the sluice was in fact rebuilt in 1832).

The building of the new embankment and road bridge over Cross Keys Wash was more directly the work of Bentinck as entrepreneur; he also had a large share in pressing forward to a conclusion existing plans to carry the Nene

[1] I hope to deal in detail with these episodes—which raise wider questions about the working of local interest groups and statutory authorities—in an article elsewhere.

[2] *A Calendar of the Freemen of Lynn, 1292–1836*, Norwich, 1913, p. 290.

[3] H. C. Darby, *The Draining of the Fens*, Cambridge, 1940, pp. 130–4, 184 ff. The main sources (both printed and MS.) for the Eau Brink Cut are in the Bentinck Papers and the Bradfer-Lawrence Papers at Norwich.

outfall to Crabhole—a measure which, when completed in 1830, meant a greatly improved drainage for Wisbech, for the North Level of the Fens, and for South Holland.[1]

Throughout his career Bentinck was a wholehearted advocate of good roads as the key to economic improvement. His illustration of what was wrong with Charles Metcalfe as an Indian civil servant was: "He sets no value upon a good road."[2] The proposed road over Sutton Bridge was to encourage the flow of trade by shortening the journey from Lynn to Newark by twenty-five miles. The difficulty was that a road bridge meant the channelling of the lower Nene, still more silted and meandering here than the Ouse before the making of the Eau Brink Cut. Rennie in 1814 had reported in favour of a complete outfall cut right out to sea at Crabhole, both to help landward traffic and to unclog the port of Wisbech. But the project was expensive; it also ran into repeated trouble with the Wisbech merchants whose warehouses a new cut might bypass.

In the matter of the Nene outfall the Marshland proprietors regarded themselves as outsiders. Hoseason wrote that they could justifiably intervene only to build the road bridge: "from our having no property and consequently no vote on the West side [of] the Nene we have no power to interfere in the taxes on lands &c" [needed to pay for the cut]. Bentinck, it followed, was much more of a free agent than over the Eau Brink Cut, where he was thoroughly identified with Marshland and then with Lynn. This seems to have enabled him to act as the catalyst of change.

Bentinck had to wage two "campaigns"—his term—in 1818–21 and again in 1824, before a final sharp burst of negotiation in 1825–6 persuaded all parties to go forward. These were his own initiative: the second time round, in 1824, he decided to "have this subject brought again before the public," if necessary to the point of bringing forward another local Bill (a first Bill had had to be given up in 1821), against the advice of Hoseason and of his solicitors. This struggle too was carried on through public meetings, pamphlets, and the promotion of local Bills. Bentinck also successfully launched a company in 1825 to raise £40,000 and build the bridge. This last seems to have been a calculated move to stir up the Bedford Level interest, which had just reached a compromise with the Lynn–Marshland interest over the Eau Brink Cut and which had no rooted objection to the Nene Outfall Cut. After a further flurry of wrangles and negotiations, Bentinck and the Bedford Level reached another compromise in March 1826. Under its terms agreed Bills were promoted; both bridge and outfall cut were built by 1830.

[1] Darby, *op. cit.*, pp. 194 ff.; D. Grigg, *The Agricultural Revolution in South Lincolnshire*, Cambridge, 1966, pp. 31–2, 140–1.

[2] Bentinck to Charles Grant, 14 April 1834, quoted in E. Thompson, *The Making of the Indian Princes*, 1943, p. 176.

Better agricultural fortunes in the mid-1820's probably helped to secure this result. The cost of the outfall cut—the final estimate by Telford and Rennie in 1826 was for £161,726—would have seemed prohibitive in the distressed years. By 1825–6 the upriver proprietors seem to have needed no more than a push—which Bentinck supplied. The impulse, though helped by the speculative fever of 1825, outlasted it. Bentinck himself had been fairly belligerent at times; in launching his bridge company in May 1825 he had announced that since "insuperable difficulties" in the way of Rennie's complete Nene Outfall Cut (which he supported) "probably still continue. . . I for one shall take no further trouble to remove them:" he would go forward with the bridge regardless. In 1826, however, he felt it "most desirable to avoid opposition and not to put to hazard a measure which, if it should now fail, will in the general opinion be lost for our times."

Bentinck thus for some ten years played a leading part in the improvement of the whole of the Fen country. Some of this work was, at that time, almost bound to come the way of a man of his rank who owned property in the area. But much of it came from his own inclination: he "must improve and invent." At Lynn he was in correspondence with Rennie in 1826 over the need for a deep water dock—something that was built only in the 1840's; in 1835, after his return from India, when he was no longer M.P. for Lynn or even thinking of standing there, he proposed to the Mayor the building of a quay. A year later he retorted to the Duke of Bedford and the North Level, who were opposing the "wild and desperate plan" for carrying the Great Northern Railway across their land, that "for a price I should consider such a project, executed at the expense of others, a godsend."

The project that most clearly transcended local interests was the reclamation of the Wash. Bentinck had long been interested in land reclamation, not only on his own property at North Lynn but on public grounds: in the manœuvres over the proposed Sutton Bridge he had canvassed the elder Rennie's forecast that it would make possible the reclamation of some 1,390 acres. In 1825 he began to look into plans, which several engineers had already suggested in the past, for taking not only the Nene but perhaps also other rivers to outfall points far out into the Wash. Bentinck's 1825 memorandum to the Office of Woods and Forests dealt only with the Nene and Ouse; it suggested that a scheme of this kind might lead to the reclamation of 50,000 acres and greatly improve the drainage of 400,000 more. By the time the younger Rennie had carried out a survey on behalf of a committee with Bentinck at its head the project had grown to Zuyder Zee proportions: there was now to be a single channel in mid-Wash uniting all four main rivers (Witham, Welland, Nene, and Ouse); the area to be reclaimed was, Rennie later said, "from 150,000 to 200,000 acres . . . in other words, a new county, of most valuable land, would be

added to the kingdom." The new project "took the world by surprise;" but when Bentinck and Hoseason went to India in 1828 "there remained none of sufficient energy and influence to push it forward." The only—belated—result was the setting up of the Estuary Company under an Act of 1846; its purpose was to reclaim land from the Wash, but all it achieved was the new Marshland Cut below Lynn.[1]

Bentinck was something of an all-purpose improver. He did not become rooted in Marshland; there is no sign that he wished to be. He took his Norfolk experience with him to Bengal; there he wrote off to his brother for samples of British draining tiles—"I hope to do miracoli [miracles] with them."[2] He also concerned himself with the drainage of Calcutta and with steam navigation on the Ganges: as he once or twice explained to fellow servants of the East India Company, he knew something of such matters through his work on the Eau Brink Cut.

V

What Bentinck had not got out of Marshland was the "competency" he had hoped for back in 1809. But for his brother Portland he might easily have gone bankrupt, like so many others, in the bad years around 1820. His reason for going out to Bengal in 1828 seems to have been at least partly that he needed, yet again, to recoup his fortunes. There was no doubt a touch of special pleading in his declaration—to a young friend whom he wished to dissuade from coming out as his aide-de-camp—that "I know not any good whatever, except riches . . . , to be had in India;"[3] but perhaps only a touch.

At least three years earlier Bentinck had made a will based on the expectation that the sale of the leases of Orange Farm and North Lynn would yield his widow a clear £2,000 a year. This suggests an unencumbered capital of £40,000. It seems an optimistic estimate to have made just then. Bentinck spent seven active and rigorous years in India. He was often ill; once or twice he feared he would not last the course. In 1831 he hoped to leave in January 1834, to "take away near £40,000 and to find a clear income at home—but to live so long may be some difficulty."[4] He did not in fact return until 1835; by then his total savings may have amounted to £70,000 or more. Much of this must have gone in scttling debts, some of them dating from the 1810's. Bentinck spent his last few years as member for Glasgow and as a promoter of steam navigation to India. When he died in 1839 all his property—unstated—went to his widow. When she in turn died four years later her will was proved

[1] Sir J. Rennie (the younger), *Autobiography*, 1875, pp. 206–8; H. J. Hillen, *History of the Borough of King's Lynn*, Norwich, 1907, pp. 781–4.

[2] Bentinck to Portland, 11 Sep. 1830, BP/PwH/280.

[3] Bentinck to Harry Verney, 8 July 1827, Claydon House MSS. (quoted by kind permission of Sir Harry Verney, Bart.).

[4] Bentinck to Portland, 14 Aug. 1831, BP/PwH/286.

at under £40,000. It was not much to show for a total of eleven years as an Indian governor. After various legacies, Lady William left one-seventh of the residue to each of three Bentinck nephews, and four-sevenths to the widow and children of her husband's brother Lord Charles Bentinck.[1] In 1879 Lord Charles's grandson succeeded as sixth Duke of Portland. Lord William's lifelong enterprise, first spurred on by the principle of primogeniture and then saved by it from failure, thus ended by benefiting the holder of the title.

In economic terms some of Bentinck's investments, notably in the oil mill, must have run to waste. His attempts to improve his own farms possibly, and his work on fen drainage certainly, made that part of East Anglia more productive. India paid for much of it, and got in exchange the services of one of her better governors.

[1] Wills of Lord William Bentinck (proved 5 Nov. 1839) and Lady William Bentinck (proved 5 May 1843), Probate Registry, Somerset House.

NOTES AND COMMENTS *continued from page* 24.

In private life his extraordinary range of interests, his love of music and literature, his enormous sense of fun, and fabulous fund of stories made him the liveliest of friends and the centre of any gathering. It was impossible to feel dull or depressed in his company.

G. E. MINGAY

PRESENTATION OF THE "FESTSCHRIFT"

The *Festschrift* in honour of Professor H. P. R. Finberg, which was published as a Supplement to the REVIEW in September, was presented to him at a dinner held at Sadler Hall, Leeds University, on 25 September. The dinner was attended by representatives of Leeds University, present and former members of the executive committee of the B.A.H.S., contributors to the volume, and other members of the Society who live locally.

1970 WINTER CONFERENCE

The winter conference of the Society was revived this year and took place in the Department of Geography, University College London, on Saturday, 28 November. The theme was 'Agriculture and the History of the Environment'; it was extremely well attended. In the morning, papers were read by M. D. Hooper and J. Sheail on 'Agricultural Change and its Impact on Wild Life' and by Hugh Prince on 'Antiquarianism in the English Landscape'. In the afternoon E. J. Collins read a paper by E. L. Jones on 'Agriculture's Reduction and Renewal of Bird Pest Problems in recent Centuries'; and George Ordish read a paper on 'The Ecological Implications of Pest Control: a Historical Survey'.

1971 ANNUAL CONFERENCE

The 1971 Conference will be held at Bodington Hall, Leeds, from 5 to 7 April. It is open to all, whether members of the Society or not. Further details are enclosed with this issue of the REVIEW.

The Enclosure and Reclamation of the Mendip Hills, 1770-1870

By MICHAEL WILLIAMS

INTRODUCTION

THE subject of the enclosure and reclamation of the 'wastes' of the country has received relatively little attention. Most research work on enclosure has been concentrated upon the question of the enclosure of the commonable arable fields and the social and economic consequences that ensued. There have been exceptions, of course: the work of Hoskins on Devon and Orwin on Exmoor in Somerset are important reminders of the type and abundance of evidence that exists about the changes which occurred in these waste lands. And more recently, the work of Harris on the East Riding of Yorkshire has delineated some of the important points and patterns of enclosure and reclamation on the Wolds. But, generally speaking, we know little about the extent and effect of enclosure and reclamation on the hitherto waste areas.[1]

The purpose of this paper is to look at the enclosure and reclamation of one local area, the Mendip Hills in Somerset. Between 1770 and the end of the nineteenth century, 144,369 acres of land, previously considered to be waste or commonable pasture, were enclosed by Parliamentary Act throughout Somerset. The Mendip enclosures accounted for about 17·7 per cent of the total land affected, most of the remainder being in the lowland floodable levels (41·4 per cent), the uplands of Exmoor (30·7 per cent), and the chalk Blackdown Hills along the southern border of the county (8·1 per cent) (see inset, FIGURE I). Although the amount of land affected by Parliamentary Act in the Mendips is small when compared with the amount in other parts of the county the reclamation commands attention because it was distinctive in many ways, and because it is well documented through the writing of John Billingsley, who wrote the County Agricultural Report in 1797 and was an energetic advocate of reclamation and enclosure, both as a writer and as a practical farmer.

THE SETTING FOR RECLAMATION AND ENCLOSURE

The Mendip Hills are a distinctive regional unit, most of which consists of carboniferous limestone which is over 600 feet, and much of which forms a remarkably uniform plateau of between 800 and 900 feet. Several inliers of old

[1] See W. G. Hoskins, 'The Reclamation of the Waste in Devon, 1550–1800', *Econ. Hist. Rev.*, 13, 1943, pp. 80–92; C. S. Orwin, *The Reclamation of Exmoor Forest*, 1929; A. Harris, *The Rural Landscape of the East Riding of Yorkshire, 1700–1850*, 1961.

red sandstone swell up above the general plateau surface and give rise to land in excess of 900 feet. The central plateau is bleak and the soils shallow, and despite an average annual rainfall that exceeds 50 inches in places there is little surface water because of percolation.

In 1791, Collinson described the desolate pre-enclosure landscape that existed above Wells: "In many parts there is very little depth of earth, the rocks rising above the turf, which, however, affords good pasture for sheep and young cattle. The surface in other parts is covered with heath, fern, and furze. The air, especially in winter, is moist, thick, and foggy, and so very cold that frost and snow inhabit these heights longer than they do almost any other parts of the county; and the few remaining trees, their leaves blasted and discoloured by the severe winds from the Channel, never attain to any considerable size."[1]

Before enclosure most settlement had ringed the plateau and was situated on the lower sheltered and warmer soils of the fringes. A plot of the villages and individual houses from Day and Master's map of 1782 shows this clearly and further reveals only two significant clusters of habitation on the plateau, at Charterhouse and Priddy, some of this settlement being associated with lead-mining, the working of which, over the centuries, had pitted and scarred the plateau surface. There was also some settlement on the eastern portion of the plateau beyond Wells, where it narrowed and was slightly less exposed (see FIG. I).

Each of the major nucleated settlements in the "fine rural vales"[2] that ringed the Mendips obtained a portion of the marginal lands of the plateau, their claim being based on ancient stocking rights exercised on the waste. Ubley was the first settlement to enclose its part of the plateau in 1771, followed by Doulting in 1775. During the years from 1782 to 1797 each of the other settlements did the same.[3]

After 1797, only the enclosures of Cheddar (no. 33, 1811) and, one hundred years later, Burrington (no. 161, 1911) were concerned with the main body of the Mendips and the remainder of the enclosures were on the outliers of carboniferous limestone to the north, at Wrington and Long Ashton Downs.[4]

From FIGURE I it can be seen that the greatest part of the area affected by enclosure was above 700 feet and on the exposed plateau top, a relationship which

[1] J. Collinson, *The History and Antiquities of the County of Somerset*, III, Bath, 1791, p. 374.

[2] *Ibid.*, p. 587.

[3] The details of the extent of land enclosed are taken from the maps which accompany the enclosure awards for these parishes, and represent the actual area involved. These awards are in the Somerset Record Office, Taunton, and each reference is followed by the Record Office numeration and the date of the Act. Those affecting the Mendips are: Ubley (no. 62, 1771); Doulting (no. 58, 1775); Shepton Mallet (no. 27, 1782); Wookey (no. 134, 1782); Blagdon (no. 132, 1784); West Harptree (no. 18, 1787); Compton Martin (no. 71, 1788); the Mendip portion of Bleadon (no. 22, 1788); Croscombe and Dinder (no. 72, 1792); Wells (no. 73, 1792 and no. 81, 1793); East Harptree (no. 65, 1794); Cheddar (no. 38, 1795); Shipham and Winscombe (no. 13, 1797), and Chewton Mendip (no. 23, 1797).

[4] Wrington (no. 124, 1810); Backwell (no. 6, 1807); Long Ashton (no. 119, 1813).

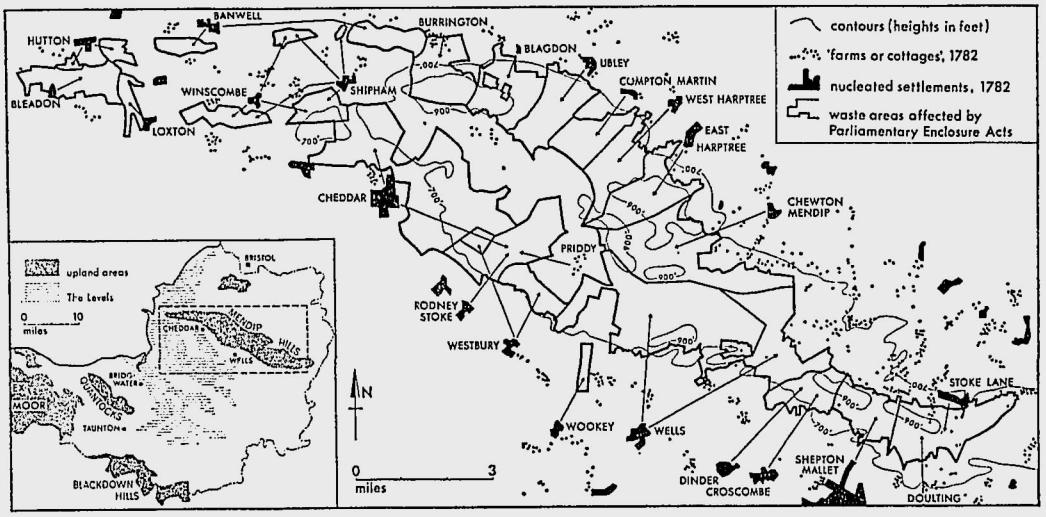

FIG. I

Somerset and the Mendip Hills. (Based on enclosure awards and maps, Somerset Record Office, Taunton; Day and Masters' map of *The County of Somerset*, 1792)

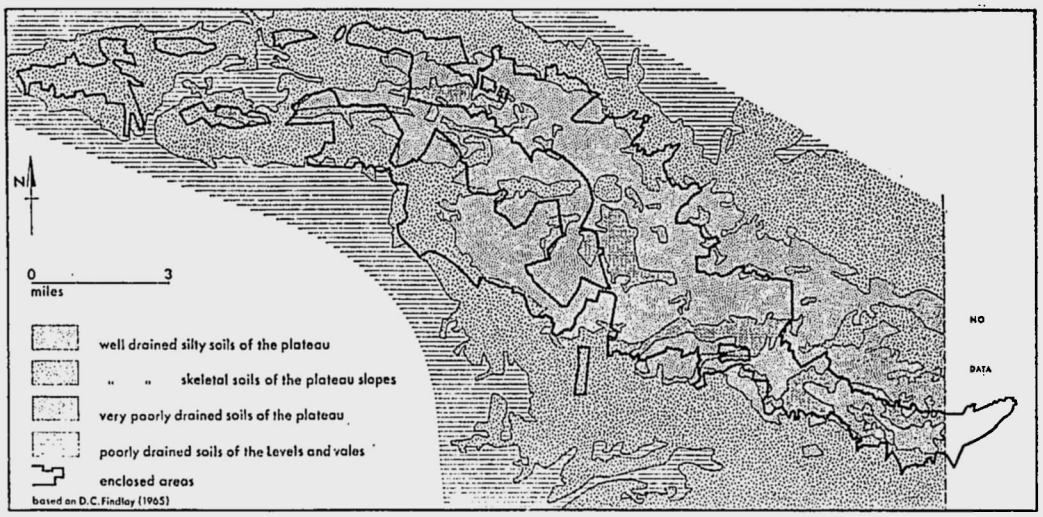

FIG. II

The soils of the Mendip Hills and surrounding areas. (The well-drained silty soils of the plateau include the Nordach, Mendip Complex, Maesbury, and Ellich Series; the well-drained, but shallow, skeletal soils of the plateau slopes include the Lulsgate, Wrington, and Stone Easton Series; the very poorly drained soils of the plateau include the Priddy, Ashen, Thruppe, and Coalpit Heath Complex Series; and the poorly drained soils of the Levels and the vales include the Wentlloog, Allerton, and other Series. Based on D. C. Findlay, 1965. See p. 68, fn. 1.)

becomes more striking when the contemporary private enclosures, lying between Shipham and Priddy in the centre of the plateau, are taken into consideration. There were two main exceptions to this however: on the gentler slopes above Cheddar and on the blocks of high ground which mark the break-up of the main mass of the Mendips, westwards towards Brean Down. On these western upland blocks, open waste land was located at much lower altitudes than on the plateau because of greater exposure to the sea and because of shallower, rockier soils, developed on the steep slopes.

The distribution of soil types is closely associated with the morphological aspect of the region, and soil type is a sensitive indicator to early reclamation endeavour, the relatively easily ploughed loams being the locale of the new colonization of the Hills in the late eighteenth century (see FIGURE II). These easily worked loams consist of four soil series, all of which have a similar profile and morphology, although developed on different parent material. They constitute a part of a major soil group, the Brown Earths. The 800-foot plateau and the area of the lower, 300–400-foot plateau near Chewton Mendip and Emborough are covered by these free-draining Brown Earths, mainly of the Nordach Series which is a silty, dark-brown soil of up to 30 inches in depth. It can be slightly to moderately acid in its reaction. The Nordach Series merges into the shallower, and sometimes stonier, soil of the Mendip Complex, mainly in the vicinity of Priddy and the northern and southern edges of the plateau. In other places, on the Old Red Sandstone inliers above 900 feet, soils of the Maesbury and Ellick Series have developed, and they are very similar to the Nordach soils in that they are silty and free-draining, but different in that they are moderately to very acid.

Around the edge of the plateau, in steep valleys and particularly on the fretted western extremity of the plateau, are more free-draining soils of the Lulsgate, Wrington, and Stone Easton Series which were not attractive for reclamation, being very shallow and stoney. These skeletal soils have remained as areas of rough grazing, particularly on the western blocks of enclosure. Entirely different from all these soils are the patches of poorly drained, peaty, gleyed podzols of the Priddy and Ashen Series which are found interspersed with the Nordach Series on the plateau top. These are spongy black soils underlain by a rusty-coloured horizon of iron enrichment. The Thruppe Series and Coalpit Heath Complex are similar in their poor drainage. These soils were difficult to cultivate because of their surface wetness, the iron pan, and their great acidity. Finally, the whole of the soils of the plateau and its fringes were surrounded by the ground-water gley soils of the Levels to the south and west and the Yeo and Chew valleys to the north.[1]

[1] For further information, see D. C. Findlay, *The Soils of the Mendip District of Somerset*, Memoirs of the Soil Survey of Great Britain, H.M.S.O., 1965.

Enclosure, of course, transformed the landscape of the plateau. The open sheep-walks disappeared, and were subdivided by hedges and fences into a regular network of fields. New farmsteads were established and new crops were introduced. Phelps in 1839 said that the enclosures had quite "altered the aspect of the forest. Farm homes have been built and an increasing population is spreading itself, roads communicating with different towns and villages round its base intersect this once dreary mountain in various parts, affording an easy access to it. Arable husbandry predominates wherever the soil will admit the plough, and fine crops of barley, oats, and in more favoured spots, wheat, are grown. Turnips and other vegetables capable of resisting the ordinary winter frosts, thrive well."[1] It is these elements of the new and changing landscape of the plateau that will now be examined in detail.

CHANGING LAND USE

Writing in 1794, Billingsley accurately distinguished between the two main soils of the plateau which he described as "for the most part deep, loamy and of a good consistence" and elsewhere as "a fine yellow mould," although occasionally there were to be found "spots of land less valuable, being of a light spongy nature, black in colour and totally unproductive of corn on the first cultivation."[2] He seems to be referring to the Nordach and Priddy series respectively.

Both soils presented problems, and a great deal of preparatory labour and capital investment were needed before they could be cultivated successfully. The paring and burning of turf was a long-standing West Country technique for the colonization of new land and although it had never been practised in the Mendips, it became a widely advocated answer to the problem of preparing the loams and the black moulds for cultivation during the late eighteenth century. But paring and burning was not the total answer to these soils; their acidity could be counteracted only by liming. By extensive and laborious experiments, accompanied by careful accounting, Billingsley was able to demonstrate the superiority of liming over paring and burning on his own Mendip land.[3] The various stages suggested and carried out by Billingsley in preparing the Nordach Series soils either for cultivation or for improved pasture are perhaps best summarized in tabular form, together with his estimate of the cost of each operation on each acre of average land.

[1] W. Phelps, *The History and Antiquities of Somersetshire*, London, 1839, II, pp. 7–8.

[2] J. Billingsley, *A General View of the Agriculture of Somerset*, 2nd edn, 1798, p. 77. Pages 17–141 of Billingsley's book deal with aspects of the new Mendip farming, and great use is made of this material throughout this paper, but no reference is made to the *General View* unless specific quotations are taken from it.

[3] J. Billingsley, 'Account of the Culture of Carrots; and Thoughts on Burn-baiting on Mendip-hills', *Letters and Papers of the Bath and West of England Society*, I, 1788, pp. 214–19; J. Billingsley, 'On the Culture of Potatoes', *Annals of Agriculture*, XXI, 1793, pp. 1–32.

	£	s.	d.
Removing rocks, clearing stones, levelling, burning furze		15	0
First ploughing	1	1	0
Second cross-ploughing		18	0
Dragging		8	0
First harrowing		3	0
Liming at 160 bushels per acre	2	10	0
Spreading lime		2	0
Second harrowing		1	6
Rolling		1	0
Third ploughing		5	0
Third harrowing		1	6
Rolling		1	0
Fourth ploughing		5	0
	£6	12	0[1]

If the above thorough scheme of reclamation was carried out by Billingsley, then there was every justification for the claim made for him that he had ploughed and reploughed his 3,000 or 4,000 acres of land four or five times, and that he had spread 500,000 bushels of lime on it.[2]

These methods of improvement were tedious, expensive, and above all, ineffectual on the soils of the Priddy series. On this soil, paring and burning were a useful beginning, and with the spreading of lime some improvement was possible. But the hard clay pan at about 6 to 8 inches below the black humus silt still impeded drainage and had to be broken up. One method used widely before deep-ploughing became common, was to shallow-plough and harrow the land, then throw it into a series of mounds and gutters to expose the rust-coloured iron pan. The land could then be either planted to potatoes or let out to potato-growers; the clay was pulverized by pick-axe or mattock and thrown up on to the mounds of black silt thereby giving them some tenacity. The total operation was calculated to cost £15 an acre, but this did not take into account the return from the potatoes, which could equal or exceed the costs of improvement. The next season the alternative areas were selected for gutters or mounds, so that over the course of a few years the whole of the pan was broken, and the soil turned and mixed.[3]

[1] J. Billingsley, 'An Essay on Waste Lands', *Letters to the Bath and West of England Agricultural Society*, XI, 1807, pp. 43–7 (hereafter J. Billingsley, *Waste Lands*).

[2] Editorial comment appended to an article by J. Billingsley, 'Remarks on the Utility of the Bath and West Society with an Account of the Progress and Improvements in the County of Somerset', *Letters to the Bath and West of England Agricultural Society*, X, 1805, p. 246.

[3] Findlay, *op. cit.*, 1965, p. 54, comments on the modification of the Priddy soils by cultivation and suggests that they may have been far more extensive than present mapping indicates. For comments on the reclamation of East Cranmore Common, see Billingsley, *General View*, p. 77.

Ideally, a mixed farming system would have been best for the Mendips, and Billingsley's advice was "to provide all necessary buildings for shelter in the winter, and for the purposes of making mountains of dung" and to the farmer "to grow but little corn and that little in the highest perfection; to have breadth of turnips, cabbages, vetches, artificial grasses" and consequently "to maintain a great stock" of sheep, cattle, pigs, and poultry.[1] Unfortunately the course taken was the reverse of these wise suggestions; allotments were assigned to farms in the vales and the Levels, and farmers took six or seven crops of grain in succession, a 'rotation' of wheat, oats, oats, oats, fallow, wheat, oats, being common. One farmer, in 1851, after taking three crops of oats in succession from one field was still saying that he would "take as many oat crops as the land would bear first . . . then lime it, and take only two crops as he wished to lay it down to grass in good heart!"[2] It was sheer exploitation which beggared the plateau soils to such an extent that some landlords restricted ploughing, even going so far as to limit tenants to grazing alone.[3]

Some indication of cropping in the parishes in the vicinity of the Mendips is given in TABLE I. It is based on the Agriculture Returns of 1801 for Somerset. Not all parishes were covered by the Returns, and in the Mendips those for Priddy, Charterhouse, Westbury, and Ashwick in particular, are missing. Nor

TABLE I

PERCENTAGE OF LAND IN CROPS, 1801

Parish	*Total acreage*	*Wheat W*	*Barley B*	*Oats O*	*Potatoes Po*	*Peas Pe*	*Beans B*	*Turnips and Rape*	*Crop combination*
Rowbarrow	40	32·5	—	55·0	12·5	—	—	—	W O
Blagdon	1,240	64·8	0·4	27·4	4·8	0·3	0·5	1·6	W O
Wells	1,533	33·9	5·7	48·7	9·4	2·0	2·6	0·4	W O
Shepton Mallet	101	21·8	6·9	61·3	4·9	4·9	—	—	W O B
West Harptree	267	18·7	2·2	56·2	14·9	0·3	—	7·4	W O Po
East Harptree	367	19·6	4·0	64·8	11·5	—	—	—	W O
Ubley	198	55·6	11·6	19·1	10·6	1·0	2·0	—	W O
Compton Martin	446	34·7	17·2	25·3	5·6	1·0	0·5	15·7	W O B T
Chewton	467	33·4	4·3	49·0	8·0	4·4	0·4	0·4	W O
Dinder	181	26·0	1·0	63·0	7·0	1·3	—	1·0	W O
Cheddar	302	59·3	2·9	11·9	15·2	1·0	9·6	—	W Po
Wookey	213	50·3	10·2	18·7	7·0	7·0	4·6	2·4	W O

[1] Findlay, *op. cit.*, 1965, p. 78.

[2] T. D. Acland, 'On the Farming of Somersetshire', *Jnl Roy. Agric. Soc. Eng.*, XI, 1850, p. 666. Reprinted the following year with William Sturge's essay and entitled *The Farming of Somersetshire*, from which this quotation is taken, p. 73.

[3] Public Record Office (P.R.O.), Home Office documents, H.O. 67/2; Billingsley, *Waste Land*, p. 49.

were all the crops grown at the time recorded in the Returns. Nevertheless, provided one does not place too much emphasis on the absolute amounts, but considers more the proportion of any parish under particular crops and their ranking one against another, then the Returns can be fairly safely regarded as a sample of the true conditions.[1]

Wheat was important enough to account for more than 50 per cent of the crop land in Blagdon, Ubley, Wookey, and Cheddar and there was not one parish which did not return some wheat. But oats was in an even more commanding position being grown in all parishes and accounting for over 50 per cent of the crop land in Rowbarrow, Shepton Mallet, West and East Harptree, and Dinder, and over 48 per cent in Wells and Chewton. Barley hardly entered into the Returns for the Mendips. The outstanding preference for oats lay in its suitability to the harsh climate and thin soils of the plateau, conditions which also accounted, in part, for the abundance of potatoes which was over 10 per cent of the cropland in five of the twelve parishes. All in all, the evidence of the Returns supports independently the evidence from other sources.

After the period of exploitive grain-farming died down in the 1820's and 1830's, grazing became important again, and was accompanied by a great expansion of potato-growing, the potatoes being cropped alternately with oats. Over 2,000 acres in the vicinity of Priddy alone were either planted by local farmers or the land was let out to the 'potato-jobbers', as they were called, who came up to the plateau for a short season. Eventually, falling prices and the potato plague put an end to this system.[2] One can say that by the middle of the nineteenth century the Mendips were used in the summer mostly for the grazing of cattle from the Levels and for the grazing of sheep throughout the year, and that there were also substantial patches of land being cultivated intelligently by the farmers that had come up on to the plateau to establish their farmsteads. But much still needed to be done and it was Acland's view in 1851 that "assuredly, a large part of the Hill must be reclaimed again before it can be properly farmed."[3]

HEDGES AND FENCES

Enclosure implied hedging and fencing and between 1771 and 1813 some 24,000 acres of land were enclosed by Parliamentary Act together with about 3,500 acres of land without an Act in the central area of the plateau. At the present time 100 acres of enclosed land results in a varying amount of fencing, depending upon the size of the fields, and upon the length of roads, which require double fencing. A series of random sample counts in 100 acre squares on

[1] Based on P.R.O., H.O. 62/2. For a discussion of the validity of the Returns and the working out of the crop combinations, M. Williams, 'The 1801 Crop Returns for Somerset', *Proc. Som. Arch. & Nat. Hist. Soc.*, 113, 1969, pp. 69–85.

[2] Acland and Sturge, *The Farming of Somersetshire*, pp. 73, 145. [3] *Ibid.*, p. 76.

the plateau gives results varying from 5 miles of fencing per 100 acres to 7·8 miles, but many fall around 6 miles. By extending this average figure over the 27,500 acres enclosed, then 1,650 miles of fencing and hedging were needed to produce the present pattern, a good measure of the effort involved in remoulding the landscape.

Because of the abundance of carboniferous limestone which either outcropped or was lying near the surface of the shallower soils, dry walls were most common, although they gave "a farm a very cold and naked appearance," and gave very little shelter to stock. Yet the enclosers often preferred the hawthorn quickset, although other kinds of hedge were occasionally planted, such as blackthorn, holly, and elder. The quickset grew rapidly and soon became close, thick, and impenetrable, such as those hedges near Shepton Mallet which by 1806 were 8 to 10 feet high, and so thick that it was said "that a bird can scarcely creep between them."[1]

Billingsley, who farmed at Ashwick Court, near Oakhill, was the principal advocate of the quickset, and as he sat on at least seven of the Mendip enclosure commissions (no. 65, East Harptree; no. 33, Rodney Stocke; no. 18, West Harptree; no. 81, Wells; no. 73, Horrington; no. 72, Croscombe and Dinder; and no. 38, Cheddar) and had reserved substantial allotments in these and other enclosures, he had plenty of opportunity to put his preferences into practice. Billingsley was said to have enclosed between 3,000 and 4,000 acres of his own land, creating nearly 100 miles of hedge and ditch fencing, and to have planted 1,500,000 thorn plants. At his own recommended planting of one every 3 inches this gives approximately 95 miles of quickset fencing, which tallies well with the previous estimate of 100 miles.[2]

But the rigours of the exposed situation of the Mendips demanded that some sort of 'dead' fence, usually a dry stone wall, be erected as a temporary shelter, it being recommended that the wall be demolished later, the stones to be used for either lime-burning, road-building, or drain-making, or, if they were of good quality, for farm buildings. The advantage of the dry wall as a rapidly erected shelter was enhanced by the cheapness of its construction, especially where the stones were abundant and had to be cleared from the fields anyway. A substantial dry wall, 2 feet wide at the bottom and 5 feet high cost 10s. or less per rope (20 feet) in 1806 which compared with 11s. for hedges with banks; 13s. 6d. for quickset hedge with a low stone wall; 15s. for a list wall (a

[1] Billingsley, *Waste Lands*, p. 10.

[2] Editorial comment appended to an article by J. Billingsley, 'Remarks on the Utility of the Bath and West Society with an Account of the Progress of Improvement in the County of Somerset', *Letters to the Bath and West of England Agricultural Society*, x, 1805, p. 246. This figure for the length of fencing is about one-half of that calculated for the present day (see above), but this is reasonable as the initial enclosure was usually concerned with the fencing-in of large blocks of land, and the internal subdivisions were erected later.

combination of dry-walling and turf), and 17s. 6d. for a mortared stone wall.[1]

Exposure to the weather was one problem in the establishment and growth of the live hedges, and stock were another. Some protection from the ravages of stock was afforded by the sheltering stone wall on one side, and after a ditch was dug on the other side. But these measures could have provided only a partial solution to the problem for the need was to keep livestock out of the field for as long as possible after the hedges had been planted. This was stipulated in some enclosure awards, although how well this regulation was observed, is not known.

All in all, the dry limestone walls predominated and gave to the Mendips one of the distinctive elements of its landscape. Writing in 1851 Sturge said, "the fences are generally stone walls, with a few white thorn hedges," a description that one would not need to alter at present. Yet, he added that although the low stone walls were inexpensive because of the abundance of stone, they were ill-adapted to "this bleak district." The high Devonshire and west Somerset banks with beech on top would have served the stock better.[2]

Closely associated with fences and hedges was the planting of trees. Billingsley summed up the advantages well. "Judicious and well-disposed belts and clumps of trees increase the beauty as well as the value of new inclosures. There are very few descriptions of soil or climate where trees of some kinds will not grow in clumps. They afford shelter and defence to the fields, are pleasant to the eye and ultimately profitable."[3] He recommended planting fir, larch, beech, ash, sycamore, and birch at one perch intervals along the hedges, but his suggestions were rarely taken up in practice as relatively few hedges were established and trees were more usually planted in clumps or belts. FIGURE IV shows the outcome of planting in the three typical parishes of Ubley, Compton Martin, and East Harptree on the northern portion of the Mendip Hills. This pattern of woodland plantation, mainly for windbreaks rather than for timber, was the result of many haphazard individual landlords' and tenants' decisions; there was little method or plan in it compared with the almost circular plantation that enclosed about 400 acres on Green Ore Farm in Chewton Mendip, which excited much comment and attention from the local agricultural writers of the nineteenth century.[4]

[1] Billingsley, *Waste Land*, pp. 17–18. Writing fifty years later, Acland gave an even lower price of 1s. 8d. per rope for low stone walls for dividing up the major allotments, which, if correct, enhanced even more the competitive advantage of dry walling against other types of fencing.—Acland and Sturge, *The Farming of Somersetshire*, p. 75.

[2] Acland and Sturge, *The Farming of Somersetshire*, 1851, pp. 146, 148.

[3] Billingsley, *Waste Land*, p. 23.

[4] Acland and Sturge, *The Farming of Somersetshire*, pp. 74, 147; J. Darby, 'The Farming of Somerset', *Jnl Bath and West Eng. Soc.*, v, 1873, p. 131 *et seq.* These plantations may owe much to Billingsley for Acland (p. 76) says that Billingsley erected many of the buildings on the farm.

THE NEW FIELDS

An inspection of any of the enclosure maps of the eighteenth and early nineteenth centuries reveals allotments ranging in size from less than 1 acre to over 250 acres. The Commissioners were concerned with the fencing of the major boundaries, and carefully stipulated on map and in schedule the owner's responsibilities for erecting fences, but, the internal subdividing fences of the larger areas were left to the discretion of the landlord or tenants. For example, the Ubley and West Harptree enclosures in FIGURE IV show a great deal of internal subdivision compared with the original layout in FIGURE III. Sometimes, however, the internal subdivisions were suggested in the award, as at Compton Martin, although these were never fixed by fences, presumably, because they made fields which were too small. Thus the enclosure awards were responsible for many, though by no means all, of the new fields. By and large, the skeletal framework of the new landscape was laid out in the late eighteenth century.

The new fields were distinguished by two features, first their regular geometrical shape, and secondly their size. The regularity and geometrical division of the plateau was in marked contrast to the older landscape in all surrounding areas, except for the Levels, where draining had left its own peculiar imprint on the land. Straight lines and right-angles tended to dominate the rural scene and contrasted with the irregular pattern that had evolved through centuries of making the landscape elsewhere. The new fields tended to be oblong rather than square, but whether this was sheer chance or deliberate planning by the Commissioners following Billingsley's advice is not known. Billingsley felt that ease of access and the provision of gates was facilitated by oblong fields, and he also averred that the feeding-off of the pasture was accomplished more economically.[1]

In order to test this oft-quoted generalization that large fields resulted from parliamentary enclosures, the modern field sizes have been plotted in FIGURE V for the main mass of the plateau and for an area of equivalent size surrounding it. Certain areas have been excluded from the map because of urban development, quarrying, or because of a pattern of minute gardens and fields too small to show. Fields have been grouped into three categories; those less than 10 acres, those between 10 and 20 acres, and those of 20 acres or more, any group of two or more contiguous fields in any one category being plotted. The results are also presented in tabular form on p. 78, but in seven categories, the first six of which are based on 5-acre intervals.

The smallest fields are in the oldest settled areas; on the fringes of the plateau and in other areas of early settlement in the vicinity of Priddy in par-

[1] Billingsley, *Waste Land*, p. 27.

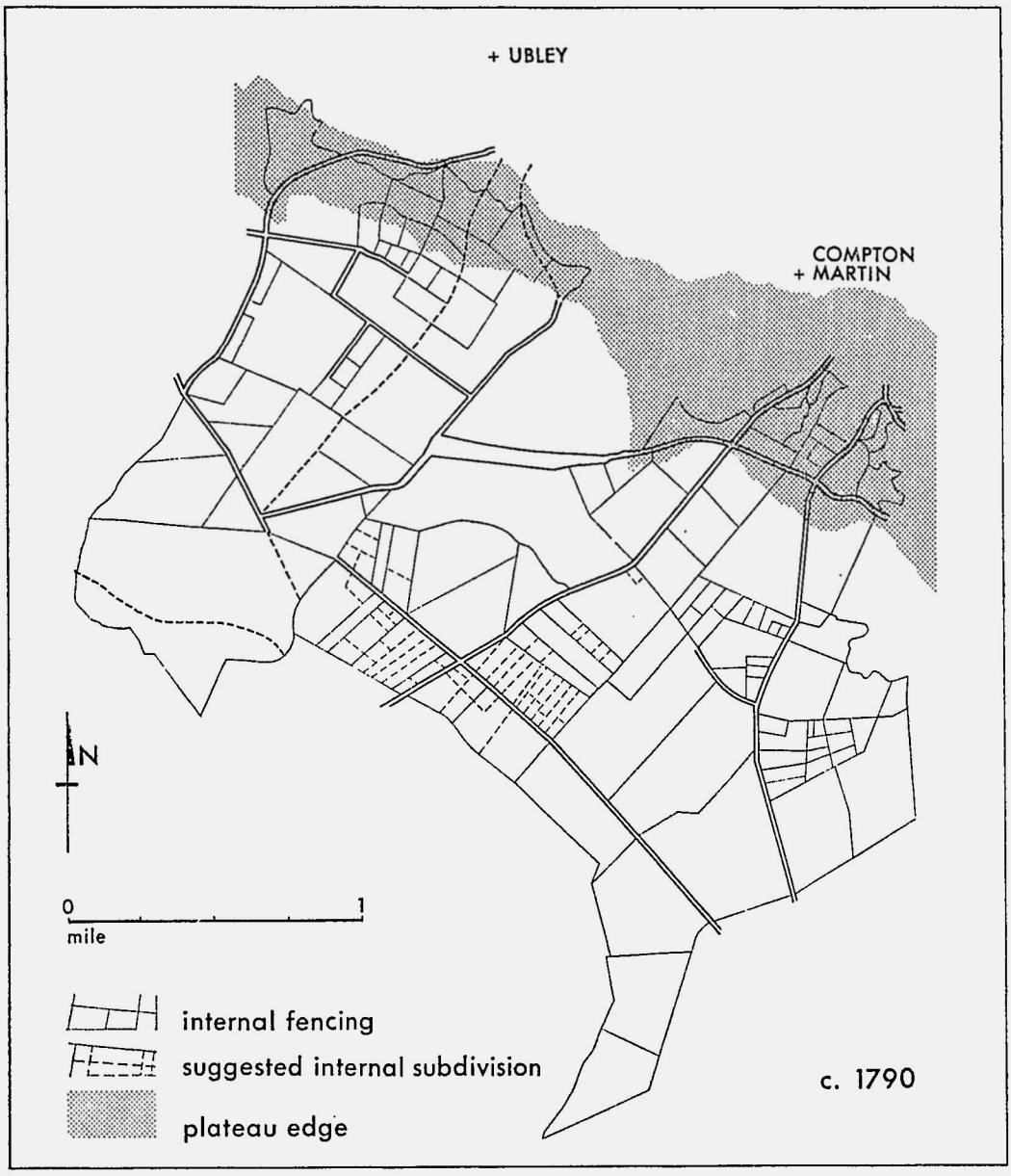

FIG. III

The Mendip enclosures of the parishes of Ubley, East Harptree, and Compton Martin, *c.* 1790. (Based on enclosure awards and maps.) The shaded plateau edge lies between the 800- and 400-foot contours

ticular, around Charterhouse, and surrounding the pre-enclosure farmsteads of the two Haydons, north-east of Wells, and Middle Ellick Farm in Blagdon. Some of the small fields are more modern, however, and in the vicinity of most new farms there were three or four small enclosures that show up as pockets of

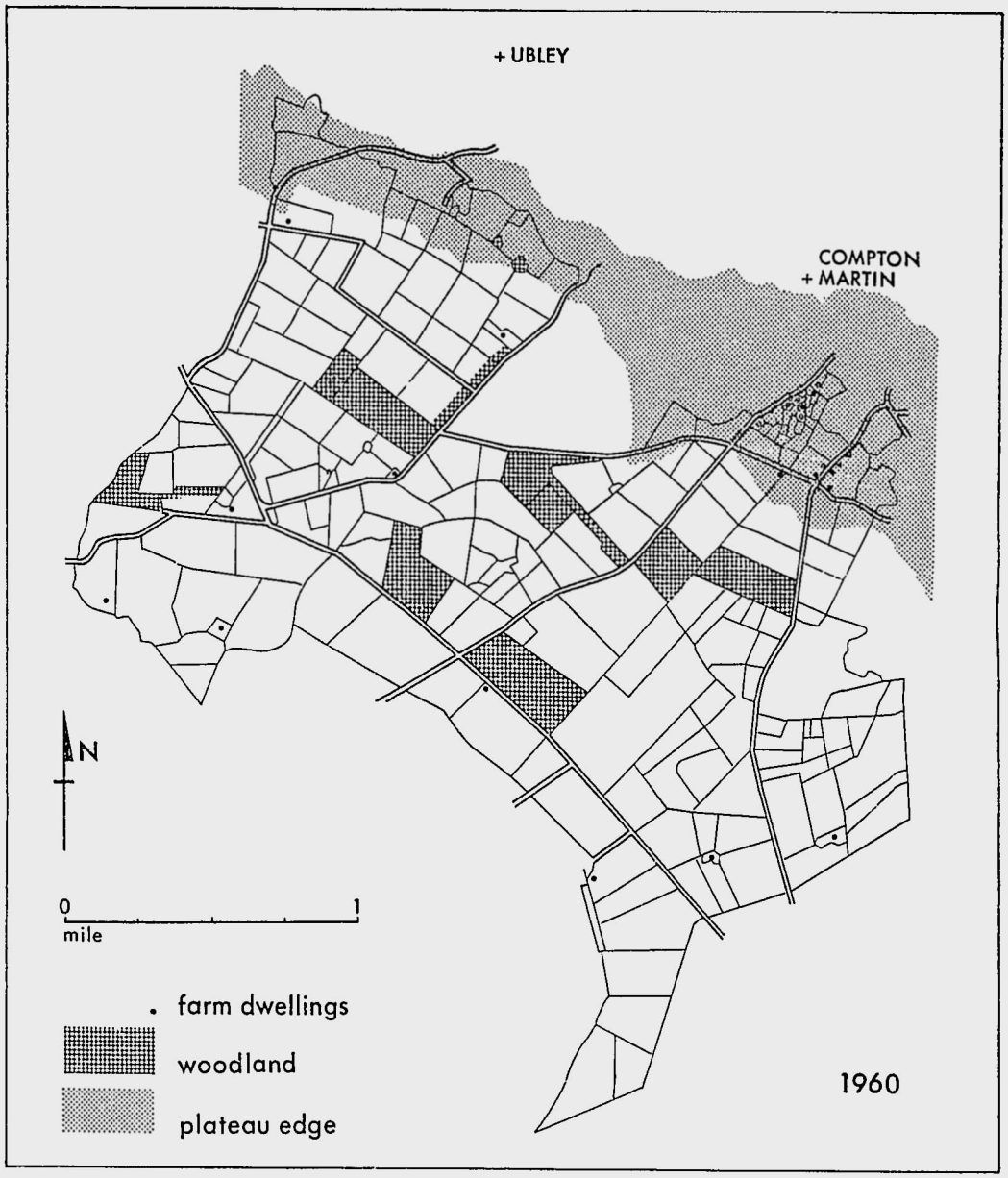

FIG. IV

The Mendip enclosures of the parishes of Ubley, East Harptree, and Compton Martin, 1960. (Based on Ordnance Survey 1:25,000 maps)

small fields, particularly in the northern arc of enclosed land and in the eastern extremity of the plateau beyond Wells, where the farms and small fields are so numerous that the pockets coalesce to give large continuous areas of small fields. But nearly half the fields of 10 acres and more were very markedly local-

ized in the areas of new enclosure and the 20-acre field was almost wholly restricted to the plateau. The obvious relationship between most fields over 10 acres and the distribution of the soils of the Nordach and Priddy Series can be seen by comparing FIGURE V with FIGURE II. One very interesting exception to the generalization that enclosure meant larger fields was the provision of 'potato gardens', presumably for displaced commoners, at The Wrangle in Compton Martin (FIGURE IV). The areas set aside in the award were later subdivided into half-acre blocks on which homes were then erected.[1]

TABLE II

THE NUMBER AND PERCENTAGE OF FIELDS OF VARIOUS SIZE WITHIN AND OUTSIDE THE AREAS OF PARLIAMENTARY ENCLOSURE IN THE MENDIP HILLS

Acres	*Inside the enclosed land*		*Outside the enclosed land*	
	Number	*Percentage*	*Number*	*Percentage*
0–4	388	24·4	1,309	47·0
5–9	475	29·9	1,039	37·0
10–14	302	19·0	292	10·4
15–19	161	10·1	78	2·8
20–24	83	5·2	29	1·0
25–29	51	3·2	13	0·7
30 or more	127	8·1	22	0·9
Total	1,587	99·9	2,782	99·8

It should not be forgotten that when the enclosure commissioners drew up their awards, they also made some drastic alterations to the pattern of roads. The tangle of poorly defined tracks which crossed the plateau is shown on Day and Master's map, *The County of Somerset* (1782). This pattern of sinuous courses was replaced by one of straight lines, roads were laid out generously to a width of 40 feet, perhaps 12 to 16 feet of which were surfaced, and the remainder left as green verges which were useful for driving stock and were sometimes let out to be grazed by the animals of former commoners.

THE NEW FARMSTEADS

A great many new farmsteads were created in the late eighteenth and early nineteenth centuries on the newly enclosed land. The location of most of them is shown in FIGURE VI, but as few of them bear a date, their construction must

[1] Social considerations such as these were not very common because there were many alternative forms of employment for the former commoners. These arrangements nowhere approach the complexity of those for displaced commoners which were carried out in Denmark. See H. Thorpe, 'The influence of enclosure on the form and pattern of rural settlement in Denmark', *Trans. Inst. Brit. Geog.*, 17, 1951, pp. 113–29.

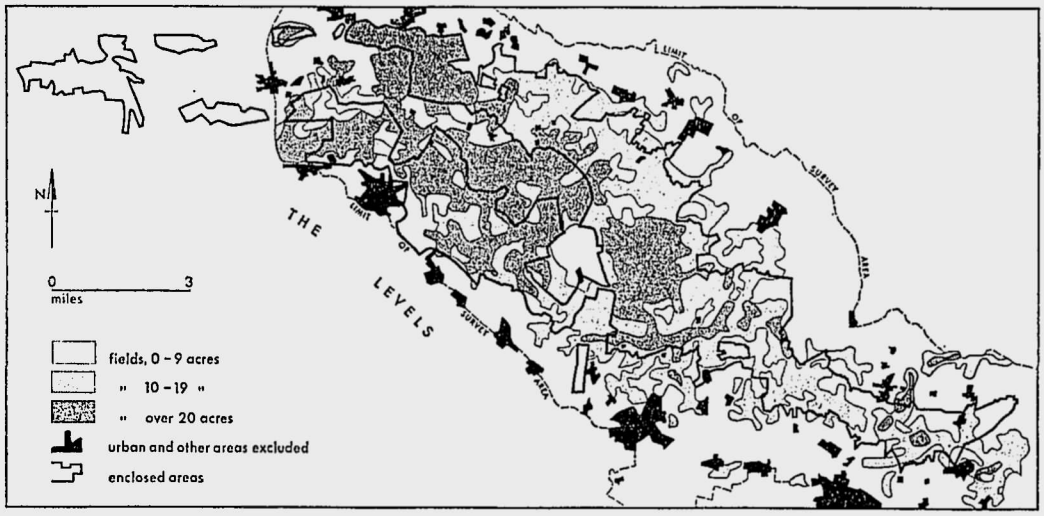

FIG. V
The sizes of fields in the Mendip Hills and surrounding areas

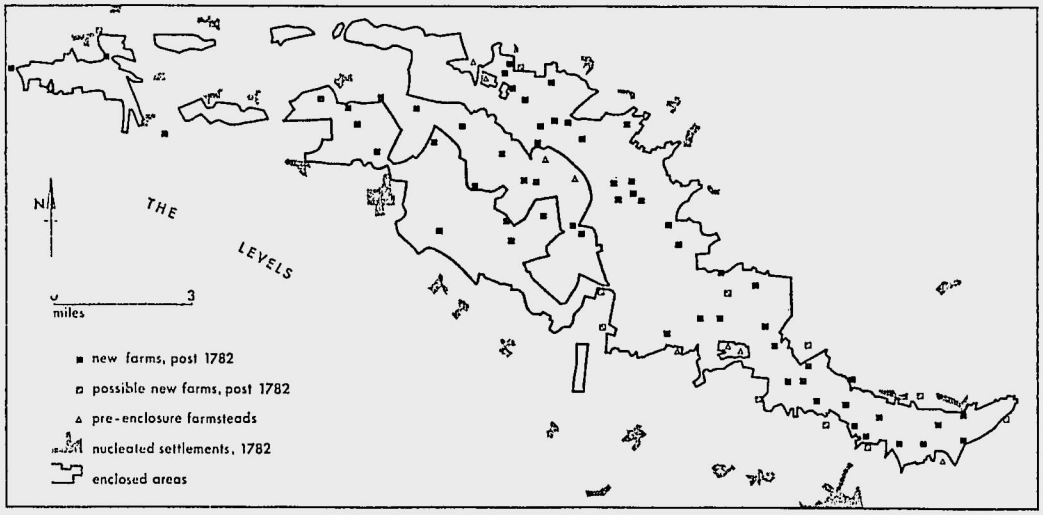

FIG. VI
New farmsteads in the Mendip enclosures after 1782

be traced from map evidence. Certainly those farmsteads located within the enclosed areas were new; they did not appear on the enclosure awards, but they do on the map of Greenwood in 1822, and also on various editions of the Ordnance Survey maps throughout the nineteenth century. Farm names also help in dating the farms. Those with possessives like Knappe's, Will's, Batt's, and

Symmer's sometimes refer to the names of the new owners, and farm names like Upper Canada, Victoria, and Wellington, and Mendip and Warren Farm are either indicative of events of the age or of conditions on the plateau where the new farms were being established.

Most of the new farms, however, did not appear until after the 1820's. Initially, many of the allotments on the plateau were assigned to homesteads in the villages of the surrounding vales and to individual farms on the plateau slopes, and these farmers exploited the new enclosures "and grew oats without manure as long as the land would bear it."[1] When the detrimental results of this method of utilization became apparent, more enlightened landlords built new farms on the plateau, and every opportunity was taken to site them carefully and build them on convenient and spacious lines.

Many farmsteads were situated fairly centrally to their land and sited either in hollows or in the lee of slight eminences on the plateau, the farmhouse usually having an east or south-east aspect. Most were constructed of local grey stone with a slate or tile roof and, in plan, were adapted to the needs of wheat and sheep-farming. The dwelling house was flanked on one side by a large barn and stalling for cattle, and on the other by a wagon house, often with a granary overhead. There was sometimes a pig-sty and a poultry house. In 1802 it was calculated that a house and buildings for a 400–500-acre farm could be built for £1,200, and we are fortunate in having the detailed costs of improvements (though not of land and interest charges) of Wigmore Farm in Chewton Mendip parish.[2] The farm was 440 acres and the total costs were as shown in TABLE III.

There was one other item of expenditure that was not accounted for in this list of costs, and that was water supply. The new farms on the plateau lay at a great distance from the old sources of water and, to meet the need for new supplies, springs were sometimes utilized, wells sunk in favourable localities, or more usually, ponds dug; one was set near the house and others in the fields, perhaps one at the intersection of four fields.

CONCLUSION

The story of the enclosure of the Mendip Hills brings to light much evidence about the methods of reclamation and improvement of the waste, and of the effects that these methods and processes had upon the land and livelihood of the rural areas when a new plan of organization was laid on the land, in the form of roads, fields, fences, and farms. From this evidence one can offer a new range of details that may serve to refine and expand existing knowledge about the reclamation of waste land, knowledge which has so far been based on only a limited view of the possible examples.

[1] Acland and Sturge, *The Farming of Somersetshire*, p. 73. [2] Billingsley, *Waste Land*, p. 45.

TABLE III

COSTS OF ESTABLISHING WIGMORE FARM, CHEWTON MENDIP

	£ s. d.	*Per cent of total cost*
Reclamation costs		
Cutting furze, levelling, hauling off surface stones, draining	183 19 2	
Ploughing, dragging, and manuring 380 acres at 160 bushels of lime per acre	2,090 0 0	
	£2,273 19 2	56·8
Establishment costs		
Stone and quickset fences	287 19 0	
Roads	100 16 4	
Limekilns	40 0 0	
Future fencing expenses	256 10 8	
	£685 6 0	17·1
Dwellings and farm buildings		
Cottage	44 14 10	
Main building (house, stable, barn, stalling)	846 0 0	
Waggon house and pig-sty	150 0 0	
	£1,040 14 10	26·0
Total	£4,000 0 0	99·9

List of Books and Articles on Agrarian History issued since June 1969[1]

Compiled by DAVID HEY

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Letters to the Editor

MADAM,—In her interesting article on 'The Economic Problems of the See of York' (Volume 18, Supplement), Miss Cross sets out to demolish a myth "that the archbishops of York in the sixteenth century endured grievous spoliation at the hands of the Crown." Her conclusion that this myth is "a pious deception," however, is not consistent with the important new evidence she has discovered.

Let us take her figures of income, adjust them to the only price index we have, namely that of Phelps-Brown and Hopkins[1] and see the result in standard prices of the 1530's. It is fair to say that the Phelps-Brown index is a cost of living index for the poor, and not for an archbishop. The archbishop was partly cushioned from the shock of rocketing food prices by a home farm and some rents in kind, while his expenses were more diverse and more weighted to labour costs and manufactured products than those of the poor. But if one uses the Kerridge[2] rent index instead, the results are the same.

Date	*Archi-episcopal Income*	*Approxi-mate Kerridge Rent Index*	*Approxi-mate Phelps-Brown Price Index*	*Archi-episcopal Income at 1530's prices*
1536	£2,000	100	100	£2,000
1560	1,800	170	180	1,000
1600	1,800	300	300	600
1640	?	430	400	?
1700	2,800	[430?]	400	700

After making allowances for the inadequacies of the indices used, the conclusions seem inescapable. Even after the recovery of some of the lost property in the reign of Mary, the income of the archbishop, in terms of purchasing power or of anticipated rental per acre, was little more than half what it had been twenty-five years before. It fell again drastically during the reign of Elizabeth, presumably because of long leases at low rents extracted from the un-

(*Continued on page* 111)

[1] E. H. Phelps-Brown and S. Hopkins, 'Seven Centuries of Prices of Consumables. . .', *Economica*, n.s. XXIII, 1956, p. 311, reworked to 1639 in L. Stone, *The Crisis of the Aristocracy, 1558–1641*, Oxford, 1956, p. 771.

[2] E. Kerridge, 'The Movement of Rent, 1560–1640', *Econ. Hist. Rev.*, 2nd ser., VI, 1953, p. 24, reworked in L. Stone, *loc. cit.*

Agriculture and the Development of the Australian Economy during the Nineteenth Century[1]

By L. A. CLARKSON

REVIEW ARTICLE OF G. L. BUXTON, *The Riverina, 1861–1891*. Melbourne, Melbourne University Press, 1967. xi+338 pp. £4.70; D. B. WILLIAMS (ed.), *Agriculture in the Australian Economy*. Sydney, Sydney University Press, 1967. xvii+349 pp. £2.80; R. DUNCAN, *The Northern Territory Pastoral Industry, 1863–1910*. Melbourne, Melbourne University Press, 1967. xv+190 pp. £3.25; P. BURROUGHS, *Britain and Australia, 1831–1855*. Oxford, Clarendon Press, 1967. xi+419 pp. £4.20.

IN Australia today one-tenth of the work force is engaged in agriculture and less than one-eighth of the gross domestic product comes from primary production. Australia is obviously far removed from the popular image that sees her as a land of sheep, kangaroos, and cricketers. But what was the position in the nineteenth century? Professor E. O. G. Shann, in his pioneer economic history, described her as "John Bull's greater woolsack", a judgement that most Australians have been happy to accept. Australia was a country of recent settlement where economic growth, according to Professor Habakkuk, "was stimulated by increased British demands for imports. Since this was a demand for primary products the economic growth did not, for the most part, take the form of rapid industrialization." Arguing along the same lines, Professor Nicholls has written with particular reference to Australia that "agricultural progress was not only clearly a major contributor to. . . subsequent economic development, but was apparently established with a minimum of time, effort, and social hardship." The revolution that has taken place in the writing of Australian economic history over the last decade or so makes it necessary to re-assess such views and permits a more accurate examination of the part that agriculture played in Australian economic development.[2]

I

When the First Fleet arrived at Sydney Cove in January 1788 one of the first tasks was to start the cultivation of crops, for the mother country intended its southern jail to be self-supporting. The difficulties were formidable: neither convicts nor guards made good farmers, there was a shortage of tools and capital, the soil was poor except where it was liable to flooding, and the climate was strange. Nevertheless the needs of a growing population remote from other sources of supply provided a market for food and encouraged farming in districts close to Sydney. By 1828 there were 71,000 acres of cultivated land, mostly on the Cumberland Plain between the Blue Mountains and the sea. There was also a good deal of pastoral farming, which by the 1820's

[1] Rather than attempt a close review of these works, I have tried to use them, together with other recent publications, as a basis for a general survey of Australian agricultural development. 'Agriculture' is used in the English sense to include both grazing and cultivation.

[2] E. O. G. Shann, *An Economic History of Australia*, Cambridge, 1930, ch. VI; Brian Fitzpatrick, *The British Empire in Australia: An Economic History, 1834–1939*. Melbourne, 2nd edn, 1949, chs. II, III, V, *passim;* H. J. Habakkuk, 'The Historical Experience on the Basic Conditions of Economic Progress', in B. E. Supple (ed.), *The Experience of Economic Growth*, New York, 1963, p. 116; W. H. Nicholls, 'The Place of Agriculture in Economic Development', C. Eicher and L. Witt (eds.), *Agriculture in Economic Development*, New York, 1964, p. 17.

was extending to the grazing lands beyond the mountains, having been forced away from the Cumberland by a shortage of grass.[1]

During the 1820's and '30's the wool-growing industry was successfully established. In the early years of settlement wool had interested only one or two substantial settlers, but by 1831 Australia was supplying 8 per cent of British wool imports. Nine years later the proportion had risen to 28 per cent and by 1850 to 53 per cent. Sheep grazing stretched out well beyond the hinterland of the first settlement, into what later became Victoria, Queensland, and South Australia, although pastoralists remained in the relatively well-watered districts. Progress was not smooth. The years between 1825 and 1828 were marked by depression, caused initially by falling wool prices in England and made worse by drought in Eastern Australia. Expansion was resumed after 1828 and continued throughout the '30's; by 1840, however, profits were again being squeezed between rising costs and slightly falling wool prices. Rosy optimism that had characterized the 1830's evaporated, credit was restricted, and serious depression occurred.[2]

During this period of pastoral expansion wheat production had failed to keep pace with the growth of the population of New South Wales. The environment was not generally well suited to arable farming which became the occupation of poor men with inadequate resources. Supplies were imported from Van Dieman's Land, but by the 1840's South Australia began to supply New South Wales with wheat and during the next half-century emerged as the principal grain-growing region of Australia.

The eastern gold discoveries of the 1850's greatly stimulated the growth of population, providing a growing market for producers of grain, dairy produce, and meat. The gold rushes caused some initial difficulty to the pastoral industry as men left to try their luck at the diggings, but production expanded throughout the '50's, and between 1860 and 1894 there was a five-fold increase in sheep numbers in eastern Australia and a three-fold increase in cattle population. The wool industry extended into the dry regions of western New South Wales and central Queensland, while cattlemen tested the possibilities offered in the Kimberley district of Western Australia and the Northern Territory.[3]

The long period of expansion in eastern Australia ended in the early 1890's when overproduction in both primary and secondary industry resulted in depression, causing a fall of a third in the value of the gross domestic product by 1895. In the pastoral industry recovery was postponed by seven years of drought. Sheep numbers were halved in the ten years after 1892 and did not regain their earlier levels before 1910. The cattle population also declined, as did the value, although not the extent, of crop production. On the other side of the continent, by contrast, the ugly duckling on the Swan river was at last spreading its wings. Gold did for Western Australia what it had done for the eastern colonies forty years before. As the population grew agricultural output of all kinds was stimulated. Most remarkable was the expansion of wheat farming from the end of the nineteenth century. Aided by the government, the acreage under wheat in Western Australia increased from 34,000 acres in 1890 to 1·4 million acres in 1914.

[1] A. G. L. Shaw, 'History and Development of Australian Agriculture', in D. B. Williams, *op. cit.*, pp. 1–4; T. M. Perry, *Australia's First Frontier, 1788–1829*, Melbourne, 1963, chs. 2, 3; E. Dunsdorfs, *The Australian Wheat-Growing Industry, 1788–1948*, Melbourne, 1956, chs. I, II.

[2] Shaw, *loc. cit.*, pp. 4–5; S. J. Butlin, *Foundations of the Australian Monetary System, 1788–1851*, Melbourne, 1952, chs. 7–10, *passim*; E. A. Beever, 'The Origin of the Wool Industry in New South Wales', *Business Archives and History*, vol. V, no. 2, Aug. 1965, pp. 91–106; J. P. Fogarty, 'The New South Wales Pastoral Industry in the 1820s', *Australian Econ. Hist. Rev.*, vol. VIII, no. 2, Sept. 1968, pp. 110–22; E. A. Beever, 'Further Comments on the Origin of the Wool Industry in New South Wales', *idem*, pp. 123–28.

[3] Shaw, *loc. cit.*, pp. 7–14; Buxton, *op. cit.*, chs. 1, 8, *passim;* Duncan, *op. cit.*, chs. 1–3, *passim*; R. L. Heathcote, *Back of Bourke*, Melbourne, 1965, chs. 4–6, *passim*; G. C. Boulton, 'The Kimberley Pastoral Industry', *University Studies in History and Economics*, University of Western Australia, vol. II, no. 2, July 1954, pp. 9–24; N. G. Butlin, 'Distribution of the Sheep Population: Preliminary Statistical Picture, 1860–1957', in A. Barnard (ed.), *The Simple Fleece*, Melbourne, 1962, pp. 284–91.

In the early years of the twentieth century there were considerable increases in the output of tropical agriculture, especially sugar in Queensland; and the export of meat, wheat, and butter grew in importance.[1]

II

Agricultural development in countries of recent settlement in the nineteenth century depended upon the application of capital and labour to abundant land. In the case of Australia it depended upon two other factors as well: the development of agricultural techniques appropriate to the condition of the Australian environment, and government activity in encouraging immigration, providing the legal framework of land settlement, and installing the social overhead capital required for economic growth.

First impressions of Australian land did not suggest that it was a fruitful source of wealth. The anguished cry of an early arrival—"the country, my Lord, is past all dispute a wretched one"—echoed down the nineteenth century, laced with flights of wild optimism. Newcomers to the Riverina district were struck by the "apparent barrenness of these plains, [and] the cheerlessness of the landscape." The Northern Territory beguiled settlers with false hopes of rich pastures, which turned into a nightmare "drought-stricken land, grassless, waterless, sweltering under a torrid sun and rolling clouds of suffocating dust of blinding and burning intensity."[2]

Two general problems had to be tackled: the unreliability of the rainfall and the poverty of the soils over much of the continent. Initially, unwilling farmers adapted English methods to Australian conditions. The first arrivals possessed ploughs but no plough animals and for ten years trees were cleared with axes and the soil between the stumps tilled with hand-hoes. There was little manure available and land was cropped continuously until declining yields compelled a shift to new areas. Cattle and sheep were kept, as far as possible, along English lines. For the first half-century of settlement no specifically Australian techniques were evolved.

The development of South Australia as the main wheat-producing colony depended upon the introduction of machinery. The stripper, which removed the ears from straw, was invented in 1843 and was well suited to the dry air of South Australia. It was followed by mechanical winnowers, binders, and reapers, and by McKay's combine harvester invented in 1884. By 1858–9 two-thirds of South Australian wheat was being harvested by machinery and ten years later almost 90 per cent. Further technical progress occurred as wheat growing extended to the dry mallee country. Areas of poor soils bearing dense mallee shrub were found extensively and were brought under cultivation, especially in Victoria, during the 1870's and 1880's. The mallee was cleared with heavy rollers pulled by horses. The crushed débris was burnt and the soil between the surviving roots ploughed by the stump-jump plough, another Australian invention. Wheat and mallee shoots came up together, but the ears were taken from the straw, which grew higher than the mallee, by means of the stripper. Straw and mallee were then burnt and ploughed in. After several years' cultivation the mallee shrub was eradicated.

With the cultivation of drier districts English wheat varieties, in general use before 1850, slowly gave way to earlier maturing types better able to withstand drought and disease. Throughout the second half of the nineteenth century, however, wheat yields declined. Cultivation techniques were still based upon continuous cropping; manuring was done sometimes, fallowing occasionally, but extensive land and high labour costs made Australian farmers indifferent to yields. Artificial fertilizers, especially superphosphates, began to be used only at the end of the nineteenth century.[3]

[1] Shaw, *loc. cit.*, pp. 15–17, 27; N. G. Butlin, *loc. cit.*, pp. 291–4; N. G. Butlin, *Australian Domestic Product, Investment and Foreign Borrowing, 1861–1938/9*, Cambridge, 1962, Table 2; F. K. Crowley, *Australia's Western Third*, London, 1960, ch. v; Sean Glynn, 'Government Policy and Agricultural Development: Western Australia, 1900–1930', *Australian Econ. Hist. Rev.*, vol. VII, no. 2, Sept. 1967, pp. 119–20.

[2] Buxton, *op. cit.*, p. 15; Duncan, *op. cit.*, p. 51.

[3] Dunsdorfs, *op. cit.*, pp. 3–17, 149–61, 189–92; C. M. Donald, 'Innovation in Agriculture', in Williams

The emergence of Australian pastoral techniques also dates from the mid-nineteenth century, with the one important exception of the introduction of merino sheep. Flocks were at first tended by shepherds and penned at night, but as the wool industry extended into the outback where there was acute shortage of labour, pastures were gradually fenced. Wire fencing became fairly common during the 1850's and '60's in Victoria and the Riverina and there was a great extension of fencing in New South Wales during the 1870's. Three-quarters of a million miles were strung across the colony by the end of the decade and a further million miles was added by 1890. By the same date pastoralists were beginning to make use of wire netting to keep rabbits out of their pastures. The spread of the pastoral industry into low rainfall areas compelled wool growers to construct dams, sink wells, and install pumps to raise artesian water. Water supplies were also required on the stock routes along which graziers sent cattle to market from outback regions. Wool producers in remote areas where high transport costs prevented the carriage of greasy wool also needed washing equipment.[1]

These technical developments increased the demand for capital which was needed also to acquire land, stock pastures, purchase seed, and construct homesteads. The early grain farmers in New South Wales were granted land and provided with tools by the governor. Pastoral farming demanded larger outlays and was therefore the concern of wealthier men, frequently officers or merchants who had made money in the lucrative import trades. Lack of capital, nevertheless, impeded the growth of the wool industry before the 1820's. Its development in the '20's and '30's depended a good deal upon capital imports. Free settlers sometimes brought a little capital or even flocks with them; but the more common pattern was that described by Dr Hartwell: "credit proceeded from the London merchants, to the colonial merchants, to the colonial retailer, to the farmer and grazier." The establishment of the Australian Agricultural Company and the Van Dieman's Land Company in 1826 with British capital marked a more formal stage of capital inflow, although both commenced operations just as the pastoral industry experienced a slump. In the 1830's the flow of British capital increased, possibly ten-fold. "A still rising volume of British expenditure in connection with convicts; the formation of banks and mortgage companies in Britain to operate in the colonies; the transfer of funds by absentee investors for disposal by individuals and firms in the colonies; the import of cash and goods by those who migrated—these were the channels through which came the floodtide of capital."[2]

The process of capital formation after 1860 has been the subject of intensive investigation by Professor N. G. Butlin. Total capital formation in Australia was at a high level, comprising about 13 per cent of gross domestic product in the 1860's and for most of the 1870's, 20 per cent at the end of the '70's, and 23 per cent during the 1880's. In the depression of the '90's the proportion fell back to around 14 per cent. During the 1870's and '80's two-thirds of all the capital was raised overseas, almost entirely in Britain. Just over half of the total capital formation was channelled into the private sector of the economy and the rest into the public sector, although the shares tended to vary inversely. Investment in agricultural activity (pastoral, arable, and dairying) accounted for 27 per cent of private investment in the 1860's, 46 per cent in the '70's, and 37 per cent in the 1880's and 1890's. Capital formation in the pastoral industry was responsible for most of this investment. Capital came from mortgages granted by land companies

(ed.), *op. cit.*, pp. 57–86; Perry, *op. cit.*, chs. 1–2, *passim*; Sir Samuel Wadham, R. K. Wilson, J. Wood, *Land Utilization in Australia*, Melbourne, 4th edn, 1964, ch. III.

[1] N. G. Butlin, 'The Growth of Rural Capital, 1860–1890', in A. Barnard (ed.), *op. cit.*, pp. 322–39; Buxton, *op. cit.*, pp. 36–55; Duncan, *op. cit.*, pp. 78–84.

[2] J. M. McCarty, 'The Staple Approach in Australian Economic History, *Business Archives and History*, vol. IV, no. 1, Feb. 1964, pp. 15–18; R. M. Hartwell, 'The Pastoral Ascendancy, 1820–1850'. in G. Greenwood (ed.), *Australia: A Social and Political History*, Sydney, 1955, p. 90; S. J. Butlin, *op. cit.*, chs. 7–9, *passim*. The quotation is on p. 227.

and by bank overdrafts. Both mortgage companies and banks relied on British funds, especially during the 1870's and 1880's. Money was used for the improvement of existing stations and, increasingly during the 1880's, for the creation of entirely new stations as speculative ventures. These were usually in the arid western areas where costs were high and productivity low.

The major component of public capital formation was railway construction, undertaken by colonial governments since it did not pay private enterprise to build railways. Railway construction accounted for about half of all public capital formation in every decade except the 1880's, when the proportion rose to two-thirds. Before 1850 farmers and graziers had relied on roads, rivers, carts, and coaches; but railways were essential to the further development of primary production. In the four eastern colonies there were fewer than 1,000 miles of railway in 1870 but these had grown to over 8,000 miles by 1890. As with pastoral finance, a great deal of the capital required for the building of railways was raised in Britain.[1]

Australian primary producers were forced into capital intensive methods because of scarcity of labour. 150,000 convicts were transported to the eastern colonies before the system was scrapped in 1853. Many of them were assigned to settlers as farm labourers and shepherds; but the growing realization that convict labour might be less efficient than free labour and that a penal settlement and a free colony were incompatible led to an end of transportation, except in Western Australia where convicts were deliberately introduced in 1849 in an effort to overcome the labour shortage. Schemes to assist immigration were tried in the 1830's as a way of establishing a supply of free labour; but the decisive decade for immigration was the 1850's when 600,000 newcomers arrived in eastern Australia, attracted by gold. Farmers and pastoralists gained little from the enlarged population. True, ex-diggers formed a pool of casual labour on which they could draw at busy times; but the increasing population stimulated manufacturing and construction industries and from about 1860 the agricultural sector had to compete in a tight market for its labour requirements. To make matters more difficult, migrants arriving in the second half of the nineteenth century generally found the outback uncongenial and most of them remained in the towns, even when they had been enticed to Australia by the prospect of boundless land.[2]

The role of governments in financing the construction of railways has already been mentioned. Other ways in which colonial governments promoted agricultural development included the provision of rural credit, encouragement of research into agricultural methods and, generally exhorting private enterprise to undertake all sorts of projects, as, for example, settlement of the Northern Territory after 1860.[3] The most important function of government was the provision of the legal framework of agricultural development through policies of land disposal. The first governor of the penal settlement was instructed to grant land freely to former convicts and settlers with the intention of establishing a self-sufficient farming community. The policy of land grants was continued until 1831, although during the '20's grants were usually tied to the capital resources of applicants. In the same decade pastoralists and graziers were taking their flocks into outlying areas without formal grant. The governor of New South Wales sanctioned this dispersal

[1] These paragraphs are based on various works of Professor N. G. Butlin: 'The Shape of the Australian Economy, 1861–1900', *The Economic Record*, vol. 34, no. 67, April 1958, pp. 10–29; *Australian Domestic Product*, Tables 6, 9; *Investment in Australian Economic Development, 1861–1900*, Cambridge, 1964, pp. 47–50, 57–165, *passim*; 'The Growth of Rural Capital', *loc. cit.*, pp. 322–39; N. G. Butlin and A. Barnard, 'Pastoral Finance and Capital Requirements, 1860–1960', in Barnard (ed.) *op. cit.*, pp. 383–95. See also Buxton, *op. cit.*, chs. 1, 8, *passim*; Duncan, *op. cit.*, pp. 37–42, 132–7.

[2] The most recent discussion of assisted immigration is by Burroughs, *op. cit.*, pp. 59–75. The later history of immigration is surveyed by F. K. Crowley, 'The British Contribution to the Australian Population: 1860–1919', *University Studies in History and Economics*, University of Western Australia, vol. II, no. 2, July 1954, pp. 55–88.

[3] Duncan, *op. cit.*, pp. 6–17, 149–56.

by the issue of tickets of occupation; but in 1826 the British government imposed limits of settlement (they were adjusted in 1829) beyond which no land was to be occupied before survey, and within which title to land had to be obtained by grant or purchase. Five years later the Imperial government issued the Rippon Regulations which introduced the principle of land sales in place of grants. The British government now regarded Australia not as a prison but as a workhouse where Britain's poor might be relieved. Consequently New South Wales was to be settled closely by substantial farmers possessing the resources to buy their land, who would provide employment for landless labourers shipped to Australia on the proceeds of revenues from the sale of land.

The proposals showed the influence of Wakefieldian colonizing theory; but colonial pastoralists had their own theory of land settlement: they simply occupied land beyond the limits of settlement in order to produce wool for the British textile industry. In the 1830's the New South Wales government was forced to recognize the reality of the squatting movement and grant annual grazing licences to pastoralists. With growing wealth came political power; and in 1847 pastoralists forced changes in land legislation that gave them the security of 14-year pastoral leases with the option of purchase. Millions of acres in New South Wales passed into the *de facto* possession of a few thousand squatters, thus creating the political problem of the post-gold decade. During the 1860's, '70's, and '80's, all the colonies tried to make land available to small farmers, who would grow food for the enlarged population of Australia, by allowing intending cultivators to select holdings from among the pastoral leases. Except in South Australia these efforts to 'unlock the land' were not very successful. The grip of the pastoralists was too strong, their ingenuity in circumventing land selection regulations too great: the advantages of the country were with sheep and cattle rather than crops; and where suited to crops, as in South Australia, with large farms rather than small. Policies for the disposal of crown land could not, successfully, run counter to economic realities, although they might frustrate development.[1]

The final factor required for the successful development of Australian agriculture was access to markets. The failure of development when markets were not easily available was well-illustrated by the abortive efforts to establish grazing in the Northern Territory after 1860. The first market in Australia was provided by the Commissariat which purchased grain, meat, and dairy produce until 1823. This market was gradually supplemented and eventually superseded by the development of the private market. As population increased in Australia the home market remained important for food producers. The export of wheat commenced in the mid-nineteenth century but did not become a significant proportion of total production before the 1880's; by the end of the nineteenth century about half the total Australian wheat production was sent overseas. The development of export markets for meat and dairy produce had to await advances in refrigeration; the pastoral depression of the 1890's encouraged interest in the export of frozen meat.[2]

Until the end of the nineteenth century wool was the one primary product produced exclusively for an export market. From the 1820's practically all the output went to the United Kingdom and, under the stimulus of a larger market than domestic demand could provide, the industry extended rapidly. The performance of the wool industry above all else has earned for Australia the reputation of an economy that grew on the basis of primary production.

III

The traditional view of the importance of agriculture in Australia's economic development is no longer unchallenged and a lively

[1] The standard work on land settlement remains S. H. Robert's *History of Australian Land Settlement, 1788–1920*, Melbourne, 1920; Perry, *op. cit.*, ch. 4, and Burroughs, *op. cit.*, *passim*, provide important reassessments of the period before 1855.

[2] Shaw, *loc. cit.*, pp. 17, 27; Dunsdorfs, *op. cit.*, pp. 18–50, 166–72, 472–7; Duncan, *op. cit.*, pp. 60–5, 140–1; N. G. Butlin, *Investment in Australian Economic Development*, pp. 435, 440.

debate has arisen since the publication of Professor N. G. Butlin's major contributions to Australian economic history and Professor John McCarty's attempts to apply staple theory to explanations of Australian economic growth.[1] In some ways Professor McCarty's use of staple theory follows the views of earlier writers, such as Professor Shann and Brian Fitzpatrick, who regarded the production of primary products for export as the driving force of the economy. To place the role of agriculture in its proper perspective we need to pose a number of questions: how large a share did primary production occupy in the nineteenth-century economy?; what part did agriculture play in attracting scarce factors, capital and labour, to Australia?; what stimulus did agricultural development give to developments in secondary and tertiary industries?; how important was the export of agricultural products to the Australian economy, and did export incomes grow faster than national income as a whole?

No estimate of the size of agricultural activity is available before 1860. Agricultural production was certainly the most important part of the economy although it is easy to overlook the amount of manufacturing, constructional, and trading activity centring upon Sydney.[2] The gold rushes caused a fall in the relative importance of agriculture; in 1861–5, when already past its peak, gold-mining accounted for almost 14 per cent of gross domestic product, compared with 18 per cent arising from agriculture. During the 1860's and '70's mining declined in importance; at the same time there was a great expansion of pastoral activity which by 1875–7 alone accounted for 14 per cent of gross domestic product and agricultural production as a whole for 23 per cent. For the remainder of the century agriculture produced just over one-fifth of the gross domestic product. The share of the pastoral industry fell back a little from the high levels attained in the '70's and declined sharply during the depression of the 1890's.

Between 1860 and 1876–8 total agricultural production grew faster than the gross domestic product. Pastoral production grew particularly rapidly, although less quickly than railway construction and manufacturing. After 1876–8 all components of agricultural production (pastoral, arable, dairying) grew more slowly than the gross domestic product. In this period the most rapid growth was in secondary industry. This sector had been substantial as early as 1860 when its share of the gross domestic product was only fractionally smaller than that of agriculture. By the 1870's it was larger, in spite of the rapid growth of the pastoral industry, and it remained so until the collapse of the 1890's. Certainly the share of agriculture in total output was large, but if primary production is to be regarded as the dynamic element in economic growth, its influence after 1860, and possibly before, must have been indirect, through its ability to attract capital and labour or the stimulus that it gave to other forms of activity.[3]

Agriculture in Australia failed to induce migration on a substantial scale and failed to absorb many of the immigrants who did arrive. The United Kingdom was the only source of migrants; and for Englishmen, Scotsmen, and Irishmen the United States and Canada were nearer at hand and cheaper to go to than the southern hemisphere. Only a trickle of Englishmen found their way to Australia without assistance before 1850. Schemes to finance immigration with funds raised by sale of land

[1] For Professor Butlin's works see earlier footnotes. Contributions to the 'staple' discussion include McCarty, *art. cit.*, pp. 1–22; G. Blainey, 'Technology in Australian History', *Business Archives and History*, vol. IV, no. 2, Aug. 1964, pp. 117–37; N. G. Butlin, 'Growth in a Trading World: The Australian Economy, Heavily Disguised', *ibid.*, pp. 138–58; G. C. Abbott, 'Staple Theory and Australian Economic Growth, 1788–1820', *ibid.*, vol. V, no. 2, August 1965, pp. 142–54; J. P. Fogarty, 'The Staple Approach and the Role of Government in Australian Economic Development', *ibid.*, vol. VI, no. 1, Feb. 1966, pp. 34–52; A. L. Lougheed, 'International Trade Theory and Economic Growth', *Australian Econ. Hist. Rev.*, vol. VII, no. 2, Sept. 1968, pp. 99–109.

[2] G. P. Walsh, 'The Geography of Manufacturing in Sydney, 1788–1851', *Business Archives and History*, vol. III, no. 1, Feb. 1963, pp. 20–52.

[3] N. G. Butlin, *Investment in Australian Economic Growth*, pp. 16–24.

had some success in bringing settlers to Australia during the 1830's but not in establishing them on land. Indeed, the theory of assisted immigration based upon close settlement and labour-intensive farms ran counter to the economics of pastoral dispersion. Gold, not land, eventually enticed a flood of British migrants to Australia. Thereafter immigration was absorbed into urban activities; in building, railway construction, and manufacturing. Colonial governments persisted from time to time in assisting immigration from Britain but they were unable to promote any substantial rural settlement.

A large part of the capital inflow into Australia during the nineteenth century went to finance the pastoral industry, although Professor N. G. Butlin's estimates show that only during the 1870's was pastoral investment, whether financed by capital imports or from domestic sources, greater than investment in residential construction. Much of the investment in railways may be attributed to the needs of pastoralists and farmers, although some of it went on suburban lines and railways associated with the development of mining. But Professor Butlin has demonstrated clearly that investment in railways was promoted by governments who largely ignored long-term profit considerations. Inter-colonial competition, rather than the needs of pastoralists considered rationally, was the driving force behind railway investment after 1860. Primary producers certainly enjoyed the external economies brought by railways but these were restricted by the failure of the colonial governments to provide an integrated system of communications. Further, railway construction not based upon strict profit criteria tended to divert resources from other occupations, including agriculture, to the detriment of total economic growth. Railways continued to attract capital until 1890, less because of the services they provided graziers and farmers, than because of the easy access possessed by colonial governments to the London capital market.[1]

Reference has already been made to the growth of manufacturing and construction in urban areas in the second half of the nineteenth century. Urbanization, in fact, was a characteristic of Australian economic development much earlier. In part it was a consequence of agricultural progress. Towns were places where agricultural produce was processed, where banks and land companies financing pastoral development had their headquarters, where auctions were held, and wool was shipped to the United Kingdom. The towns too, were centres where industries developed to meet the requirements of pastoralists and farmers for equipment and consumer goods. But, clearly, urbanization and its associated constructional and manufacturing activities cannot be attributed wholly, or even mainly, to the needs of agricultural producers. In the first half of the nineteenth century Sydney was the administrative centre of eastern Australia, a port for the arrival of convicts, settlers, and imports, a centre for whaling and sealing which before the 1830's were more important activities than the production of wool. Melbourne mushroomed during the 1850's under the stimulus of gold discoveries. The pattern of immigration after 1860 further confirmed Australia as one of the most highly urbanized countries in the world. Manufacturing and building served the needs of these growing urban communities and in turn created further employment which encouraged the continued concentration of population. The main manufacturing activities in the second half of the nineteenth century were the clothing and textile trades, metals and manufacturing, the production of building materials, and the food, drink, and tobacco trades: "industries naturally arising from the circumstances of the population." Little of this manufacturing activity and even less of building construction can be attributed to the needs of agriculture. Even the demand of pastoralists for millions of miles of fencing wire from the 1870's and the demand for iron for railways failed to establish a successful iron smelting industry in Australia before the end of the nineteenth century. There was some manufacture of agricultural implements, some processing of agricultural products, some general engineering connected with agricultural requirements, but such

[1] *Ibid.*, pp. 291–8.

demands were much outweighed by the needs of the urban populations.[1]

To re-establish the primacy of agricultural development in explaining successful economic development in nineteenth-century Australia we are left with its role in the export trade. Here again a caveat must be entered against the traditional explanations. Professor McCarty's ingenious attempt to depict the demand of the Commissariat for agricultural produce as the 'export' market before 1820 simply illustrates that agricultural production was a weak stimulus to economic development in the early phase of Australian history. The export of wool was not well established until the 1820's, or possibly even the 1830's. For two, perhaps three, decades pastoral exports were an engine of growth; but in the '50's they were surpassed by gold, exports of which remained of greater value than the export of wool until the end of the 1860's. From that date, until the revival of mining in the 1890's, agricultural produce, particularly wool, dominated Australian export trade. But the growth of the export trade was slower than the growth of the economy as a whole. The proportion of export earnings to total national income was reduced by more than half between 1860 and 1887; it grew again in the 1890's only because export earnings remained fairly stable while the value of gross domestic product fell.[2]

Agriculture was, however, practically the sole provider of export earnings during the nineteenth century, except for the two decades in which the export of gold was important. The earnings from the sale of wool overseas paid for growing imports, many of them connected directly with the process of urbanization, and serviced the ever-increasing capital inflows on which Australian economic growth depended. The burden of interest and dividends increased from the 1870's and reached 37 per cent of export incomes by 1890. Much of the economic development in the form of urban building, manufacturing, and railway construction contributed very little to exports, and the continuation of capital inflow, therefore, depended very much on the ability of the wool industry to earn foreign exchange. But pastoral expansion itself was becoming less and less profitable in the late 1880's as the industry moved into the high-cost areas of the arid outback. By 1890 the long period of expansion, dating from 1860, was over. Australia was, temporarily, no longer a place attractive to British investors.

Australian economic development in the nineteenth century was hydra-headed. Taking the century as a whole the centres of growth were as much the coastal cities as the pastoral plains. A great deal remains to be known about the processes of economic development; in particular the Australian penchant for urban existence, despite all the myths to the contrary, still requires an explanation. But the re-writing of Australian economic history has proceeded sufficiently far to permit the identification of two important functions for agriculture in the complicated story of economic development. Farming was the first economic activity taken up in new settlements. Early arrivals in Australia were forced into agriculture since the Imperial government did not intend to provide them with food indefinitely; and as regional studies have demonstrated, the hope of profit from the grazing of sheep or cattle or the production of crops encouraged pioneers to move into virgin districts. Secondly, the success of the wool industry in producing a commodity demanded by the industrializing countries of the world made possible the import of capital on which continued expansion depended. These were important roles for agriculture, although more modest and more complex than that implied in the view that regards Australia as the rural sector of the British economy during the nineteenth century.

[1] N. G. Butlin, *Investment in Australian Economic Growth*, chs. III, IV, *passim.*; Blainey, *art. cit.*, pp. 127–9; H. Hughes, *The Australian Iron and Steel Industry, 1848–1962*, Melbourne, 1964, pp. 1–25.

[2] McCarty, *art. cit.*, pp. 10–15; Abbott, *art. cit.*, *passim.*; Blainey, *art. cit.*, pp. 118–27; Butlin, *Investment in Australian Economic Growth*, p. 30; 'The Shape of the Australian Economy', p. 18.

Book Reviews

DON and PATRICIA BROTHWELL, *Food in Antiquity. A Survey of the Diet of Early Peoples.* Thames and Hudson, 1969. 248 pp. £2.10.

In this first comparative study of food in ancient and primitive societies Don and Patricia Brothwell have made a fascinating survey of the whole field of human diet. They have correlated information gleaned from archaeological remains of animals and plants with evidence from written records and pictorial representations to provide a concise world-wide reference work on the eating and drinking habits of early man, and on when different foods were first consumed.

As long as primitive man, like an animal, spent most of his working hours in search of food, he could not progress far towards civilization. This crude food gathering of the Palaeolithic age led to the hunting and fishing cultures of the Mesolithic period, which allowed a slow increase in population. But the first population explosion occurred following the Neolithic revolution, after it was discovered that food could be obtained by cultivating plants and domesticating animals. Important as domestication was in easing food supply and allowing settled communities the leisure that provided the basis of civilization, the authors perhaps devote too many pages and illustrations to it at the expense of food preservation and cooking, since domestication has been well covered elsewhere.

The survey of food sources starts with the utilization of mammals, and covers progressively simpler animals down to molluscs and insects. The authors point out that there is no place for a food bias in a collecting economy, and so virtually all animals that could be caught were eaten, from the elephant to the dormouse, later specially fattened in earthenware pots by the Romans.

Following domestication, animals would tend to be more valuable alive, and so emphasis would be placed on the preservation of meat—first by drying, then by smoking (was this discovery associated with cooking, could the Brothwells have told us more?) and later by salting, to which they devote two pages plus maps showing the distribution of salt workings.

The authors mention the use of blood from living animals (not, however, tracing it to the modern black pudding), but are apparently unaware that some tribes actually cut flesh from living cattle, afterwards pinning the skin over the wound.

Cheese represents a method of preservation, and dairy products receive three pages; Pliny is quoted as saying that camel's milk is the sweetest. The abundance of olive oil in the Mediterranean region apparently lessened the importance of butter to the Greeks and Romans, and milk products appear to have reached their fullest development among the nomadic peoples of central Asia. Here milk was fermented to preserve it just as in the west fruit-juice was fermented for storage as wine.

Yoghurt is not mentioned, but the authors raise the fascinating possibility of bog butter being a study source of the hairs of ancient cattle. I am told, however, that in the Near East one detects butter made from sheep's milk by observing the fuzz of wool fibres seen when the edge is held against the light!

The survey continues through fowl, reptiles (snakes and crocodile eggs), amphibians, and the very important fishes to the invertebrates. Molluscs are easy to collect and have a high protein value, and their shells are found on many sites throughout the world, from earliest times, even when vertebrates are available. The authors tell us that the Romans cultured land snails in addition to oysters, the elaborate Roman recipe for a sauce containing herbs and spices to accompany them being given.

The eating of insects was common among Palaeolithic peoples. These have high food value: locusts for instance in addition to having 20 per cent fat, and 75 per cent protein are rich in minerals and vitamins. I have urged archaeologists to look out for the tiny remains of insects, and the Brothwells endorse this plea by entreating us to excavate carefully the abdominal region of skeletons in search of such remains, as well as fruit and cereal seeds. The

one skeleton I found apparently had nothing but plain soil in this region, neither had it any remains of clothing around the bones.

This level of investigation, however, requires an entirely new approach at the literally microscopic level, which the authors describe as having already been followed, along with chemical analysis, with coprolites.

Plants and plant products cover even more variety than animals from fungi to the carbohydrate-rich cereals. Honey is three-quarters sugar, and was its main source, at any rate in Europe until sugar cane was introduced by the Moors. Among the many intriguing facts recorded is that the practice of glazing ham with honey was begun by the Romans. The two natural and concentrated foods, milk and honey, are often linked in myths. Mead was the first intoxicating drink, and they claim that the accidental discovery of fermentation was probably made from the half-empty honey-pot left out in the rain, leading man to alcoholism and the illicit still! Other drinks covered are tea, coffee, and cocoa.

The introduction of the different cereals, wheat, barley, millet, rye, oats, rice, and maize, is dealt with in detail, and there are chapters on vegetables (pulses, roots, and tubers, green vegetables including asparagus, mustard, seaweed, and salad plants); fruit and nuts (bananas to pomegranates, dates, figs, grapes—and a description of the widespread eating of acorns); olives, oils, herbs, and condiments (all more ancient than one might imagine), and finally diet and disease (famine, dietary disorders, infant feeding, and food poisoning).

The book has a bibliography of 117 references and a good index, and is lavishly illustrated with 67 plates, 46 figures, and 7 tables. It is packed with interesting and valuable facts, and all in all gives an excellent coverage, providing a unique survey of the vast subject of food that has never before been attempted in one volume.

M. L. RYDER

L. P. WILKINSON, *The Georgics of Virgil: A Critical Survey*. Cambridge University Press, 1969. 364 pp. £4.

This is a work of major importance. Surprisingly, in view of the interest taken in the poem by generations of English readers, it is also the first full-length study of the poem in the English language. Your reviewer's task is the strictly limited one of assessing what the author, a classical scholar already well known for the excellence of his critical work on Horace and Ovid,[1] has to tell us about the technical elements in the *Georgics*, and how the poet has moulded them into the framework of a great work of art. The title of the ninth chapter—'Agricultural Lore'—gives a clue to the author's approach. The *Georgics* is not to be regarded as a didactic poem about farming, but as a descriptive poem in which the techniques of farming take their natural place among the varied activities of the countryside, the dances and the merry-making, as well as the unremitting struggle to make nature yield up her bounty to the husbandman.

Two chapters, the fourth and the ninth, are of particular interest. In the former chapter, Wilkinson writes with authority on the complex problem of the structure of the poem, dismissing the more fanciful theories of some recent critics, and showing, with apt illustrations, how the poet's growing mastery over his artistic resources was applied to the handling of the often intractable material which his choice of theme imposed upon him. He then presents us with an admirable outline of the content and structure of the whole poem with its recurrent poetic themes and ingenious variations (ch. IV, pp. 76–107). Particularly felicitous is his analysis of Virgil's treatment of field-crop husbandry in Book I, lines 43–203, which is worked out in detail as a fine example of the poet's way of handling a prosaic subject. In the ninth chapter Wilkinson addresses himself directly to the reader who is attracted to the *Georgics* largely, or even primarily, by its natural history and agricultural lore. While modestly disclaiming any competence in the technical aspects of the subject, and relying on what seem to be the best authorities, he begins by warning the reader "not to credit Virgil with being either an expert husbandman or a keen observer of nature without first reading the agricultural authorities." Wise words indeed,

[1] *Horace and his Lyric Poetry*, 2nd edn, Cambridge, 1951; *Ovid Recalled*, Cambridge, 1955.

which may well lead to a renewal of interest in a long-neglected aspect of classical antiquity.[1]

After a brief review of the technical sources, Wilkinson proceeds to examine a number of passages of varying length to illustrate both the poet's method and the shortcomings of his technical knowledge. Both here and in Chapter IV the commentary is conveniently arranged under broad headings, such as 'field crops', 'weather lore', and so on, and items dealing with the same topic in different parts of the poem are brought conveniently together.

Not least among the pleasures of this delightful and stimulating work are the author's own felicitous translations. The following passage (*Georg.* III, 75–88) is set beside its original in Varro's *De Re Rustica* to show what the poet has made of a prosaic list of the 'points' of a foal suitable for breeding (*RR* 2.7.5):

"The quality of the horse can be determined from the foal; if it has a *head* of moderate size and well-proportioned limbs, dark eyes, full nostrils, and close-set ears; the *mane* abundant, dark, slightly curling with very fine hair, *falling on the right side of the neck*; the chest broad and full, broad shoulders, *a fair-sized barrel*, the flanks converging towards the base, broad shoulder-blades, *preferably with a double spine* or at any rate with the backbone not projecting, tail full and somewhat curly, limbs straight and sloping evenly rather inwards than outwards, the knees round but not large, and tough hooves; the veins should be visible all over the body, since a horse with this feature is easily treated when sick. . . It is an indication of future quality if the colt, while out at grass with its mates, challenges them in racing or in other activities to show its superiority; if, *when the herd has to cross a river*, it runs with the leaders and does not look back at the rest."

"From the first a well-bred horse in the paddock picks his feet up higher than the herd and brings them down again lightly. He is first on the road, first to venture into menacing rivers and to entrust himself to the unknown bridge, nor is he startled by chance noises. His neck is high, his head well-tapered, barrel short and back full-fleshed, his gallant chest rippling with muscles. . . Again, if the clash of arms sounds from afar off, he cannot keep still, ears pricking, limbs aquiver, and in his nostrils rolls the breath of pent-up fire. His mane is thick, and falls, when tossed, over his right shoulder. A double ridge runs along his spine. He digs into the ground, and his solid hoof thuds heavily."

Georg. III, 75–88.

There are few errors on the technical side: the most obvious is the statement on p. 242 that trees, apart from the vine and the olive, were a 'sideline'. But even modest farms needed plenty of cut timber for various purposes, and the leaves of deciduous trees, notably the elm, were vital as fodder in the lean months when there was little else to be had.

Space forbids analysis of the many good things in the final chapter, but readers of this journal will find much to interest them in Wilkinson's account of the later history of the *Georgics*, which provides a fitting conclusion to a book which is both illuminating and immensely readable.

K. D. WHITE

H. P. R. FINBERG, *West-Country Historical Studies*. David and Charles, 1969. 232 pp. £2.50.

Professor Finberg's new collection of essays consists of revised versions of his *Devonshire Studies*, considerably augmented by three further large-scale studies with a west-country bearing. The earlier work contains the seminal study of the open field in Devon, and the delicious essay on Abbot Bonus, undone by lack of money and excess of drink. It is a good story very well told, and more important than might appear at first sight. Historians are familiar with the eternal squabbles of monks and bishops over exemptions and precedence: this essay gives life to the legal issues and shows in a microcosm just what was at stake. Most important, however, are the new essays. St Patrick at Glastonbury, an O'Donnell lecture,

[1] Columella, the most important of the Roman authorities, still awaits a commentary in any language, and the last full-length study of Roman agriculture appeared as long ago as 1788 (Adam Dickson, *The Husbandry of the Ancients*, Edinburgh, 1788).

achieves the rare distinction of being both hard-headed and original on its thorny and cloudy subject. But it is the sixty pages of charter studies that have most relevance to readers of this review. In particular Professor Finberg has a general point to make about the principles of charter criticism which needs to be pondered over. He wishes to disagree with the line taken by Dr Chaplais in a number of recent studies, and he points to what he considers fundamental differences of method and approach which lie between their differing verdicts on particular charters. Dr Chaplais, it is well known, relies exclusively on diplomatic and palaeographic criteria, Dr Finberg, following Stenton, lays most weight on the *Sitz im Leben* of charters, in particular their topographical context. Dr Finberg scores what seems a bull's-eye in his discussion of the *Homme* Charter of 846. This is one of those mysterious charters in which a king—Æthelwulf of Wessex in this case—books an estate to himself. This charter has not seemed hitherto of very great importance; it amounts to a modest but unsensational grant of twenty hides. Dr Finberg has shown by following up the boundaries that this twenty hides amounted to "65,000 acres of the best land in Wessex." He argues, convincingly, that it was rich but unsettled land—it had been a frontier area—and this was the beginning of the process of settlement which culminated in the imposition of a much greater rate of assessment by the time of Domesday. The whole discussion is an exemplary reminder of the danger of treating hides as though they were units of area and it suggests that the topographical-historical discussion of the other charters, in which kings booked land to themselves, might elucidate this mysterious practice.

The essay on 'Fact and Fiction from Crediton' seems to me less happy, especially Dr Finberg's defence of Crawford Charter IV, the first Sandford charter. This charter, Dr Chaplais—and myself—have argued, is a post-Conquest forgery. It seems to me that what is really and fundamentally at issue on the problem of charter-criticism is the assumption, made by Dr Chaplais, that charters are criminals in the dock, guilty until proved innocent, and the assumption, made by Dr Finberg, that in the dock they should go but as innocent until proved guilty. In this case I should find for Dr Chaplais and against the authenticity of the Sandford charter although I would allow a little but not much mercy in the sentence, in view of Dr Finberg's topographical plea. The charter, according to Mr Ker as well as Dr Chaplais, is in an imitative script of much later date than it claims. It is not a cartulary copy but appears to be a genuine title-deed, sufficiently cleverly got up to deceive Stevenson. It is the only 'original' charter to abolish completely the common burdens; it is yet to be proved that this was ever done by any Anglo-Saxon king. It contains a number of other unique proposals which smell of the aftermath of the tenth-century reform to me. Dr Finberg, who is less interested in the inner life of monasteries than what went on in their fields, has overlooked the possibility that the charter was forged, not to deceive the king, but to improve the position of their *mensa* against the bishop. More important, it seems to me that these judicial approaches to charter criticism are beside the point. To judge a genuine instrument false, or, as is commonly done, to reject a genuine instrument altogether when its falsity is only partial, is tantamount to taking a piece of precious evidence and eliminating it from historical discussion as effectively as by burning it. Clearly, certainty will never be achieved. What we must seek is to reduce to a minimum the risk of either over-scepticism or over-credulity. We must, I believe, treat them as narrative sources are treated, to be tested line by line by every means available. In no sense are the diplomatic-palaeographical criteria privileged. It was exclusive reliance on these that induced Ewald and Drögereit to attribute CS 54, an obvious late forgery, to St Aldhelm. And they must be supplemented by considerations of context, especially the topographical context which is the lesson above all we need to learn from Dr Finberg. If we put Dr Chaplais's comments—and I may add mine—alongside Dr Finberg's on the Sandford Charter we shall, I think, see that it must be a forgery intended to deceive. Equally we shall also see what the motive of deception was, and, most

important, how far and with what degree of confidence its evidence may be used. It is too often forgotten that a forgery is evidence of something no less important than a genuine charter, and the function of criticism is to make the one as the other useful for the appropriate purpose. I have before, and shall probably again, point to the necessity of a study of the techniques of forgery in Anglo-Saxon diplomatic. Until we attempt such a study a dimension will be missing from our criticism. This is unfortunate because Anglo-Saxon charters can alone solve the basic questions of the social structure of early England, and its relationship to contemporary agriculture.

ERIC JOHN

J. Z. TITOW, *English Rural Society 1200–1350*. Allen and Unwin, 1969. 208 pp. £2 cloth, £1.10 paper.

Dr Titow's book consists of a collection of documents chosen to illustrate the nature of the source material for the study of rural society at this period, and a long introduction. This includes some guidance as to the use of the documents, but is mainly taken up with a discussion of a number of the problems at present occupying economic and social historians of the period. The open-field system, population increase and land shortage, agricultural improvement, demesne cultivation and landlord investment, peasant status, and what Dr Titow dubs the standard of living controversy are amongst the topics dealt with. This part of the book is lively, clear, and thoughtful. It should provide an interesting introduction for those newcomers to the subject at whom, we are told, the book is primarily aimed, although they might find some preliminary reading necessary to get full advantage of parts of the discussion. There is also much to interest the specialist. Dr Titow briefly recapitulates the arguments, criticizes, often at some length and sharply, those historians he disagrees with, and gives his own opinions. These are often supported with new evidence from that veritable cornucopia of documents which survives from the estate of the Bishop of Winchester.

Many of the views Dr Titow expresses are already familiar from his previous, valuable work, and much of the argument is convincing. Few would disagree with his criticisms of Professor Russell and Lynn White Jnr, who are singled out for particular attack. Nevertheless, there are several points in his discussion of the problems and sources which are worth taking up.

At several points Dr Titow emphasizes, perhaps in fact over-emphasizes, what he calls the business acumen of the landlords of the period. For example, their accounting system comes in for some praise which might mislead beginners. Not every historian, or for that matter, contemporary, has found the calculation of profits, or total production, from ministers' accounts as simple as Dr Titow seems to suggest, and it surely is significant that much greater emphasis is put on checking on manorial officers than on the calculation of profits, important though the former obviously was to absentee landlords. Also, it should be remembered that even the unusually sophisticated methods of profit calculation described by Dr Stone at Norwich Cathedral Priory showed grave flaws, at least in the early fourteenth century.

Dr Titow again praises the landlords when he raises the important question of their investment in their estates. He asserts that although investing only a tiny proportion of their estate incomes, they yet invested enough, that is as much as "the ceiling on what could usefully be spent on an estate" allowed, and, rather more vaguely, "enough to expand production or maintain it at as high a level as was possible in the circumstances." This seems doubtful and fits uneasily into Dr Titow's own thesis about the development of agriculture on the Winchester estates at this period. Surely more could usefully have been spent by most or all landlords on the wider application of a number of improvements found in the thirteenth century or soon afterwards? And should not the absence of more spectacular improvement in the thirteenth century rather be explained in terms of, for example, landlord mentality, social structure, easy availability of other sources of income, or the nature of the market for agricultural produce, than by reference to some insuperable technical limitations?

Dr Titow's own contribution and his summary of recent discussion of the peasant standard of living at the end of the thirteenth century is most useful and his conclusions convincing. However, one can accept these and still wonder if, concerned primarily to demonstrate wide-spread poverty, he dismisses too easily the possibility that non-agricultural incomes could be important to significant numbers of the peasantry. Off-farm opportunities for peasants would, admittedly, vary from region to region, and a supplementary income from industrial (or pastoral) activities, such as was clearly common in the forests, need not make a peasant smallholder rich. But the expansion of agriculture alone must have stimulated other industries. For example, the new barn whose construction is described in document 19 needed about 10,000 laths, 67,000 tiles, 70,000 pegs, and 67,700 nails, all goods typically made in the country.

The account of the cost of the new barn and those of new assarts and improvements on other Winchester manors and of St Giles's fair are interesting additions to the selection of examples of manorial documents—chiefly accounts, court rolls, and various types of survey —in the section devoted to documents. Many of these, like many of Dr Titow's examples in the Introduction, are from the Winchester estates. Designed for non-specialists, they are translated with the Latin included for doubtful passages.

There is much more of interest in the book. For example, Dr Titow adds to the fascinating body of information about the role of peasant widows, which he and Professor Postan have already provided, an inventory and valuation of the widows of Brent. Throughout, Dr Titow gets over admirably his own enthusiasm for what he shows to be an important period.

JEAN BIRRELL

R. E. F. SMITH, *The Enserfment of the Russian Peasantry*. C.U.P., 1968. 180 pp. £2.10.

This is a slim volume but it contains a wide-ranging and thought-provoking collection of documents of great interest to anyone concerned with the relationship of lords and peasants in the Middle Ages, and the factors which led to the second era of serfdom in the seventeenth century. This development was completely at variance with that which occurred in western Europe and there is still plenty of scope for discussion of the reasons.

The problem is presented by means of a selection of Russian documents in English translation (and the English really is English; Professor Smith eschews the use of Russian terms wherever it is possible to employ an equivalent English one), each of which is preceded by some explanatory comment. In addition, an introduction, which is a joint effort by Professors Rodney Hilton and R. E. F. Smith, sets the problem in broader perspective; Professor Smith describes the political and economic history of Muscovy and summarizes the main social trends to be inferred from the documents; Professor Hilton explains the differences in the documentary evidence *and* the substantive condition of the peasantry in eastern and western Europe. The capable translations of Professor Smith and the crystal clear analysis of Professor Hilton together bring out both the similarities in the obligations of servile peasants in both halves of Europe, and the contrasted territorial circumstances. Western Europe was an old-settled, even in some places a congested, land by 1200; Russian villages were tiny oases in an expanse of forest and steppe. Western European landlords busied themselves with listing labour services and food rents in refined detail, while Russian landlords laboured to prevent, or at least to restrain, the mobility of peasants and to devise means of reclaiming those who fled their jurisdiction.

The rigour of servile obligations varied considerably from estate to estate in the Middle Ages—in the manner familiar in western Europe. Some landlords attracted tenants with special privileges and exemptions; some peasants had wrung rights to pass land to their heirs, and to move from one lord to another. But the growth of state power in the late fifteenth century was everywhere accompanied by a tightening of control by lords over their tenants. For example, the permitted movement of peasants from one estate to another began

locally to be associated with one season of the year only—around St George's Day (26 November); in 1497 it became the law of Muscovy in the Law Code of that year. Events were leading on inexorably to the second era of serfdom. But how is it to be fully explained? These documents are concerned with social organization, and they shed little light on farming systems. They show peasant communities with ample means of voicing their protests against coercive stewards and unjust landlords. Indeed, some of the most interesting documents are those written on tree bark by the peasantry and recovered by archaeologists, the earliest printed here dating from the late thirteenth century. Yet these communities lacked the power to resist enserfment. Why?

Professor Smith's final remarks seem to put the responsibility for enserfment on the growth of market demand and the growing maturity of the state machine. What he does not discuss is the commodity which was principally in demand. Was it grain? The second serfdom in eastern Europe seems generally to be associated with great grain-growing estates rather than with pastoral country. Thus East Germany affords one of the best-known examples of a territory where the demand for grain—from western Europe—played the major role in enslaving the peasantry. Poland offers a like example. But Muscovy, if Professor Smith is right, was different. The foreign demand for grain did not impinge much on its economy. Demand arose out of the military needs of the state. This must necessarily imply a considerable internal movement of grain and other food, similar to that which developed in England. The rise of the food market in sixteenth-century England is thought to have been deeply influenced by the demand for food to supply armies and the royal household. What then was the condition of Muscovy's internal trade in food when the peasants were submitted to a second serfdom? This book does not set out to answer such a question, but raises it indirectly. It is a most stimulating contribution to the comparative history of agrarian societies in Europe.

JOAN THIRSK

R. B. PUGH (ed.), *A History of the County of Dorset*, Vol. III. O.U.P., 1968. xiv+190 pp. £6.30.

The whole of this volume is devoted to the Dorset Domesday and Geld Rolls, translated by Ann Williams, who also contributes extensive introductions and notes. The editors of the corresponding volumes for Devon and Cornwall based their work on the Exeter Domesday, merely noting such variants as occur in the abbreviated Exchequer version, but as four-fifths of Dorset are missing from the Exeter manuscript, here the Exchequer version takes first place. The blurb on the jacket states that the Exeter Domesday, so far as it survives, is printed side by side with the Exchequer, and if this had been done it would have facilitated comparison between them; in fact, however, Exeter is printed after and below the corresponding paragraphs from the Exchequer.

The translation adheres faithfully and impenitently to the models which have been current in the Victoria County Histories for some three-quarters of a century. *Servi* are still disguised as "serfs," and *villani* as "villeins." This is nicely designed to mystify anybody who looks up "villein" in the Oxford English Dictionary and finds that it means "one of the class of serfs."

The introduction, running to 60 pages, provides a painstaking digest of the Domesday particulars. It is not clear why the writer considers it unlikely that the petty boroughs of Dorset had courts of their own; there is documentary proof that those of Devon already had them in 1018. One wonders whether the heads of the religious houses would have agreed that they "suffered no major upset" from the impact of Norman rule (p. 36). The enfeoffment of knights on their land, mentioned only two pages later, must have struck them as a grievous imposition, involving as it did a serious loss of revenue. On p. 41 the bishop's ship-soke is confused with his diocesan endowment.

The Victoria History may or may not be right in assigning the Geld Rolls to 1084 and rejecting the arguments for 1086, but it is simply not true that this is the "view of most scholars" today.

H. P. R. FINBERG

ARTHUR RAISTRICK, *West Riding of Yorkshire*. Hodder and Stoughton, 1970. 192 pp., illustrated. £2.00.

CHRISTOPHER TAYLOR, *Dorset*. Hodder and Stoughton, 1970. 216 pp., illustrated. £2.00.

Sixteen years ago Messrs Hodder and Stoughton launched a series of books dealing with the history of the English landscape county by county. They fixed the price at too low a figure to admit of satisfactory production, and the printing of the carefully chosen plates left nearly everything to be desired. Moreover they published the overall survey by the editor, Professor W. G. Hoskins, as an introductory volume, and as his book had all the hallmarks of a classic it naturally skimmed the cream off the subject and the market. In these circumstances it is not surprising that the venture came to an abrupt stop after only four counties had been dealt with. Those four volumes are still available, but the publishers—are they perhaps ashamed of past incompetence?—refrain from listing them as such.

The series has now been revived under the same editor but in a greatly improved format. No one is better qualified to cope with the West Riding than Dr Raistrick, the distinguished geologist and engineer, who has known the Riding all his life. The area extends over nearly 3,000 square miles, from the high fells bordering on Westmorland to the low-lying agricultural vales on the east, with vast industrial conurbations in between. The man-made history of this landscape is as diverse as its scenery is dramatic. To do justice to it, a writer needs wide knowledge, good judgement, and affectionate enthusiasm. Dr Raistrick has all three. They are notably in evidence in his final chapter, where he discusses the new phase upon which the landscape is entering today at an accelerated pace. He does not pretend to like the new, terribly monotonous, multistorey blocks of offices and flats, but has great hopes that the Country Parks envisaged by the Act of 1968 will soon occupy the place which the private parks of the nobility and gentry occupied in the past, and may preserve some of the best of them in the process.

The book is illustrated with thirty-two plates and thirteen diagrams. Students of our early history will note with particular interest the author's stout refusal to take the Domesday record at its face value (pp. 39–41), his fascinating analysis of the village plan at Linton revealing the outline of original settlement (pp. 68–70), and his description of the small farms characteristic of Norse rather than Danish occupation (p. 92). It is, however, disconcerting to find him repeating the hoary fable that in 886 Alfred the Great "incorporated" Ripon with a Wakeman, twelve Elders, and twenty-four assistants—this at a time when Alfred's writ did not run in Yorkshire, and four and a half centuries before any borough was "incorporated."

Mr Taylor's book has a distinctly individual flavour. A good third of it is devoted to the pre-Domesday landscape. We are all familiar with the notion that prehistoric man occupied the downlands and left the valleys to be settled later by his descendants or conquerors. In Dorset the notion is encouraged by the remarkably large number of Neolithic barrows, Bronze Age burial mounds, and Iron Age fortresses visible in the high places of the county. It is easy to assume that where the remains of the prehistoric and Roman past abound, there the builders must have lived. But Mr Taylor will have none of it. Armed with the knowledge gained during seven years of work in the county with the Royal Commission on Historical Monuments, and enjoying the advantage of access to the Commission's as yet unpublished material, he stoutly asserts that both the prehistoric and the Romano-British inhabitants made their homes in the valleys and low-lying areas as well as, or even more than, on the downs which have preserved so much of their handiwork because—and only because—they have been less intensively used by their successors.

I have no doubt myself that he is right. Even a sceptical reader can hardly fail to be impressed by the well-argued case he sets forth in his first two chapters. It looks as if this book will have the honour of pioneering a reconsideration of long-cherished ideas and a fresh approach to the history of the landscape.

The rest of the book in no way falls below the standard of the opening chapters. There is

much of interest on the extension of settlement, the formation of manors and parishes, and the growth of towns. As Dorset has been little damaged by industry in any period, the author has no depressing tale to tell of derelict areas or blighted scenery. The book is even more fully illustrated with photographs, maps, and plans than its companion in the series, now so happily revived.

H. P. R. FINBERG

V. M. and F. J. CHESHER, *The Cornishman's House: an Introduction to the History of Traditional Domestic Architecture in Cornwall.* D. Bradford Barton, Truro, 1968. 142 pp. 17 plates, 5 figures. £1.60.

Mr and Mrs Chesher have produced a very valuable addition to the small but growing number of regional studies of rural houses, based on examination of buildings and study of documents, especially probate inventories. Their book is modest in scope; it leaves aside houses in towns and villages; it is not concerned with the great houses, nor does it deal with the results of the industrial revolution, but within its limits it provides a very valuable account of surviving houses dating from the Middle Ages to the eighteenth century. Their number is small owing to the thin population in the Middle Ages and even later. The idiom, owing to natural and climatic conditions—Cornish gales, a relative scarcity of good timber, and a humid atmosphere that means "sweating walls and rotting timber" (pp. 13–14)—recalls that of the Scottish highlands and islands rather more than Wales or Cumberland. Buildings are extremely difficult to date, because ornamental or structural features found in other parts of England or Wales can scarcely as yet be used for comparison, and in plan they seldom conform to expectations. Cornish society was less diversified than elsewhere and houses of superior social status were of very modest scale. Nevertheless, medieval homes with open hall, or a first-floor hall, can be found, and a great rebuilding can be demonstrated, both from Richard Carew and from surviving houses, to have started before 1600—earlier than in other parts of the highland zone. The new houses are remarkable mainly in that, within the limits imposed by the environment, those which can be proved to have belonged to gentlemen or yeomen are so small, and include types of plan not found elsewhere. Nevertheless, in other respects, Cornishmen of the seventeenth century were behaving as would be expected, by, for example, adding a parlour wing or a storeyed porch to their houses.

It is to be hoped that *The Cornishman's House* will have wide sales—wide enough eventually to justify a second edition. If that hope is realized, the book would be improved by having a map (especially one of building materials), more plans, and references in the text to illustrations. Further thought will have to be given to such outstanding problems as that of the place of the long house or byre house in Cornwall. The evidence from other counties may not solve such problems, but reference to other studies, such as those of S. R. Jones and J. T. Smith in *Brycheiniog* (long houses) or R. W. Brunskill in the *Transactions of the Cumberland and Westmorland Archaeological Society* (tower porches in Cumberland), would further enhance the value of a very courageous study.

M. W. BARLEY

BARBARA KERR, *Bound to the Soil: A Social History of Dorset, 1750–1918.* John Baker, 1968. xix+288 pp. £3.50.

From the 1840's onwards, thanks to the visits of Free Trade propagandists and the publication of the *Reports of the Special Assistant Poor Law Commissioners on the Employment of Women and Children in Agriculture* (1843), Dorset became the stock example of an overpopulated and backward county in the Deep South of England. Miss Barbara Kerr's highly original, even idiosyncratic, book is therefore a welcome addition to the literature on the social and economic life of the English countryside for the past two hundred years if only because it corrects this nineteenth century oversimplification. It does much more, however. Written with a constant awareness of the basic importance of the different soils to be found in the county, it is firmly based on research in the various classes of material in the Dorset

County Office and the Public Record Office. These sources have been skilfully supplemented by the personal reminiscences of those who remember the county as it was before 1891 and by some documents still in private hands. Many interesting topics are touched upon, e.g. the decline of maritime occupations, and the vital importance of the estate agent or steward in the rural economy. Where else can one find documented such a striking example of bad management as the sad story of the great Earl of Shaftesbury and his rascally agent R. S. Waters, whose misdeeds hindered the noble lord's wish to improve the living conditions of the labourers on 18,000 or so acres of Dorset? Eight of the ten chapters deal with specific localities (Arne, Whitchurch Canonicorum, Burton Bradstock, the Vale of Blackmoor, Bere Regis, Thornford, Gillingham, and Wimborne St Giles), and their histories are used to illustrate the wide variety of farming conditions in the county. There is a final chapter on Dorchester itself, in which Miss Kerr, among other things, documents the rise of the nineteenth-century contractors, auctioneers, and estate agents who grew to dominate the town by 1914. There are many excellent illustrations and maps. Inevitably omissions occur, e.g. there are only a few slight incidental references to the Tolpuddle labourers' case of 1834. The same is true of the coming of the railways. Here a map would have been useful. There is a repeated howler, too, about the non-existent "Speenhamland Act" of 1795 (pp. 97, 106). And were the English industrial poor really "a byword of destitution among the countries of Europe?" (p. 224). These are minor flaws, however, in a first-class addition to agrarian history.

W. H. CHALONER

J. M. G. VAN DER POEL, *Honderd jaar landbouwmechanisatie in Nederland.* Veennam en Zonen, Wageningen. 307 pp., 127 illus. 35 f.;
GÜNTHER FRANZ (and eighteen specialist contributors), *Die Geschichte der Landtechnik im 20 Jahrhundert.* DLG Verlag-G.M.B., Frankfurt am Main. xii+449 pp., many illus. DM.80.

It is a matter of common knowledge, indeed, the casual observation of the tourist, that the last hundred years have seen the almost wholesale mechanization of farming processes in western Europe, U.S.A., Australia, New Zealand, Argentine, etc., but the histories of this development so far written are few. Those that have been written do not, in general, deal with the whole subject in a comprehensive way, but are confined to the story of the use of individual machines in particular places. Examples spring to the mind, such as Ronald H. Clark's *Development of the English traction engine*, 1960; Reynold M. Wik, *Steam power on the American farm*, 1953; Clark C. Spence, *God speed the plough; the coming of steam cultivation to Great Britain*, 1960.

Both the above-named books are more comprehensive than this, and are planned to describe the whole range of machines etc. that have been adopted in their respective countries. At first glance, therefore, it seemed possible to review them jointly, but closer examination showed that this would not be possible because of the different structure of the two books, the Dutch one being the individual work of Dr van der Poel, and the German a symposium under the editorship of Professor Dr Günther Franz. Separate notes therefore follow, but first of all a definition of mechanization may be useful—to the writer if to no one else.

Possibly the general impression of farm mechanization is that the adoption of the self-propelled or earlier tractor-hauled combine harvester marks its apogee, the average non-farmer being quite unaware of the wide range of other machines now in use. Others, even farmers, think of the initiation of mechanization as the adoption of a power unit, first the steam engine, later the oil-fuelled tractor, that superseded animal power used in an earlier time—at least in some parts of the world. But the first machine in the proper sense of the word used on farms was not a power unit. It was the seed drill; but even that first machine was not very widely used a century ago. The second true machine was the threshing drum. Other things, especially those used in Dutch dairies, were in some degree mechanical.

(*a*) Inventiveness was not lacking in the Netherlands before the present age. The fore-

runner of the so-called Dutch barn was a hay barn which had an adjustable roof fixed on wooden uprights on which it could be raised and lowered according to the amount of hay that must be stored. It was much admired and recommended to Elizabethan farmers by Sir Hugh Plat. The *dorsblad* was a heavy, ribbed cone, the small end of which was attached to an anchor so that it would run round in a circle over the ears of corn and thus rub out the grain. Various patterns of semi-mechanical churns were made, the motive power being provided manually or by a horse or horses walking in a circle, horse gear as it was called in England when applied to driving a threshing drum or other barn machinery.

But modifications of hand or horse-power implements were also made in other countries before the age of true mechanization. It was in these other countries that factory production of farm implements and machines was born. There is some slight possibility that a factory for making ploughs was started at Rotherham, Yorkshire, in the third or fourth decade of the eighteenth century, but this is only a possibility. The Rotherham plough owed something to the Dutch plough. Robert Ransome's factory at Ipswich, 1783, was the first plough-making factory. The Smyths of Peasenhall, Suffolk, began making their seed drills in the early decades of the nineteenth century. Germany followed with Schwerz's factory that was a department of the Hohenheim Agricultural Institute. Enterprising Americans entered the market at about the same time with McCormick's reaper and other farm requirements, such as the steel plough, the sulky plough, etc., but these were the forerunners of an industry that could grow and expand only with better knowledge of the requirements of manufacture, and a keener appreciation of the use of the things in the field.

The Netherlands, however, remained a non-industrial country until the mid-century. More, the average farmer was handicapped by his limited financial resources, and mentally inhibited by his prejudice in favour of using the appliances to which he, and indeed his forefathers, were accustomed. Nevertheless, the efforts of enterprising representatives of English firms had some effect, although, as in other countries, the introduction of elaborate and expensive machinery, like steam-propelled ploughs, depended upon the initiative of wealthy landowners and the richer farmers. An early factory for making implements in the Netherlands was established in 1847; but it was one of the members of the Netherlands Royal Agricultural Society who was a great enthusiast for steam-ploughing, J. P. Amersfoodt. He made a journey to England and visited makers of this kind of tackle. An interesting feature of his journey was that he did not think the Fowler plough was suited to Dutch conditions, so he took a Hohenheim plough for them to copy, for the Dutch trade. Oddly, this plough itself was derived from a Low Countries' pattern. The first steam plough worked in the Netherlands was used in October 1862. Steam power, too, was applied to driving the threshing machine, the number of these machines rising from 33 in 1870 to 266 in 1900; but in 1885 there were still 5,802 horse-driven threshing machines in use as well as 901 manually operated. Seed drills, grass mowers, grain reapers, and haymaking machines were in use, but it was after the turn of the century that the new machines were more rapidly introduced, and these included the whole gamut of what was then to be had. The development of the oil-fuelled tractor, which was more mobile and handy than the vast steam engine, gave a further impetus to this tendency. The existence of 600 manure spreaders in 1900 is a measure of the enterprise of the Dutch farmers. There was probably none in England at that date.

From that time onwards the use of more complex machines became more commonplace until today it is no unusual sight to see the most modern types of machine at work on the farms. The self-propelled combine, potato and sugar beet harvesters, and seed drills of the most up-to-date type are illustrated in Dr van der Poel's book. It would be a work of supererogation to try to mention them all here, but this work is one that could not well be done without. It could be translated into English with advantage, and it is undoubtedly a contribution to knowledge of the progress of farm

mechanization in a small country which is of the greatest value in making comparisons with the progress in larger ones with more varied conditions to contend with: perhaps it even carries some lessons for the developing countries.

(*b*) This book's title limits its range to the twentieth century, but Professor Dr Günther Franz's introduction carries the story well back into the nineteenth, when a marked degree of mechanization of the kind then possible took place, especially on the larger German farms. At the same time there was a large number of small peasant farms where traditional methods continued, and continue, to be employed.

The German authorities were evidently concerned about the progress of agriculture, and collected statistics of farm machinery some sixty years before a similar scheme was launched in this country, and at that late date only because of the need for precise information to underpin the wartime food production campaign. Steam ploughs were naturally more frequently in use on the larger holdings of 200 hectares upwards. Some quite small holdings were then (1882) using seed drills and reaping machines as well as steam-driven threshers, but there was also a large number of other powered threshers, some manually operated, though the greater part of all this apparatus was used on the big farms. The number of these things rose rapidly, and a type of motor plough was designed in 1909. Factory production of ploughs had been initiated at Hohenheim in 1818, and both ploughs and other farm machinery were produced industrially after about 1850.

Electricity was made available in rural Germany between the wars, and this enabled electric motors to be used as power for barn jobs. Milking machines to the number of 9,000 were being used in 1928. The first combine had been imported in the previous year. The tractor and rubber-tyred wagon both became ordinary farm equipment, and, as in other countries, the rate of acquisition of all sorts of mechanical devices rapidly increased after the Second World War. Details of the new devices and their application to farming processes are supplied by the specialist contributors. It would be invidious to choose between them in this kind of commentary. Taken as a whole they demonstrate that German agriculture is today highly mechanized, and that German farmers, more especially those working the larger holdings, are using all the most modern apparatus that is on the market. This symposium forms an invaluable work of reference on the history of farm mechanization in Germany as it has taken place during the past hundred years, a development that has been pretty general in all of what are now designated developed countries.

G. E. FUSSELL

CLARENCE H. DANHOF, *Change in Agriculture: The Northern United States, 1820–1870.* Harvard University Press; London, Oxford University Press, 1970. xiv+322 pp. £4.75.

Mr Danhof's long-promised book originated with a suggestion by Professor Arthur H. Cole that entrepreneurship in agriculture required investigation. The field chosen for examination here is the commercialization of farming in the states from Massachusetts west to Iowa; the choice of period is defended with the argument that these fifty years saw near self-sufficiency give way to market-oriented agriculture (while a copious periodical literature starts after 1820, but statistical materials which would need quite different handling start after 1870); and the chief theme is that the farm population included a key minority who were innovators with characteristics like those of contemporary innovators in industry. Mr Danhof involves himself, and the reader, in what the livelier farm operators sifted out as likely to prove useful in their individual localities from the mass of information about new managerial skills, new plant varieties and crop rotations, breeds of stock, implements, and machines, which equally novel farm journals put before them. Until now the activities of the advanced American farmer of the nineteenth-century have perhaps been obscured by the longer persistence of obsolescent values and practices within agriculture than in many other sectors of the economy.

The core of the book is made up of the chapters which describe and document closely the adoption of innovations. Students of the

diffusion of new farm practices, equipment, or even whole new systems of farming, and not merely those concerned purely with historical cases, will find detail of great value here, enough no doubt to push generalizations beyond those offered by the author. The business unit in the agriculture of the northern states was the family farm in 1870 as it had been in 1820, and faced with this appearance of structural stability one does not anticipate that institutional changes were the propellant of technical advance. Mr Danhof does not think so either, and it is almost with surprise that a re-reading shows how carefully and at what length he has considered 'external' developments—in markets and marketing institutions, transport, capital supply, agricultural societies, and the foretaste of governmental involvement when the Morrill Act of 1862 induced the states to found the land grant colleges. Nevertheless the direction of this enquiry is towards the response of individual farmers to new opportunities or pressures to sell their produce rather than sitting down to eat it in the farm kitchen. No heroes are elevated amongst them, though the author's eye is fixed firmly on the emergence of business methods and the striking change in values which accompanied this shift in the behaviour of what was a comparatively small proportion of farmers. No heroes: but some enterprising individuals can be singled out by name as their experiments pass along the conveyor belt of the historical record.

The struggle between the old and new value systems is nicely brought out. The dominant generation of 1820 most approved the man who added acre to acre and whose family toiled and trod most skilfully to avoid buying consumer goods. By 1850 loud voices were submitting that "money making . . . is, in our country at least, the main point in farming." By 1870 this view had more or less prevailed, and while Mr Danhof gives all due weight to the "invincible *inertium*" of agriculture's silent majority, this victory for commercialism in farming was basic to the urbanization and economic growth of nineteenth-century America.

The strength of the book lies in the thematic approach. Concentrating on the uptake of innovations by farmers makes for a more coherent volume than the textbook approach where a chapter on this chases a chapter on that without properly interlocking. But the trunk of the tree is not delineated only for the branches to be lopped off; instead they are drawn from less stereotyped angles. For instance, while Mr Danhof is not strictly concerned with that relentless driving force of American agricultural history, the frontier movement, he succeeds in marking out the changes which cheap western produce forced on farmers in the eastern states, mentions the paradoxical flow of food towards the outermost frontier line, points to the void of falling yields which followed a decade or at most a generation behind the grain frontier, and describes the methods of recovering soil fertility (by conserving FYM and using rotations centring on red clover) which flowed in turn into the threatening vacuum. In short, the book could be used as a text while being less disjointed than most such, or even than most regional studies.

Commercializing agriculture meant a concentration on some products at the expense of others, which was an inducement to improve certain promising breeds of animals and varieties of crops. Who pioneered these improvements in an egalitarian rural society? There is a special fascination here in the contrasting patterns of innovation in the United States and in the landlord–tenant-dominated agriculture of Britain. Mr Danhof describes the marks of the innovating American family farmer—he sold his produce on the market, was a good manager, made plans and constantly revised them—but admits that printed sources do not expand on the way such a man arrived at his decisions. Nor do the observations about growing urban markets, the suffusion and commingling of ideas from different countries in Europe, or the new techniques in transportation, really explain why one man responded eagerly though his neighbours plodded along in their ruts. I am sure that this stimulating book will attract other scholars to delve into the wells of human creativity which turned American farmers so speedily and forcefully into businessmen.

E. L. JONES

POLLY HILL, *Studies in Rural Capitalism in West Africa*. African Studies Series 2. C.U.P., 1970. xxiii+174 pp. £3.50.

For nearly twenty years, Polly Hill has visited remote villages of West Africa and explored the history and structure of economic activities conducted by farmers, fishermen, and traders. The present book contains six of her studies, covering cocoa farming, seine-net fishing, cattle owning, and cattle trading, all in Ghana; and in Nigeria, the nineteenth-century trade in tobacco from Katsina, and the farming structure of one village near the same ancient trading city.

The emphasis in these studies lies on the acquisition and use of capital in various forms in the indigenous economies. They all show the importance of family inheritance and family connections for the successful entrepreneurs, since capital, credit, and information do not move easily between strangers. Another interesting point is the mutual support provided by traders within the migrant communities which engage in long-distance trade across the boundaries set by states, tribes, and languages. Immigrants manage the cattle herds in Ghana for crop farmers who invest their capital in livestock, and other immigrants organize the trade in beef cattle from the northern savannah regions to the meat-eating towns in the coastal belt of West Africa. Information about supplies and markets, the provision of credit, accommodation, and insurance against bad debts and other losses, all come through personal connections in these trades, not through commercial institutions, common in industrial countries.

The final study in this collection, on the farming structure of a Hausa village, also suggests the existence of a minimum level of capital in determining future differences in wealth and income. Above a certain level, these farmers could afford to buy manure for their fields, to store their crops for sale some months after harvest when prices had generally risen, and to trade in grain or other products in the dry season. Below this critical level, farmers tended to become increasingly impoverished, as they ceased to buy manure, sold at low prices after harvest and bought food later at higher prices, and finally sold their manured plots to pay their debts. These studies of enterprise and accumulation in farming, fishing, and trading offer fascinating parallels to the development of similar businesses in the early stages of economic growth in other countries.

E. H. WHETHAM

KWAMINA B. DICKSON, *A Historical Geography of Ghana*. C.U.P., 1969. xiv+379 pp. with 58 maps and diagrams. £7.50.

This major work by a leading African geographer provides the first comprehensive account of the historical geography of Ghana. The book is divided chronologically into four parts. Part I covers the long period from the earliest archaeological evidence of man's existence in Ghana (more than 40,000 years ago) to the end of the seventeenth century. Naturally, historical and archaeological sources for this immense period of time are scarce but the author sets the scene for later events by summarizing the existing state of knowledge concerning the introduction of farming to West Africa in neolithic times (about which there has been controversy) and describing the different regions and peoples of Ghana before the arrival of the Europeans.

Part II covers the period from about 1700 to about 1850, and is mainly based on the observations of a Dutch trader, William Bosman, who published a detailed account of the coastal area around 1700 (the original Gold Coast only penetrated a few miles inland and most of modern Ghana was not included in it). Bosman was a thorough observer and this section has much of interest on early agriculture, trade, and settlements.

Part III covers the period from about 1850 to 1936 and is the fullest section of the book. After the establishment of British control over the whole coast in 1872, and its extension inland to cover Ashanti and the Northern Savanna lands after 1900, the output of colonial records rapidly increased, enabling the author to give a much more detailed picture. After 1900 economic development was rapid, primarily in cocoa production, as Ghana rose to be the world's leading producer, and second-

ly in mineral production as the gold, manganese, and diamond-mining industries developed. The book ends with an analysis of the population, settlements, and economic geography of Ghana in 1939, since the author maintains that all the basic elements of modern Ghana were in existence by that date. Nevertheless it would have been interesting to have had a comparison between 1939 and the present day, although one can see that this might have made the book unduly long. It is much to be hoped that the author will fill this gap by a second volume covering the period since 1939.

It is difficult to do justice to a book of this length and scope in a short review. The 58 maps and diagrams are fascinating in themselves and agricultural historians will particularly welcome those showing export statistics and the two distribution maps defining the area and extent of cocoa purchases in 1927 and 1936–7. There is an excellent bibliography, and the author has made profitable use of original documents in the Public Record Office in London, particularly for the early period of British rule in the 1880's. His analysis of the relationship between the transport problem and economic development is also excellently done. Some sections would have been even more interesting if it had been possible to go more deeply into the causes of development. This applies to subjects like the beginning of cocoa cultivation and European investment in gold mining. In places, too, more comparison with other West African countries would have been illuminating, but these are minor criticisms of an absorbing book which is likely to be the standard work on its subject for many years to come. M. A. HAVINDEN

LETTERS TO THE EDITOR *continued from page* 87.

willing archbishops by influential courtiers.[1] Sandys's laments were all too well justified after all. Even the recovery in the seventeenth century was not very impressive, since the result was a mere 15 per cent improvement on the position in 1600. In 1700 the real income of the archbishop was not very much more than a third of what it had been in the palmy days before the Reformation. The Archbishops of York were certainly never impoverished during this period, but the "myth" of permanent despoliation is fully confirmed rather than destroyed by the new evidence.

LAWRENCE STONE

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MADAM,—I think Professor Stone's disagreement with me is more apparent than real and largely depends upon our different opinions over what constitutes royal spoliation of the see of York in the sixteenth century.

My argument is that although the see of York underwent a considerable loss in income through the two Henrician exchanges of ancient archiepiscopal manors for royal impropriations, the restoration of archiepiscopal manors in the reign of Mary brought the endowments of the see (on the 1536 valuations) to within striking distance of what they had been in 1536. These endowments remained permanently with the see and were not interfered with by Elizabeth. I agree, of course, that the archbishops suffered severely from inflation, as did so many great lay landowners, but the crown can scarcely be blamed for a fall in the real value of the income of successive archbishops of York caused largely by economic forces outside the control of monarch and archbishop alike.

[1] For a description of these more subtle methods of exploitation, see L. Stone, *op. cit.*, pp. 405–8.

Professor Stone is quite right to point out that the archbishop's income of about £1,800 in 1600 was worth very much less in real terms than an apparently similar income of rather over £1,800 in 1536. However, I question the usefulness of adjusting the archbishop's income at different dates in the sixteenth century in accordance with the Kerridge Rent Index or the Phelps-Brown Index.

The assumption behind Professor Stone's argument seems to be that if the archbishops had been permitted by the crown to retain undisturbed their ancient archiepiscopal lands they would have stood a significantly better chance of ensuring that their income more nearly matched the rise in prices. The positive evidence we have does not support this assumption. Just before Archbishop Holgate surrendered the regality of Hexham to Henry VIII it was valued, in 1536, at a little under £197.[1] The crown retained the regality, perhaps partly for military reasons, until 1632, and when it was surveyed in 1608 it had actually fallen £5 in value.[2] If the crown failed to raise rents in the regality over three-quarters of a century it is hardly likely that an archbishop would have done so. The ancient lands which the archbishops of York retained, or had restored to them before Elizabeth's accession, were not improved over the century. The lordship of Ripon was valued at almost £263 in 1536; in 1597 it brought in almost £267; the income from the lordship of Otley apparently rose by only £5 between these two dates, whereas the lordship of Scrooby brought in £13 more in 1597 than it had been valued at in 1536. Clearly on these lands the archbishops had as yet made no attempt to raise rents. On the other hand, it cannot be argued that the archbishops of York had been forced to exchange manors which at some future date could have been improved for impropriations which were not capable of improvement. Because of the absence of receiver general's accounts before 1597 it is not possible to know in detail how the mass of impropriations were administered. The 'Great Collection' of impropriations was valued at the time of the 1545 exchange at £505;[3] in 1597 apparently the same collection of impropriations was worth only just under £458 but in 1700 these thirty-three rectories together with some of their corn rents brought in a gross £999.[4]

Why the archbishops of York in the second half of the sixteenth century failed to raise their rents can only be a matter for speculation since no detailed information about their economic activities survives earlier than 1597. They may well have found it easier, and less contentious, to exploit their patronage than attempt to increase rents. Archbishop Sandys, for example, granted lucrative ecclesiastical offices in the northern diocese as well as leases of archiepiscopal land to his sons, and, despite his complaints, succeeded in founding at least three county families.[5] Because of the lack of precise evidence it is not possible to assess how often archbishops of York granted leases to their dependants to the long-term disadvantage of the see, or were forced to make unfavourable leases to courtiers, but from this latter practice not even their pre-Reformation predecessors had been exempt. Taking an overall view, it seems not that the archbishops of York were deliberately despoiled by the crown after 1553, but that the crown and the archbishops stood together in a similar defensive position: both were caught by the little-understood phenomenon of inflation with which both in the short run were ill equipped to deal.

CLAIRE CROSS

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[1] These valuations are given to the nearest pound and, unless otherwise stated, are taken from Tables I and II in my article in *Agric. Hist. Rev.*, vol. 18, Supplement, pp. 82–3.

[2] *Ibid.*, p. 75–6. [3] P.R.O. C 66/750. [4] Borthwick. CC Ab. 2. 6.

[5] The archbishop's eldest son, Sir Samuel Sandys, settled at Ombersley in Worcestershire, Sir Edwin Sandys at Northbourne in Kent, and Sir Miles Sandys at Wilburton in Cambridgeshire.

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Demesne Arable Farming in Coastal Sussex during the Later Middle Ages

By P. F. BRANDON

IN the early fourteenth century only parts of Kent among all the provinces of England exceeded the wealth of coastal Sussex.[1] The prosperity of this tract was derived from many sources but its primary basis lay in its sheep-and-corn farming which rested upon exceptionally favourable physical conditions, easy access to tide-water, and close proximity to markets in maritime England and on the Continent.[2] The quality of its flock management, the widespread substitution of a legume course for bare fallow, and densely sown fields producing grain yields higher than the medieval norm placed it firmly in the vanguard of the agricultural development of its day. The agrarian institutions chiefly responsible for this unusually high level of technical efficiency were manors of the classical type of Seebohm and Vinogradoff, with large demesnes and bodies of dependent cultivators, grouped into extensive honours and archiepiscopal, episcopal, and monastic lordships. They functioned, *par excellence*, as 'federated grain factories' during the period of intensive demesne exploitation, and gave the tract both social and geographical coherence. Indeed, they dominated its economy by the immense scale of their operations,[3] largely conducted with increasing flexibility within consolidated demesnes which were separated from the *tounmanneslonds*, the attenuated common fields of the servile tenants.

The origins of the agrarian conditions within these manors have long invoked an enquiry which shows no sign of abatement,[4] but little attention has

[1] F. E. Glasscock, 'The Distribution of Lay Wealth in Kent, Surrey, and Sussex in the early Fourteenth Century', *Archaeologia Cantiana*, 80, 1965, pp. 66–8.

[2] N. S. B. Gras, *The Evolution of the English Corn Market*, 1915, pp. 50, 285; R. A. Pelham, 'Studies in the Historical Geography of Medieval Sussex', *Sussex Archaeolog. Coll.*, LXXII, 1931, pp. 167–75; Public Record Office, *Calendar of Patent Rolls, Henry VI*, vol. III, p. 345.

[3] Examples are the Honour of Arundel which comprised no less than 8,000 acres of demesne arable (M. Clough, ed., *Two Estate Surveys of the Fitzalan Earls of Arundel*, Sussex Record Society, LXVII, 1968, pp. 91–171), the arable demesnes of the Bishop of Chichester which exceeded 3,000 acres, and the large estates of Battle Abbey, the Archbishop of Canterbury, the de Warennes, and others.

[4] Notable matters being actively debated are the origins of the social structure, the settlement pattern west of the Arun, and the dispersed 'outliers' in the Weald. Jutish influences have been plausibly argued by J. E. A. Jolliffe, *Pre-Feudal England: The Jutes*, 1933, pp. 73–97. A local antiquary, W. D. Peckham, postulated the survival of Celtic features in the settlement pattern of the western part of the coastal plain ('Customary acres in south-west Sussex', *Sussex Archaeolog. Coll.*, LXVI, 1925, p. 155) and this theory has been revived by G. F. G. Jones who discerns in the servile sub-structure of the discrete estates in coastal Sussex and their constituent settlements something of the character of the Welsh *maenor* (*Antiquity*, XXXV, 1961, pp. 221–32).

been given hitherto to the contribution of these large estates to medieval agricultural development.[1] For this purpose the dearth of records earlier than the last quarter of the thirteenth century is compensated for by later *compoti* which are unusually continuous and complete, those for the Sussex estates of the Benedictine foundation of Battle Abbey being especially voluminous.[2] These documents are supplemented by large numbers of extents attached to *Inquisitions post mortem* and fuller surveys undertaken by manorial officials. There is a fairly even spread of documentation over an area comprising the Sussex coastal plain, the South Downs, the 'foreland' of fertile soils at their foot, and the transitional zone to the north bordering the Weald proper. This fact, and the relative unimportance of such members of medieval rural society as the lesser gentry until the fifteenth century (about whose activities the records are silent), make it possible to discern more clearly than for many parts of England, the outlines of the regional economy.

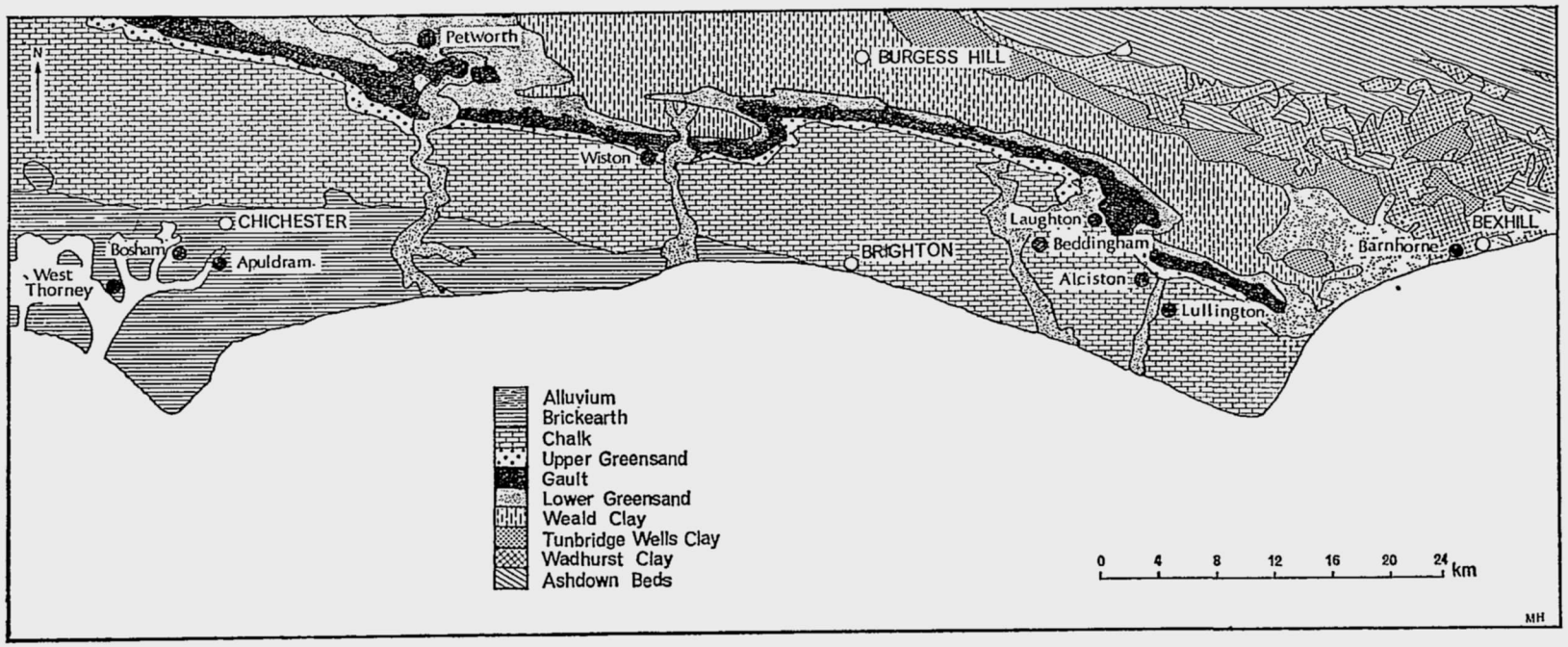
The configuration of the land was everywhere conducive to arable farming and, as a whole, the climate greatly favoured large-scale cereal growing. The only district which appears to have had a serious climatic disadvantage was the extreme western part of the coastal plain. This was prone to drought in spring and summer which reduced crop yields, especially of legumes, which probably suffered most in the seedling stage.[3] The soils are diverse but generally of high fertility, and possess mechanical and other properties which made them particularly suitable for arable husbandry in an era when farming was critically dependent on weather conditions. Two soil belts offered especially good opportunities for tillage. One was the Brickearths on the lower parts of the coastal plain, which texturally, and in other respects, are akin to continental loess and comprise part of an area adjudged by Marshall, writing in 1798, to be "the most valuable arable district of equal extent in the island."[4] The other was the

[1] R. A. Pelham discussed the agriculture of the Chichester estates in 1388 and drew attention to the crop distributions which can be detected from the information given in the Nonae Rolls of 1341.—See 'The Agricultural Geography of the Chichester estates in 1388', *Sussex Archaeolog. Coll.*, 78, 1937, pp. 195–210, and 'Studies in the Historical Geography of Medieval Sussex', *ibid.*, LXXII, 1931, pp. 158–67. E. M. Yates has also used the Nonae returns to demonstrate the high productivity of the western part of the Coastal Plain.—'The Nonae Rolls and Soil Fertility', *Sussex Notes and Queries*, 15, 1962, pp. 325–8.

[2] The series of *compoti* used for this article are those for Alciston, Apuldram, Barnhorne, and Lullington (estates of Battle Abbey) and the lay manors of Beddingham, Bosham, Chalvington, Stoke, Stoughton, Thorney, and Wiston.

[3] For example, the *compoti* of Apuldram and Bosham invoke drought as an explanation for crop losses, reduced yields, and poor pasture in ten seasons between 1344 and 1363.—P.R.O. SC6/1016/8, 9, 13, 15, 16, 18 (Apuldram); West Sussex Record Office (hereafter W.S.R.O.) Acc. 939, 2, 6, 7, 8, 9 (Bosham). The present-day climatic liability of the district is discussed by J. M. Hodgson, *Soils of the West Sussex Coastal Plain*, Harpenden, 1967, pp. 18–19. The present author discusses the meteorological factor in Sussex medieval farming in a forthcoming number of the *Transactions of the Institute of British Geographers*.

[4] W. Marshall, *The Rural Economy of the Southern Counties*, 1798, vol. II, p. 239.



COASTAL SUSSEX: THE GEOLOGICAL BASIS OF THE SOILS

soil derived from the Malmstone which lies at the foot of the Chalk escarpment and receives added downwash from the Chalk.[1] The soils developed on the South Downs varied from the thin, flinty soils at high elevations (the low-valued 'dry and stony' arable of extents)[2] to the fine red loams along their southern flanks. West of the Findon dry gap there are more extensive surfaces covered with Clay-with-Flints and associated deposits, and this yields badly aerated soils deficient in minerals which for centuries have been largely under woodland.[3] The only other soils which medieval farmers considered inferior were those derived from the belt of marine gravels lying at the southern edge of the Chalk, and known locally as 'shravey' which give rise to light, stony soils now highly esteemed but which have been much improved by enclosure, drainage, and other techniques of agricultural improvers since the eighteenth century.[4]

As one of the most suitable tracts for tillage in England, coastal Sussex was well settled even in 1086.[5] Much new land was subsequently reclaimed from marshes, woods, and heaths. It is most notably represented by the new crop of farms, cultivated in severalty, in the precinct (*precinctus*) of the Manwood attached to the Bishop of Chichester's manors south-west of Chichester;[6] by the 'breaches' made by almost every demesne in the coastal plain; and by such place-name elements as 'innome', 'reading' or 'reed', of frequent occurrence in medieval and sixteenth-century surveys of the downland and scarp-foot zone. Surviving as lightly grazed areas when the process of reclamation petered out in the mid-thirteenth century were the sandy districts and saltmarshes, important elements of the coast of west Sussex (which had a markedly different configuration from that of the present day), and the almost unbroken series of commons, parks, warrens, and parks on the 'shravey'. Elsewhere, apart from abundant pasture in the valley floors above the level of spring tides and every manor's little woodlot, utilized mainly for building timber, fencing, and fuel, the vistas were heavily grazed sheep-walks and great expanses under corn.[7]

[1] Rev. A. Young, *A General View of the Agriculture of the County of Sussex*, 1813, p. 6. The high values placed on arable on these soils in the fourteenth-century extents suggest that medieval assessments of fertility were similar to those of Marshall and Young.

[2] P.R.O. C135/162/11 (Findon and Kingsbarns Manors).

[3] Hodgson, *op. cit.*, pp. 45–60; P.R.O. C133/104/21; C134/103/1; C135/24/28–9; British Museum (hereafter B.M.) Add. MS. 5701, fol. 143.

[4] P.R.O. C133/127/9 (Bosham, Funtington, Stoke, Stoughton, and Thorney). For deprecatory sixteenth- and seventeenth-century judgments, see P. F. Brandon, 'The Commonlands and Wastes of Sussex', unpublished Ph.D. thesis, University of London, 1963, p. 312. Cf. Marshall, *op. cit.*, pp. 238–9.

[5] S. H. King in H. C. Darby and E. M. J. Campbell, eds., *The Domesday Geography of South-East England*, 1962, pp. 432–7, 444.

[6] The name manwood is derived from the Anglo-Saxon *maene wudu*, common wood.—A. Mawer and F. M. Stenton, eds., *The Place-Names of Sussex*, English Place Name Society, VI(i), 1929, p. xxii.

[7] For a fuller account see Brandon, thesis cited, pp. 210–13, 229–37, 256.

With long stretches of low shorelines and much land below the level of near high tides,[1] coastal Sussex was particularly vulnerable to frequent flooding, which was a consequence of the fall in the relative level of land to sea and the increased frequency of storm-tides in the later Middle Ages. The acreage reported wasted was mainly saltmarsh and meadow but increasingly at hazard were the extensively tilled marsh and fields bordering the maze of creeks where cereal production required special methods of cultivation.[2] Early 'forerunner' floods such as the 'great flood' at Apuldram in 1274–5 were manifestations of a rapid submergence leading to the great storm of 1287 which destroyed Old Winchelsea and was responsible for severe flooding all along the coasts of Sussex and Kent.[3] Between 1291 and 1341 much land was lost[4] and thereafter severe and recurrent inundations, particularly those of the 1380's, 1400's, and 1420's caused crop losses at several points along the coast and in the lower reaches of valleys. The most seriously affected localities were the Pevensey marshes and the coast west of Bognor; elsewhere crop losses were sporadic[5] but frequent and serious enough to warrant defensive measures. The resultant deterioration of drainage was doubtless a factor in the development of convertible husbandry which is observable from the end of the fourteenth century.

The marked degree of intensive demesne farming is reflected in the tenemental organization of the estates and in the dependence on large bodies of wage-earning labourers after the commutation of work services became general. The classes of tenants which predominated throughout coastal Sussex in the late thirteenth century were villeins (*villani* or *rustici*) who held small yardlands at low money rents and cottars, who were exceptionally important. The social structure of Apuldram in 1300 which had nine 'major' cottars

[1] J. A. Steers, *The Coastline of England and Wales*, 1964, p. 311; Marshall, *op. cit.*, pp. 219–20; A. Ballard, 'The Sussex Coast-line', *Sussex Archaeolog. Coll.*, LIII, 1910, pp. 5–25.

[2] In all the low-lying districts of West Sussex, which have retentive strong loams, it was the medieval practice to sow the winter corn on narrow ridges called stitches with a water furrow, regularly cleansed, dividing them, two such stitches comprising a typical arable strip (hilf) of about half a customary acre. The item '. . . *pro sulcris aquarum mundand ad salvandum semen yemale*. . .' is regularly entered on the Bosham compoti. This method of cultivation continued into the late eighteenth century when it was commended by Marshall.—P.R.O. SC6/1020/16–23; Marshall, *op. cit.*, p. 235; W. D. Peckham, *Sussex Notes and Queries*, 8, 1941, p. 88.

[3] P.R.O. SC6/1019/22; P.R.O. *Calendar of Patent Rolls, Edward I, 1281–92*, pp. 320, 290; L. F. Salzman, 'The Inning of the Pevensey Levels', *Sussex Archaeolog. Coll.*, LIII, 1910, p. 37. The present author has made a fuller study of this aspect in a paper entitled 'Agriculture and the effects of Floods and Weather at Barnhorne during the Late Middle Ages', *Sussex Archaeolog. Coll.*, forthcoming.

[4] A. R. H. Baker, 'Some Evidence of a Reduction in the Acreage of Cultivated Lands in Sussex during the early Fourteenth Century', *Sussex Archaeolog. Coll.*, 104, 1966, p. 4. It is uncertain to what extent the flooding during the period before 1341 resulted in the permanent loss of land. At Barnhorne and Hoo, where losses were considerable at that time, they were regained in the latter part of the fourteenth century, only to be lost again in the 1420's.

[5] East Sussex Record Office (hereafter E.S.R.O.), Glynde MSS. 998–1002; Lambeth Palace Muniments, CR.248, 881; P.R.O. SC6/1020/11–18; E.S.R.O. CP.151.

(holding four acres each), six 'minor' cottars, and ten virgate holders (holding between eight and twenty-four customary acres),[1] originally performing work services on demesne arable exceeding 500 statute acres, was a typical example of a Benedictine estate. The estates of the Archbishop and of the Bishop of Chichester similarly contained large numbers of tributary tenants. At Bosham, which had 155 customaries and 17 cottars performing onerous work services, the appendant hamlets were composed of colonies distinguished by different tenures, and at Westbourne, another large lay manor, no less than 90 cottars, additional to 92 customaries, held small parcels of land in a single common-field.[2]

A regular staff of wage labourers made an early appearance on some of the Church estates[3] and the final demise of labour dues after the Black Death created critical seasonal labour problems on the diminishing number of big corn-growing manors. The extent of the difficulty and its solution is most apparent in documents relating to east Sussex where by the end of the four-teenth century manors near Lewes and Seaford regularly employed reapers for about five weeks who migrated southwards from the overcrowded assarted districts in the depths of the Weald, from places as far as ten to fifteen miles away. For nearly a century, at least, some 50–80 inhabitants of Framfield, Heathfield, Hellingly, Waldron, and Walberton found seasonal employment at Alciston and Lullington,[4] both properties of Battle Abbey. The custom of hiring forest peasants was also practised at Glynde, whence Mayfield sent men,[5] and doubtless generally in the locality of Lewes in the late fourteenth and the fifteenth centuries. Occasionally pestilence disturbed the flow,[6] and in rainy weather the carts provided to take the reapers' corn allowances back to their villages had difficulty in negotiating the Wealden byways.[7] In times of low

[1] S. R. Scargill-Bird, ed., *Custumals of Battle Abbey*, Camden Soc., N.S., vol. XLI, 1886–7, pp. 53–7.

[2] P.R.O. C133/104/21 and C133/127/10. Cottar holdings were concentrated at Creed and virgaters at Walton.—Brandon, thesis cited, pp. 368–9.

[3] The Bishop of Exeter had ploughmen, carters, reapers, and threshers on his estate at Chidham in 1277 and Apuldram had twenty-three farm servants in 1286 and harvest work was paid for in cash. —P.R.O. Assize Roll 924, m.7od; P.R.O. SC6/1016/5.

[4] E.S.R.O. G.44/51 (1398 A.D.) and *passim* (Alciston); P.R.O. SC6/1026/9 and *passim* (Lullington). Some of the Hellingly labourers may have held land of the Abbey but it had no lands and tenants in the more distant parishes and thus the seasonal migration was essentially extra-manorial. The origins of the custom probably date from the insistence that virgaters in Wadhurst were to undertake work services on the Archbishop's estate of Stonham near Lewes.—A. E. Wilson, 'Farming in Sussex in the Middle Ages', *Sussex Archaeolog. Coll.*, 97, 1959, p. 113.

[5] E.S.R.O. Glynde MS. 1075 (1371/2 A.D.).

[6] As in 1426 (E.S.R.O. G.44/77). This outbreak has previously been considered to have been confined to London. See J. M. Bean, 'Plague, Population and Economic Decline in England in the Later Middle Ages', *Econ. Hist. Rev.*, XV, 1962–3, p. 428.

[7] In 1428 extra expenses were incurred after heavy rains '*propter vias nocinas defectas et irracionabiles*'.—E.S.R.O. G.44/79.

wheat prices, as in 1463 and 1464, they were powerful enough to withhold their labour until an agreement was reached to substitute generous board 'at the lord's table' for their traditional allowance of corn.[1]

Some demesnes were fragmented into strips, intermingled with the tenants' lands similarly disposed, and dispersed over all the township fields. H. L. Gray detected several instances of this arrangement, which he termed 'open fields' (using the term synonymously with *common* fields) and equated the system of land division and management with his 'Midland System'.[2] Most of his examples were of the familiar three-field, or more strictly, three-course type, involving a triennial fallow, and the ubiquity of this rotation has been established by later work.[3] Additionally, Gray identified two examples of what he regarded as 'two-field' townships (where half the arable was fallowed in any one year) and Pelham and Cornwall have contributed a few more examples of this type.[4] According to Fussell, the 'two-field' system was developed on the northern slopes of the Sussex Downs.[5] None of the 'two-field' examples yet cited, however, can be regarded as proven since the diagnostic traits adopted to define them are distinctly dubious.[6] A more detailed examination of the available evidence made by the present author[7] has failed to bring to light a single unequivocal instance of the biennial cycle of cropping with a fallow each alternate year. If, indeed, such a two-course system was ever adopted in coastal Sussex it would seem to have been superseded at the latest by the middle of the thirteenth century by which time evidence of more intensive rotations becomes steadily available.

The medieval court rolls of Sussex manors assume, almost invariably, the form of an economic document recording fines and amercements accruing to the demesne and financial loss resulting from livestock deaths. They are silent on the regulations for cropping the common fields and the grazing of the fallows, which matters presumably were settled by a majority voice. Enrolments of manorial regulations begin to appear at the end of the fifteenth century but are

[1] E.S.R.O. G.44/111, 112. [2] H. L. Gray, *The English Field Systems*, 1915, pp. 63, 498–9.

[3] See Brandon, thesis cited, pp. 277–9.

[4] Gray, *op. cit.*, p. 498; Pelham, *op. cit.*, 1937, p. 197; J. C. K. Cornwall, 'The Agrarian History of Sussex, 1560–1640', unpublished M.A. thesis, University of London, 1953, pp. 44–6.

[5] In his introduction to Lord Ernle's *English Farming, Past and Present* (sixth edn, 1961), p. xlvi.

[6] Gray's Broadwater example is based on evidence deduced from an Enclosure Award which makes reference to two common fields but also to older enclosures which Gray left out of his reckoning. His medieval example of Amberley is based on a survey which exists only in a transcript which could be corrupt as larger sowings (and also demesne leases) are recorded in other extant medieval documents. Pelham's classification of field systems is partly based on the ratio of fallow to the total arable recorded in a survey of the Chichester estates in 1388. This cannot be regarded as acceptable since it makes no allowance for the likelihood of convertible husbandry on all or some of the fields. Two of Pelham's examples result from an over-statement of the extent of arable, and by his reckoning should actually be classified as 'three field'. For a fuller discussion see Brandon, thesis cited, pp. 273–6.

[7] Brandon, thesis cited, pp. 273–9.

not common until a century later. By this time they were clearly an attempt to give permanence to ancient customs then being rapidly eroded by wilful tenants who were sowing the fallows and choosing their crops and the times of their sowing unilaterally. Some of these references to earlier practices are invaluable. At Jevington in 1584 the order was enrolled that: "all the tenants observe this ordinance in ploughing and sowing the common fields, one year with wheat (*triticeo*), another year with barley, and the third year they should not sow the said common fields or any of the fields called the lanes of this manor contrary to the ancient custom, but shall permit the fields . . . to be each third year unsown according as they were used before."[1] At Worthing in 1560 it was required of tenants that those: "having land in the common fields called the Eastfield and the Westfield shall sow their season or laynes for wheat altogether and for barley altogether and their tares and *peason* in like sort, so as one of them shall not hurt another by reason of their land lying lay. . ."[2] Other enrolments in sixteenth-century court rolls testify that fields with intermingled arable strips in coastal Sussex functioned as common fields in the most rigidly defined sense,[3] with regulations enforcing the simultaneous sowing of each of the courses (*laynes* or seasons) and the strict observance of a regular fallow and its collective grazing. Communal shepherds or herdsmen were elected to supervise the livestock, and their duties included the oversight of the ewe couples grazing young corn in common until mid-May, and the folding of the village sheep on each strip of the arable fallow.[4]

For evidence as to medieval communal cultivation and grazing the main sources are the extents attached to *Inquisitions* of the late thirteenth and fourteenth centuries. Some of these extents record the proportion of the demesne which could be sowed yearly and place no value on the residue in fallow because it lay in common (*iacet ad warectam et nihil valet quia in communi*). As Gray himself noted this statement is not entirely free from ambiguity since the disposition of the demesne arable is not clarified,[5] but the testimony of its intermingled character amidst tenants' lands is afforded by other sources.[6] Certain other demesnes are recorded in fourteenth-century extents, or in other documents, as being cultivated by the lord in severalty but within enclosures taken down after the harvest to enable collective grazing on the fallows until

[1] E.S.R.O. CP.193, m. 17.

[2] W.S.R.O. Add. MS. 453, fol. 12, The Middlefield was evidently to be fallowed in that year.

[3] J. Thirsk, 'The Common Fields', *Past and Present*, 29, 1964, p. 3.

[4] W.S.R.O. Wiston MS. 5244; Brandon, thesis cited, pp. 287–90.

[5] Gray, *op. cit.*, p. 46.

[6] The demesnes concerned are: Amberley and Rackham (B.M. Add. MS. 6165, fols. 215–16); Applesham (P.R.O. C135/43/9); Eckington in Ripe (C135/56/36); Itford (C135/47/10); Kingston-by-Shoreham (C135/158/26); Pyecombe (C135/69/45); Sutton-next-Seaford (C135/43/9); and Bulsham in Yapton (C135/94/2). The intermingled condition of the demesnes at Applesham, Eckington, Kingston, and Sutton is indicated by later evidence.—Brandon, thesis cited, pp. 218, 360, 364, 380, 381.

Lady Day or Easter.[1] It thus seems unlikely that the late thirteenth- and fourteenth-century usage of the intermingled arable strips differed materially from later practice.

Previous writers on Sussex medieval agriculture have concluded, or taken for granted, that the intermingling of the demesne arable with tenants' lands and its usage in conformity with peasant practice was general.[2] A detailed study of the available evidence does not support this view which can be seen in retrospect to have been unduly influenced by the generalized accounts of the so-called 'Midland System' of common-field farming. Most demesnes reported to have been 'in common' appear to have been the smaller estates, not held by the greater magnates or those in townships with few customary tenants and thus with lands not inconveniently disposed. The greater estates in the second half of the fourteenth century incorporated tenements vacated at the Black Death and absorbed into the demesne whenever they could not be let. Such lands naturally assumed the form of dispersed strips amidst the remaining tenanted land in each of the three *laynes*, but such arable never formed more than a small proportion of demesnes and its identity was perpetuated on the grange exit (*Exitus Manerii*) on the dorse of the accounts by the use of customary, as distinct from statute measures normally adopted for the remaining demesne fields.[3]

By 1300 the majority of demesnes in coastal Sussex appear to have been cultivated in severalty. The archbishop's Sussex demesnes were so farmed, it seems, from the thirteenth century, if not always separated off by physical barriers from the tenants' common fields;[4] so were those of Battle Abbey; and, with the exception of the Amberley estate, so were the properties of the Bishop of Chichester. Consolidated demesnes were not confined to Church estates because these were to be found at Bosham, on the estates of Thomas Tregoz near Goring, and at Wiston.[5] Further light is thrown on this matter by the valuations in the *Inquisitions* of grazing on demesne fallow (this was not counted when the fallow was collectively grazed); these exceeded in number and greatly in acreage demesnes recorded in the same sources as being 'in common'.[6]

[1] Barnham, Walberton, and Middleton (P.R.O. C135/85/6); Halnaker (C135/85/6); Bepton (C135/136/24); Laughton SC11/877); Southerham (Sussex Record Soc., 57, p. 131); West Thorney (W.S.R.O. Acc. 939).

[2] W. Melville, 'The Pastoral Custom and Wool Trade of Medieval Sussex', unpublished M.A. thesis, University of London, 1932, p. 72; Pelham, *op. cit.*, 1937, p. 197; A. E. Wilson, ed., *Custumals of Sussex Manors of the Archbishop of Canterbury*, Sussex Record Soc., 57, 1958, p. xxxii.

[3] P.R.O. SC6/1016/5–23. 1020/11–24; P. F. Brandon, 'Arable farming in a Sussex Scarp-Foot Parish during the Late Middle Ages', *Sussex Archaeolog. Coll.*, 100, 1962, p. 62.

[4] F. R. H. du Boulay, *The Lordship of Canterbury*, 1966, p. 132. The present author's conclusions were identical (see thesis cited, p. 270).

[5] The evidence for and against cultivation in severalty is presented in Brandon, thesis cited, pp. 267–72.

[6] Beeding (P.R.O. C135/162/11); Birling (C135/137/18); Drayton (C135/56/34); Findon

The consolidation of the Sussex demesnes and their state of several cultivation did not necessarily leave an outward mark on the countryside. On the coastal plain the demesne fields were generally surrounded with a ditch. Standing trees were planted along the hedgerows (rewes) and afforded grazing for tenants' cattle. On the downs and at the scarp-foot, especially in east Sussex, such permanent enclosures were unusual, presumably because it was the lord's custom to lease for payment his sheep to fold the tenants' arable[1] and in these circumstances temporary wattle hurdles more appropriately protected the lord's corn in 'open fields'.

The abundance of river meadows and marsh at the head of silting creeks provided grazing for more cattle than were normally kept in corn-growing districts of medieval England,[2] but cow-keeping was a relatively subordinate enterprise. Grain-growing dominated activities and for this purpose the size of demesne fields was extremely variable ranging in size from huge fields at Apuldram and Bosham,[3] for example, to small open-field furlongs at Alciston and elsewhere. In actual practice, however, the larger fields were invariably subdivided by temporary fences for folding and sowing purposes, and each ephemeral parcel newly created in this way underwent different rotations contemporaneously, a system which readily lent itself to the flexibility increasingly adopted on arable demesnes in the fourteenth century.

The leading crop throughout coastal Sussex was wheat. The stiff Chalk Marl of the scarp-foot and the loamy soils of the coastal plain were both ideal for the crop but even on the thin soils of the Downs it was the prime objective, although only slightly more dominant there than barley. Rye, which was sown for the use of the *famuli* only on the poorer soils such as the 'shravey', on the sandier formations beyond the scarp-foot and on 'upland' fields bordering marshes in east Sussex, was never an important crop. Oats were generally of less importance than barley and were sown on heavier soils to break pasture. The crop was locally dominant on the Lower Greensand in the transitional zone bordering the Weald and a large production was obtained from low-lying arable in the valley floors of the coastal plain.

(C135/162/11); Keynor in Sidlesham (C135/84/13); Kingsbarns in Parish (C135/162/11); Lordington (C135/210/11); Milton Street in Arlington (C135/85/5); Portslade, *ibid.*; Poynings (C135/213/1); Pulborough (C135/77/7); River (C135/88/10); Streat (C132/42/6); Tadesham in Eastbourne (C135/88/10); Washington (C135/162/11). Most of the arable at Sutton and Applesham was also in this category (C135/43/9). The many manors with demesne cultivation in excess of the traditional two crops and a fallow, to which reference will be made, must also have been farmed in severalty. On demesnes farmed in severalty the grazing of fallows was regarded as a valuable perquisite but the facility was purely discretional and sometimes withheld.—W.S.R.O. Acc. 939.

[1] E.S.R.O. G.44/1 (Alciston and Lullington).

[2] M.M.Postan, 'Village Livestock in the Thirteenth Century', *Econ. Hist. Rev.*, XV, 1962–3, p. 237.

[3] The main arable field at Apuldram exceeded 150 statute acres and at Bosham several fields were large enough to constitute single farms when leased out to tenants during the fifteenth century.—P.R.O. SC6/1016/5–23 and W.S.R.O. II/A/14–17.

Like the economically advanced district of east Kent, with which it had distinct geographical affinities, coastal Sussex was one of the leading legume producers of medieval England. A great increase in legume cultivation in England generally has been observed from the late thirteenth century[1] and on the Sussex Downs and elsewhere in Sussex an increase in legume sowings, synchronizing with this broad trend, is detectible.[2] The manors of the coastal plain are a special case. From the earliest extant *compoti* of the decade 1270–80, they emerge as major producers, regularly sowing leguminous crops on a field basis as part of an established rotation, to the extent of 20–30 per cent and even more of the total sowings, and this proportion was normally maintained throughout the Middle Ages.[3] The previous history of legume cultivation on these coastal plain manors is obscure,[4] but its origin is evidently much earlier than in most of England for which its maritime position close to the Continent and to Kent, another precociously developing region, is presumably partly responsible.

In terms of acreage vetch (*vesce*) was the main leguminous crop on all the soils of coastal Sussex. Its importance lay in its availability in spring to sustain ewes and lambs before nourishing grass could be provided. Since most manors in coastal Sussex had large sheep flocks it was invariably sown as a preparation for wheat, for which its nitrogenous and weed-smothering properties made it admirable.[5] *Haras*, the medieval Latin name for the 'horse-meat' extensively grown in south-east England during the sixteenth and seventeenth centuries, was also important.[6] Pulse was used for fattening but its main use in Sussex was for potage (*potagium*), and thus, as commutation proceeded and the numbers of

[1] T. A. M. Bishop, 'The Rotation of Crops at Westerham, 1297–1350', *Econ. Hist. Rev.*, o.s., IX, 1938, pp. 43–4; R. A. L. Smith, *Canterbury Cathedral Priory*, 1943, p. 139.

[2] Vetch and pulse, minor crops in the 1280's at Stoke and Stoughton on the Chalk become important early in the fourteenth century.—P.R.O. SC6/1030. At Chalvington and Laughton, on the southern margin of the Weald, legumes were insignificant until 1339 and 1341 respectively. Peas and beans were merely garden crops at Chalvington in 1278 and as late as 1295 they were being grown, probably experimentally, 'on small pieces of ground'.—E.S.R.O. CH.244, 246, 249–82 (Chalvington); M. Clough, 'The Estates of the Pelham Family in East Sussex before 1500', unpublished Ph.D. thesis, University of Cambridge, 1956, p. 58.

[3] P.R.O. SC6/1016/5–23; 1020/11–24; 1030/1–30.

[4] All the leguminous crops are mentioned in the mid-thirteenth century custumals of manors of the Bishop of Chichester.—W. D. Peckham, ed., *Sussex Custumals*, Sussex Record Society, 31, 1925, p. 5 *et passim*.

[5] It was also adopted as a useful stand-by for feeding livestock in times of fodder shortage, particularly after a long hard winter when it would give energy to the plough-oxen and horses and fatten swine. It was also fed off as a standing crop (*in campestre*) and its versatility must have permitted a heavier livestock stocking of better quality animals which in turn would have improved the quality of wool and increased the supply of manure. The vetch was spring sown. The practice of 'double-cropping' with both a spring and an autumn crop, thus yielding a supply of fresh fodder throughout the year, appears not to have been introduced in the fourteenth century.—P.R.O. E372/148 fol. 29r; W.S.R.O. Wiston MS. 524; Alciston E.S.R.O. G.44/4; P.R.O. C133/4/15. The custom is detectible from seventeenth-century probate inventories.—P. F. Brandon, thesis cited, p. 297.

[6] B.M. Add. MS. 29794; P.R.O. SC3/1030/23; SC6/1016/5; SC6/1020/12; Eric Kerridge, *The Agricultural Revolution*, 1967, p. 31.

regular servants on the big corn-growing manors increased, so did the pulse sowings needed to provide the liveries. Conversely, as lords reduced their farming activities generally in the later fourteenth century the ratio of pulse to other crops tended to diminish and, exceptionally, peas and beans were no longer cultivated.

As to the place of legumes in crop rotations our present information is extremely meagre. The rotations involving legumes so far reported fall into the single category of the familiar two- or three-course incorporating a fallow (except for occasional instances of 'inhoking'), and legumes were thus grown at the expense of other spring sown crops.[1] The complete suppression of fallowing by the substitution of legumes, or its substantial reduction by this 'bean husbandry' (which was an early development in parts of Italy and is traceable in Flanders in the fourteenth century) is a development which has drawn little comment in England, although it is likely to have been general in east Kent from at least the end of the thirteenth century.[2] The ancient persistence of the orthodox rotation involving a regular fallow until the introduction of roots and clover in the eighteenth century indicates that earlier departures from this practice were not widespread in England, but its likely development has been noted in populous districts where the waste had already been substantially reclaimed and where sea or river transport facilitated the marketing of produce.[3]

Coastal Sussex was one such district. 'Internal conquests' had virtually ceased by the late thirteenth century[4] and the larger manors were obliged to bring under cultivation the heavier clays in distant 'outliers' within the Weald.[5] In the circumstances an intensification of the arable farming was a natural development. One aspect of this was the high sowing rates which prevailed generally. As a rule all the manors in coastal Sussex sowed seed more densely in the first half of the fourteenth century than the sample of Winchester manors

[1] Bishop, *op. cit.*, pp. 43–4; P. D. A. Harvey, *A Medieval Oxfordshire Village: Cuxham, 1240–1400*, 1965, pp. 18–19, 48–9, 164–5; R. H. Hilton, *The Economic Development of Some Leicestershire Estates in the Fourteenth and Fifteenth Centuries*, 1947, pp. 65–6, 152–6; A. J. Roderick, 'Open-field Agriculture in Hertfordshire in the Later Middle Ages', *Trans. Woolhope Naturalists' Field Club*, 33, 1949–51, pp. 57–8.

[2] It has yet to be shown whether this is correct but intensive arable cropping in east Kent (Gray, *op. cit.*, pp. 301–2) was associated with a prodigious output of legumes on the estates of the Archbishop of Canterbury and on those of Canterbury Cathedral Priory.—Smith, *op. cit.*, pp. 40–1, and B.M. Add. MS. 29794. See also A. Smith, 'Regional Differences in Crop Production in Medieval Kent', *Archaeologia Cantiana*, LXXVIII, 1963, pp. 147–60.

[3] Examples of such districts, termed *Intensitätsinseln* by Riemann, are quoted by B. H. Slicher van Bath, *The Agrarian History of Western Europe*, trans. O. Ordish, 1963, p. 15.

[4] At Stoughton, on the Chalk, an exceptionally late *innome* was manured and planted with trees and hedges in 1283–4.—P.R.O. SC6/1030/16.

[5] For example, Wiston manor was cultivating land at Ashurst before the Black Death which had not been sown before (*non seint adhuc*) and Alciston manor tilled land at *Sternershe, Swynelond, Hege, Binorthelondfriche*, and other places at Hellingly whose very names betoken its marginal character.—W.S.R.O. Wiston MS. 5247 and E.S.R.O. G.44/1–8.

selected by Beveridge;[1] and the sowing rates are also substantially higher than those recommended by Walter of Henley and his contemporary.[2] Wheat was normally sown at the rate of 3–4 bushels per statute acre (the same rate as in the late eighteenth century), the lower seeding being typical on the rich soils of the coastal plain and the 'maam', and the higher on the Chalk where growing conditions are always more adverse. Six bushels of barley to the acre was standard on the coastal plain; $6\frac{1}{2}$–$7\frac{1}{2}$ bushels to the acre were sown on the east Sussex 'maam', and even this was exceeded by the practice at Lullington on the Chalk where 8 bushels to a statute acre were regularly sown throughout the period 1360–1409. Oats were generally sown at the rate of 5–6 bushels to an acre. The divergence in seeding rates between medieval and modern practice is greatest in the case of the spring-sown grains. The medieval farmer's insistence on dense sowings is probably to be partly explained by his need to smother unclean ground, the problem of weed control doubtless being intensified with the reduction of bare fallowing, and his inability to obtain a good tilth in spring with the inefficient means of ploughing available. There is also some evidence that modern varieties of grain tiller rather more profusely than older strains.[3]

The sowing rates in the late fourteenth century were slightly reduced at certain manors, but marked declines were reserved for the fifteenth century when more lightly sown demesnes were normal, and this downward alteration in seeding rates is particularly noticeable on the manors of Battle Abbey. This manipulation of seed rates on large estates has been observed elsewhere[4] and it appears to have been widely adopted as an expedient for adjusting, within certain limits, grain production according to costs and market factors.[5]

The other development which is very marked in coastal Sussex was the elimination of the fallow period on the best arable fields, and its shortening generally on all but the most impoverished and intractable land. The evidence for this vigorous spurt forward in agricultural techniques is afforded by many sources. The most unambiguous are the particulars as to the proportion of the demesne arable which could be cultivated in any one year, such details being normally confined to the late thirteenth and early fourteenth centuries when the extents attached to *Inquisitions post mortem* are particularly detailed. In east Kent at this time many demesnes were said to be capable of being cropped

[1] W. H. Beveridge, 'The Yield and Price of Corn in the Middle Ages', *Economic Jnl*, 1927, 2, p. 161.

[2] E. Lamond, ed., *Walter of Henley's Husbandry*, 1890, p. 19; the anonymous author of *Dite de Hosbandrie*, *ibid.*, p. 67.

[3] For this last statement I am indebted to Mr W. E. H. Fiddian of the National Institute of Agricultural Botany, Cambridge.

[4] Smith, *op. cit.*, pp. 133–4.

[5] As recently as the 1940's farmers increased sowing rates in the expectation, largely unfounded, of higher yields.—H. Jackson and J. B. Page, 'Seed Rates of Spring Barley and Winter Wheat', *Experimental Husbandry*, 1957, 2, pp. 1–11.

annually in their entirety.[1] That the same was true in coastal Sussex is indicated by the phrase '*possunt seminari quolibet anno*' which is attributed to the demesne arable at Ford and Rustington in 1284 and to that at Eastbourne in 1338.[2] Since most demesnes in coastal Sussex comprised some arable on low-lying land on the coastal plain or on heavy clays beyond the scarp-foot, the complete sowing of the demesne was rarely practicable but the hard-worked nature of the best tillage ground is shown by the cropping of 110 out of 130 arable acres said to be cultivable yearly at Folkington and the 80 per cent which could similarly be sown at Lordington.[3]

Further light on intensive cropping in excess of the traditional three-course husbandry is afforded by comparing the sown acreages recorded in manorial *compoti* (which disclose that the sowing of legumes was invariably in the *leyne* which would normally have been fallowed) and the extent of demesne arable calculated from these documents, or provided by contemporary manorial surveys and the extents attached to *Inquisitions* (TABLE I). It seems evident from such sources that the sowing of a large proportion of the 'fallow' with legumes was ubiquitous in the thirteenth and fourteenth centuries.

Information as to the crop rotations adopted and the lengths of continuous tillage on specific fields is obtainable from several sequences of *compoti* with detailed grange exits. The earliest evidence of yearly sown fields is provided by the accounts of Bosham where the sowings and fallowings of thirty-seven named fields (the entire demesne) were meticulously recorded for the years 1294/5 to 1296/7.[4] The Bosham fields fall into two groups. One group amounting to 340 customary acres (31 per cent of the total arable) was sown in each of the three years whilst the residue of the demesne, with the exception of a single field which was not cropped, was fallowed once during that time. An almost identical cropping programme, with a similar proportion of arable cropped without intermission, was pursued between 1357/8 and 1364/5,[5] when field names were once again entered on the manorial exits. It is not possible to trace the field croppings at Bosham for other periods but from the uniformly high sowings throughout the period 1284–1302 (after which date a long gap occurs in the extant records) it can be inferred that the pattern disclosed by the detailed accounts of 1294–7 was maintained during the longer spell. The fields triennially fallowed were sown with wheat and oats in succession. The con-

[1] Gray, *op. cit.*, pp. 301–2. [2] P.R.O. C133/39/9 and C135/56/36.

[3] P.R.O. C135/85/5 and C135/210/11.

[4] P.R.O. SC6/1020/21–3. There is no thirteenth-century manorial survey of Bosham extant, but the size of each recorded field remains virtually constant and thus the total acreage of each can be ascertained from the manorial accounts. The fields in fallow are mentioned on the obverse of the rolls.

[5] W.S.R.O. Acc. 939. The details of vetch and bean sowings in 1362 and 1363 were not recorded because they were utter failures as a consequence of drought, but this omission does not obscure the cropping programme.

TABLE I

DEMESNE CROPPING IN COASTAL SUSSEX

Manor	*Demesne arable acreage*	*Date of survey or field measurement*	*Date of sowing*	*Wheat (acres)*	*Barley (acres)*	*Oats (acres)*	*Legumes (acres)*	*Total sown acreage*	*%Fallow*
Alciston	205*	1380–4 (5 yr. av.)	1380–4 (av.)	81	49	9	44	183	10·8
Beddingham	210*	1362–88 (25 yr. av.)	1362–88 (av.)	74	65	7	29	175	16·7
Bishopstone	262	1388	1388	107	88	11	24	230	12·2
Bosham	343*†	1357–64 (7 yr. av.)	1357–64 (av.)	136	55	25	105	321	6·4
Eastbourne	126	1345	1345	36	37	4	24	101	20·0
Ferring	214	1388	1388	71	40	20	40	171	20·1
Peppering	60	1397	1397	16	16	7	10	49	18·3
Preston	300	1388	1388	112	100	20	18	250	16·7
Sidlesham and Greatham	277	1388	1388	100	38	50	68	256	7·6
Stoke (by Bosham)	150†	1307	1301	24	41	35	35	135	10·0
West Thorney	96	1307	1297	26	16	5	42	89	7·3
	76*	1351	1351	27	6	13	18	64	15·8
	76*	1352	1352	25	7	20	22	74	2·6

* Main arable fields only. † Customary acres.

Sources: E.S.R.O. G44/37–41; Glynde MSS. 996–1003; B.M. Add. MS. 6165 fols. 211–20; W.S.R.O. Acc. 939; P.R.O. C145/269/5; C133/127/9–10; SC6/1148/1; SC6/1020, 1030.

tinuously cropped land also followed a three-course rotation consisting of wheat, barley (or oats), and legumes as a substitute for fallow. This rotation is identical to the old Kentish 'round-course' strongly approved by Tusser, in one of his little jingles, nearly three hundred years later.[1]

A detailed comparison of the field cropping in 1294/7 with that of 1357/65 is instructive. Some of the fields were cropped continuously over both the spells covered by the detailed documents and these in turn can be identified with fields described in 1578 as being "the best corn ground as it yieldeth generally six, seven, or eight bushels of wheat for one bushel of seed."[2] There would thus seem to have been a core of arable which might be appropriately called 'every year's land'. Other fields in which the fallow had been suppressed in 1294/7 were fallowed more frequently in 1357/65 and others substituted in their place for continuous cropping. The frequency of fallowing overall, therefore, was evidently considerably less than the traditional one year in three. It will be observed that the simple expedient of 'stealing a fallow' by means of the legume course was no different in essence from the widespread custom in medieval England of making an occasional 'inhok' into the 'fallow' field. It is the scale and regularity of the practice at Bosham which mark a distinct advance.

The grange exits of Alciston manor, the principal estate of Battle Abbey, form a complete series between 1369 and 1399[3] during which period field names were systematically recorded on the grain exits. As earlier at Bosham a substantial proportion of the demesne was cropped for long periods together with only occasional fallowings over the whole thirty years covered by the detailed documents. The cropping programme, however, had considerably more flexibility than the inexorable three shifts at Bosham and the principle of only fallowing when it was strictly necessary seems to have been firmly established. Some fields were fallowed traditionally every third year; on others the proportion fallowed triennially was only approximately half the total acreage, the remainder being under legumes, and although the precise subdivisions of the fields cannot be ascertained it would appear from the regularity of the practice that such land was being worked on a double three-course shift with a fallow each sixth year.[4] Some fields were sown on the unorthodox system of several white crops in succession and rested for only an occasional year, and even on others, where the fallow was a normal proceeding, it could be interrupted by a legume course or some other sowings.[5]

[1] Hall and Russell, *op. cit.*, p. 23; Thomas Tusser, *Five hundreth pointes of good husbandrie*, 1590 edn, p. 38.

[2] W.S.R.O. Add. MSS. 2275, fols. 85r, 85d. [3] E.S.R.O. G.44/19–53.

[4] Many fields on other manors, e.g., at Beddingham, appear to have been cultivated on this rotation.—W.S.R.O. Glynde MS. 996–1003.

[5] Some of the irregularities occurred on demesne strips interspersed amongst the tenants' lands in

At Wiston, for which manor *compoti* with a sequence of field-names are extant for the years 1376–87, the departures from the orthodox three-course husbandry are the most marked.[1] Here none of the fields was cast into three seasons and the principle of sowing two successive corn crops followed by a recuperative crop or fallow was abandoned. Instead, as Godman noted in 1911, "there appears to have been no recognized rotation of cropping but wheat was cultivated on the land most suitable for it and as often as it permitted."[2] Here is another echo of ancient Kentish practice and a sign of the depth of the historical roots in the sixteenth- and seventeenth-century husbandry of coastal Sussex.[3]

It is thus evident that much of the demesne arable of coastal Sussex was cultivated much more intensively and flexibly than most other districts in England during the late thirteenth and fourteenth centuries, if not before. The development of this process from the orthodox three-course husbandry cannot be precisely ascertained, but the cropping programme described at Bosham would appear to have been representative of an initial stage, while those at Alciston, Wiston, and at Beddingham,[4] being more sophisticated (and later) divergences, are signs of the greater innovations practised towards the end of the fourteenth century. The standard rotation on better arable appears to have been the 'round course' of wheat, barley, and legumes, but this was far from immutable. Consistent with the maintenance of fertility, the contingencies of the weather and those deriving from the unsettled economic conditions of the later fourteenth century were allowed to influence cropping.

The introduction of the more advanced techniques associated with legume husbandry did not lead to the neglect of older practices. The preparation of a bare fallow for wheat[5] remained one of the most important tasks in the farming year. It was thrice ploughed (the time-honoured *rebinatio*), and dunged either directly by the sheep-fold or with manure carted from the yards, in which case it was mixed with earth, as custom demanded.[6] Marl, and where obtainable, slush, and even mud from pits in the village street,[7] were applied to land re-

the common-fields (*tounmanneslonds*) and, since this land had been customary land comprising several tenements before the Black Death, it is probable that the tenants were conforming to the same rotations, but there is no positive proof of this.

[1] W.S.R.O. Wiston MS. 5256–66.

[2] P. S. Godman, 'On a Series of Rolls of the Manor of Wiston: the Agriculture of the Fourteenth Century', *Sussex Archaeolog. Coll.*, LIV, 1911, p. 140 and Table I.

[3] Eric Kerridge, *The Agricultural Revolution*, 1967, pp. 46–53.

[4] E.S.R.O. Glynde MS. 996–1003.

[5] A high proportion of wheat followed the legume course but the yield after a bare fallow was normally greater. The value of the wheat crop following the *rebinatio* in comparison with that on continuously sown land is not clear in the fourteenth century, but as late as 1676 an acre of wheat after a summer fallow was valued at nearly 40 per cent more than other wheat.—Brandon, thesis cited, p. 295.

[6] As on the Archbishop's manors in Sussex.—P.R.O. SC6/1128/11.

[7] P.R.O. SC6/1030/21 (Stoughton, A.D. 1271–2).

quired for the wheat or barley 'season'. The proportion of the demesne arable under recuperative crop or rested and dunged could be very substantial. At Bosham in 1295/6, when 126 acres were under legumes in place of a fallow, a further 35½ acres were dunged by carting and slush was spread on another 16 acres; additionally, the sheep-fold was in use.[1] On the Archbishop's manor of Bersted in 1348, of 83½ acres fallowed, 45½ acres were dunged by carts and another 12 acres by the fold.[2]

The sheep-fold was the principal means of maintaining fertility on manors on the downland and at the scarp-foot and it remained the chief characteristic of Sussex farming for generations. It provided a means of consolidating the light Chalk soils which would not otherwise have been suitable for intensive tillage, and as a method of dunging it was unsurpassed for its cheapness and efficiency.[3] The relatively plentiful and flexible supply of dung goes far to explain the thickly sown fields and the adaptability of the device must have contributed to the early development of flexible rotations. The sheep-fold was properly regarded as the very basis of successful corn-growing and manorial custumals testify to its importance by minutely specifying the regulations to be observed in its operation.[4] Its role was naturally more significant on manors with large downland sheep pastures than on the lower coastal plain, where folding was also conducted[5] but where pastures were less extensive, and much of the lower-lying arable was not sufficiently well drained to permit regular folding. This contrast between the two localities is brought out by the differences in the numbers of sheep stocked per acre of arable (statute measure) which on the lower coastal plain did not exceed 1·80 in the fourteenth century whereas on the downland and scarp-foot manors the ratio never fell below 3·00.[6]

A detailed discussion of the grain yields of coastal Sussex is beyond the scope of this paper but at this point some mention is appropriate of the returns achieved by this labour-intensive corn and legume husbandry. The available data are, unfortunately, very fragmentary. They relate mainly to the period after 1350 and largely to the manors of Battle Abbey (TABLE II). The ascertainable yield ratios, it will be noted, are roughly commensurate with the meagre returns associated with medieval husbandry generally. The *net* yields *per acre* (statute measure) are more informative, even if some doubts as to the local peculiarities of measurement render them less reliable.[7] Of the less densely

[1] P.R.O. SC6/1020/23. [2] P.R.O. SC6/1128/11.

[3] On the Archbishop's manors in 1333 carting dung and spreading it for wheat cost 5s. an acre; an acre dunged by the sheep-fold cost 4s.—P.R.O. SC6/1128/10.

[4] Wilson, *op. cit.*, p. 115.

[5] W. D. Peckham, ed., *Sussex Custumals*, Sussex Record Soc., XXXI, 1925, pp. 14, 23 *et passim.*

[6] P.R.O. C133/127/9–10; C134/100/15; C145/269/5; C136/108; Lambeth Palace Muniments, 959, 976, 1057; P.R.O. SC6/1016/7–23; E.S.R.O. Glynde MS. 998 and G/44/36–44; W.S.R.O. Acc. 939.

[7] The present author will discuss these matters in a forthcoming paper in *The Economic History Review.*

TABLE II

GRAIN YIELDS IN COASTAL SUSSEX, 1353–1418

Manor	*Period (inclusive)*	*Harvests*	*Grain exits extant*	*Approx. extent of demesne arable (statute acres)*	*Wheat*		*Barley*		*Oats*		*Approx. no. of sheep per acre of arable*
					Yield ratio	*Net yield per acre (bushels)*	*Yield ratio*	*Net yield per acre (bushels)*	*Yield ratio*	*Net yield per acre (bushels)*	
Apuldram*	1353–66	14	13	350	3·82	7·21	2·98	10·96	3·15	11·91	1·40
	1369–79	10	10	300	3·44	7·32	3·17	13·02	2·44	8·64	1·40
Beddingham	1362–88	25	24	250	4·06	10·00	2·88	11·75	3·32	11·50	3·10
Wiston	1371–75	5	5	200	2·47	4·41	2·49	7·45	2·29	6·45	3·33
	1378–91	14	13	200	2·58	4·74	3·28	11·40	3·38	11·90	3·33
Alciston*	1376–93	18	17	450	5·11	12·33	3·56	15·87	3·50	13·90	3·33
	1396–1412	17	16	450	4·58	10·74	3·30	13·80	3·98	15·97	3·33
Lullington*	1379–94	16	16	300	3·58	10·32	2·83	14·64	—	—	3·33
	1399–1418	20	20	300	3·29	8·00	2·46	10·80	—	—	3·33

* Manors of Battle Abbey.

Sources: P.R.O. SC6/1016, 1017, 1018, 1019, 1024, 1025; W.S.R.O. Wiston MSS. 5251–69; E.S.R.O. Glynde MSS. 998–1002; G44/28–70.

sown manors, the productivity of wheat and barley at Apuldram appears to have been approximate to that on the sample of Winchester manors studied by Beveridge which, however, had inferior oat yields to those on the Sussex manors and negligible legume sowings.[1] Wheat production at Wiston was abnormally low and grain production generally poor. This may be a rather exceptional case since mildew was a frequent explanation for low yields. On the other hand, the more densely sown manors, Beddingham, Alciston, and Lullington, the two latter being properties of Battle Abbey and sown at particularly high rates, had outstandingly good *net* yields during the latter part of the fourteenth century. In the light of the little information on yields which is available it would be imprudent to attempt generalizations but at least it may be said that reduced fallowing in coastal Sussex does not appear to have had an adverse effect on corn yields. Hence grain production probably rose on manors where the traditional rotations were least observed. The achievements of the Benedictine monks of Battle, as elsewhere in England, are especially noteworthy.[2] It has been observed that "medieval enterprise may have been more successful in increasing the area than the productivity of cultivated land."[3] There is much evidence in support of this view, but it would seem that both aims were capable of realization under especially favourable conditions of relatively abundant manure, efficiently applied, to land of high natural fertility, as at the scarp-foot of the South Downs or in the Chalk valleys.[4]

Apart from the sheep-and-corn husbandry with its characteristic round course of wheat, barley, and legumes or fallow, the only other method of cultivation of outstanding importance in coastal Sussex was convertible (alternate) husbandry, under which system fields underwent a short bout of continuous cultivation and were then rested for a similar period to recuperate, when they made tolerable pasture and accumulated fertility if adequately grazed. Such a system was more appropriate in districts where livestock farming was the main objective, and where rainfall was sufficient to nourish the grass, and in these circumstances it was of minor significance on the coastal plain. Nevertheless, even during the 'high farming' peak in the late thirteenth and early fourteenth centuries villeins were required to render work services at Selsey when old land was to be broken,[5] and during the same period at Apuldram and Bosham a few

[1] Beveridge, *op. cit.*, p. 161; Gras, *op. cit.*, pp. 261–70. The farming system on the Winchester manors is left unexplained; presumably cultivated land underwent a regular fallow.

[2] R. A. L. Smith, 'The Benedictine Contribution to Medieval English Agriculture', *Collected Papers*, 1947, pp. 103–16.

[3] Philip Jones in M. M. Postan, ed., *The Cambridge Economic History of Europe*, vol. I, *The Agrarian Life of the Middle Ages*, 1966, p. 377.

[4] The ratio of sheep to each acre of arable land at Alciston and Lullington was about 3·33 in the late fourteenth century. That the number of sheep was not necessarily the prime factor accounting for the high yield is indicated by the fact that the sheep/arable ratio at Wiston was about the same.

[5] W. D. Peckham, ed., *Sussex Custumals*, Sussex Record Soc., XXXI, 1925, p. 14.

fields bordering the innumerable creeks (and doubtless suffering from inadequate weed and water control) were only sown with oats occasionally when it was necessary to restore the sward.[1] By the late fourteenth century the practice of convertible husbandry on the coastal plain increased to a point when, although still subordinate to the higher yielding 'round course', it had encroached upon some of the formerly more intensively tilled arable. The names of some of these fields, such as the *Hamme* and *Breach* field at Apuldram,[2] suggest that quasi-permanent cultivation had retreated from the poorer arable fields, which tumbled down to pasture between intervening periods under the plough. An explanation for this reduced arable activity is not forthcoming from the manorial documents, but it may reasonably be inferred that it was a response to the major disincentives arising from the fall in grain prices and rising labour costs; this would have exacerbated, by continual neglect, the deteriorating drainage of the coastal districts.[3]

A very dissimilar farming to sheep-and-corn husbandry, in which convertible husbandry played a major role, was adopted in the transitional zone of moderate fertility between the Weald proper on the north and the sheep-and-corn belt previously discussed. This zone can be identified as a narrow strip from Barnhorne, sited on Alluvium and Wealden beds, through Ripe, Chalvington, Laughton, and Hamsey, and westwards to Petworth and Midhurst. The main geological formations in this zone are the Gault and Weald Clays and the various beds of the Lower Greensand. The low-valued arable recorded in the extents of manors in this zone was said to be capable of being cultivated less intensively than under the biennial system of much of the Midlands, the amount of arable being sown in any one year ranging from only one-quarter at Laughton and Petworth to one-third at Midhurst.[4] Wheat and barley could be sown only on particularly fertile fields,[5] and at Little Horsted, where the demesne was not self-sufficient in grain, provision was made for the carriage of grain from the port of Seaford.[6] On estates with sufficient documentation the arable farming is revealed as a type of convertible husbandry in

[1] P.R.O. SC6/1016/5–23; 1020/11–24.

[2] P.R.O. SC6/1016/5–23. By the 1420's arable at Apuldram was largely confined to one major field and others cropped irregularly for short spells. The reduced economic activity at this period is indicated by the remission of rents at Ferring (Lambeth Palace Muniments, CR.451) and a fall in rents derived from parcels of demesne at Bosham (W.S.R.O. Acc. II/A/14–17).

[3] Arable on the Archbishop's manors had fallen drastically and the convertible nature of some of it is indicated by the valuation of land at Newtimber as 'arable and pasture' at 4d. an acre.—P.R.O. C145/269/5.

[4] At Laughton 50 out of 213 acres were stated to be cultivable yearly in 1359 (P.R.O. C135/144/12), at Petworth 120 acres of 500 in 1314 (C134/41/1), and at Midhurst 26 acres out of 80 in 1284 (C133/39/9).

[5] At Hamsey of 220 arable acres 140 could be sown with wheat and barley, and the remainder were suitable only for oats.—C132/42/8.

[6] P.R.O. C135/47/11.

which a relatively small acreage near the main barns was generously manured and frequently cropped. The plough was taken round the remaining fields in an orderly sequence, and each was sown until it 'ran out' when it was left to recover.[1] On the Gault Clay, fields under this method of husbandry could be sufficiently upgraded in fertility to warrant their temporary inclusion in the more intensive 'leynes' worked under sheep-and-corn farming.[2] Throughout the zone the arable demanded large artificial increases of fertility or long recuperative periods of rest. Heavy applications of marl are recorded in the first half of the fourteenth century, but later the costs of dressing the land in this way became excessive and cheaper substitutes, such as *sleech* (oozy ditch mud), were used instead.[3]

All sowings were highly dependent on favourable weather at the times of ploughing and during the growing season. Wheat could not be sown in a wet autumn and heavy winter rains severely reduced yields and sometimes necessitated the resowing of land with spring crops. Conversely, dry weather at the wheat sowing could also cause crop failure.[4] More successful were sowings of rye and dredge (though both were abandoned with the decline in livery renders) and oats. As a whole the yields of all grains were lower and more erratic than those derived from sheep-and-corn husbandry. A notable trend from the end of the fourteenth century was the decline in arable farming, which was accompanied by the virtual abandonment of sheep-rearing in favour of cattle-keeping. It is not clear whether the marked fall in sheep stocks was due to the high incidence of murrain (summers which were wet and warm constituting the greatest hazard on these heavier soils by providing the necessary pre-conditions for rot which carried off great numbers) or whether the sheep, being valued mainly for their dung, were rendered superfluous by the change in farming objectives.[5]

[1] Brandon, thesis cited, pp. 251–4; *idem.*, *Sussex Archaeolog. Coll.* (forthcoming).

[2] Several fields at Alciston, such as The Heye and Northwood, were treated in this manner at the end of the fourteenth century.

[3] At Chalvington marl was dug *in marleria dominium* and thus was presumably from the upper stratum of the Weald Clay and substantial dressings were given when summer weather permitted it in the first half of the fourteenth century, 11½ acres being marled, for example, in 1347. This operation kept seven men and six boys busily employed in paring off the overburden at the pit and in digging, loading, and spreading, only two of whom were members of the *famuli*. The whole operation cost 7s. per acre.—E.S.R.O. CH.248, 250. By 1388 marling at Ewhurst was costing 13s. 4d. an acre.—E.S.R.O. CH.183. At Barnhorne, in addition to marl, sleech was applied to the fields.

[4] E.S.R.O. CH.246, 250, 253, 257, 260, 267.

[5] The author wishes gratefully to acknowledge the receipt of a grant from the Central Research Fund of the University of London towards research expenses.

Grain Price Analysis and Harvest Qualities, 1465–1634[1]

By C. J. HARRISON

THE first systematic calculation of annual harvest qualities, between 1480 and 1619, was made by Professor Hoskins and in a later article he extended his list to 1759.[2] He has provided an example of a statistical method by which harvest qualities can be calculated from price lists. He has pointed out the importance of knowing the annual quality of harvests if one is to understand properly the economic and social changes in pre-Industrial England. He has argued convincingly that in sixteenth-century England "the harvest was the most fundamental fact of life" in an economy which could never be certain of providing adequate food supplies in every year.[3] The main part of this article consists of an introduction to an alternative list of harvest designations to Hoskins's. My debt to him for providing a statistical method and for stimulating an interest in the topic is gratefully acknowledged.

Hoskins's method is fully explained in the main body and Appendix I of his first article. He took a series of annual average wheat prices and a series, calculated from them, of 31-year moving average prices. He assumed the moving price to be the norm for the year, that is the price at which wheat would have sold if the harvest had been an ordinary one. He then calculated the percentage difference between the annual average and the moving average price for each year and labelled the harvest for each year according to how far, in terms of the percentage difference, the annual average price was above or below the moving average price. The points of demarcation used were described as follows. "Where the average price for any given year was 30 per cent or more below the norm for that year, I classified the harvest as 'abundant'. Where it was between 10 and 30 per cent below the norm I termed it 'good'. Where the average price for the harvest-year was within ±10 per cent of the norm, the harvest was classed as 'average'. Average prices between 10 and 25 per cent above the norm were taken to indicate a 'deficient' harvest; between 25 and 50 per cent above the norm were called 'bad'; and an average of 50 per cent and more above the norm was termed a 'dearth'."[4]

[1] The main part of this article was awarded the Wedgwood Memorial Prize, an undergraduate History essay prize at the University of Keele, in 1968.

[2] W. G. Hoskins, 'Harvest Fluctuations and English Economic History 1480–1619', *Agric. Hist. Rev.*, XII (1), 1964, pp. 28–46 and 'Harvest Fluctuations and English Economic History 1620–1759', *Agric. Hist. Rev.*, XVI (1), 1968, pp. 15–31. Further footnote references will be to the first article.

[3] Hoskins, *op. cit.*, p. 29. [4] *Ibid.*, p. 43.

Hoskins claimed that "when we look at the graph of the fluctuations in the average price of wheat from year to year we are looking at an electro-cardiagram of a living organism." He denied that he attached "too much importance to a single crop which was not of universal consumption" and he argued that "the movements of wheat prices reflected fairly closely the movements of other food-prices."[1] The publication of Dr Bowden's price indexes makes it possible, by applying Hoskins's method to different sets of data and comparing his results with the new ones, to test his assumption that wheat price movements reflected the movement of other food prices (in this article we are concerned only with grain prices) and, therefore, could be used on their own to designate harvest qualities.[2] The following preliminary remarks are introduced in order to answer some of the possible objections to this approach and to prevent confusion.

The original sets of data are given in different units: Hoskins's in shillings per quarter, Bowden's in terms of a price index, having as a base 100 which relates to the period 1450–99. The same statistical processes have been applied to both sets. What is being compared is not the original data but the percentage differences and harvest qualities calculated from them. It does not matter, therefore, that the original sets of data are given in different units.

It is difficult to decide exactly where Hoskins is drawing the line between one harvest designation and the next.[3] The harvest-year 1505 which has a percentage difference of $-10{\cdot}1$ is labelled 'average' whilst that for 1749 which is 10·3 per cent below the norm is called 'good'. The number of occasions on which any problem arises is small. The following points of demarcation are used in APPENDIX II and are given in order to avoid any ambiguity. (Hoskins's figures, reproduced in APPENDIX II, are corrected to the nearest whole number.)[4] Those harvests 30 per cent or more below the norm are termed 'Abundant' (A).[5] Those harvests between -29 and -11 per cent inclusive are termed 'Good' (G), and those which lie ± 10 per cent inclusive of the norm are termed 'Average' (Av.). Those which are 11 to 25 per cent inclusive above the norm are termed 'Deficient' (D); those between 26 and 49 per cent inclusive are termed 'Bad' (B), and those 50 per cent or more above the norm are termed 'Dearth' (Dth).

Bowden's data relate to harvest years and each one of these is labelled by reference to the calendar year in which it begins. "Thus harvest year 1620, for

[1] Hoskins, *op. cit.*, p. 40. See FIG. 1 for a similar graph.

[2] P. Bowden, 'Statistical Appendix' in Joan Thirsk, ed., *The Agrarian History of England and Wales, IV, 1500–1640*, pp. 814–70. I would like to thank Dr Bowden for permission to use these figures.

[3] See the quotation from Hoskins on p. 135.

[4] I would like to thank Dr Hoskins for permission to use these figures.

[5] The letters in brackets are the abbreviations used in APPENDIX II.

example, related to the period 29th September 1620 to 28th September 1621."[1] Hoskins indicates, in his first appendix, that he is using harvest years but he does not state explicitly how he is labelling them. However, from his use of Beveridge's Exeter wheat price series where "the price for each year relates to the harvest of that year" it can be seen that he is using the same method as Bowden.[2] The set of data on prices and wages by E. Phelps Brown and S. Hopkins, which is much used by historians, is labelled differently, namely, by reference to "the calendar year beginning during the harvest year e.g. against Michaelmas 1400 to Michaelmas 1401 [they] put the calendar year 1401."[3] Failure to recognize this difference can lead to confusion and error.[4] M. Drake, in his examination of demographic changes in the West Riding of Yorkshire in the late sixteenth and early seventeenth century, notes that his general theory is not supported by Phelps Brown and Hopkins's figures. The problem arises, in part, because he failed to take into account the above differences in labelling.[5]

Bowden's price series provided complete lists of the annual average prices (expressed as a price index) for wheat, oats, and an average of all grains, the latter being the annual average price of wheat and oats, and of barley and rye where they were known. In APPENDIX I Bowden's annual average prices for wheat, oats, and his average of all grains are reproduced along with the 31-year moving averages and the percentage differences calculated from them. Unfortunately, the barley series is not a complete one but the two main blocks of continuous data and the calculations made from them are also listed in APPENDIX I.[6] FIGURES I to IV illustrate the changing relation each year between the annual average and moving average price for each of these commodities. (The moving average provides not only a norm against which the annual average may be seen but also a simple and direct illustration of the general price rise in this period.) In APPENDIX II, the main results of the computations are listed together with Hoskins's results in a simplified form. Under each heading, the first column lists the percentage differences, the second the

[1] Bowden, *op. cit.*, p. 869.

[2] W. H. Beveridge, 'A Statistical Crime of the Seventeenth Century', *Jnl of Econ. and Business Hist.*, I, 1929, p. 530.

[3] E. H. Phelps Brown and Sheila V. Hopkins, 'Seven Centuries of the Prices of Consumables compared with Builders' Wage Rates', *Economica*, n.s., XXIII, 1956, p. 307.

[4] For a critical discussion of the use of the term 'harvest year' and of which method of labelling is the most appropriate, see J. Z. Titow, *English Rural Society, 1200–1350*, 1969, pp. 27–9.

[5] M. Drake, 'An Elementary Exercise in Parish Register Demography', *Econ. Hist. Rev.*, ser. 2, XIV, 1961–2, p. 434, n. 3. Drake's argument that it was economic depressions rather than harvest failures which had the most direct effect on mortality in the area of the West Riding he was studying, is further weakened by his apparent failure to take into account the differences involved when comparing data based on harvest years with that based on 'church years', where the two will coincide for only six months.

[6] I would like to thank Mr A. G. Barrand who organized all the computations, the results of which form the main part of this article. I also acknowledge the assistance of Dr H. H. Greenwood, Director of the Keele University Computer Centre.

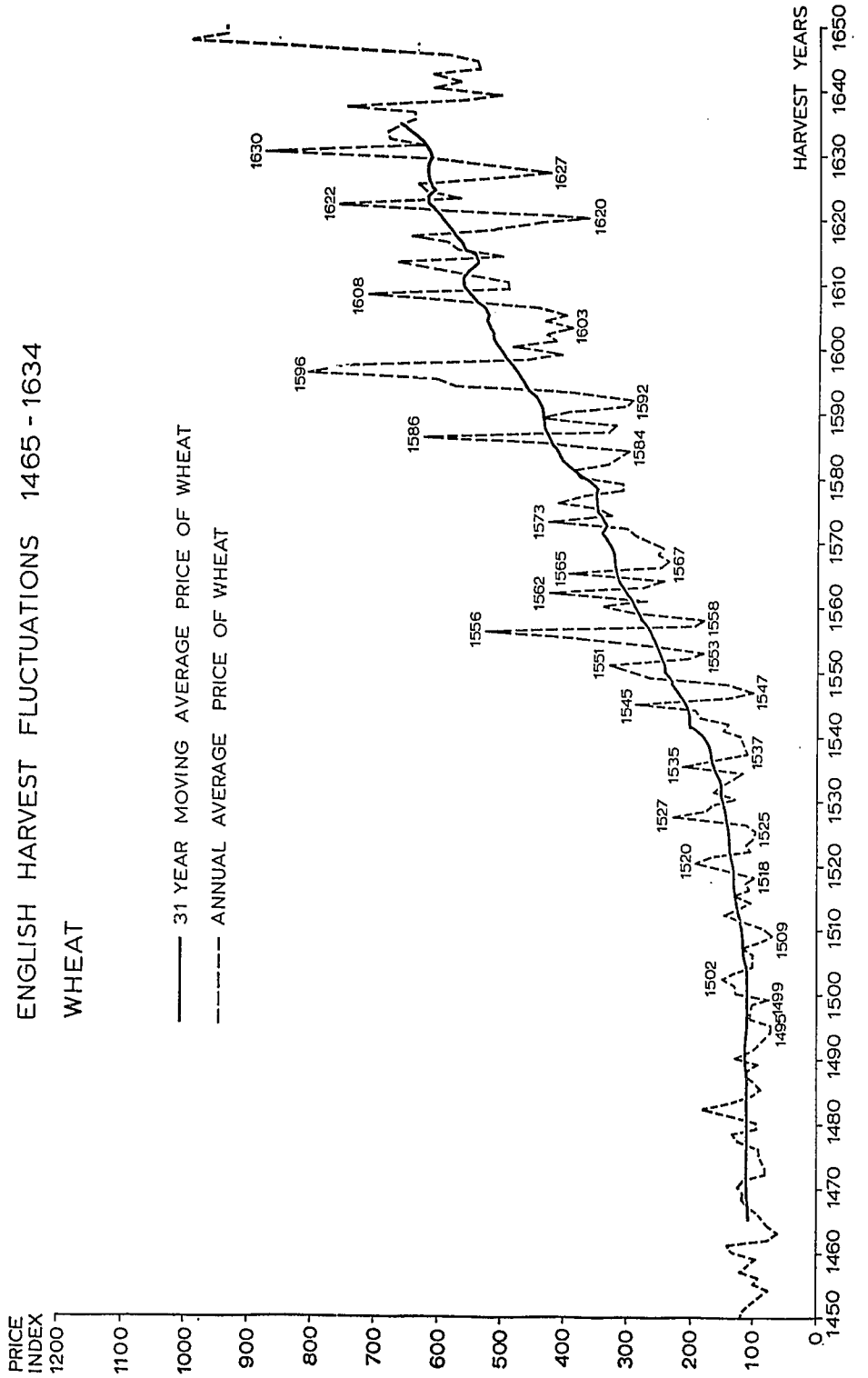
designations of harvest quality. It is hoped that this will facilitate comparisons between the two sets of data.

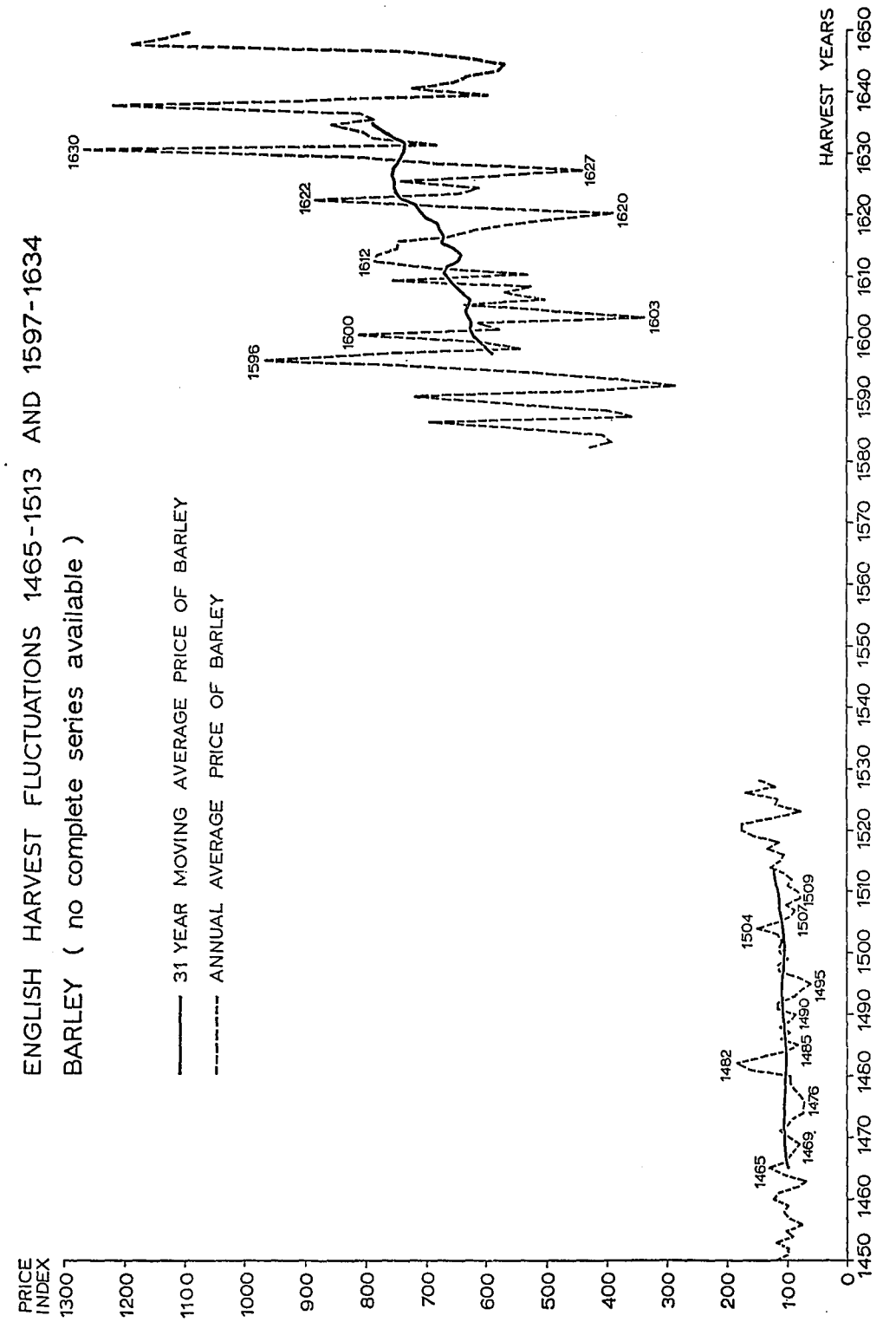
Was Hoskins correct in assuming that "the movements of wheat prices reflected fairly closely the movements of other food prices?"[1] Turning first to the graphs it can be seen that wheat prices did not rise as much as other grains, but one price series may reflect another without being the same, and an examination of the general trends shown by the moving averages seems to support Hoskins's assumption. However, if one compares the annual price movements important differences can be seen. There are much larger differences in the year-to-year price of barley than in that of wheat. An examination of the peaks and troughs in the annual average prices of the various grains reveals not only similarities but also differences between them.

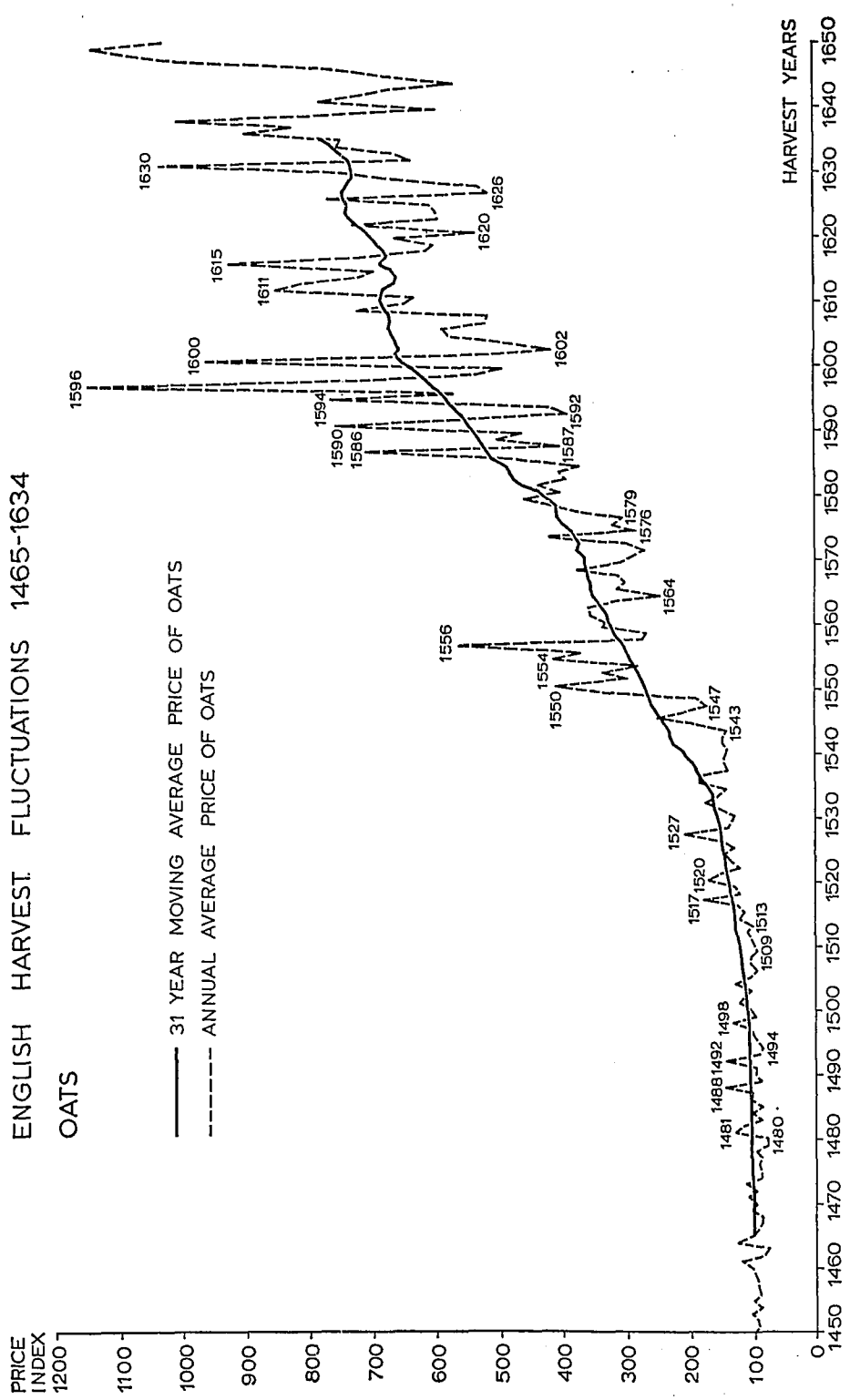
The graphs show a prima facie case for questioning Hoskins's assumption. It can be tested by comparing his list of harvest designations with those calculated from the individual grains and the average of all grains, because, if he was correct, there should be no significant difference between them. Comparing Hoskins's wheat list with the average of all grains between 1480 and 1619, one finds that 67 out of 140 comparisons are different. This is a difference of 48 per cent or 1 in every 2 between the two lists. Hoskins's list of harvest qualities differs from the one calculated from Bowden's wheat prices, but if one compares the latter with the average of all grains, 66 out of the 140 comparisons between 1480 and 1619 are different, a 47 per cent difference between the two lists. If one compares Hoskins's list with that for oats for the same period, 87 out of 140 comparisons are different, giving a 62 per cent difference. If one compares the list of harvest qualities calculated from the barley prices, where known, with the list calculated from Bowden's wheat prices, then out of 87 possible comparisons, 48 are different, giving a 55 per cent difference between the lists. There is, then, a significant difference between Hoskins's list of harvest qualities and those calculated from the other grains. He was wrong, therefore, to assume that wheat prices reflected other grain prices, let alone other food prices in general.

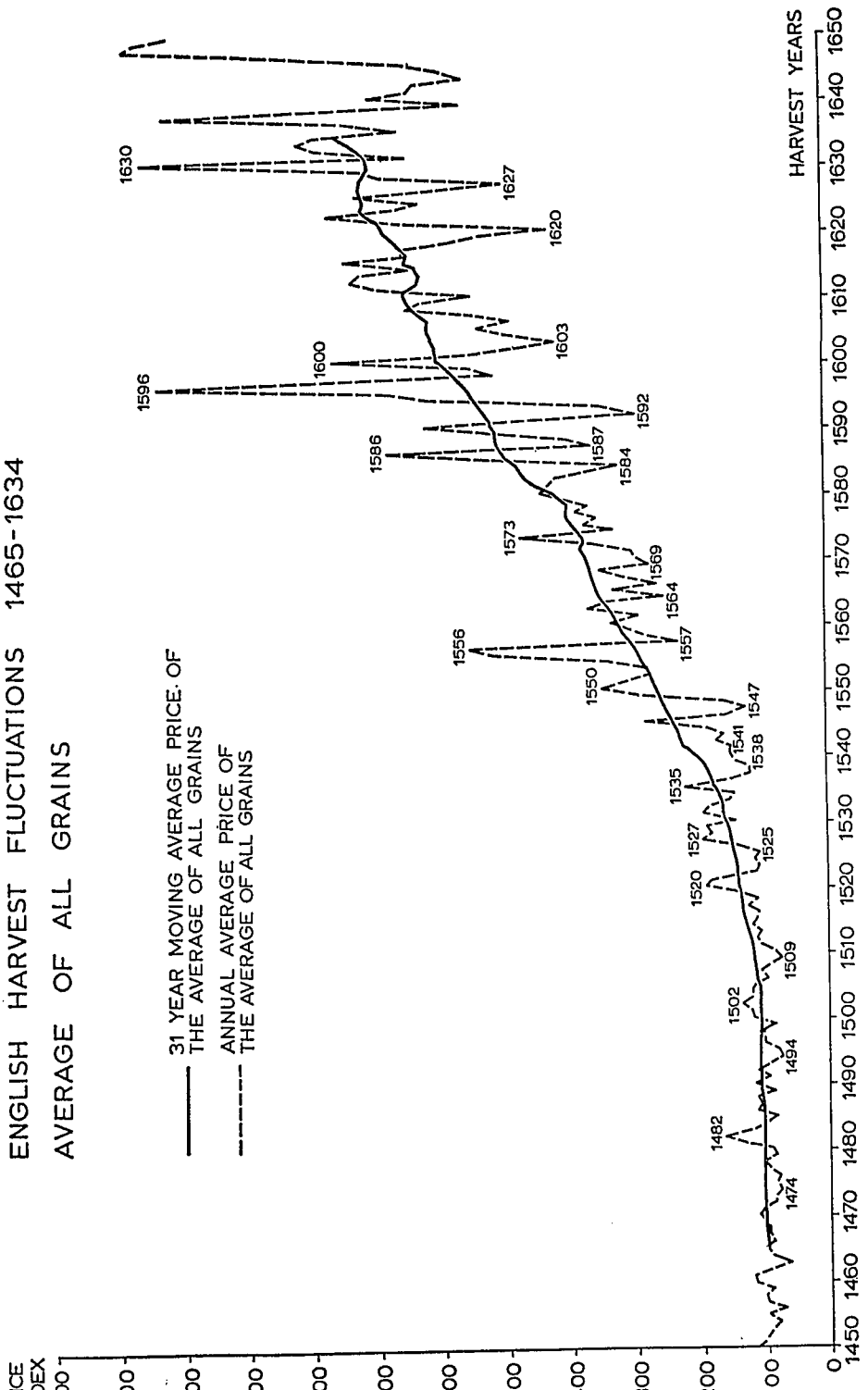
An examination of those occasions when Hoskins's list differs from that based on the average of all grains shows that 41 of the 67 instances occur within the three harvest designations centred around the norm, namely, 'Good', 'Average', and 'Deficient'. This is not surprising since most harvest designations fall within this group but it does indicate that these designations about the norm are the most suspect. Most of the differences show a shift of one grade; for example, Hoskins lists the 1483 harvest as 'Bad' whereas on the basis of Bowden's average of all grains it would be classed as 'Deficient'. In only seven instances is there a difference of more than one grade; thus Hoskins lists 1558 as 'Abundant' whilst the average of all grains would list it as 'Average'. It cannot

[1] Hoskins, *art. cit.*, p. 40.


ENGLISH HARVEST FLUCTUATIONS 1465 - 1634
WHEAT
31 YEAR MOVING AVERAGE PRICE OF WHEAT
ANNUAL AVERAGE PRICE OF WHEAT
PRICE INDEX
HARVEST YEARS
1630
1627
1622
1620
1608
1603
1596
1592
1586
1584
1573
1567
1565
1562
1558
1556
1553
1551
1547
1545
1537
1535
1527
1525
1520
1518
1509
1502
1499
1495


ENGLISH HARVEST FLUCTUATIONS 1465-1513 AND 1597-1634
BARLEY (no complete series available)
31 YEAR MOVING AVERAGE PRICE OF BARLEY
ANNUAL AVERAGE PRICE OF BARLEY
PRICE INDEX
HARVEST YEARS
1465
1469
1476
1482
1485
1490
1495
1504
1507
1509
1596
1600
1603
1612
1622
1620
1627
1630


ENGLISH HARVEST FLUCTUATIONS 1465-1634
OATS
31 YEAR MOVING AVERAGE PRICE OF OATS
ANNUAL AVERAGE PRICE OF OATS
PRICE INDEX
HARVEST YEARS
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
1450 1460 1470 1480 1490 1500 1510 1520 1530 1540 1550 1560 1570 1580 1590 1600 1610 1620 1630 1640 1650
1596
1630
1626
1620
1615
1611
1600
1602
1594
1592
1590
1587
1586
1579
1576
1564
1556
1554
1550
1547
1543
1527
1520
1517
1513
1509
1498
1494
1492
1488
1481
1480


ENGLISH HARVEST FLUCTUATIONS 1465-1634
AVERAGE OF ALL GRAINS
31 YEAR MOVING AVERAGE PRICE OF THE AVERAGE OF ALL GRAINS
ANNUAL AVERAGE PRICE OF THE AVERAGE OF ALL GRAINS
PRICE INDEX
HARVEST YEARS
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1450 1460 1470 1480 1490 1500 1510 1520 1530 1540 1550 1560 1570 1580 1590 1600 1610 1620 1630 1640 1650
1482
1474
1494
1502
1509
1520
1527
1525
1535
1541
1538
1547
1550
1556
1557
1564
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1584
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1600
1603
1620
1627
1630

be argued that, because most of the differences involve only one move up or down the scale of harvest qualities, the difference of 48 per cent between the two lists is not important. What is being tested is not how much but how often the two lists differ. Just how different a picture one can get, can be seen if one compares, in APPENDIX II, the two lists for the decade beginning 1510.

A detailed examination of the two lists and the inferences which can be drawn from them are revealing. If one takes the period 1480–1619 inclusive and compares the harvest pattern from each list of a typical decade no significant difference can be seen although there are more really bad harvests, i.e. 'Bad' and 'Dearth' according to Hoskins. In a typical decade, 2 in 5 harvests were good, 1 in 3 average, and 1 in 4 poor.

TABLE I

THE TYPICAL DECADE, 1480–1619 INCL.

	Wheat (Hoskins)		*Average of all grains (Bowden)*	
	Number	%	*Number*	%
Abundant	12		12	
Good	48 } 60	43	47 } 59	42
Average	45	32	49	35
Deficient	10		20	
Bad	18 } 35	25	8 } 32	23
Dearth	7		4	

If one takes a slightly longer period each side of the central point of 1549–50 a less dismal picture of the typical decade emerges with 2 in 5 harvests good, 2 in 5 average, and 1 in 5 poor.

TABLE II

THE TYPICAL DECADE, 1465–1634 INCL.

	Average of all grains	
	Number	%
Abundant	14	
Good	55 } 69	41
Average	68	40
Deficient	20	
Bad	9 } 33	19
Dearth	4	

Hoskins examined Utterström's view "that there may have been a fundamental climatic change in the mid-sixteenth century over most of north-west Europe which adversely affected the quality of harvests in the second half of the sixteenth century."[1] Others also have identified the mid-sixteenth century as a period of change for the worse in Britain's climate. Thus Lamb calls the period between 1550 and 1700 the 'Little Ice Age' and notes the wet summers and dry or snowy winters.[2] Manley, although more cautious makes the same point. "Later in the fifteenth century there is a little evidence towards quieter and warmer conditions... In Elizabethan days, however, the climate as a whole appears to have turned a little colder."[3] Hoskins divided his list and compared the harvest patterns of the two halves and rightly inferred from his list that there was no significant difference between the two halves. TABLE III shows his results in detail. It should be noted that there are more 'abundant' harvests in the first half.

TABLE III

A COMPARISON OF HARVEST PATTERNS BETWEEN THE TWO HALVES OF THE SIXTEENTH CENTURY USING HOSKINS'S DATA

	1480–1549 incl.		*1550–1619 incl.*	
	Number	%	*Number*	%
Abundant	10		2	
Good	20	30	28	30
Average	22	31	23	33
Deficient	7		3	
Bad	8	18	10	17
Dearth	3	26	4	24

If one does the same operation with the average of all grains a different picture emerges. As many as 1 in 2 harvests in the first half were good compared with 1 in 3 in the second, and only 1 in 5 were poor compared with 1 in 4 in the second. The same proportions are revealed whether one uses the average of all grains for 1480–1619 or the whole list. If one chooses to use the average of all grains, as opposed to Hoskins's, then the accounts of the climatic history by Utterström, Lamb, and Manley are given some support.

[1] Hoskins, *op. cit.*, p. 30. See G. Utterström, 'Climatic Fluctuations and Population Problems', *Scandinavian Econ. Hist. Rev.*, III, 1955, pp. 3–47.

[2] H. H. Lamb, 'Britain's Changing Climate', *Geogr. Jnl*, vol. 133, 1967, p. 453.

[3] G. Manley, *Climate and the British Scene*, 1952 (references to the Fontana edition, 1962), p. 290.

TABLE IV

THE HARVEST PATTERNS IN THE TWO HALVES OF THE SIXTEENTH CENTURY BASED ON THE AVERAGE OF ALL GRAINS

	1480–1549 incl.		*1550–1619 incl.*	
	Number	%	*Number*	%
Abundant	8		4	
Good	26	34	21	25
Average	21	30	28	40
Deficient	10		10	
Bad	4	15	4	17
Dearth	1	21	3	24

A comparison of the harvest pattern by decades, given by the two lists, shows considerable differences, and this despite the fact that many differences cancel each other out; that is, within a single decade one can have a year which the two

TABLE V

THE HARVEST PATTERN BY DECADES

	Wheat (Hoskins)		*Average of all grains (Bowden)*	
Decade	*Abundant & Good*	*Deficient, Bad, & Dearth*	*Abundant & Good*	*Deficient, Bad, & Dearth*
1470–9	—	—	6	0
1480–9	1	3	3	3
1490–9	5	1	5	0
1500–9	3	4	3	2
1510–9	5	2	6	0
1520–9	5	5	4	5
1530–9	5	1	5	3
1540–9	6	2	8	2
1550–9	4	4	1	5
1560–9	5	3	4	0
1570–9	4	2	4	1
1580–9	5	1	4	2
1590–9	4	4	5	3
1600–9	6	1	6	1
1610–9	2	2	3	3
1620–9	4	1	4	0

lists designate 'Good' and 'Average' respectively and another year which they list as 'Average' and 'Good'.

The above is a comparison of the trends which can be seen and the inferences which can be drawn from the two lists. There remain the central questions, namely, which set of data should be used for deciding the harvest quality of any particular year and what reliance can be put on such a list?

It has been shown that wheat prices did not closely reflect the movement of other grain prices and that there are significant differences in the harvest qualities calculated from the different lists. Hoskins's basic assumption justifying his use of wheat prices on their own to evaluate harvest qualities has been shown to be false. (It should be noted that when he made his list, the additional data used in this article were not available.) The average of all grains is based upon the broadest possible price data for grains. There are, therefore, good *a priori* reasons to prefer this list of harvest qualities to any other made from the price list of a single grain. Whether it is, in fact as well as in theory, more reliable than Hoskins's list can only be known as historians test both lists against other evidence, both statistical and literary.

The use of any price list to calculate, by whatever method, the quality of a harvest in a particular year is, of course, open to question. The national average price or price index either of a single grain or of all grains is an abstraction. Prices varied according to the season of year. They varied from region to region and market to market and within the same market they varied according to the differing quantities and qualities of the grain being bought and sold. The national annual average price is a necessary simplification of the surviving data.[1] Hoskins tried to take account of this by listing Beveridge's Exeter wheat prices and comparing the national picture with that of the south-west. Ideally, lists of annual harvest qualities should be constructed for all the major regions. But for some regions, at least, the data surviving will prove insufficient to justify the use to which they must be put. The problem of regional variations can be met, to a limited extent, by selecting the harvest list which reflects the special farming practices of the region being studied. Thus the barley harvest may be crucial in East Anglia and the oats harvest in the north. For some questions, in pastoral regions, the grain harvest will be less important than the hay harvest.

The regional and local historian will be able to provide sufficient criteria on some occasions to justify the use of a list of a particular grain. The historian concerned with the national picture may be able, on some occasions, to select a list by using criteria arising out of the question being asked. Whilst the grain which the farming community sold was often wheat (and this was done to raise cash) the grain which they bought to eat was barley or, especially in bad

[1] See Bowden, *op. cit.*, pp. 868–70.

years, rye or oats. The state of the wheat harvest may be relevant when one is considering the effect of the harvest on the general economy but it will be less relevant when one is dealing with the demographic effects of the harvest.

No lists of harvest qualities can be used uncritically. They give an indication rather than a proof of the harvest quality of a particular year. Sometimes it will be possible to select a list according to the region being studied or the question being asked. Where no criteria of selection can be made or no such specific list exists then the historian should use the average of all grains because, despite all its limitations, it is based on the broadest collection of data possible and is, therefore, the list most likely to reflect the quality of the harvest.

Appendix I

GRAIN PRICE ANALYSIS, 1450–1649

	Wheat			*Barley*			*Oats*			*Average of all grains*		
Year	*Price (Index no.)*	*Moving average*	*% Diff.*	*Price (Index no.)*	*Moving average*	*% Diff.*	*Price (Index no.)*	*Moving average*	*% Diff.*	*Price (Index no.)*	*Moving average*	*% Diff.*
1450	116	0	0	116	0	0	100	0	0	119	0	0
1451	112	0	0	100	0	0	94	0	0	107	0	0
1452	99	0	0	97	0	0	97	0	0	101	0	0
1453	87	0	0	116	0	0	106	0	0	94	0	0
1454	73	0	0	92	0	0	91	0	0	83	0	0
1455	94	0	0	102	0	0	102	0	0	99	0	0
1456	89	0	0	77	0	0	91	0	0	76	0	0
1457	116	0	0	99	0	0	94	0	0	103	0	0
1458	105	0	0	105	0	0	95	0	0	106	0	0
1459	93	0	0	100	0	0	100	0	0	94	0	0
1460	132	0	0	124	0	0	105	0	0	122	0	0
1461	138	0	0	115	0	0	120	0	0	124	0	0
1462	74	0	0	81	0	0	86	0	0	89	0	0
1463	60	0	0	70	0	0	79	0	0	67	0	0
1464	74	0	0	106	0	0	127	0	0	95	0	0
1465	83	103	−19	130	99	31	106	101	4	104	101	2
1466	92	103	−10	102	101	0	94	102	−7	92	101	−8
1467	106	105	0	97	104	−6	88	102	−13	98	103	−4
1468	114	106	7	88	105	−16	88	102	−13	98	104	−5
1469	114	107	6	80	105	−23	103	102	0	105	104	0
1470	121	107	13	95	105	−9	98	102	−3	114	104	9
1471	112	107	4	112	105	6	109	102	6	108	105	2
1472	79	108	−26	99	105	−5	98	102	−3	88	106	−16
1473	79	107	−26	93	106	−12	113	104	8	87	106	−17
1474	82	107	−23	72	106	−32	90	104	−13	80	106	−24
1475	89	108	−17	71	105	−32	90	104	−13	86	107	−19
1476	89	107	−16	72	105	−31	93	104	−10	82	106	−22
1477	122	105	16	78	105	−25	89	104	−14	96	105	−8
1478	130	106	22	90	105	−14	97	104	−6	105	105	0
1479	92	106	−13	95	105	−9	79	105	−24	88	106	−16

Year	Wheat			Barley			Oats			Average of all grains		
	Price (Index no.)	*Moving average*	*% Diff.*	*Price (Index no.)*	*Moving average*	*% Diff.*	*Price (Index no.)*	*Moving average*	*% Diff.*	*Price (Index no.)*	*Moving average*	*% Diff.*
1480	94	106	−11	95	104	−8	79	104	−24	92	105	−12
1481	132	107	23	163	102	59	130	103	26	136	105	29
1482	177	107	65	184	102	80	116	104	11	168	106	58
1483	132	107	23	141	103	36	90	105	−14	121	106	14
1484	98	105	−6	105	103	1	102	106	−3	100	105	−4
1485	86	106	−18	82	105	−21	89	106	−16	85	106	−19
1486	96	106	−9	109	105	3	103	106	−2	117	106	10
1487	108	107	0	95	105	−9	105	106	0	110	107	2
1488	106	109	−2	113	106	6	144	107	34	116	108	7
1489	91	109	−16	95	108	−12	90	107	−15	90	110	−18
1490	127	110	15	86	109	−21	98	108	−9	120	111	8
1491	100	110	−9	116	110	5	98	108	−9	97	111	−12
1492	89	111	−19	117	110	6	143	108	32	113	112	0
1493	81	110	−26	88	111	−20	90	109	−17	89	112	−20
1494	70	108	−35	77	111	−30	87	109	−20	76	111	−31
1495	70	107	−34	59	110	−46	93	109	−14	81	111	−27
1496	103	108	−4	79	110	−28	101	110	−8	102	112	−8
1497	102	108	−5	113	108	4	104	109	−4	105	111	−5
1498	99	107	−7	114	105	8	134	109	22	105	109	−3
1499	72	106	−32	100	105	−4	97	110	−11	86	109	−21
1500	126	106	18	113	105	7	104	110	−5	120	109	10
1501	128	107	19	113	106	6	119	111	7	124	110	12
1502	147	108	36	109	107	1	111	114	−2	138	110	25
1503	130	107	21	117	107	9	105	114	−7	123	111	10
1504	98	108	−9	152	109	39	127	114	11	122	111	9
1505	99	112	−11	116	111	4	104	116	−10	117	115	1
1506	98	113	−13	95	114	−16	95	118	−19	98	117	−16
1507	113	113	0	88	115	−23	104	119	−12	107	118	−9
1508	85	114	−25	102	113	−9	105	119	−11	94	118	−20
1509	69	114	−39	77	115	−33	94	121	−22	77	118	−34
1510	81	115	−29	82	116	−29	97	122	−20	87	120	−27
1511	111	117	−5	99	119	−16	103	124	−16	106	122	−13
1512	144	121	19	93	121	−23	108	127	−14	114	125	−8
1513	121	123	−1	104	122	−14	101	128	−21	107	127	−15
1514	102	125	−18	127	0	0	121	128	−5	121	130	−6
1515	127	127	0	112	0	0	115	129	−10	113	132	−14
1516	105	128	−17	106	0	0	124	131	−5	111	135	−17
1517	109	129	−15	132	0	0	178	133	33	129	137	−5
1518	97	129	−24	114	0	0	121	134	−9	113	137	−17
1519	140	128	9	154	0	0	127	136	−6	144	138	4
1520	191	132	44	175	0	0	170	138	23	193	142	35
1521	166	134	23	176	0	0	153	140	9	183	143	27
1522	104	134	−22	124	0	0	121	142	−14	116	144	−19
1523	109	134	−18	77	0	0	135	143	−5	110	144	−23
1524	99	135	−26	121	0	0	142	144	−1	116	146	−20
1525	95	137	−30	116	0	0	129	146	−11	110	149	−26
1526	110	139	−20	168	0	0	146	147	0	141	151	−6
1527	227	140	62	121	0	0	207	149	38	198	153	29
1528	175	142	23	146	0	0	138	150	−8	182	155	17
1529	165	144	14	0	0	0	134	153	−12	189	158	19

Year	Wheat			Barley			Oats			Average of all grains		
	Price (Index no.)	*Moving average*	*% Diff.*	*Price (Index no.)*	*Moving average*	*% Diff.*	*Price (Index no.)*	*Moving average*	*% Diff.*	*Price (Index no.)*	*Moving average*	*% Diff.*
1530	130	150	−13	0	0	0	129	157	−17	148	163	−9
1531	162	151	7	0	0	0	152	160	−5	196	165	18
1532	150	150	0	0	0	0	173	162	6	188	165	13
1533	133	151	−11	0	0	0	156	162	−3	155	167	−7
1534	116	157	−26	0	0	0	145	169	−14	148	173	−14
1535	213	162	31	0	0	0	184	179	2	225	180	25
1536	156	167	−6	0	0	0	182	183	0	154	184	−16
1537	108	168	−35	0	0	0	139	189	−26	123	187	−34
1538	113	170	−33	0	0	0	144	194	−25	124	192	−35
1539	116	176	−34	0	0	0	144	204	−29	148	200	−26
1540	122	185	−34	0	0	0	140	211	−33	154	214	−28
1541	146	200	−27	0	0	0	147	226	−34	153	228	−32
1542	139	202	−31	0	0	0	147	230	−36	175	232	−24
1543	185	201	−7	0	0	0	143	232	−38	164	234	−29
1544	192	205	−6	0	0	0	192	239	−19	192	239	−19
1545	288	210	37	0	0	0	251	245	2	286	244	17
1546	139	215	−35	0	0	0	200	253	−20	160	249	−35
1547	99	224	−55	0	0	0	172	260	−33	130	255	−49
1548	138	228	−39	0	0	0	186	265	−29	162	260	−37
1549	265	232	14	0	0	0	330	268	23	298	263	13
1550	294	241	21	0	0	0	411	273	50	353	269	31
1551	329	242	35	0	0	0	297	277	7	313	271	15
1552	204	245	−16	0	0	0	337	282	19	281	276	1
1553	179	250	−28	0	0	0	282	290	−2	279	284	−1
1554	267	254	5	0	0	0	413	295	39	340	289	17
1555	383	259	47	0	0	0	374	300	24	521	294	77
1556	528	264	100	0	0	0	564	304	85	558	299	86
1557	194	270	−28	0	0	0	275	309	−11	235	306	−23
1558	179	279	−35	0	0	0	270	318	−15	284	317	−10
1559	291	284	2	0	0	0	336	323	4	314	322	−2
1560	339	289	17	0	0	0	331	327	1	337	328	2
1561	271	293	−7	0	0	0	356	329	8	296	331	−10
1562	426	301	41	0	0	0	358	335	6	372	339	9
1563	275	308	−10	0	0	0	317	343	−7	343	347	−1
1564	244	314	−22	0	0	0	247	352	−29	258	355	−27
1565	394	317	24	0	0	0	313	355	−11	335	360	−6
1566	247	320	−22	0	0	0	302	355	−14	267	363	−26
1567	235	321	−26	0	0	0	313	359	−12	321	366	−12
1568	252	324	−22	0	0	0	378	361	4	355	369	−3
1569	243	328	−25	0	0	0	310	364	−14	277	371	−25
1570	265	334	−20	0	0	0	291	366	−20	299	378	−20
1571	288	342	−15	0	0	0	272	377	−27	305	383	−20
1572	301	335	−10	0	0	0	298	372	−19	368	377	−2
1573	427	339	25	0	0	0	417	379	10	478	383	24
1574	328	348	−5	0	0	0	285	386	−26	334	391	−14
1575	348	351	0	0	0	0	319	400	−20	378	401	−5
1576	411	350	17	0	0	0	306	408	−25	359	405	−11
1577	369	351	5	0	0	0	375	409	−8	391	405	−3
1578	309	350	−11	0	0	0	407	411	0	372	404	−7
1579	310	360	−13	0	0	0	461	426	8	414	413	0

Year	*Wheat*			*Barley*			*Oats*			*Average of all grains*		
	Price (Index no.)	*Moving average*	*% Diff.*	*Price (Index no.)*	*Moving average*	*% Diff.*	*Price (Index no.)*	*Moving average*	*% Diff.*	*Price (Index no.)*	*Moving average*	*% Diff.*
1580	379	372	1	0	0	0	405	437	−7	444	427	3
1581	381	386	−1	0	0	0	439	465	−5	434	451	−3
1582	333	402	−17	429	0	0	396	479	−17	422	468	−9
1583	316	410	−22	394	0	0	406	486	−16	370	474	−21
1584	299	415	−27	409	0	0	374	490	−23	324	481	−32
1585	427	423	0	547	0	0	472	512	−7	556	498	11
1586	626	428	46	697	0	0	709	520	36	684	506	35
1587	331	433	−23	361	0	0	403	525	−23	365	512	−28
1588	320	436	−26	399	0	0	502	531	−5	407	514	−20
1589	437	436	0	568	0	0	465	537	−13	531	514	3
1590	394	439	−10	720	0	0	757	547	38	624	521	19
1591	304	442	−31	451	0	0	573	554	3	443	525	−15
1592	295	447	−34	287	0	0	392	561	−30	296	532	−44
1593	388	459	−15	379	0	0	417	572	−27	350	540	−35
1594	578	465	24	520	0	0	765	580	31	621	549	13
1595	607	471	28	740	0	0	574	586	−2	681	554	22
1596	811	477	70	971	0	0	1148	601	91	1039	562	84
1597	746	484	54	779	590	32	718	614	16	778	572	36
1598	462	495	−6	545	602	−9	535	624	−14	518	582	−10
1599	407	502	−18	617	614	0	498	634	−21	557	592	−5
1600	485	511	−5	816	625	30	962	652	47	768	606	26
1601	416	516	−19	583	629	−7	526	660	−20	555	609	−8
1602	432	517	−16	617	627	−1	419	657	−36	480	608	−21
1603	391	523	−25	338	633	−46	502	664	−24	420	616	−31
1604	434	527	−17	487	636	−23	581	669	−13	501	620	−19
1605	401	525	−23	639	631	1	589	672	−12	543	617	−11
1606	447	532	−15	506	629	−19	523	671	−22	492	618	−20
1607	571	547	4	571	643	−11	519	672	−22	554	629	−11
1608	715	556	28	527	655	−19	721	679	6	654	642	1
1609	493	564	−12	759	663	14	648	685	−5	633	651	−2
1610	495	566	−12	534	671	−20	633	685	−7	554	655	−15
1611	545	563	−3	698	665	4	853	683	24	699	652	7
1612	606	551	9	792	648	22	810	663	22	736	634	16
1613	667	543	22	788	645	22	721	661	9	725	631	14
1614	504	548	−8	752	654	14	695	668	4	650	638	1
1615	574	564	1	749	676	10	924	686	34	749	655	14
1616	590	569	3	664	672	−1	717	675	6	657	651	0
1617	647	578	11	624	679	−8	616	679	−9	659	659	0
1618	517	586	−11	565	685	−17	603	691	−12	586	670	−12
1619	450	595	−24	493	703	−29	661	699	−5	535	683	−21
1620	366	603	−39	391	713	−45	539	709	−23	432	688	−37
1621	598	611	−2	670	719	−6	730	717	1	666	695	−4
1622	763	621	22	886	743	19	596	733	−18	773	713	8
1623	573	621	−7	648	754	−14	599	741	−19	666	720	−7
1624	625	614	1	614	756	−18	607	737	−17	634	718	−11
1625	637	618	3	745	755	−1	768	742	3	729	720	1
1626	521	621	−16	577	759	−23	517	744	−30	603	723	−16
1627	427	623	−31	443	757	−41	532	738	−27	504	721	−30
1628	525	621	−15	690	750	−8	667	730	−8	693	716	−3
1629	609	617	−1	825	743	11	741	729	1	723	711	1

Year	*Wheat*			*Barley*			*Oats*			*Average of all grains*		
	Price (Index no.)	*Moving average*	*% Diff.*	*Price (Index no.)*	*Moving average*	*% Diff.*	*Price (Index no.)*	*Moving average*	*% Diff.*	*Price (Index no.)*	*Moving average*	*% Diff.*
1630	881	620	42	1277	739	72	1034	731	41	1064	712	49
1631	630	627	0	689	739	−6	639	734	−12	653	715	−8
1632	684	641	6	795	757	5	663	746	−11	793	730	8
1633	686	651	5	812	774	4	754	763	−1	819	743	10
1634	668	665	0	862	791	8	745	778	−4	794	758	4
1635	645	0	0	792	0	0	900	0	0	667	0	0
1636	645	0	0	817	0	0	824	0	0	752	0	0
1637	750	0	0	1225	0	0	1004	0	0	1031	0	0
1638	575	0	0	899	0	0	764	0	0	762	0	0
1639	507	0	0	602	0	0	597	0	0	569	0	0
1640	615	0	0	728	0	0	781	0	0	708	0	0
1641	574	0	0	657	0	0	717	0	0	649	0	0
1642	616	0	0	637	0	0	666	0	0	640	0	0
1643	542	0	0	582	0	0	571	0	0	565	0	0
1644	546	0	0	574	0	0	680	0	0	600	0	0
1645	590	0	0	634	0	0	764	0	0	663	0	0
1646	804	0	0	736	0	0	1000	0	0	847	0	0
1647	997	0	0	1191	0	0	1085	0	0	1091	0	0
1648	943	0	0	1135	0	0	1140	0	0	1073	0	0
1649	942	0	0	1097	0	0	1030	0	0	1023	0	0

APPENDIX II

TABLE SHOWING PERCENTAGE DIFFERENCES BETWEEN ANNUAL AND 31-YEAR MOVING AVERAGES OF GRAIN PRICES, 1465–1634

% Diff. = Percentage Difference; HQ = Harvest Quality; A = Abundant; G = Good; Av = Average; D = Deficient; B = Bad; Dth = Dearth.

Year	*Wheat (Hoskins)*		*Wheat (Bowden)*		*Barley (Bowden)*		*Oats (Bowden)*		*Average of all grains (Bowden)*	
	% diff.	*H.Q.*	*% diff.*	*H.Q.*	*% diff.*	*H.Q.*	*% diff.*	*H.Q.*	*% diff.*	*H.Q.*
1465			−19	G	31	B	4	Av	2	Av
66			−10	Av	0	Av	−7	Av	−8	Av
67			0	Av	−6	Av	−13	G	−4	Av
68			7	Av	−16	G	−13	G	−5	Av
69			6	Av	−23	G	0	Av	0	Av
1470			13	D	−9	Av	−3	Av	9	Av
71			4	Av	6	Av	6	Av	2	Av
72			−26	G	−5	Av	−3	Av	−16	G
73			−26	G	−12	G	8	Av	−17	G
74			−23	G	−32	A	−13	G	−24	G
75			−17	G	−32	A	−13	G	−19	G
76			−16	G	−31	A	−10	Av	−22	G
77			16	D	−25	G	−14	G	−8	Av
78			22	D	−14	G	−6	Av	0	Av
79			−13	G	−9	Av	−24	G	−16	G

Year	*Wheat (Hoskins)*		*Wheat (Bowden)*		*Barley (Bowden)*		*Oats (Bowden)*		*Average of all grains (Bowden)*	
	% *diff.*	*H.Q.*	% *diff.*	*H.Q.*	% *diff.*	*H.Q.*	% *diff.*	*H.Q.*	% *diff.*	*H.Q.*
1480	−9	Av	−11	G	−8	Av	−24	G	−12	G
81	32	B	23	D	59	Dth	26	B	29	B
82	75	Dth	65	Dth	80	Dth	11	D	58	Dth
83	27	B	23	D	36	B	−14	G	14	D
84	−3	Av	−6	Av	1	Av	−3	Av	−4	Av
85	−14	G	−18	G	−21	G	−16	G	−19	G
86	−5	Av	−9	Av	3	Av	−2	Av	10	Av
87	9	Av	0	Av	−9	Av	0	Av	2	Av
88	1	Av	−2	Av	6	Av	34	B	7	Av
89	−10	Av	−16	G	−12	G	−15	G	−18	G
1490	23	D	15	D	−21	G	−9	Av	8	Av
91	−4	Av	−9	Av	5	Av	−9	Av	−12	G
92	−17	G	−19	G	6	Av	32	B	0	Av
93	−22	G	−26	G	−20	G	−17	G	−20	G
94	−31	A	−35	A	−30	A	−20	G	−31	A
95	−32	A	−34	A	−46	A	−14	G	−27	G
96	−1	Av	−4	Av	−28	G	−8	Av	−8	Av
97	−2	Av	−5	Av	4	Av	−4	Av	−5	Av
98	−2	Av	−7	Av	8	Av	22	D	−3	Av
99	−27	G	−32	A	−4	Av	−11	G	−21	G
1500	21	D	18	D	7	Av	−5	Av	10	Av
01	27	B	19	D	6	Av	7	Av	12	D
02	39	B	36	B	1	Av	−2	Av	25	D
03	23	D	21	D	9	Av	−7	Av	10	Av
04	−5	Av	−9	Av	39	B	11	D	9	Av
05	−10	Av	−11	G	4	Av	−10	Av	1	Av
06	−14	G	−13	G	−16	G	−19	G	−16	G
07	3	Av	0	Av	−23	G	−12	G	−9	Av
08	−26	G	−25	G	−9	Av	−11	G	−20	G
09	−38	A	−39	Av	−33	A	−22	G	−34	A
1510	−31	A	−29	G	−29	G	−20	G	−27	G
11	2	Av	−5	Av	−16	G	−16	G	−13	G
12	25	D	19	D	−23	G	−14	G	−8	Av
13	2	Av	−1	Av	−14	G	−21	G	−15	G
14	−15	G	−18	G			−5	Av	−6	Av
15	1	Av	0	Av			−10	Av	−14	G
16	−13	G	−17	G			−5	Av	−17	G
17	−11	G	−15	G			33	B	−5	Av
18	−21	G	−24	G			−9	Av	−17	G
19	14	D	9	Av			−6	Av	4	Av
1520	54	Dth	44	B			23	D	35	B
21	29	B	23	D			9	Av	27	B
22	−21	G	−22	G			−14	G	−19	G
23	−16	G	−18	G			−5	Av	−23	G
24	−23	G	−26	G			−1	Av	−20	G
25	−25	G	−30	A			−11	G	−26	G
26	−18	G	−20	G			0	Av	−6	Av
27	66	Dth	62	Dth			38	B	29	B
28	27	B	23	D			−8	Av	17	D
29	18	D	14	D			−12	G	19	D

Year	*Wheat (Hoskins)*		*Wheat (Bowden)*		*Barley (Bowden)*		*Oats (Bowden)*		*Average of all grains (Bowden)*	
	% *diff.*	*H.Q.*	% *diff.*	*H.Q.*	% *diff.*	*H.Q.*	% *diff.*	*H.Q.*	% *diff.*	*H.Q.*
1530	−12	G	−13	G			−17	G	−9	Av
31	7	Av	7	Av			−5	Av	18	D
32	2	Av	0	Av			6	Av	13	D
33	−9	Av	−11	G			−3	Av	−7	Av
34	−23	G	−26	G			−14	G	−14	G
35	36	B	31	B			2	Av	25	D
36	−5	Av	−6	Av			0	Av	−16	G
37	−34	A	−35	A			−26	G	−34	A
38	−32	A	−33	A			−25	G	−35	A
39	−31	A	−34	A			−29	G	−26	G
1540	−24	G	−34	A			−33	A	−28	G
41	−24	G	−27	G			−34	A	−32	A
42	−27	G	−31	A			−36	A	−24	G
43	−7	Av	−7	Av			−38	A	−29	G
44	−4	Av	−6	Av			−19	G	−19	G
45	43	B	37	B			2	Av	17	D
46	−34	A	−35	A			−20	G	−35	A
47	−52	A	−55	A			−33	A	−49	A
48	−31	A	−39	A			−29	G	−37	A
49	15	D	14	D			23	D	13	D
1550	33	B	21	D			50	Dth	31	B
51	41	B	35	B			7	Av	15	D
52	−11	G	−16	G			19	D	1	Av
53	−23	G	−28	G			−2	Av	−1	Av
54	9	Av	5	Av			39	B	17	D
55	50	Dth	47	B			24	D	77	Dth
56	105	Dth	100	Dth			85	Dth	86	Dth
57	−29	G	−28	G			−11	G	−23	G
58	−41	A	−35	A			−15	G	−10	Av
59	4	Av	2	Av			4	Av	−2	Av
1560	26	B	17	D			1	Av	2	Av
61	−13	G	−7	Av			8	Av	−10	Av
62	44	B	41	B			6	Av	9	Av
63	−8	Av	−10	Av			−7	Av	−1	Av
64	−8	Av	−22	G			−29	G	−27	G
65	34	B	24	D			−11	G	−6	Av
66	−16	G	−22	G			−14	G	−26	G
67	−20	G	−26	G			−12	G	−12	G
68	−19	G	−22	G			4	Av	−3	Av
69	−21	G	−25	G			−14	G	−25	G
1570	−21	G	−20	G			−20	G	−20	G
71	−12	G	−15	G			−27	G	−20	G
72	−7	Av	−10	Av			−19	G	−2	Av
73	28	B	25	D			10	Av	24	D
74	2	Av	−5	Av			−26	G	−14	G
75	9	Av	0	Av			−20	G	−5	Av
76	11	D	17	D			−25	G	−11	G
77	6	Av	5	Av			−8	Av	−3	Av
78	−14	G	−11	G			0	Av	−7	Av
79	−13	G	−13	G			8	Av	0	Av

Year	*Wheat (Hoskins)*		*Wheat (Bowden)*		*Barley (Bowden)*		*Oats (Bowden)*		*Average of all grains (Bowden)*	
	% *diff.*	*H.Q.*	% *diff.*	*H.Q.*	% *diff.*	*H.Q.*	% *diff.*	*H.Q.*	% *diff.*	*H.Q.*
1580	0	Av	1	Av			−7	Av	3	Av
81	0	Av	−1	Av			−5	Av	−3	Av
82	−20	G	−17	G			−17	G	−9	Av
83	−26	G	−22	G			−16	G	−21	G
84	−25	G	−27	G			−23	G	−32	A
85	10	Av	0	Av			−7	Av	11	D
86	42	B	46	B			36	B	35	B
87	−21	G	−23	G			−23	G	−28	G
88	−25	G	−26	G			−5	Av	−20	G
89	1	Av	0	Av			−13	G	3	Av
1590	−5	Av	−10	Av			38	B	19	D
91	−27	G	−31	A			3	Av	−15	G
92	−32	A	−34	A			−30	A	−44	A
93	−13	G	−15	G			−27	G	−35	A
94	29	B	24	D			31	B	13	D
95	36	B	28	B			−2	Av	22	D
96	83	Dth	70	Dth			91	Dth	84	Dth
97	64	Dth	54	Dth	32	B	16	D	36	B
98	−3	Av	−6	Av	−9	Av	−14	G	−10	Av
99	−13	G	−18	G	0	Av	−21	G	−5	Av
1600	0	Av	−5	Av	30	B	47	B	26	B
01	−14	G	−19	G	−7	Av	−20	G	−8	Av
02	−15	G	−16	G	−1	Av	−36	A	−21	G
03	−24	G	−25	G	−46	A	−24	G	−31	A
04	−16	G	−17	G	−23	G	−13	G	−19	G
05	−20	G	−23	G	1	Av	−12	G	−11	G
06	−11	G	−15	G	−19	G	−22	G	−20	G
07	8	Av	4	Av	−11	G	−22	G	−11	G
08	35	B	28	B	−19	G	6	Av	1	Av
09	−7	Av	−12	G	14	D	−5	Av	−2	Av
1610	−10	Av	−12	G	−20	G	−7	Av	−15	G
11	0	Av	−3	Av	4	Av	24	D	7	Av
12	9	Av	9	Av	22	D	22	D	16	D
13	24	D	22	D	22	D	9	Av	14	D
14	−2	Av	−8	Av	14	D	4	Av	1	Av
15	4	Av	1	Av	10	Av	34	B	14	D
16	2	Av	3	Av	−1	Av	6	Av	0	Av
17	12	D	11	D	−8	Av	−9	Av	0	Av
18	−15	G	−11	G	−17	G	−12	G	−12	G
19	−25	G	−24	G	−29	G	−5	Av	−21	G
1620	−37	A	−39	A	−45	A	−23	G	−37	A
21	1	Av	−2	Av	−6	Av	1	Av	−4	Av
22	26	B	22	D	19	D	−18	G	8	Av
23	−3	Av	−7	Av	−14	G	−19	G	−7	Av
24	8	Av	1	Av	−18	G	−17	G	−11	G
25	6	Av	3	Av	−1	Av	3	Av	1	Av
26	−13	G	−16	G	−23	G	−30	A	−16	G
27	−29	G	−31	A	−41	A	−27	G	−30	A
28	−14	G	−15	G	−8	Av	−8	Av	−3	Av
29	5	Av	−1	Av	11	D	1	Av	1	Av

Year	*Wheat (Hoskins)*		*Wheat (Bowden)*		*Barley (Bowden)*		*Oats (Bowden)*		*Average of all grains (Bowden)*	
	% *diff.*	*H.Q.*	% *diff.*	*H.Q.*	% *diff.*	*H.Q.*	% *diff.*	*H.Q.*	% *diff.*	*H.Q.*
1630	48	B	42	B	72	Dth	41	B	49	B
31	4	Av	0	Av	−6	Av	−12	G	−8	Av
32	11	D	6	Av	5	Av	−11	G	8	Av
33	9	Av	5	Av	4	Av	−1	Av	10	Av
34	4	Av	0	Av	8	Av	−4	Av	4	Av
35	−2	Av								
36	−3	Av								

Notes and Comments

FORTHCOMING CONFERENCES

WINTER 1971

The winter conference will be held on Saturday, 27 November 1971 at the Geography Department, University College, Gower Street London. It will discuss the historical background to the European Common Agricultural Policy and its implications for British agriculture. Papers will be read by Michael Tracy and Ray Rickard, and the Dutch and Danish agricultural attachés will contribute to the discussion.

SPRING 1972

The annual conference will be held from Monday, 10 April to Wednesday, 12 April, at Wye College, near Canterbury, Kent. The conference will concentrate on the history of Kentish agriculture and will include an excursion, but it is hoped to have some more general papers as well on comparisons between English and European agriculture, including one by Professor E. Leroy Ladurie of the Sorbonne. It is hoped to include papers on Kentish agriculture by Professor Alan Everitt (background to the excursion which he will lead), Norah Carlin (medieval estates of Canterbury Cathedral priory), Dennis Baker (history of the hop industry), and Margaret Tyler (rural social structure in the nineteenth century).

THE 1971 ANNUAL CONFERENCE

The Annual Conference was held at Bodington Hall, University of Leeds, from Monday, 5 April to Wednesday, 7 April 1971. Papers were read by Mr Ian Kershaw (The agrarian crisis of 1315–1317: some evidence from the West Riding of Yorkshire), Mr David Grace (The agricultural processing industries, 1750–1850), Mr David Hey (The rural communities of South Yorkshire, 1660–1820), and Professor Herman Freudenberger (Bohemian and Moravian aristocracies). On the afternoon of 7 April, Mr Bernard Jennings led an excursion to Nidderdale, visiting Harrogate, Ripley (an attractive nineteenth-century estate village), the field systems and enclosures of Forest Moor, and the lead mines of Greenhow on Bewerley Moor.

THE ANNUAL GENERAL MEETING

The Society's nineteenth AGM was held at Bodington Hall, University of Leeds on 6 April 1971, with Professor W. E. Minchinton in the Chair. Professor W. G. Hoskins was elected President and Mr C. A. Jewell and Mr M. A. Havinden were re-elected Treasurer and Secretary respectively. Professor A. M. Everitt, Mr George Ordish, and Dr W. J. Rowe were re-elected to the Executive Committee.

(*Continued on page 174*)

The Culleys, Northumberland Farmers, 1767–1813

By D. J. ROWE

MATTHEW and George Culley were born, respectively, in 1730 and 1734, the sons of Matthew Culley. There were also two other brothers, Robert, the eldest, and James, who was probably born between Matthew and George. The brothers were brought up at Denton, near Darlington, in County Durham, where their father had a farm of about two hundred acres. Matthew Culley, senior, was particularly interested in new and improved methods of agriculture and in the early 1760's sent George and Matthew, the two of his sons who showed the greatest interest in farming, to Dishley in Leicestershire as pupils of Robert Bakewell, who was already becoming famous for his improvements to the Leicestershire sheep and longhorn cattle. There they picked up the principle of breeding by taking the best animals and continually breeding from them, which they were to follow for the remainder of their lives. They returned to Denton but there was little scope for them to put their ideas into practice. The farm was small, and would in any event become the property of Robert when their father died, and Robert was little interested in farming, being more concerned to have a gay bachelor life. Thus in 1767, Matthew and George moved to north Northumberland, tenanting a farm at Fenton, north of Wooler. At some stage they were joined by James, if indeed he did not go with them initially, since, until his death in 1793, he was in partnership with Matthew and George, working their Northumberland farms.

The great attraction about north Northumberland was that large farms were available; one thousand acres was not uncommon and rents were reasonable. The basic reason for the latter was that the agriculture of the area had been considerably retarded as a result of the Border Wars with the Scots. Large areas of suitable agricultural land had remained uncultivated for long periods until the mid-seventeenth century and farming practice had improved only slowly since that time. The disadvantage was that the agricultural techniques of the area were backward, but this would not worry the Culleys, nor the other advanced Durham farmers who moved to north Northumberland in this period, since they knew the methods they intended to adopt and were not to be discouraged by the poor practice of other farmers.

Of the first years which they spent at Fenton we have no record, but one of their earliest activities, at the time that Arthur Young was involved in his agricultural tours, was travelling in England and Scotland, examining the

agricultural methods of various areas. No doubt as pupils of Bakewell they were already becoming known in farming circles, and they met and stayed with many farmers throughout the country, who might have been less willing hosts had they known what was written by the brothers in their journals of farming practice. Unlike Young's tours the Culley journals were never intended for publication but merely as reports for their own interest. Nevertheless, they show that the brothers had already picked up much of what was to be the advanced farming practice of the late eighteenth century. They were very critical of farming which did not reach their standard, although they were always on the look-out for new ideas and techniques which they could adopt to improve their own practice. Undoubtedly these tours helped to give them that broad knowledge of agricultural technique which placed them among the leading farmers of their period. Among the remaining Culley papers[1] there are accounts of tours made by George Culley to Leicestershire in 1765 and again in 1771, to Scotland in 1771, and through the Midlands into East Anglia in 1784, while there are the journals of Matthew's tours to Scotland in 1770 and 1775 with notes made by George, including comments on farming practice in Scotland in 1794 and in 1798, when, in company with his nephew Matthew, the son of George, he went to Leicestershire. The comments made in the journals of these tours throw a lot of light on the views held by the Culleys on farming and more particularly on the state of farming practice in various parts of the country. Together with these journals go the letters sent by one of the brothers who was touring to the other at home, commenting on agricultural practice seen, and giving advice as to what should be done on their Northumberland farms.

Putting together the experience they had obtained at Dishley and from their tours, the brothers determined to adopt the best farming practice of which they were aware, on arable as well as pasture. Their major introduction to Northumberland was a variation on the famous Norfolk crop rotation. It was found that "Those who have practised the Norfolk system on thin light soils, find their crops grow worse, especially the turnips and clover, and many have been obliged to adopt this system, by which they find their lands renovated; and, instead of having to complain that their soil was 'tired of turnips and clover', they now find that it produces abundant crops, and that every rotation brings it nearer its former fertility."[2] "This system" was a form of mixed farming or convertible husbandry. It involved a crop rotation lasting over six or seven years, but from about 1800 more usually of five years, of oats, turnips, barley, or wheat, and the remaining years pasture. It was found that a rotation of this

[1] In the Northumberland Country Record Office (N.C.R.O.). These journals are in ZCU 1.

[2] J. Bailey and G. Culley, eds., *General View of the Agriculture of the County of Northumberland*, 3rd edn, 1805, pp. 70–1.

kind provided the best kind of balanced farming for the soil, and it created the sheep and turnip husbandry for which the Culleys and north Northumberland became famous. It spread also beyond the dry, light lands on which the Culleys farmed to the heavy, wet clays and loams further south in the county and helped to do away with the fallowing which was previously common. The Culleys were strongly opposed to fallows, recommending their replacement by leguminous crops, and in their report on the county Bailey and Culley wrote, "we cannot help being inclined to think, that the quantity of naked fallow might be very much reduced, and in another century will probably be totally abolished, if no fortuitous circumstances arise to check the exertions and spirit for improvement which have been so prevalent of late years, and so generally diffused through this district."[1]

In encouraging the adoption of the new rotation in Northumberland the Culleys were instrumental in encouraging more farmers to grow turnips (and also artificial grasses), a crop which had only recently been grown in the county but which was soon of importance as a winter feed for sheep, which fed off the turnips in the fields and in doing so left their droppings and manured the field, a system of management called folding. The particular contributions made by the Culleys to the cultivation of turnips were to drill the seed rather than sow it broadcast and especially to grow turnips on a ridge and furrow system, with a thick layer of manure on the ridge immediately below the turnip seed. Thus, when the seed rooted it got the full benefit of the manure and the Culleys obtained good crops, having experimented with different types of seed, and were soon selling considerable quantities of turnip seed to farmers in the area. Early in the nineteenth century George Culley wrote to some satisfied customers, "I am very happy to hear that our turnip seed has given such general satisfaction in your neighbourhood. Indeed it is a very pleasant circumstance to us that this has been the case wherever it is sown, and our demand increases every season. We grow all the seed we sell and now raise none but the large *globular* white, which we ourselves prefer, and find that it meets with the approbation of all our customers. We have tried *green* and *red* both formerly, but left them off as we found the white not only feeds better, but withstands the winter best, and grows to a very sufficient size . . . it will not be more than 1s. p. pound or £5 12s. the cwt. . . I own it higher than the best London prices. But our demand is such that we can always sell higher than others and indeed price is of no consequence in turnip seed, where you can be assured of a good commodity."[2] It was typical of the business efficiency of the Culleys that they missed nothing which could be raised and sold at a profit. Around the turn of the century they were receiving around £500 annually from the sale of about 10,000 pounds of turnip seed.

[1] Bailey and Culley, *op. cit.*, pp. 68–9. [2] N.C.R.O., ZCU 31, 24 Feb. 1803.

The Culleys did much to drain the marshy lands along the banks of the rivers on their land and to embank the rivers to prevent flooding. Having done this they became interested in the creation of water meadows in order to obtain early grass for sheep and cattle feed in the months March–May when winter feedstuffs were running short. George Culley applied to Robert Bakewell for any suggestion in this field and was recommended to apply to George Boswell of Piddletown in Dorset, for a man to do watering.[1] It was eventually decided that Culley should send a man to Dorset to learn the practice of watering meadows during the winter season, October–April 1787–8.[2] The practice became common and the Culleys recommended water meadows to many of their farming acquaintance; in 1799 we find Matthew Culley writing to John Welch, who was the Culleys' steward and land agent at Denton, where land had come into the hands of Matthew on the death of Robert in 1783, "We are watering our meadows, now in harvest, and our cattle and sheep are all taken off them... The water at Denton should be made use of whenever opportunity offers, and especially in floods. Turn your attention that way . . . to Draining and Irrigation, as the advantages resulting therefrom are obvious."[3] This arrangement with Boswell provided Culley with another correspondent to add to the many improvement-conscious farmers throughout the country with whom he maintained contact. Boswell also bought corn seed from Culley, a branch of agriculture in which the Culleys are not usually considered to have been active. In January 1789 Boswell asked George Culley to send him bags of the various types of oats which the Culleys usually sowed. In April he wrote again, "Each of the kinds are vastly superior to any we grow here but the Poland are infinitely beyond any ever seen in this country... I bought six quarters of Poland oats imported at Weymouth from the Continent, though thought here very good yet when compared with yours, they fell very short indeed." The story was completed in October when Boswell wrote once more, full of praise for the produce of the seed he had had from Culley[4] and thus giving some evidence that by this period north Northumberland deserves to be considered as advanced in some aspects of corn-growing, in addition to stock-rearing, as the rest of the country.

It is, however, in stock-rearing that the Culleys made their biggest mark in Northumberland farming. Although they took with them from Denton to Fenton in 1767 their herd of shorthorns, which was much admired by Robert Colling, and which was one factor in encouraging his work on the breed, the Culleys had no marked success as cattle breeders in Northumberland. Their correspondence shows that they bred and sold cattle, some fine horses, and

[1] University of Newcastle-upon-Tyne Library, Bakewell MSS, 8 Feb. 1787.
[2] N.C.R.O., ZCU 12, 25 March 1787. [3] *Ibid.*, ZCU 44, 17 Sept. 1799.
[4] *Ibid.*, ZCU 14, 24 Jan., 6 April, and 25 Oct. 1789.

showed some slight interest in pigs, but their success and fame came in the field of sheep-breeding. Impressed with the long-woolled Dishley sheep, becoming known as the New Leicesters, which they had seen as pupils of Bakewell, the Culleys introduced them to north Northumberland. They were not entirely suitable for the upland pastures on the slopes of the Cheviots, which formed part of many of the farms in the area, since they were considerably less hardy than the Cheviot and Heath breeds of sheep, which were the standard sheep in the area. The Culleys, therefore, crossed their Dishley tups (rams) with ewes of the Teeswater breed which were common in the Darlington area in which they were brought up, and thus produced the Culley or Border Leicester, a fairly hardy, quick-growing sheep which fed and fattened readily and spread widely throughout the county. William Marshall wrote of Culley, "His breed of sheep are known, even to the 'farthest Thule' by the popular name of the 'Culley breed'."[1] Later the Border Leicesters were crossed with Cheviots to produce half-bred ewes, still a common practice in the area.

A recent study of the development of livestock has suggested that the Culleys had only one flock of long-woolled Dishleys on the border farms of Northumberland, among several from which the Border Leicester evolved in the early nineteenth century, and that they do not have a unique claim to having fathered that breed.[2] There is certainly no doubt that there were other herds of Dishleys in north Northumberland in the late eighteenth century but there is no evidence to suggest that any of them were established before 1767 when the Culleys arrived at Fenton. Similarly it would seem that the Culleys kept a more pure herd of Dishleys than their neighbours, and were the first to introduce the Teeswater cross. Contemporaries, as we have seen in the case of William Marshall, certainly considered the Culleys (George particularly) to be the leading authority on sheep, next to Bakewell. To some extent this may have resulted from the fact that George Culley was a better publicist than many of his rivals. In 1786 he published his *Observations on Livestock; containing Hints for choosing and improving the Best Breeds of the most Useful Kinds of Domestic Animals*, which went through four editions in the next twenty years and, popularly known as "*Culley on Livestock*," was the authority on the subject.

In his correspondence and comments made when touring the country George Culley made clear the failings of many sheep-breeders and the actions which he and his colleagues were taking to overcome them.

In his book Culley wrote, "A person who has travelled through the different breeding counties, cannot but remark the great diversity of opinion in the

[1] W. Marshall, *The Review and Abstract of the County Reports to the Board of Agriculture*, 1808–18, reprinted 1969, vol. I, Northern Department, p. 11.

[2] R. Trow-Smith, *A History of British Livestock Husbandry, 1700–1900*, 1959, p. 273.

characteristic distinctions of excellence in domestic animals, particularly sheep. A Norfolk sheep-breeder says, sheep should be *black-faced* and *black-legged*; that their *horns* should come out *forward*, and turn in such a manner as you can see the *ears through*, or *behind*, the *circle of the horns*. A Wiltshire sheep-breeder, on the contrary, says, that sheep should have *white faces* and *white legs*; and that their *horns* should come out *backwards*, in such a manner, that the *ears* may be seen before the *horns*. . . Could any of these people 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*."[1] His views on the matter were formed during various tours and especially that of 1784 when he wrote to Matthew telling him of the sheep he saw. At Arthur Young's in Suffolk he wrote "his sheep are scabbed."[2] Of the sheep in the Nottingham area, "It's amazing how fashions change, not many yrs ago, nothing wo'd do but short carcass [*sic*] & short legs, now they must be long carcassed & stand high or they will not do at all, thin necked, streight [*sic*] topped, flat topped, and wide, in short light in the useless part, & thick in the usefull part, I am talking of sheep Mr Matt."[3] From Sawton in Yorkshire he wrote, "I sent you a letter from Malton yesterday. Afterwards we took a look at the Tups which were come to the fair against Monday. My friend B. Sayles makes only a middling figure. . . A Mr Lees of Lackenley much worse, this young man has been thorough [*sic*] Lincoln & hired a Tup of Mr Chaplin, a rare skinned one he says, such a one as will please the Wolds people. Surpassing strange, these people do not see thorough this delusion, no wonder my bro'r James lost his usefull sheep by breeding to the tastes of these mistaken folks, I am very sure that you cannot conceive how bad these sheep are. I would not have missed coming this road upon any acc't, when they will awaken from this delirium I know not. I asked young Lee if the Tup he had hired of Mr Chaplin was fat, he candidly confessed that he was not, 'but a deal of Bone and Skin' thats the thing Mr Matt. The fattest sheep we saw were at Mr Codds of Bakewells kind, but said they were little wadling *Toads*."[4]

Not all sheep breeders were so backward. From Ranley in Lincolnshire George wrote that local breeders had given up the battle "to better judgment, this truly great and indefatigible man Mr B[akewell] convinces in gen'l

[1] G. Culley, *Observations on Livestock*, 4th edn, 1807, v–vi.

[2] N.C.R.O., ZCU 1, 23 Dec. 1784.

[3] *Ibid.*, ZCU 9, 18 Nov. 1784. Even at the time George was the better known agriculturist of the two, although Matthew was competent and George had a high opinion of him. On one occasion when writing to John Welch, George said, "I am giving you long lectures without thinking that my brother will be with you in a little time, who, when his head is unclouded, 'can see as far into a milstone [*sic*] as him that picks it'. In fact, though he is not a good salesman, there are few better advisers."—*Ibid.*, ZCU 44, 29 Jan. 1801.

[4] *Ibid.*, ZCU 9, 10 Oct. 1784.

wherever he goes."[1] Many breeders while admitting they were wrong were not yet prepared to pay the prices of good stock. From Sawton he wrote, "I could have let a few Tups tollerably [*sic*] well I think, tho' they are not fond of giving above 5 guineas. Mr Sayle let some at no more than 3 g. . . it is amazing to me that they do not try to get better, because they confess they are wrong, & many of the Wolds people are or seem to be convinced of their mistake, & they must necessarily change the sort. I am of opinion they are ashamed to come to us . . . Mr Clever . . . candidly owns . . . that ours were best in England except Mr Bakewells and he tho't ours as good."[2]

The Culleys were very proud of this growing reputation that their flocks were second only to Bakewell's. In 1789 George wrote to John Bailey, agent to Lord Tankerville at Chillingham Castle in Northumberland, "I have the satisfaction to say that we have not used a Tup for more than these twenty years and of any other Person than Mr Bakewell, and we have the *Honor* [*sic*] to stand second in his alphabetical list of Breeders, that have stuck longest to the Dishley Blood."[3] A few months later he wrote to Bakewell telling of a Mr Donkin who had said that the Culleys' sheep were only a mixed breed and that his own were the only pure Leicesters. The publishers of the work in which this statement appeared were prepared to make an apology if Culley could show the superiority of his sheep. He went on, "Therefore, sir, if you will be so kind as say how long the Culleys have been your customers, and the prices from lowest to highest, we shall be able, I hope, to vindicate our Character in the face of the Public against this *Daring Champion* for we are all willing to claim kindred to you and as near as we can, we also flatter ourselves would [*sic*] being pretty deep in your Blood. However your certificate can alone decide this matter."[4]

Throughout this period, until his death in 1795, the Culleys remained in close contact with Bakewell, visiting him occasionally and corresponding regularly, always prepared to pick up any new information. While on tour in 1784 George wrote to Matthew from Dishley, ". . . when I reflect that we were glad to spend a few days or wks with this extraordinary man [Bakewell], when we co'd scarce afford it, makes me scruple less to spend a little time and not a little money with this genius, now we can the better afford it. Besides he is so much the more communicative now than in Ashworth's administration, indeed there is nothing now scarce that he will not give a thoughtful answer to."[5] There can be little doubt that Culley was a very uncritical admirer of Bakewell, as Trow-Smith has suggested,[6] taking little notice of the earlier breeders on whose

[1] N.C.R.O., ZCU 9, 4 Dec. 1784. [2] *Ibid.*, 10 Oct. 1784.
[3] *Ibid.*, ZCU 44, 27 April 1789. It would seem that Culley meant chronological when he used alphabetical, since the first on the list was Nathaniel Stubbins, from whom Culley sometimes had tups.
[4] *Ibid.*, 2 July 1789. [5] *Ibid.*, ZCU 9, 26 Nov. 1784. [6] Trow-Smith, *op. cit.*, p. 63.

work Bakewell built. But Culley was no slavish follower of Dishley ideas. Trow-Smith, himself, has written, "Standing beside these sheep [the New Leicesters] and using them as the tools to fashion even better stock than the Dishley barrel-on-four-short-legs there are such men as Culley and Robson."[1] Culley was also a businessman foremost and an admirer of Bakewell second, and this led to a number of sharp exchanges in their correspondence, since Culley was not prepared to pay high prices for sheep which he did not think came up to standard. During the summer of 1787, Bakewell had let a tup jointly to Culley and Benjamin Sayle, neither of whom was satisfied with him. Bakewell sent a second, making Culley an allowance for the first.[2] There was a further disagreement in the autumn of 1791 over the price to be paid for a tup called *Star* which Culley had had from Bakewell. Culley wrote, "I cannot say I am at all satisfied with the price you charged for *Star* as I said before, '*as I am in your power*, I shall pay for this time whatever you charge' . . . last year you solicited me much to have a sheep, my answer was, 'we had been so little benefitted by what tups we lately had from Dishley, especially as the best could not be come at, that I thought it imprudent to throw away money'. Upon your further urging me *that it would look well as we were old acquaintance* etc. etc. or arguments to that effect, I said if you would send me a sheep that did us good, I would willingly give an hundred, but would not go farther."[3]

With breeders other than Bakewell, George Culley was less inclined to patience. In the summer of 1793 he had four tups from Nathaniel Stubbins, the breeder who had had Dishley stock the longest. They were to cost £210 for the best one and £70 each for the others. Despite a plaintive note from Stubbins that he knew one of the last three was not as good as the others and a hope that Culley would not deduct the full amount, the latter sent a cheque for £350 with a note that he had deducted £70 "because the 4th was a nonentity he did no business." Stubbins in his next letter noted, "I have received . . . £350 . . . as I mentioned in my last I was in hopes you would have made it guineas." but he got no change out of Culley.[4]

It is possible that Culley's rather peremptory attitude was due to a disagreement between the Northumberland and Leicester tup breeders' associations, Stubbins being secretary of the latter. In November 1788 a number of Leicestershire sheep-breeders, possibly at the instance of Bakewell, met and formed a tup-breeders' society. Robert Honeybourn, Bakewell's nephew, was appointed treasurer and a subscription of ten guineas was charged.[5] The aim of the association was to promote the breeding of rams of the Dishley type and to restrict the methods by which they were hired. Early in 1790 Bakewell

[1] *Ibid.*, p. 46. [2] Bakewell MSS., *op. cit.*, 31 Aug. and 22 Sept. 1787.
[3] N.C.R.O., ZCU 31, 1 Nov. 1791. See also Bakewell MSS.
[4] *Ibid.*, ZCU 18, 22 Aug., 31 Aug., and 30 Oct. 1793.
[5] Bakewell MSS., *op. cit.*, 22 Nov. 1788. See also 18 Nov. 1789 and 13 Feb. 1790.

suggested to George Culley that he should form a similar association in Northumberland, since that county was one of the major breeding areas of the Dishley sheep. Notice was taken of this and the Milfield Society (so called because of the name given to the north Northumberland plain, on which the Culleys and their associates farmed) was established in the early summer of 1792, with Lord Hume as president. It adopted similar rules to those of the Leicestershire society and was welcomed by that body as a step towards improving the standards of sheep-breeding.

Some agreement had to be reached between the two societies as to their respective spheres of influence, and initially the Leicestershire society offered not to let tups north of York before 8 June. Culley, the promoter of the Milfield Society, had suggested that a line from Hull through York and Leeds to the Irish Sea should limit their respective lettings, except to members of each other's society, since "without Something of this sort, it will be in vain for us to associate."[1] The Leicestershire society finally offered not to let tups to Scotland, Northumberland, Durham, Cumberland, and Westmorland except to members of the Northumberland society, and proposed that the two societies should be on an equal footing in Lancashire and Yorkshire, providing that the Milfield Society agreed to the Leicester restriction not to let tups to farmers who dealt with the marketing trade. This was accepted but the latter constraint, aimed at restricting the use of Dishley tups for building up pedigree herds and, of course, maintaining the supremacy of the existing breeders, was to cause considerable trouble. Many sheep farmers were still opposed to the Dishley sheep. William Mure wrote to inform George Culley that "the inveterate enemies to *Cullies sheep* turned in a blackguard Galloway ram amongst the flock at a distant farm on hand, out of the whole flock only 5 could be found that had not got the ram. . ."[2] He had been expecting a ram hired from Culley to put to his sheep. But even where opposition to the new breed was less strong than this, there was resentment against the restriction on letting tups at market. As evidence of this, Culley had invited B. Colling to Barmpton to join the Milfield Society. He replied that, "It is so very little that is done in this quarter that I think it rather bordering upon vanity for a man to call himself a tup man, however if I was a few miles nearer you I should not have the least objection to join your society."[3] Yet a couple of months later Colling made it clear that his real reason for not joining was that the rules against letting to market in Yorkshire would have been too inconvenient for him.[4] Culley also met much opposition of this type among Northumberland farmers and the Milfield Society approached the Leicester group with a view to waiving the restriction. This did not lead to any relaxation in the rules, despite Culley's argument that

[1] Bakewell MSS., *op. cit.*, 13 April 1792. [2] N.C.R.O., ZCU 18, 22 Dec. 1793.
[3] *Ibid.*, ZCU 17, 24 May 1792. [4] *Ibid.*, 5 July 1792.

if the two societies ignored this market other breeders would step in. Relations between the two societies deteriorated and in June 1793, Honeybourn, on behalf of the Leicester society, wrote to Culley accusing him of letting a tup to a market dealer. Culley replied that he had obtained an agreement from the breeder, of Malton in Yorkshire, that none of the produce of the tup would be let at market but that he could not prevent the breeder from selling his old tups at market. The rift was not healed and in December Culley wrote to inform the Leicestershire men that the Milfield Society had been dissolved since the attitude of the Leicester society destroyed the reason for the association.[1] He claimed that the Leicester men had let tups into Yorkshire without informing him and that Bakewell had sold forty ewes to a Northumberland farmer, among other complaints. These were refuted by Stubbins but relations remained strained, and with the death of Bakewell in 1795, Culley largely withdrew from contact with the Leicestershire breeders. This he could afford to do since he no longer needed sheep from them to improve his herd and his reputation had been made.

The basis on which this reputation had been built was the excellent herds of sheep which the Culleys possessed. Gradually farmers in the neighbourhood and from farther afield came to the Culleys to improve their flocks. When at Northallerton, on tour in 1784, George wrote to Matthew, "Mr Cleaver has insisted upon having 10 ewes tupped of J. Taylor by big tup. I am to dine with him tomorrow. I saw him and he is highly pleased with the tup, and like a man acknowledges ours are the best sheep in England, save Dishley."[2] In 1785 Culley offered Lord Darlington two tups. Darlington had previously had tups from the Culleys but had had some disappointment and on this occasion wrote, "you wished to send me a tup or two . . . if they did not please, you desired nothing for them. I wish you to let me know, if they do please, the price I am to give, before you send them."[3] Culley replied that the price would be 40 guineas and Darlington accepted and afterwards had several further dealings with the Culleys. Three years later, Colonel David Hume of Caldra wrote that he wished to improve his herd and wanted to hire a tup.[4] Thereafter the Culley papers show that they were doing an increasing trade in tups over long distances. In 1790, Culley was doing business with a Norfolk man he had met. "When I had the pleasure of seeing you . . . you expressed a wish to buy a quantity of ewes, of the Dishley blood, and I am vain enough to think that no breeder is more in that blood than we are, for we have had tups from Mr Bakewell for near thirty years. And as proof that they are tolerably good, we have for some years let tups, from 5 to 20 guineas each, & lately up to 50 & 60 & upwards, this very year we have let some to go 150 miles at the latter prices.

[1] *Ibid.*, ZCU 4, 14 June and 11 Dec 1793. [2] *Ibid.*, ZCU 1, 6 Oct. 1784.
[3] *Ibid.*, ZCU 10, 25 July 1785. [4] *Ibid.*, ZCU 13, 1, 6, and 28 Sept. 1788.

And this is the more extraordinary, when it's understood that before we came into this frozen region there never had been a tup sold for above three guineas."[1] It was not long before the distance of the Culley dealings increased. "Yet I say our sheep are larger in general than Mr B. because they are orriginally [*sic*] descended from the Teeswater Sheep, which are confessedly the largest sheep in this Island, but far from handsome, which first suggested the Idea to us of crossing from Leicestershire sheep which I am happy in saying has succeeded beyond our most sanguine expectations. For we now let a number of Rams every Season to great advantage. If not so high as our great Master B., higher than any other North of the River Trent and I should be very happy to have some of our tups or Ewes sent into Ireland, provided it could be done to the mutual advantage of you and us."[2]

Beyond the inevitable suspicion held by vested interests against new ideas, the Culleys had, above all, to overcome the objections of sheep breeders to paying the high prices which breeders of the Dishley sheep charged. Culley's comment, quoted above, that a tup had never been sold for more than 3 guineas before they moved to north Northumberland may well be an exaggeration, but it is a far cry from the 50 guineas a season which Culley was charging for letting his best tups at the end of the 1780's, with a limitation on the number of ewes which might be put to the tup. Even this price was not high when compared with the 100 guineas level which Bakewell had reached and the price rise of the following two decades was to make this look small. Culley's letters again show the financial problems which occurred when dealing with prospective customers. William Key, who had arranged to have a tup from Culley in the summer of 1792 wrote with regard to "the prices which I hope will not be extravagantly high, for we are thought by our neighbours to be mad to give such prices at this time o' the day when we have, or at least should have, so much of the blood already but our intentions is not to change as long as we are well used by you."[3] Since Key had obviously been converted to the Dishley breed for some time it can be no surprise that more recent converts were put off by high prices. In the following year, W. Marshall, Lord Breadalbane's agent, wrote to Culley from Taymouth, "I now beg of you to forward to this place at the proper season, one hundred of such ewes as you think will be likely to become profitable to Lord Breadalbane's Estate, and to the Culley breed of sheep, and with them a ram of a middle price; by a person conversant in the care and management of longwooled [*sic*] sheep, and who can remain here until the ewes have dropt their lambs in the spring, and as much longer as may be found requisite, or as he may be inclined to stay."[4] When Culley replied, giving the

[1] N.C.R.O., ZCU 31, G. Culley to Mr Colhoun, near Thetford, Norfolk, 9 July 1790.
[2] *Ibid.*, ZCU 44, G. Culley to Thos. Dawson, Dublin, n.d.
[3] *Ibid.*, ZCU 17, Wm Key, Malton, Yorks. to G. Culley, 18 Aug. 1792.
[4] *Ibid.*, ZCU 18, 21 July 1793.

prices which would be charged he received the following response, "I am sensible that the offer you are so good as to make of your own ewes would be, under ordinary circumstances, most acceptable. But we are here in a low priced country, and to give even three guineas a head for breeding ewes would, by the people of the country, be considered as the height of folly and extravagance. Nevertheless, it would I think be right for Lord Breadalbane to make the *experiment* in such a manner as to give it a fair chance of success. Suppose you were to send half a score of your own, and fifty of your neighbours' stock, with a ram at twenty guineas. . ."[1] On the back of this letter Culley has noted his reply, sending a tup for the season at 20 guineas, 10 of his own ewes at 3 guineas each, 20 of Mr Darling's at 29 shillings each, and 30 of Mr Chisholm's at 22 shillings each. These were among the more moderate prices, since at the same period Culley was selling his best ewes at 5 guineas. One of the financial difficulties which Culley met over his tup-letting and ewe-selling was of his own making. In 1797 he had an acrimonious correspondence with George Richmond over the amount of a bill due for sheep.[2] This was not uncommon and would seem to have been due to Culley's habit of stating a price, which the purchaser then said was too high and Culley replying that he would wait until the purchaser had seen how good the sheep were. Working on the assumption that the purchaser would be very pleased, Culley charged the original price whereas the purchaser, thinking he had made his point, expected a lower one. Despite these various problems the Culleys had built up a very profitable sheep trade by the end of the eighteenth century, and towards the end of one season George told John Welch, "We had some customers in the tup way yesterday, who took about £100 worth, we are now very likely to exceed £1,000, . . . a sum I did not at first look for, for £500 is certainly a very fair sum that way."[3]

Beyond their obvious success in sheep breeding the Culleys became well known for other aspects of improved farming practice. We have seen the considerable demand for turnip seed; their red wheat was also much demanded by local bakers and the correspondence shows that there was a considerable demand for the seed from farmers over a wide area and especially in Scotland. They also has a small trade in letting pedigree stallions and bred and sold some cattle. Of the latter they must have been fairly confident of their quality since George wrote to a Mr Walker, "we can spare 8 or 10 very useful heifers I think 2 & 3 years old, some in calf and some unbulled, . . . & the price shall be left to yourself. If you come . . . you could take a look at the cattle in the vicinity of

[1] N.C.R.O., ZCU 18, 16 Aug. 1793.

[2] *Ibid.*, ZCU 22, 29 Sept. 1797. Nevertheless the Culleys were far from being Shylocks in their approach to business. Compare, for example, the following comment from Matthew to John Welch (ZCU 44, 28 June 1801), "I am glad you have quitted your sheep, and I would not have you delay selling so long again, and by all means to avoid the name of hard or dear seller."

[3] *Ibid.*, ZCU 44, 20 Oct. 1802.

Darlington. Thus, come in the coach to Darlington then go to Mr Collings, & he will furnish you with a horse to reconoitre [*sic*] the neighbourhood. And if you can suit yourself better there, may take a part or none of ours as you like."[1]

As their fame spread, it is little surprising that more and more commissions should come their way. In the late 1780's Sir John Sinclair was sending sheep from a Scottish agricultural society for the Culleys to experiment with. In the early 'nineties Sinclair approached Culley for information in compiling *An Analysis of a Sheep Farm, managed on the Culley principles* and commenting that "Your mode of occupying arable ground, mixing sheep farming and husbandry, is, I am satisfied, the most profitable of any, & I want to give some account of it . . . from your answers to the inclosed queries."[2] Early in 1793 Culley was approached by Arthur Young for advice on the latter's intended purchase of a large moorland estate in north-west Yorkshire. With this acquaintance with the first president and first secretary of the Board of Agriculture, formed in the summer of 1793, it is not surprising that George Culley became involved in the preparation of the county reports on agriculture to the Board. He was initially invited to prepare the report on Cumberland and obtained the assistance of John Bailey, estate agent to Lord Tankerville of Chillingham Castle in Northumberland. The two of them then did the report on Northumberland. It was one of the best of the county reports, William Marshall, the leading contemporary writer on agriculture, commenting, "it is much to be apprehended, that, in going the round of the Board's Reports, *we shall not see its like again.*"[3] The report comprised a thorough survey of the agriculture of the county and went on to recommend all those improvements which the Culleys had introduced on their own farms in the previous three decades—the new crop rotations, careful stock breeding, 21-year leases, heavy manuring, the value of drainage, etc.[4] When the county surveys were completed Culley was one of the favoured agriculturists requested by Sinclair to revise a complete set of the draft reports. Culley continued to be consulted on the various schemes of the Board of Agriculture and often had to show that these were poorly conceived, but never more so than with a printed circular sent out by Arthur Young to obtain information on the method of ascertaining the comparative merit of different breeds of sheep.[5] To the question "what sort of sheep should be required, [for the comparison] a Ram, Ewe, or wether," he replied, "In my humble opinion this question comes absurdity in the face of it. For what comparison can be made or conclusions drawn from feeding a single

[1] N.C.R.O., ZCU 31, 2 Aug. 1790. [2] *Ibid.*, ZCU 2, 6 Nov. 1792.
[3] Marshall, *op. cit.*, p. 116.
[4] G. Culley, *et al.*, *General Views of the Agriculture of the Counties of Northumberland, Cumberland and Westmorland*, 1805, new edn with an introduction by D. J. Rowe, 1971.
[5] N.C.R.O., ZCU 44.

sheep of any of these sorts. I think the numbers of each kind should not be less than 10 and those lambs when weaned." Young's suggested method of comparison was "too complicated, because I apprehend it [comparison] does not depend so much upon the size . . . as that of paying most for what they eat. Therefore, that breed or kind of sheep must be the best which will produce the most pounds of mutton from a given quantity of food." The sting was then kept in the tail of the answer, "We have long given up the Idea of Merit being annexed to size."

In all this welter of new ideas and fame the Culleys made sure that materially their farming prospered. The following chronology[1] drawn up by the Culleys shows the rate at which their farming interests grew.

		No. of sheep	*No. of neat cattle*	*Total value of neat cattle and sheep*	
On entering Fenton in the year	1767 we had	1,078	30	£1,277 2 0	
	68	1,058	78	1,392 12 0	
	69	1,026	77	1,499 5 0	
	1770	1,053	110	1,745 16 0	
	71	1,074	126	2,000 13 0	
	72	1,310	129	2,279 11 0	
	73	1,080	111	1,895 11 0	
	74	1,210	123	2,264 19 0	
We entered to Westfield this year	75	wanting	150	2,350 17 0	
	76	1,133	200	2,372 3 0	
	77	1,431	236	2,706 9 0	
We entered to Eastfield this year	78	wanting	245	2,517 0 0	
	79	1,922	246	3,449 0 0	
	1780	1,881	228	3,152 11 0	
	81	2,283	313	4,113 1 0	
We entered to Redhouse this year	82	2,154	272	3,967 10 0	
	83	3,005	267	4,739 10 0	
	84	3,601	303	6,053 12 0	
We entered to Campfield and Marldown	85	2,710	317	5,264 2 0	
We entered to Wark and Grindon	86	3,270	415	6,800 10 0	We lost Eastfield and Marldown
	87	3,360	452	7,075 14 0	We lost Adderstone
	88	4,012	473	7,562 14 0	
	89	4,122	564	8,348 9 0	
	1790	4,181	556	8,126 1 0	
	91	3,921	588	8,392 8 0	
	92	3,875	610	8,547 0 0	
We entered to Eastfield new lease We entered to Thornington & Longknow	93	3,390	524	7,954 0 0	
	94	4,441	552	9,026 10 0	
We entered to Shotton	95	4,424	515	8,814 14 0	We lost Fenton
We entered to new lease of Westfield	96	3,932	453	7,844 2 0	
	97	4,313	486	8,528 6 0	
	98	4,099	476	9,005 0 0	We lost Redhouse, this year is higher valued than any above.

[1] N.C.R.O., ZCU 33.

On 16 April 1781 Matthew, George, and James Culley signed a deed of co-partnership to run for 15 years. Matthew and George had taken Fenton for 21 years from 17 March 1767 and Crookham (also called Pallinsburn) Westfield for 21 years from 24 August 1774. All three brothers entered leases for Crookham (Pallinsburn) Eastfield for 15 years from 1 September 1778, and Prudlare Farm for three years from 12 May 1780.[1] In addition the three brothers jointly leased Grindon for 21 years from Whitsun 1786.[2] From 1783 Matthew was the owner of Denton, near Darlington, following the death of his elder brother Robert, and until his death in 1804 it was farmed by an agent, John Welch, with whom Matthew and George kept up an illuminating correspondence, mainly concerned with day-to-day running of the farm. It is interesting to note that Denton was used by the brothers for wintering cattle. On 17 September 1799, Matthew wrote to John Welch, "I wrote to you a few days since, & neglected to say that you should before this have said, how many feeding cattle can be wintered by you at Denton. The sooner they can be sent from hence [Wark] the better, as we would be enabled to keep the rest better, & prolong the time of putting ym to turnips, which are a very indifferent crop."[3] For the sheep on the other hand it was their normal practice during the winter to bring them down from the hill farms to the low-lying farms where winter pasture was better. In one letter George comments, "It is happy for us that we have such a land of Goshen as Wark."[4]

When James died in 1793 the partnership was dissolved and the farms in the possession of the remaining brothers were as follows: Fenton for seven years at £750 p.a. to Whitsunday 1795; Grindon, 21 years at £900 p.a. to Whitsunday 1807; Wark, 21 years at £1,000 p.a. to May Day 1807; Westfield, 21 years at £260 p.a. to May Day 1796; Eastfield and the General's Close, 15 years at £330 p.a. to May Day 1793; Redhouse, £235 p.a. to May Day 1797. To these were added Thornington and Longknow, leased from Lord Tankerville for 21 years at £600 p.a. from 5 April 1793, and Shotton, 6 years at £100 p.a. from Whitsunday 1795, while the Westfield lease was renewed for 21 years in 1796 at £393 15s. p.a., and Eastfield for 15 years in 1793 at £483 p.a.[5] On 21 March 1797 Matthew and George signed articles of agreement for an equal co-partnership in Wark (Matthew's residence), Eastfield (George's residence from 1795 when the Fenton lease was not renewed), Westfield and the General's Close, Thornington, Longknow, Shotton, Redhouse, and Grindon. The partnership was to be dissolved on 12 May 1807 when the Wark and Grindon leases expired, and Thornington was then to be retained by Matthew, and the others by George.[6] It would seem that the partnership was

[1] N.C.R.O., ZCU 43. [2] *Ibid.*, ZCU 46. [3] *Ibid.*, ZCU 6.
[4] *Ibid.*, ZCU 44, G. Culley to J. Welch, 29 Jan. 1801. [5] *Ibid.*, ZCU 33.
[6] *Ibid.*, ZCU 43.

dissolved early in 1804, since by an award adjudicated by John Bailey, Thomas Bates, and John Nisbet, Matthew assigned his interests in Eastfield, Westfield, the General's Close, and Longknow to George, and George assigned his interests in the remaining farms to Matthew and was to pay £1,109 as the difference in value.[1] In any event the death of Matthew in December 1804 would have dissolved the partnership. After this Matthew's tenancies came into the hands of his son Matthew, as did Denton, which was leased for a nominal sum to George. In his turn George found tenants for the Denton farms, since they were too distant for him to continue to run them. On 26 November 1806 the north farm at Denton was let to William Cumming for 14 years at £420 p.a., and on 23 January the demesne farm was let to John Wetherall for 15 years at £1,500 p.a.[2]

With the increasing size of the farms they controlled, the Culleys' prosperity rose. We have already seen the rise in the valuation of stock on their farms, but there are also a number of total valuations of farming assets. On the occasion of James's death, an independent valuation of livestock and implements on the five main farms gave a total of £14,495 15s., of which sheep made £7,509, cattle £3,283, horses £1,722, and implements of husbandry £525. To this should be added the valuation of corn crops at £5,251 16s. 4d.[3] For 1798 a further valuation survives and this gives a detailed breakdown as in the table on page 172.[4]

While these valuations are obviously conservative and do not reflect contemporary market values (e.g. tups valued at £2 per head), they do reflect the scale of the Culley activities, which also extended to the ownership of a quarry, and lime- and brick-kilns to provide materials used for constructional and drainage purposes on their farms. The economic returns from the Culleys' farming interests may be seen from several annual farming accounts which have survived for the years around the turn of the century.[5] The accounts would seem to cover only sales to and purchases from outside bodies by the Culleys, and to make no attempt to impute a value to the crops grown for consumption on the farms. This is suggested by the fact that of receipts of £25,700 in the 1799 account, £24,300 is stated to have been received on behalf of Eastfield and Westfield farms, whereas receipts for such large farms as Grindon and Wark were only £115 and £844 respectively. It would seem likely that the produce of the former farms was used for sale purposes and of the latter for home consumption.[6] In 1799 the total profit of all the farms was given as just over £5,500, but it is unlikely that this was the genuine profit of the farms,

[1] *Ibid.*, ZCU 46, award dated 30 June 1804. [2] *Ibid.*, ZCU 36.
[3] *Ibid.*, ZCU 33, 6/9 May 1793. [4] *Ibid.*, 22 Nov. 1798. [5] *Ibid.*, ZCU 33.
[6] Alternatively it may be that Eastfield and Westfield were the farms through which most of the Culley produce passed to market, and the value was given to them. But if this were so there would seem little point in the exercise of dividing payments and receipts by farm.

Cattle	*Nos.*	£	*Horses*	*Nos.*	£	*Sheep*	*Nos.*	£
Bulls	5	60	Work & riding	123	984	Tups	90	189 0
Milk cows	55	550	Young	31	186	Wethers & dimmonds	290	362 10
Feeding cattle	87	1,044	Foals	6	30	Fat ewes & gimmers	593	741 5
Working oxen	126	1,008				Flock ewes & gimmers	1,679	2,093 15
Young cattle up to 3	52	312		160	1,200	Tup & ewe hogs	1,447	723 10
Young cattle up to 2	69	345	Old swine	66	66			
Calves	82	287	Pigs	50	25			
	476	3,606		276	1,291		4,099	4,108 0*

Total no. of livestock 4,851 (201 less than 1797) value £9,005 (£476 1s. 4d. up on 1797).

* This total is incorrectly added in the MS. and should be £4,110.

Wheat stacks	97 at	£25 per stack	£2,425	
Barley	28	£20	560	
Oats and pease	104	£15	1,560	
Hay	17	£15	255	
Turnip seed			100	
Turnips and potatoes			1,239	
Household furniture and Farm utensils			400	
			6,539	Total £15,544

since a number of complicated payments and receipts on capital account (for purchase and sale of estates) were made. Since these entries are impossible to understand in the light of the little evidence given, a genuine profit figure is impossible, but adopting the most pessimistic interpretation it could not have been less than £4,500. The account for 1801 is straightforward (see table on page 173).

It is probable that 1801 was a very good year, since in the following year the profit made, after allowing for interest and rents, was £4,750, mainly as a result of the fact that receipts from sales of wheat were nearly £5,000 down on the previous year, although volume was only slightly less. The remaining payments and receipts in 1802 were much the same, except that sales of cattle and sheep each produced an extra £500. There are two features of the accounts particularly worthy of notice. Wages of the work-force accounted for between one-third and two-fifths of total expenditure. But more important than this is the amount of total revenue accounted for by arable produce. In all four years at the turn of the century, for which accounts are available, receipts from sales of wheat, oats, and barley exceeded (in 1801 were almost double) receipts from cattle and sheep; and in all years receipts from wheat sales alone always ex-

22.11.1801.	*Dr.* £ s. d.		*Cr.* £ s. d.
Rents and Tithes	4,091 14 8		149 4 10
Labour	5,179 16 8		
Sundries	1,018 0 2½		77 16 1½
Turnip seed		9,029 lb	521 16 11
Taxes and cesses	939 1 5		
Wood and iron	388 5 9½		
Willows			5 9 2
Expenses, tolls, etc.	271 10 1		
Clover and rye grass seeds	376 8 9		
Hay			33 15 2
Swine		no. 32½	65 4 2
Potatoes		m. 683	164 7 4½
Lime	69 12 0	Denton	143 7 9
Wheat	m. 42 38 9 11	m. 14,256½	10,937 3 1½
Barley	m. 17 12 6 0	m. 1,923	727 13 5¼
Oats		m. 7,088½	1,990 19 3
Pease	m. 152 91 15 4	m. 222	74 16 5
Cattle and calves	no. 82 553 10 10½	no. 109	2,632 1 6½
Sheep and wool	no. 214 355 3 6	sheep no. 1,288	3,227 4 5½
		wool	773 15 11
		tups no. 86½	1,080 0 6
Horses and mares served	no. 12 243 1 0	no. 45	149 3 6
Butter			88 5 9
	paid £13,268 16 2½*		rec'd £22,842 5 4¾

Money made by the farms this year £9,213 9 2¼
after interests and rents £9,519 18 7¼

− Principal money paid off £4,135 6 8
+ Principal money lent out £5,695 3 6

* This total is incorrectly added in the MS. and should be £13,628 16s. 2½d.

ceeded receipts from sheep and were about the same as from sheep and cattle combined. This has interesting implications, since Northumberland was not considered of major importance as a corn-growing county and oats was normally considered to be of greater importance than wheat. Secondly the Culleys have always been considered mainly as pasture farmers (the arable part of their crop rotation being chiefly aimed at feeding stock) but these accounts would suggest that the larger part of their revenue came from sales of corn, which obviously implies that a considerable acreage of their farms was devoted to it. Since there is no evidence as to the relative cost/benefit of their arable and stock sections and the available accounts cover only a short period it is not possible to make any further comment beyond reconsidering the importance of arable sales to north Northumberland farmers.

It is clear from these accounts that the Culleys had become prosperous by the end of the eighteenth century and this was signalled by a change within a dozen years, from 1795 to 1807, from being large tenant farmers to landed

proprietors. On 23 June 1795 the brothers purchased the estate of Akeld and Humbleton (on the River Glen above Wooler) for £24,000.[1] It became the residence of Matthew for the remainder of his life and then passed to his son Matthew. Six years later the 300-acre estate of Easington Grange was purchased for £13,000 and promptly let to a tenant farmer.[2] The final triumph came in 1807 when Fowberry Tower, with its estate, was purchased from Sir Francis Blake for £45,000.[3] It was to be the home of George's son, Matthew, and was the place where George Culley died on 7 May 1813. By this time the Culleys had obtained a position in landed society and it was as landowners and politicians that the cousins Matthew were known in the first half of the nineteenth century. It is right that George Culley's should be the final words on this metamorphosis, "Whenever I am at Fowberry, I am struck with astonishment, when I reflect on our beginning in Northumberland 43 years ago. To think of my son, now inhabiting *a Palace*! altho' his father in less than 50 years since worked harder than any servant we now have, & even drove a *coal cart*!"[4]

[1] N.C.R.O., ZCU 43. [2] *Ibid.*, ZCU 31, 30 Oct. 1801.

[3] *Ibid.*, 24 June 1807, considerable sums of money were borrowed from banks at Berwick and Darlington to facilitate these various purchases, and were paid off out of farming profits.

[4] *Ibid.*, ZCU 30, George Culley to his son, 3 Aug. 1810.

NOTES AND COMMENTS *continued from page* 155.

In his report Professor Minchinton noted that membership had risen from 687 to 707 and hoped that members would continue their efforts to make the activities of the Society known. It had been a successful year. The winter conference in London on 'Agriculture and the History of the Environment' had attracted a large audience and the publication of Professor Finberg's *Festschrift* as a supplement to the *Agricultural History Review* had been a notable achievement. Work was proceeding on the translation of a new edition of the classic work on European agricultural history by Professor Wilhelm Abel, *Agrarkrisen und Agrarkonjunktur* (*Agrarian Crises and Economic Fluctuations*) which the Society hoped to publish next year.

Finally he welcomed the new President and paid tribute to his predecessor, Dr Fussell, who had laboured almost alone for many years to create an interest in agricultural history when it was unfashionable.

The Treasurer reported that the Society's finances were still healthy despite the expansion of publishing activities. The Editor reported that she was pleased by the high standard of articles being offered to the REVIEW. A leaflet giving the names and addresses of members would be circulated with the next issue and a pamphlet on the bibliography of enclosure would soon be issued.

In conclusion the Treasurer thanked the retiring Chairman for all the hard work he had put in over the past three years and the meeting joined in expressing the Society's gratitude.

THE NORTH SCARLE COW CLUB

The centenary of an organization now probably unique in British Agriculture was celebrated in September 1970 by 15 farmers and, doubtless, 47 of their cows in a group of villages on the Kesteven–Notts. boundary, north of Newark-upon-Trent.

(*Continued on page* 191)

Changes in the Supply of Wild Rabbits 1790–1910

By JOHN SHEAIL

DR Chaloner has recently drawn attention to developments in the breeding and raising of poultry during the late nineteenth century.[1] Among others, "The Anglo-American Poultry Company and Cyphers Incubator Company may be specifically named as having introduced improvements likely to revolutionize the poultry industry."[2] At the same time, experiments were being carried out in breeding large numbers of rabbits in artificial conditions, thereby increasing the growth rates of the animals and reducing the amount of rabbit damage to farmland and woods.

Rabbits are not native to the British Isles: they were introduced by the Normans and kept in warrens where the animals were periodically slaughtered for their fur and meat.[3] Wild rabbits were usually reared in one of three habitats—grass-heathland, coastal dune formations and islands, and on calcareous grasslands. Thorold Rogers, in his famous study of medieval prices, wrote that "Rabbits do not seem to have been plentiful, at least the price paid for them is relatively exceedingly high."[4] In the 1690's, Gregory King estimated that there were 1,000,000 rabbits in England valued at 5d. each, compared with only 24,000 hares which were priced at 1s. 6d. each.[5] The period examined in this note starts with the 1790's, when the practice of keeping rabbits in warrens was still very important in some parts of the country.

There was usually a section on the wild rabbit in the Board of Agriculture reports published around 1800. In 1796, the Board heard that there were important warrens in North Ormsby, Lincolnshire, and sent a letter to a warren owner in that locality.[6] The letter contained nine questions, seeking information on rent, output, and the reproduction rates on the warren. The Board wanted to know whether the common or silver-grey rabbits were reared and whether the animals' diet was supplemented in winter. There is a long section on warrens in the county report later compiled by Arthur Young in 1799.[7] He described the warren at North Ormsby as one of the best in the county and noticed that the more valuable silver-greys were kept. However, the warren owner believed that corn and grass seeds for sheep would have been more profitable than rabbits during the 1790's.

This decline in the value of warrens, detected from the late eighteenth century onwards, continued. Although the price of rabbit fur and meat was maintained, landowners found more profitable ways of using their previously marginal farmland. The rabbits were slaughtered and replaced by other farmstock and crops: rabbit-keepers searched for other ways of breeding large numbers of animals and tried to keep rabbits in a completely artificial habitat.

Rabbits were sometimes bred and reared in pits, sunk six or seven feet into a well-drained soil. The animals made their burrows in the walls which were reinforced to prevent the sides from collapsing. The pits gave them

[1] W. H. Chaloner, 'A Note on the Origins of the "Broiler" Industry', *Agric. Hist. Rev.*, XVII, 1969, p. 161.
[2] Edith Bradley and Bertha la Mothe, *The Lighter Branches of Agriculture*, 1903, pp. 199–200.
[3] Elspeth M. Veale, 'The Rabbit in England', *Agric. Hist. Rev.*, V, 1957, pp. 85–90.
[4] J. E. Thorold Rogers, *A History of Agriculture and Prices*, 1865, vol. I, p. 33.
[5] Gregory King, 'Natural and Political Observations, 1696', in *An Estimate of the Comparative Strength of Great Britain* by G. Chambers, 1802, pp. 428–31.
[6] I am most grateful to Mr J. K. Nixon for permission to quote from two letters written by Sir John Sinclair.
[7] Arthur Young, *General View of the Agriculture of the County of Lincolnshire*, 1799, pp. 382–94.

shelter and stopped their escape. 'Artificial warrens' were set up on the Isle of Thanet and at Swanscombe in Kent in the 1830's.[1] In the former place, a hole was dug, six feet deep and three feet wide, one foot away from another hole which was four feet wide. The two holes were used for breeding and exercise respectively, and they were connected by a small tunnel. Lids of wood, oil-cloth, or tarred-sail covered the holes and could be lifted off during fine weather. The owner found that the wild rabbits flourished, ate all the food given them, and that it was easier selecting and trapping the best animals within the confines of the artificial warren.

Many other keepers were content with more modest structures. They bred wild rabbits in hutches and rough sheds, placed in the middle of a plot of land. Litters of rabbits were allowed to run about the small, enclosed pieces of land during the daytime. Experiments were carried out in increasing the output of these warrens and some attempts were made at setting up 'rabbit farms', where rabbits could be reared very intensively. One 'farm' had a thousand rabbits arranged like an enormous chest-of-drawers, with rabbits in each compartment, but after a short time the venture failed because an epidemic broke out and hundreds of young rabbits died. Outbreaks of infection could destroy an entire population within a few days and large sums of money could be lost. The same thing happened in enclosed poultry pens because, in the words of one writer, "We cannot violate any of Nature's rules with impunity . . . pure air is as necessary, and even more so, than wholesome food."[2]

Having failed to breed large numbers of rabbits in this way, keepers were forced to keep the wild rabbits in the open air, and they revived some of the old warren practices of the eighteenth century, although the grounds of the new warrens were much smaller. Even some of the old arguments on the merits of warrens were revived. A writer in 1884 observed that, "A cow consumes daily as much grass as will 150 rabbits. The rabbits will in twelve weeks realize, at 1s. 6d. each, £11 5s. 0d., whereas the produce from a cow during twelve weeks will certainly not amount to £6."[3] This kind of calculation was similar to the estimates made by William Marshall and John Parkinson at the end of the eighteenth century. It is likely that these Victorian rabbit-keepers read many of the early agricultural books which made reference to warrens. A number of new books also appeared which included discussion on the subject of small warrens of wild rabbits. Morant wrote one called *Rabbits as a Food Supply and how to Fold them on our Poor Pastures*. A short while later, in 1884, Lloyd Price published *Rabbits for Profit*, and the most famous book of all was written by John Simpson, called *The Wild Rabbit in a New Aspect, or Rabbit-Warrens that Pay*.

A few warrens were established in the late nineteenth century. Wistman's Wood warren was formed in the 1890's and covered 330 acres of Dartmoor.[4] Marginal cornland on light chalkland soils frequently reverted to grass and the land was "absolutely abandoned to rabbits." This occurred in a valley called Poverty Bottom on the South Downs,[5] and a number of landowners in Hampshire, Wiltshire, and Sussex found their fields were "unfit for any other purpose than for conversion to a rabbit warren." Big wire fences were erected around the warrens, which soon became covered with wiry weeds, mosses, and lichens. At first, farmers made a profit on the sale of rabbit fur and meat, and some professed that, "It will serve me my time."[6]

The books and letters of John Simpson were brimming full of confidence that these new warrens would be profitable. In 1896, he wrote, "At the most moderate estimate, I am sure that every acre of any moderately good estate, wood or fields, would produce annually at least fifty

[1] *Quarterly Jnl of Agric.*, IX, 1839, pp. 30–4; Anonymous, *Farming for Ladies*, 1844, pp. 322–39.
[2] G. F. Morant, *Rabbits as a Food Supply*, 1883, pp. 18–20.
[3] R. J. Lloyd Price, *Rabbits for Profit*, 1884, p. viii.
[4] Brian le Messurier, *Crossing's Dartmoor Worker*, 1966, p. 61.
[5] William Somerville, 'Poverty Bottom', *Board of Agric. & Fish.*, Misc. Pubns, no. 20, 1918.
[6] W. H. Hudson, *A Shepherd's Life*, 1910, pp. 15–16.

good rabbits, and leave ample stock."[1] He later claimed that as many as a hundred rabbits could be killed on an acre of ground each year, as long as the soil was well manured with gas-lime and salt. Several writers in the *Field* magazine challenged Simpson on this point. They thought that he was wildly optimistic in forecasting immense profits from keeping rabbits. One correspondent in 1912 pointed out that the return on investments had declined. The idea of turning rabbit warrens into an Eldorado was a delusion. In the 1880's, rabbits were sold for 3s. a couple, and Simpson in the 1890's received 2s. 9d. a brace. By 1912, some dealers gave as little as 1s. for a couple. All this time, the cost of running a warren was increasing, and many men gave up trying to make a profit.

Warreners experienced competition from two directions. Throughout the nineteenth century, large quantities of rabbits had been imported from the Low Countries, but from 1869 onwards rabbit fur (and later carcases) were imported from Australasia. In 1889, Australia sent £341,735 worth of skins: in 1903, the figure had risen to £723,881. At first, the imports merely supplemented the output of English warrens, but gradually they undercut the market of the home producer. Australian producers even found it possible to sell tinned rabbits in England.[2] There was a further source of competition: the Ground Game Act of 1880 gave tenant farmers the inalienable right to kill and sell rabbits on their land. Rabbit-money was a useful subsidiary income, especially in times of agricultural depression. There were often over fifteen rabbits per acre in the fields and woodlands by the late nineteenth century, and farmers and full-time rabbit trappers used gin-traps to crop the population. Their overheads were small or non-existent, and the rabbit warrener was unable to compete.

A few sportsmen maintained warrens on moorland and calcareous grasslands. On Fyfield Down, Wiltshire, about 5,000 rabbits were killed each year by visiting parties of sportsmen, and the carcases were sold to poulterers and game salesmen in the Central Market, London, in order to defray the expenses of the sport.[3]

The value and function of the warren had been transformed since the early 1800's. The extensive commercial warrens had fallen into decline and keepers failed to find alternative ways of rearing large numbers of wild rabbits cheaply. By the late nineteenth century, even the few surviving warrens on marginal farmland were no longer profitable. Competition from abroad and the rabbit-trapper ended the period of commercial warrens in England.

[1] *The Field*, LXXXVII, 1896, p. 302.

[2] *Select Committee on the Game Laws*, House of Commons, 1872–3, Q. 7375; Patrick Wright (ed.), *The Standard Cyclopaedia of Modern Agriculture*, 1911, vol. 10, pp. 69–72; E. C. Rolls, *They All Ran Wild*, 1969, pp. 72–8.

[3] Wiltshire Record Office, MS. 106.

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Book Reviews

EMMANUEL LE ROY LADURIE, *Les Paysans de Languedoc*. S.E.V.P.E.N. Paris, 1966. 2 vols. 1063 pp. £8·62½.

Professor Ladurie's study of peasant agriculture in Languedoc between the sixteenth and eighteenth centuries is a remarkably sustained analysis of a large province of France containing several contrasted farming regions. His work started with the discovery of parish tithe accounts giving lists of peasant holdings, and the tithes which they paid in kind, at various dates between 1500 and 1800. This rich mine of information yielded all the detail necessary to chart in individual parishes changes in the distribution of land, changes in the crops grown, and in their yields. But combined with other material, the intricate pattern of parochial detail finally gave the author a panoramic view of the whole province and of the divergent development of the farming regions over a period of eight generations. In short, this regional study yielded large generalizations on agricultural development which have already stimulated wider use of the tithe documents in other parts of France. Some far-reaching conclusions on the productivity of crops over almost the whole country have been digested and summarized in a preliminary way in a recent article in *Annales*.

Professor Ladurie's scene is set in a Mediterranean province with a wide coastal belt of cornland, vineyards, and olive groves, and a mountainous hinterland that includes the Cevennes. There was also a marshland zone at the mouth of the Rhône, but the principal contrast lay between High and Low Languedoc. High Languedoc was a country of graziers, dairymen, and transhumant shepherds who moved down to the marshes of the Camargue every winter. Little grain was grown; chestnuts were one of the substitutes for bread, and chestnut wood was used to make barrels for wine, anchovies, and sardines. Timber industries, mining, and leather-working were vital supplementary employments to agriculture. Low Languedoc was the country of corn, vines, and olives, and in addition had the advantage of receiving before others all the novelties in agriculture which poured in during the sixteenth and seventeenth centuries from Spain, Italy, the Middle East, and the New World. But Languedoc was a relatively homogeneous peasant society, and its agricultural techniques were backward. How then did these peasant communities meet the changing circumstances of the sixteenth and seventeenth centuries?

Professor Ladurie's study offers a multitude of insights into the flexibility of their economies and the valiant efforts made to meet economic crises with original and resourceful solutions. In Low Languedoc a kind of horticultural revolution took place—a century before such a thing occurred in southern England—as melons, aubergines, courgettes, peppers, artichokes, tomatoes, maize, beans, and sainfoin were integrated into the farming system. The task was made easier because the fruits and many of the vegetables were well suited for cultivation on small holdings by peasants with little capital but ample supplies of labour. Given the social framework of peasant-farming, and the muted demands of the local market (when compared, say, with the strident demand of industrial towns in the Netherlands upon their rural hinterland to engage in commercial production) the spread of the new crops was impressive.

Meanwhile in the Cevennes the outstanding development was the revival of the silk industry under Huguenot inspiration, spurred on by the introduction of a new variety of mulberry tree. Other industries too were continuously invigorated by recruits arriving from the north to settle in the south. And as Protestantism spread in the mountains, all technical skills were kept up to date by the contacts that were maintained between the Cevennes, Geneva, and other Calvinist centres. Subsidiary farming areas turned to yet other solutions. The vine harvest was gathered some two or three weeks later in the seventeenth century than in the sixteenth, thus improving the quality of the wine and promoting sales abroad. Between

1627 and 1636 Languedoc was exporting to Italy more wine than corn. In the moorland areas of the *garrigues* between the mountains and the coast, vinegrowing was extended into places where it had not hitherto penetrated. On the marshlands much drainage was carried out between 1600 and 1640 with the assistance of the Dutch in order to make more cornland, though this enterprise lost momentum when grain prices slumped, and it virtually ceased after 1660.

Thus the sixteenth- and seventeenth-century crisis was not one long and monotonous disaster for the whole province but rather a challenge which the regions met in different ways with varying degrees of success. The chequered story of their experiences could only be fully told if the course of development in each region were separately pursued, and Professor Ladurie does not follow these divergent paths consistently enough to their separate conclusions to be able in the end to weigh the relative merits of these different farming systems. He provides no map of Languedoc (though he had every opportunity in volume II which is wholly devoted to tables, graphs, and a description of his sources); he does not clearly define the agricultural regions of the province; and he presents his evidence in terms of individual parishes when his conclusions would have emerged more strongly if he had grouped his material by farming regions. However, this is a pioneer study—in the scale of its canvas and in the breadth of its conclusions—so that many of the lessons it teaches cannot have appeared to full view until after the study was completed. Future workers will doubtless improve upon the method of analysis which Professor Ladurie has here pioneered.

What Professor Ladurie does offer is a far-ranging conspectus of changes in landholding in Languedoc as a whole, covering the thirteenth to eighteenth centuries, and assimilating evidence on population changes and price movements as well as changes in cropping systems. He sees a rhythmic development beginning in the twelfth century when populations rose, cultivation became more intensive, and vine-growing in particular was extended. These trends gave way to a less intensive husbandry, more pasture-farming, and the consolidation of land into larger units after the plagues. Then when population rose again after 1500 the fragmentation of holdings among the smaller peasantry was resumed, sometimes as a result of land sales, sometimes through the practice of partible inheritance. Single examples of the subdivision of farms among members of one family are given, but the subject is not explored in depth, so that the relative importance of sales and inheritance customs cannot be assessed. More intensive cultivation in these years involved the spread of corn, olives, and vines, once more at the expense of stock; but as supplies of animal manure diminished, yields inevitably declined. The purchasing power of wages also fell, and the spirit of revolt manifested itself in the refusal to pay tithes—a revolt which lasted from the 1560's until 1600—and in the increasing support given to Protestantism, particularly in the pastoral districts of the mountains and the coastal marshlands. Yet things were not as bad in the sixteenth century as they were to become later. Taxes did not rise, rents remained stable, and money tithes did not keep in step with prices.

After 1600 even these resilient peasant economies failed to withstand the fresh onslaughts of war, bad seasons, plague, rising rents, rising tax burdens including a sharp increase in the salt tax in the 1640's and 1650's, and falling grain prices particularly after 1654. Small peasants and labourers were pauperized, mortality rates rose, land was abandoned, and some areas wholly depopulated. The fragmentation of holdings among the lower ranks of the peasantry continued up to 1680, but it went hand in hand with an opposite tendency in the upper reaches of society. Large farms increased in size and number at the expense of the medium holdings, and this trend became uppermost after 1680 until 1770. It then gave way to another phase of fragmentation which lasted until about 1870, but Professor Ladurie does not pursue his story beyond 1770.

The detailed analysis of the circumstances surrounding successive bouts of land fragmentation and consolidation covers the period 1500–1750. The growth of the larger farms

which it discloses has also been emphasized in other studies of east, west, and northern France in the seventeenth century, and is also a major theme in the history of arable farming regions in England at the same period. Arguing from these analogies, we may wonder whether the trend towards larger farms in Languedoc could not be more precisely traced to particular types of farmers and farming systems instead of being ascribed to the province as a whole. Similarly, we may wonder whether the fragmentation of small farms was not more conspicuous under horticultural and perhaps also pastoral systems (in the mountains but not in the marshes: Dutch drainage usually created large farms) than among the corn growers. Certainly, the evidence of new and expanding industries in the mountains, and the cultivation of a more varied selection of labour-intensive fruits and vegetables in parts of the plain, would seem to point to these two types of peasants in Languedoc as the ones who were better equipped than the rest to resist the pressures from engrossers of land. And this conclusion would coincide with that drawn from other French, Dutch, and English examples.

It will be clear by now that Professor Ladurie's book is a most exciting and stimulating study for anyone interested in exploring the social structure and economic problems of different systems of farming in the special conditions of the sixteenth and seventeenth centuries. Professor Slicher van Bath's work on west European agriculture presented many local illustrations; here are more. But this is not the sum of Professor Ladurie's contribution to agricultural history. We can see how his evidence on the dates of the wine harvests led him on to his more recent work on climatic changes and their influence on farming. Now the Sixth Section of the École Pratique des Hautes Études has assembled a group of historians to calculate total national agricultural production from the tithe records. Only the preliminary results are available, since western France is not yet adequately represented. But the present indications are that in the three and a half centuries between 1400 and 1750, France's great spurt in agricultural production occurred between 1500 and 1550; and Toutain's suggestion that a rise of 60 per cent occurred in farm produce between 1700 and 1789 seems to need revision to a more modest estimate of between 25 and 40 per cent.[1] The total harvest to be reaped from the seeds sown by this study of Languedoc has not yet been gathered in.

JOAN THIRSK

ERIC KERRIDGE (ed.), *Agrarian Problems in the Sixteenth Century and After*. Vol. 6 of *Historical Problems: Studies and Documents*, ed. G. R. Elton. George Allen and Unwin, 1969. 216 pp. £1·75.

This is an important book, but also a difficult one for two separate reasons. It deals with a technical subject—the land law—and it attacks the late R. H. Tawney's *The Agrarian Problem in the Sixteenth Century* (1912) in such an extreme form as to undermine the reader's confidence in Dr Kerridge's objectivity. The dust-jacket announces that Dr Kerridge's research has led him to question Tawney's conclusions in their entirety and to propound four alternative propositions: (1) customary tenants enjoyed legal security in and before the sixteenth century; (2) enclosures proceeded legally and without oppression in the sixteenth and later centuries; (3) rural depopulation was less extensive than sometimes supposed; (4) that such depopulation as there was often proved economically profitable and not without social benefit. The book thus challenges not only Tawney, but also much recent work on deserted villages, especially W. G. Hoskins's study in *Essays in Leicestershire History* (1950) and M. W. Beresford's *The Lost Villages of England* (1954). However, Dr Kerridge's attempt to belittle the importance of deserted villages is too brief to carry much weight, and he reserves his heavy artillery for Tawney.

[1] E. L. R. Ladurie, 'Dîmes et Produit Net Agricole (XV^e–XVIII^e Siècle)', *Annales*, 1969, pt 3, pp. 826–32. See also Joseph Goy and A. L. Head-Koenig, 'Une Expérience. Les Revenus Decimaux en France Méditerranéenne, XVI^e–XVIII^e Siècles', *Études Rurales*, 36, Oct.–Dec., 1969, pp. 66–83, and the references therein cited.

Readers familiar with Tawney's work will, however, have noted that Dr Kerridge has altered the emphasis of the argument to suit his own purposes. He asserts that the essence of Tawney's case was the ruthless eviction of copyholders by grasping landlords to make way for large, enclosed farms, even though the copyholders held by inheritance and by *custom of the manor*; and that in making this assertion Tawney was guilty of a fundamental misunderstanding of the nature of the English law. In fact, Tawney was doubtful about the legal position of copyholders holding by the custom of the manor, and believed that the law usually protected them when custom was favourable to them. It can be argued that Tawney's main assertion was not that customary tenants were evicted in large numbers, but that they were obliged to pay higher entry fines; and that it was the commercialization of agriculture, by which the profits were transferred to landlords rather than retained by peasants, which constituted the most revolutionary agrarian change in the sixteenth century. On this problem Dr Kerridge has little to say although in an earlier work, 'The Movement of Rent 1540–1640' in the *Economic History Review* (1953) he lent powerful statistical support to Tawney's view.

It is however probably true that, although Tawney was careful to say that the agrarian changes of the sixteenth century were statistically unimpressive in relation to the whole country and that the face of the countryside was not radically altered between 1485 and 1700 (Tawney, pp. 401–2), there has been a tendency for his qualifications to be forgotten and for the agrarian changes of the sixteenth century to be unduly magnified; but whether this amounts to the tendentious misrepresentation of which Dr Kerridge complains is doubtful. It is a pity that by his attacks on Tawney's good faith he has detracted from the value of his study which otherwise makes an important contribution to our understanding of the land law in the early modern period.

Dr Kerridge's method has been to select twenty-four documents illustrative of the relations between landlords and tenants and to write a long (117 pages) and detailed introduction to explain them. The documents fall broadly into two main classes—those illustrating legal support for customary tenants holding by the custom of the manor (eleven documents, mainly extracts from law books such as Bracton, Littleton, and Coke) and those illustrating the process of enclosure by agreement (sixteen documents, such as extracts from a manorial court book, enclosure agreements, and proceedings relating to enclosure in the Court of Chancery).

The introduction is divided into six sections entitled the Manor, Tenures and Estates, Security of Tenure, Enclosure, the Ratification of Enclosures, and Depopulation and Impopulation. The dust-jacket claims that Dr Kerridge "describes fully and precisely, and for the first time, all the legal ties between the landlord and tenant in early modern England," and this is certainly an exhaustive account supported by a wealth of documentary references. There is, however, some danger that it will prove to be too indigestible for the university student, for whom this series was designed, for the technicalities of the land law are hardly exciting reading; but scholars will be grateful to Dr Kerridge for his labours.

The section on the manor and its courts covers reasonably familiar ground, and there is an interesting discussion of the methods of Courts of Survey. The second section on Tenures and Estates is the most important in the book, for in it Dr Kerridge makes the distinction between the two systems of land law—the tenurial system which was feudal and the estates system which was capitalist—the distinction which he maintains has been neglected by previous scholars. The argument is technical and involved, but its essence is that by the sixteenth century the old system of tenures based on feudal relationships—either military or labour services—had become obsolete, and a new system of land law, known as the system of estates, had been superimposed on it. An estate was a property or interest in land "irrespective of the tenure by which it was held" (p. 60). If a man bought a copyhold for life, even if it was held under a customary tenure, it counted as a freehold estate and would be protected as such under the common law. Dr

Kerridge quotes Sir Edward Coke, *The Compleate Copyholder* (London 1641), in support of this: "A freehold is taken in a double sense: either 'tis named a freehold in repect of the state of the land or in respect of the law. . . In respect of the state of the land, so copyholders may be freeholders; for any that hath any estate for his life, or any greater estate in any land whatsoever may in this sense be termed a freeholder" (p. 33). On the basis of this distinction Dr Kerridge claims that copyholders were legally freeholders and in fact enjoyed complete security of tenure in the sixteenth century. As regards copyholders of inheritance, who seem to have been about half the total, this was probably true, particularly where the entry fines were fixed by custom. Where the fines were not fixed, security of tenure depended on meeting certain conditions—basically an agreement to pay a 'reasonable' entry fine. Dr Kerridge shows that the courts would usually define 'reasonable' as equal to about twice the annual improved value of the holding, and maintains that lords could not evict if tenants refused to pay an 'unreasonable' fine. He regards this as no hardship to tenants. Possibly not, but a 'reasonable' fine could still represent a considerable increase on the old customary figure, and by implication a copyholder of inheritance could be evicted if he refused to pay such a fine. Dr Kerridge is, however, probably right in his contention that copyholders of inheritance seldom were evicted in practice, and that evictions, where they occurred, took place quite legally at the expense of the various types of customary tenants who held at will, such as those with copies for years, tenancies for less than a year, and bond tenancies. In sum, Dr Kerridge argues that tenurial change was much less in the sixteenth century than Tawney implied, and it is useful to have his evidence of this widespread stability to set against the small but significant examples of breaches in the old system. The discussion of enclosure in the remainder of the book covers more familiar ground, but it is instructive to have detailed examples of the process of agreement.

If a second edition is published it would be helpful to remove the unfair personal attacks on Tawney, who cannot answer back, and to expand the list of four books recommended for further reading at the back, especially as students will have considerable difficulty in finding their way around amongst the abbreviations in the copious footnotes, despite Dr Kerridge's hope that his system makes it possible to trace the references. The addition of the map of farming regions published in the author's *The Agricultural Revolution* (1967) would also be of assistance since the regions (as described in Dr Kerridge's personal terminology) are frequently referred to without identification. The same is also true of villages, and although there is an index of places, it does not include the counties in which the villages stand. Not every student can be assumed to have Dr Kerridge's wide knowledge of local topography.

In conclusion, this book will be of value to scholars of the early modern land system who are already basically familiar with its problems, but it is too technical for the student who is approaching the subject for the first time. It is also weakened by an over-legalistic approach which is somewhat unrealistic. The fact that the law had provisions for protecting customary tenants does not necessarily mean that they would in practice be prepared to risk the expense, delay, and trouble of opposing their powerful lords in court. The social context of the period thus also needs to be taken into account. Finally, the absence of an adequate bibliography is a serious drawback, particularly in a book designed for students. Perhaps general editors should give their contributors more guidance.

M. A. HAVINDEN

MARY D. LOBEL and ALAN CROSSLEY (eds.), *A Victoria History of the County of Oxford*, Vol. IX, *Bloxham Hundred*. Oxford University Press for the Institute of Historical Research, 1969. xxiv+205 pp. £7·35.

Bloxham hundred is one of the more distinctive parts of Oxfordshire. It lies in the far north of the county, and spans a farming countryside famous (thanks to Arthur Young) as the 'red land'. Physically quite diverse, it runs from the Cherwell valley below Banbury right to the top

of the Cotswold crest, where Shenlow Hill reaches the respectable height of 743 feet above O.D. At the upper levels the marlstone rock of the Middle Lias underlies the much-praised red land, long acclaimed for its corn yields. In the valleys of the Cherwell and its Sor Brook feeders the land is floored by clays of the Lower Lias, giving scope for fine pasture. As pointed out on the opening page of the volume under review, the physical foundations of the region are reflected in more than its vernacular architecture, where village after village is replete with seventeenth- and eighteenth-century manor houses, farmhouses, and cottages built from the honey-coloured marlstone, which is easily quarried throughout the district.

Its foundations are also evident in agrarian history. 'Uncommonly good soil' was noted here by Leland in the 1530's, and it has supported a type of mixed farming that was praised by many observers during the intervening centuries. Hence a system of convertible husbandry was found at Bloxham from as early as 1513, reflected in leys lying intermixed with the arable strips in common fields. Another characteristic of this part of Oxfordshire was the way in which the fields themselves were widely cultivated in a system of 'quarters'. For instance, at Bloxham the field structure had become reorganized into quarters by 1542 at the latest. It is not certain if there were four medieval fields at Bloxham, but the South Field was divided into its Ailcombe, Milton, Cowhill, and Ovenhill Quarters down to the Parliamentary inclosure of 1802. In the North Field, however, there were at least seven distinct quarters, and such arithmetical licence had appeared as early as the sixteenth century. The suggestion is made that they were so complex because they were meant to provide two separate rotation courses in what was a large and dispersed area. In fact ley farming was recorded between 1513 and 1552, and a peas field in 1598.

The merits and shortcomings of the *Victoria County Histories* as historical writing have been much debated in recent years (for instance by Professor Finberg on Gloucestershire in this REVIEW), and there is no need to prolong the debate in general terms here. What is clear is that each resplendent volume is nothing if not a quarry of factual information wrested from public and private records. Under the familiar and inexorable headings—manors, local government, economic history, mills, churches, Roman Catholicism, Protestant Nonconformity, schools, charities—we are free to search for the data we wish to use. It is an authoritative and apparently exhaustive treatment, so much so that fresh young research students have been known to blench at their first confrontation with a volume, refusing to believe there may be estate plans in the Bodleian or college archives, for example, that have escaped the vigilance of the *V.C.H.* Accepting this basic function, therefore, we can still be surprised that some of its material is not more accessible and more standardized in terms of topics, issues, or problems of general importance. Let us take a case suggested for us on the opening page of the Bloxham volume.

Only in three parishes (Adderbury, Broughton, and Drayton), we are told, "was there extensive early inclosure for specialist farming." What more natural, then, than to try to discover how extensive these early inclosures were in each case? But in practice the calculations take far longer than expected, and perhaps longer than they need have done. First Adderbury: the Act of 1768 declared there were 965 acres of old inclosures, dating from between 1517 and 1717, while the Act allotted 4,310 acres of open land. Although the *V.C.H.* does not remind us of the fact, we can safely assume that the old inclosures were considered apart from the open land, but when we try to find the total acreage of the old parish (in order to calculate proportions) we have to formulate it for ourselves by adding four separate acreages. Once that is done we can say that in 1768 the old inclosures at Adderbury accounted for 18 per cent of the parish. Next Broughton, which is more difficult: we read how Sir Richard Fiennes inclosed Broughton for pasture between 1589 and 1602, but it is extraordinarily hard to fix the acreages involved. Thus in part of Broughton there were 450 acres of open field arable in 1592, and the award of 1805 allotted 513 acres of common

field and waste, so we can do no more than estimate 1,400 acres of old inclosures in 1805, or 66 per cent of the parish. Lastly Drayton, where the 666 acres of old inclosures at the award of 1802 comprised 71 per cent of the parish: here we have to add up for ourselves the acreages involved in the award.

The point is that it should be easy to make a meaningful assessment of the scale of pre-Parliamentary inclosure in areas where the process may have been part of the general course of agricultural improvement. Terms like 'extensive' are not adequate, so having done the sums for the three parishes already mentioned it seems worth doing them for the whole hundred, through each of the eleven parishes from Adderbury to Wroxton. The result is a total of about 4,375 acres of old inclosures, or 14 per cent of Bloxham hundred. The logical step then is to widen the exercise to other Oxfordshire hundreds for comparative purposes, and to test the hypotheses of H. L. Gray in his *English Field Systems* (1915): although Gray devoted over thirty pages of his pioneer work to Oxfordshire, he is not cited in the index of the Bloxham volume, doubtless because he appears only in the occasional footnote.

F. V. EMERY

J. GERAINT JENKINS, *The Welsh Woollen Industry*. National Museum of Wales: Welsh Folk Museum, Cardiff, 1969. 410 pp. £2·75.

Apart from a few articles in periodicals, there has been no study of the woollen industry in Wales, and this book is warmly to be welcomed. Its arrangement is perhaps better suited to the industrial archaeologist than to the economic historian, since the history is mainly treated by regions, so that, after having followed it in Montgomeryshire from the domestic industry of the seventeenth century to the factory system of the nineteenth, one begins again with Merioneth and so again with other regions in later chapters. The factors which affected the development of the industry in these regions were not always the same; but the varying influences which promoted the rise and decline of flannel in Montgomeryshire, of the stout unfinished cloth known as 'webs' in Merioneth, and of the production of flannel and shirting for the mining valleys in Pembroke and Carmarthenshire might more easily be compared if they were recounted in closer association with one another. The arrangement which Mr Jenkins has chosen does, however, enable him to list in detail the mills in each district and to give many examples of the machinery they contained in the nineteenth century.

No short review could afford room for the comments which might be made on various points in this book. One of its most interesting aspects lies in the description of the domestic industry, which lingered much longer in Wales than in the rest of the country. Mr Jenkins gives a vivid picture of an almost self-sufficient society, very poor but not entirely poverty-stricken, processing the wool from its own sheep in close association with farming and supplying mainly a local market. Even after the arrival of carding and spinning machinery about 1800 the pattern remained the same. Wool was taken to the mill for spinning and woven cloth went back there to be fulled, but the local market remained of great importance though commercial production steadily increased. There is an interesting list of dyestuffs, the greater part of them to be found in the neighbourhood of the industry with only a few imported ones. As one would expect in such a community, the materials made were determined by the nature of the wool available in the locality, and there are some useful remarks about Welsh wool at the beginning of the book.

Such a situation, even to the dyestuffs used, must have existed over a large portion of the English countryside in the Middle Ages where it eventually resulted in the emergence from the ranks of the farming community of some very well-to-do clothiers. That this did not happen in Wales (except to a very modest extent) seems to have been due to the fact that Welsh farms afforded no surplus from which to accumulate capital. Sellers could not afford to wait for a better price and where they sold for wider distribution they fell victims to buyers from outside the region, as the Montgomeryshire flannel makers did to the Shrews-

bury drapers. In later days at least two agricultural societies, one in Brecon in 1755 and another in Glamorgan in the 1780's, tried to inject capital into the decaying industry around them; but neither was very successful, probably because such societies, composed of the gentry of the neighbourhood, were not sufficiently familiar with the conditions of the industry.

What impresses one in the account of the industry in the factory age is the resemblance to developments elsewhere. Manufacturers prospered or went bankrupt at the same periods and for the same reasons as they did in the west of England and in Yorkshire, and communications played the same important part, for good or ill, as they did elsewhere. Even the failure to embark on new materials or to look for new markets when old ones failed was not peculiar to Wales. Incidentally, the obligation to give twelve yards in a piece of 132 yards in length was only the customary allowance of one yard in twenty applicable everywhere to cover shrinkage, and not a peculiar burden on Welsh industry.

The illustrations are particularly good as showing the very small scale on which many Welsh mills worked; and much can be learnt about the early buildings of the Industrial Revolution by looking at them, since many never progressed beyond this stage. There are numerous diagrams showing the situation of fulling-mills in various districts, but a map of the whole Principality with some familiar place-names marked upon it would greatly assist the non-Welsh reader.

J. DE L. MANN

UCKO, P. J. and DIMBLEBY, G. W. (eds.), *The Domestication and Exploitation of Plants and Animals*. Duckworth, 1969. xxvi+581 pp. with 8 plates and numerous text figs. £7·35.

The scientific tools for the investigation of subjects such as the origins and development of plant and animal husbandry have, during the last two or three decades, become much more numerous and far sharper than they were. Cytology and genetics have given far more certain insight into the ancestry of cultivated plants and domesticated animals, and thanks to pollen-analysis we have been enabled to trace not only the former natural plant communities and their movements during the last 15,000 years, but we can also follow the progressive modification wrought upon them by man. Morphogenetic study aided by statistical analysis has given increased precision to the identification of plant and animal remains found in an archaeological context, and throughout the world radiocarbon dating now provides an invaluable common, and quasi-absolute, time-scale against which we can set the sequences both of archaeological events and the environmental changes to which they are so closely related.

This is the context in which the Institute of Archaeology in London held the 1968 conference, contributions to which from the wide disciplines of botany, zoology, ethnography, and archaeology have been assembled in the volume now edited by Dr Ucko and Professor Dimbleby. The fifty contributions are assembled under the five headings: Origins of domestication, Methods of investigation, Regional and local evidence for domestication, Studies of particular taxonomic groups, and Human nutrition.

To a considerable extent, and not surprisingly, the fields of the different authors overlap. For the near East, where research has been so active, the same basic information on the origin of cereal cultivation is presented by several authors. However, since these include many of the primary research workers themselves, e.g. Zohary, Flannery, van Zeist, and Riley, one has a very clear sense of being at the very front of advancing knowledge. All of these and others rightly acknowledge the debt owed to Hans Helbaek, whose authority in the identification of plant remains from archaeological sites is unchallenged.

D. M. Dixon shows how the history of ancient Egyptian cereals is illuminated by linguistic evidence and Mme Leroi-Gourhan foreshadows the use of fossil pollen in tracing the earliest spread of cereal cultivation. D. Zohary gives a masterly account of the ancestry of cereals in the near East, especially in ecological and genetical relationships to their wild progenitors. The significance of 'selfing',

of failure of seed dispersal, and delayed germination in the evolution of the new plant races are succinctly described, and excellent distribution maps of the wild cereal species are given. C. D. Darlington writes to stress the way in which men, stock, and crops became increasingly interdependent and indeed shaped each other's pattern of evolution. In this he contrasts the activity of evolutionary process in the grain farmers with the necessarily sluggish process in the root farmers of the tropics where vegetative reproduction and minimal cultural care prevailed. J. G. Hawkes performs a very useful service in reporting and reinforcing the pioneer views of Vavilov and de Candolle by reference to his own work and that of modern crop geneticists. He postulates three major stages in establishment of a cultivated seed crop: gathering and colonization, harvesting, sowing; the first two adventitious rather than deliberate. It seems that cultivated plants were derived from nature's misfits, mainly those of disturbed and open soils and of strongly seasonal climate: not from climax vegetation.

It is left to W. van Zeist to reconstruct the ecological environment of the near East—linking present-day ecology through palynology to conditions under which agriculture originated. He reports his own decisively important pollen-analytic study from Lake Zeribar in Iran where C^{14} dating is a vital ancillary tool, and provides a beginning for the reconstruction of the vegetation and climate of those regions of the near East where cereal cultivation began 10,000 to 8,000 years ago.

K. V. Flannery and C. Vita Finzi both stress the significance of the geological environment in conducing to early agriculture. Flannery describes the 'Broad spectrum collecting stage' and with others accepts the view that in the near East there may well have been a long period during which plant gathering and early cultivation existed side by side.

One aspect of the book, dominant in numerous accounts and secondary in others, is discussion of the evolution of new taxa of plants and animals under domestication, where new and diverse technologies have given far greater power in solution of the evolutionary problems envisaged so long ago by Charles Darwin. Some studies of this kind relate to the near East, but they mostly concern crops from regions with less intensively developed archaeology; thus we have illuminating articles on the cultivation of yams, ground nut, chile peppers, and *Phasaeolus* beans. Other contributions, such as those of M. S. Drower on the domestication of the horse, and D. M. Dixon on cereals in ancient Egypt, indicate how remarkably far back the evidence of linguistics and documentation can take us in favoured regions.

W. C. Sturtevant uses recent historical ethnographic evidence from the West Indies, on the production of tapioca, arrowroot, and other starches, to deduce principles that should be more generally applied in interpreting archaeological evidence of plant husbandry and utilization. P. A. Jewell's eye is on the future, not the past, in considering the potentialities of domestication of species, especially the larger ungulates, to exploit more effectively climatic regions of the world unsuitable to the temperate region stock so persistently introduced there.

These scattered references will give some notion of the very wide scope and interest of the symposium and of the book that has resulted from it. We are shown the remarkable impact already made by the Natural Sciences on archaeology, and in factual knowledge and conceptural approaches alike we witness the startling recent growth of our knowledge of the origins of both plant and animal husbandry.

H. GODWIN

TOOLS AND TILLAGE. *A Journal of the History of the Implements of Cultivation and Other Agricultural Processes*, ed. by Axel Steensberg, Alexander Fenton, and Grith Lerche. Vol. 1. no. ii, 1969. G.E.C.GAD. Vimmelskaftet 32, 1161 Copenhagen. $3.00 U.S.

This is the second number of an annual. Its aims and contents (64 pp. per issue) are sufficiently described in its title. It is printed in English and German.

The first article is by Hans-Ole Hansen, and its title is 'Experimental ploughing with a Døstrup ard replica'. The work described was done from 1962 to 1968, and refers to similar experiments made in Czecho-Slovakia in

1946–7 and in England in 1956–7. The methods of trial employed were highly technical as such work must necessarily be, and are described in great and precise detail. The conclusions are set out in seventeen paragraphs, the first of which states that these trials form an improved methodical basis for further experiments. It was determined that the speed of ploughing was between 3·6 and 4·6 kilometres an hour. This seems about a normal speed for an ox-drawn plough, even of a more sophisticated type. The tractive effort exerted by the animals was 100–150 kilograms in a grass field and 100 in loose sandy loam. Much of the other information collected relates to the effect of the work on the components of the ard, and the results of using it on the soil for preparing a seedbed, if it could be so called. (I must confess that the technique of these experiments is a trifle complex.)

The second contribution is by Holger Rasmussen, 'Grain Harvest and Threshing in Calabria', and is based on personal visits made in 1953 and 1955. Although this is not commented upon, the methods described are little different from those practised in classical times. The grain is cut with a sickle, tied in sheaves with straw and heaped, not in shocks as was the practice in England, but dumped in a circle or a number of circles. Gleaning is practised apparently with rewarding results. Threshing is the work of oxen hauling a 'threshing stone' over the grain spread on a cleared site. Winnowing is by throwing the threshed grain in the air when a wind is blowing. All this is pure classicism, and the processes used are obviously very ancient.

Jiro Iinsume under the title 'The No-No-Hi-Kara-Suki of Shosoin' gives a brief résumé of the probable history of hoe culture in Japan, and the development of the plough in that country with some glances at the possible influence of Korea and China upon Japanese farming. Alexander Fenton contributes 'A Plough Type from the Outer Isles of Scotland'. In the Gaelic this was the *crann-nan-gad*. The construction of this implement is described in considerable detail, both verbally and by diagrams.

G. E. FUSSELL

ALAN GAILEY and ALEXANDER FENTON (eds.), *The Spade in Northern and Atlantic Europe*. Ulster Folk Museum & Institute of Irish Studies, Belfast, 1970. xiii+257 pp., numerous drawings, and 32 plates. £1·80 inc. postage.

This is a collection of papers read at a conference held in Belfast on 19–22 March 1968. Since there are no less than twenty contributors it is an almost impossible task to write a reasonable review of this production in brief. The introduction by E. Estyn Evans does something to remove this obstacle. He emphasizes the use of the spade as an implement of cultivation in Ireland, particularly in the so-called 'lazy bed' method of growing potatoes, but argues that "there is reason to believe that manual sod-cutting tools are of great antiquity in Ireland and other parts of north-western Europe." And again "there is abundant evidence to show that prehistoric man in north-western Europe, from Neolithic times onwards, had devised methods of cutting and severing sods for various purposes."

It is these various purposes and the various types of tool designed to make them possible with which the contributors to this symposium are concerned. Evans suggests that the ard was only used after the "solid sod" had been removed, presumably by some sort of spade, and not necessarily, nor indeed probably, as a preparatory measure.

The use of some pattern of spade (there are many) to remove the top slice of turf in order to make a 'lazy bed' for growing other crops besides potatoes, is apparently one of the primary uses of the tool. A breast plough or spade was widely used for paring and burning, and is the subject dealt with by several of the contributors. The various types of medieval spade are discussed, and other designs used for cutting turf and peat for fuel in widely spaced regions from Ireland, Wales, Somerset, and Scotland to Scandinavia fill many pages. But there is one important omission. Among the many different spades used for so many different purposes the special designs of spades used for cutting drains and ditches are not included. Drainers dug their ditches first using a wide bladed spade, the next spit with a

narrower blade, and the final cut with a long narrow-bladed spade. This process was usual when the drain was to be filled with stone or brushwood (later pipe tiles were used) and covered in again forming what was called a hollow drain. It was a very ancient system described by Palladius if by no earlier writer. This is however a comparatively trivial defect when such a mass of novel material is presented, such as has certainly never before been collected, even though Estyn Evans protests that the symposium is but a beginning of this particular branch of enquiry. G. E. FUSSELL

RAGNAR JIRLOW, *Die Geschichte des Schwedischen Pfluges*. With a Swedish summary. Nordiska Museets Handlingar 72, Stockholm, 1970. 140 pp.; 104 illus. No price stated.

The author of this work needs no introduction to students of plough history. He has been engaged upon it for nearly a quarter of a century, and has published a goodly number of studies on particular aspects of the subject over the years, but has confined his interest closely to the development of plough types in his native country, and the various designs in use there through the centuries; nor has he omitted to describe the local types developed to meet the conditions the farmers worked in.

The land surface of Sweden is difficult for the farmer except perhaps in the most southerly areas, only slightly more than half being capable of cultivation, and that in the face of serious obstacles caused by rugged scenery and stones of greater or less size. Perhaps this is why the Swedish farmers have developed a wide diversity of plough patterns. As in other countries the prehistoric form was that of the now well-known ard (*aratrum* or *araire*). It would not be possible to say that the later types of asymmetrical ploughs, some with wheels, some without, and fitted with a mouldboard and coulter, were developed from the ard, but something of this sort may have happened.

Dr Jirlow has supplied very comprehensive details of the different patterns of mouldboard plough that were used, both locally and through the centuries, and it may be said that this book is the definitive history of the plough in Sweden. It would be a work of supererogation to attempt to summarize it in the course of a brief review for the story can only be understood by careful and meticulous reading.

G. E. FUSSELL

RAY B. WESTERFIELD, *Middlemen in English Business, Particularly Between 1660 and 1760*. David and Charles Reprints, Newton Abbot, 1969. 335 pp. £3·75.

Westerfield's book was originally published in Volume 19 of the *Transactions of the Connecticut Academy of Arts and Sciences* (1915) and hence, in its present form, appears for the first time as a separate entity. The publishers are to be congratulated on making this important work available to a wider readership.

The book falls into two parts: the first five chapters provide a close analysis of the activities and organization of middlemen in four major sectors of the economy; chapters six and seven are a more theoretical appraisal of trends in the period 1660–1760. Three of the four trades considered—corn, livestock, and textiles—are of direct interest to the agrarian historian, who perhaps too often forgets the distributive network upon which production depended. The fourth trade is that in minerals, primarily coal.

Westerfield saw as the "most prominent phenomena" of the period: freedom from governmental control; increased speculative activity; the extension of trade over a broader geographical market; the dominance of a capitalist class; and a separation of functions and divisions of the middlemen's occupation. Clearly it was not only English overseas trade which quickened during the later seventeenth century. The rapid development and improvement in agriculture in this period, recently suggested by Dr Kerridge, was accompanied by remarkable advances in distributive networks. The later chapters reinforce this impression of a revolution in the facilities and techniques of commerce in the later seventeenth and early eighteenth centuries.

Modern research has modified Westerfield's conclusions but has done little to affect his general theme. His concentration on printed

source materials led to some errors which more detailed research might have avoided. The fair was not in continuous decline in the fifteenth century but later expanded and remained a vital organ of commerce throughout the eighteenth century. Legal restraints on the activities of middlemen did not entirely disappear in this period but were enforced in many provincial towns in time of dearth of provisions. Nor is it easy to accept the rigidity of Westerfield's scheme of the specialization of functions (see diagram facing p. 328): it is extremely difficult to classify tradesmen at this period with any accuracy. Innkeepers particularly were middlemen with interests of considerable diversity. Indeed, the major criticism of this comprehensive study is its superficiality. Too often the chronology is telescoped, models are forced on to inadequate evidence, and local and regional variations subordinated to the great design. It is difficult to accept that Tudor corn policy was "dictated by the needs of London" (p. 160).

Westerfield's geography left much to be desired: a misreading of Pococke placed Bala in Ireland (p. 319); archaisms like 'Rumford' (p. 189), 'Farrington' (p. 169), and 'Guilford' (p. 319) appear with tedious regularity. In a single chapter Newbury is spelt in three different ways, and the reader is irritated by 'Warwich' (p. 206), 'Charlburg' (p. 148), and 'William of Malmesburg' (p. 345). The maps are badly located in a pocket inside the back cover, and are themselves poor, containing a curious 'German Ocean' in the place of the North Sea.

Quite apart from the errors, the text is confused and badly annotated. The footnotes are particularly poor, and in some cases misleading. Titles are never italicized, and frequently over-abbreviated. Chandler's *Essai sur l'État du Commerce d'Angleterre* never appears in full in any footnote. The bibliography is inadequate, subsuming under a single title all the primary sources and secondary materials used in the book. At its best it is untidy. One also regrets that this book has no index. The pagination is confusing, being that of the original periodical, which means that the book starts with page 111.

The enterprise of the publishers in making this work available, is to be applauded, but the reprint retains the deficiencies of the original. An annotated edition, with a scholarly introduction, would have both corrected the errors and assisted the inexpert reader. It is perhaps symptomatic of historians' neglect of this field that this remains the most important single volume on the subject. It cannot be ignored, but must be read with great care.

J. A. CHARTRES

ALAN EVERITT, *New Avenues in English Local History*. Leicester U.P., 1970. 33 pp. 25p.

Unlike the two previous incumbents in the Leicester chair in English Local History, Professor Everitt in this, his Inaugural Lecture, does not feel the need to justify his subject as a distinct branch of history. The work of Professors Finberg and Hoskins has established the discipline as respectable, though, to quote the latter, it was "the creation of generations of amateurs." To Professor Everitt, if one might put words into his mouth, we are all local historians now.

Local history has been distinguished not so much by the uniformity of its scholars' work as by the rapidity of its growth as an academic subject, by its influence, and by the excellence that the Leicester Department has set as its standard. To pioneers like Hoskins and Finberg, both distinguished innovators, Professor Everitt shows himself a worthy successor. For he too has claims as an innovator, both in fields of study and in the exploitation of archive resources: his work on market towns and his exploratory work on the Chancery cases establish this. It is therefore pleasing that in his Inaugural Lecture he writes not of the nature but of the matter of his subject.

This lecture draws together in an illuminating way many strands of thought thrown out by Professor Everitt in his earlier work. Here his special interests in Kent and Northamptonshire are demonstrated in a stimulating analysis of markets and nonconformity in nineteenth-century England. He suggests quite convincingly that the disintegrated property pattern of the 'lost market town' may have some causal function behind the growth of nonconformity.

The inhabitants of such decayed market towns chose 'to snap their fingers at the Establishment' through nonconformity. It is a fascinating hypothesis that deserves fuller exposition.

Unlike many Inaugural Lectures this has a novelty and a theme that should interest most readers of the *Review*. Taking the microscopic rather than panoramic view, and the research rather than the survey approach, Professor Everitt has at once demonstrated the virtues, and perhaps the defects, of the subject and himself.

J. A. CHARTRES

A. G. TANSLEY, *Britain's Green Mantle*. Second edition revised by M. C. F. PROCTOR. George Allen and Unwin, 1968. 327 pp. 50s.

Dr M. C. F. Proctor of Exeter University has revised Sir Arthur Tansley's book about the vegetation of Britain. The book describes the sorts of plant communities that occur in Britain and the way these communities change. The book is a beginner's version of Sir Arthur's great work, *The British Isles and their Vegetation*, clear and easy and without too much of that ecological theory that tends to the scholiastic.

The first two chapters describe the changes that have occurred in the British vegetation over the last ten thousand years. This brief section forms an adequate introduction to this important topic and could lead on to Dr Winifred Pennington's *The History of British Vegetation*. The next three chapters describe the effect of climate, soil, and animals, including man, on the development of the vegetation. The main body of the book, twelve chapters, classifies and describes British vegetation. This follows a conventional, commonsense classification. Vernacular names are used, and the Latin confined to brackets. The types are illustrated with superb photographs, largely from Dr Proctor's own collection. The final chapter reviews and encourages work on the conservation of vegetation.

This is an excellent book to introduce a historian, with a knowledge of the countryside, to the British vegetation. My only quibble would be that it does not give sufficient stress to the effects of man on all the vegetation of Britain.

J. ELSTON

MICHAEL ALTSCHUL, *Anglo-Norman England, 1066–1154*. C.U.P., 1969. xii+84 pp. £1·75.

This is a handlist, compiled in America for the Conference of British Studies, of 1838 books and articles classified under the headings: Bibliographies; Catalogues, Guides, and Handbooks; General Surveys; Constitutional and Administrative History, Political History, Foreign Relations, Social History, Economic History, Agricultural History, Science and Technology, Military and Naval History, Religion, Fine Arts, Intellectual History. There are a few omissions. Round's criticism of an article by W. H. Stevenson, and Dr Titow's of one by Dr Thirsk, are rightly included, but there is no mention of the rejoinders by Stevenson and Thirsk. The author occasionally subjoins comments of his own. The dates 943 and 972 given for Glastonbury and Winchcombe refer to the Benedictine reform of these monasteries, not, as a reader might suppose, to the original foundation. It is startling to find Geoffrey of Monmouth, that arch-romancer, credited with "a major work of twelfth-century historiography." Occasional blemishes notwithstanding, this is a useful compilation.

H. P. R. FINBERG

R. B. WERNHAM (ed.), *The New Cambridge Modern History. Vol. III: The Counter-Reformation and Price Revolution, 1559–1610*. Cambridge University Press, 1968. xvi+599 pp. £3.

And so with only two volumes yet to appear, the New Cambridge Modern History pursues its relentless way. Cast in an old-fashioned mould, political history still dominates this volume. Reflecting his own interests, Professor Spooner's chapter on the economy of Europe is largely concerned with monetary matters and less than three pages deal with agriculture. Scattered references to cultivation or tenure appear in other chapters but some authors discussing matters where some reference to either of these topics might have had some relevance manage to ignore agriculture altogether. Is it not curious considering the importance of agriculture in the sixteenth-century European economy that so little space

is devoted to it? Even then the editorial policy of eschewing footnotes and bibliography deprives the reader of the opportunity of following up the authorities used though they may be mentioned by name in the text.

W. E. MINCHINTON

RICHARD NEVE, *The City and Country Purchaser*. David and Charles Reprint, 1969. xx+284 pp. £4·20.

This book was first published in 1703, subtitled *The Builder's Dictionary*, and was intended for the use of "Workmen". The new edition of 1726, which is used here for reproduction, contained additions making it "fit for Gentlemen's Use." Although the publisher's blurb says it was "one of the most valuable books on building methods and estate management" of the early eighteenth century, this is really going much too far. It is only a guide to "estate management" in so far as it tells the landowner about materials for building purposes and the prices he should pay. There are many useful articles, for example, those on bricks, tiles, and building, but the book as a whole is only of very marginal interest to agricultural history, and is far more useful to the student of later vernacular building. The quality of reproduction is not always as clear as it might be. Indeed, though this book may have been a minor classic in its time, it is difficult to see why the publishers chose to reprint it at all. A much more valuable book to put back into print would have been Innocent's *English Building Construction*, first published in 1915, and now quite unobtainable.

W. G. HOSKINS

W. CAREW HAZLITT, *Gleanings in Old Garden Literature (1887)*. Reprinted by Gale Research Company, Detroit, 1968. 264 pp. $8.50.

This is a reprint of 1887 which is exactly what its title implies, random snippets on the history of gardening. The publisher's leaflet claims it as a complete history of horticulture in Great Britain. This may have been true in 1887. Books such as Alicia Amherst's *History of Gardening in England* and, much more recently, R. Webber's *The Early Horticulturists* have completely superseded it.

JOAN THIRSK

NOTES AND COMMENTS *continued from page* 174.

"A Friendly Society called the North Scarle Cow Insurance Club for Mutual Assistance in case of loss by Horned Cattle" was formed in September 1870, to insure the loss of, rather than by, cottagers' and small farmers' cows of the time. The earliest remaining records show that in 1899 one member had three cows insured, 12 had two cows, and 16 had just one.

Rule 3, as revised in 1928 and again in 1960, reads: "If any member's Cow die, the Committee shall make the most they can of her, and give an account to the Society of the same; and shall receive as much money from the general stock as shall amount to eighteen shillings in the pound on the value of the beast when alive. No cow shall be valued at more than £20."

Rule 7, 1928, states: "When any illness shall happen to a member's Cow, he or she shall give immediate notice to the Committee, who shall without delay attend such Cow and see that the best help be had as the case may require; and if such member shall neglect to give such notice, and the Cow die, he shall receive no benefit from the Society."

As far as is known, and certainly since 1899, the entrance fee to the society has always been 10s. per cow and the annual subscription 6s. per cow, at first paid quarterly. Cows registered with the society—only after inspection by the committee to see that they were healthy—were branded on the horn with a 'star' by an official brander appointed from 1900. From 1904, he received an official sixpence for his service from the owner of the cow, or a shilling if the cow were more than two miles from North Scarle. To combat the latter high cost three branders were elected in 1923, one for each of

the districts which by then had their own inspecting committees—North Scarle (Lincs.), Harby, and Girton with Besthorpe (Notts.). Branding was abandoned in 1960, because of fewer cows with horns, in favour of a register of Ministry numbers tattooed in cows' ears.

Except during the First World War and since the Second, the amount paid out for a dead cow has generally been less than the full £18—£12 or £15 being more usual—in accordance with the committee's valuation of the cow.

The society received the carcase value of the cow, including that of hides, often sold to a member, until 1929. The rise and fall of agricultural prosperity in the first third of this century can be seen in amounts received for hides—7s. in 1901, 35s. in 1919, 10s. in 1923, and 20s. in 1929 for the last sold before the modern knackers' trade became universal.

Peak enthusiasm for the society was during the First World War, with 40 members insuring 65 cows in 1914. Three cows was the largest contribution of any member until 1947, and today the largest contributors have only eight, six, and five cows registered, respectively, even though their herds are very much larger. In 1962 one enthusiast registered 14 cows.

The trough was reached in 1964 when there were only 12 members, but still with 44 cows, and a debate was raised at the annual meeting on whether "the society had outlived its usefulness." But it was agreed "that we carry on" and "all voted for it." Perhaps members were influenced by their largest cash reserves in history—over £258—at the end of the previous year.

Throughout its recorded history the society has generally paid out for between one and three cows a year. When no claims were received, as in 1962, there was a "gain on year," as it is recorded. When four claims were paid in 1947, the "loss on year" rose to £44 11s.

The many cottagers and smallholders of the district were the real beneficiaries of the society. Mr Leonard Wells, secretary for thirty-eight years, remembers 17 or 18 cows belonging to perhaps a dozen cottagers being "tented" on roadside grazings, to save the little grass at home, until after the last war. The "tenter," a youngster or a woman or perhaps an old man, would receive coppers a week from each cottager.

The 1969 Ministry returns show 22 holdings in North Scarle to have fewer than 30 acres and 32 to have fewer than 100 acres. Even though one farmer may now farm a number of holdings the figures indicate the farm structure of the past.

The district is also known for some of the poorest soil in the East Midlands, the gravel over lias produced by the uncertain prehistoric meanderings of the River Trent. It drains and dries too quickly except in a wet year and, freshly cultivated, is like a puffy beach to walk on.

So small farms on very poor soil—as is often the case—must be among the original stimuli to the formation of this Friendly Society to protect each other against the disaster of bovine loss. Perhaps also the Scandinavian influence, producing a Lincolnshire peasant more independent than his contemporaries—as suggested by the historian Maurice Barley—had something to do with it.

Why it has survived into its hundredth year, to the time when dead cows are rarely worth less than its maximum benefit, is clearly related to the wide family responsibilities still accepted in the district. To the Dixons, the Hennells, and the Slingsbys who have been members through most of the society's known history must be added the family name of Wells.

This family had 5 out of 29 members in 1899, 12 out of 25 members in 1949, and still has 6 out of 15 members in 1970.

C. DAVID EDGAR

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