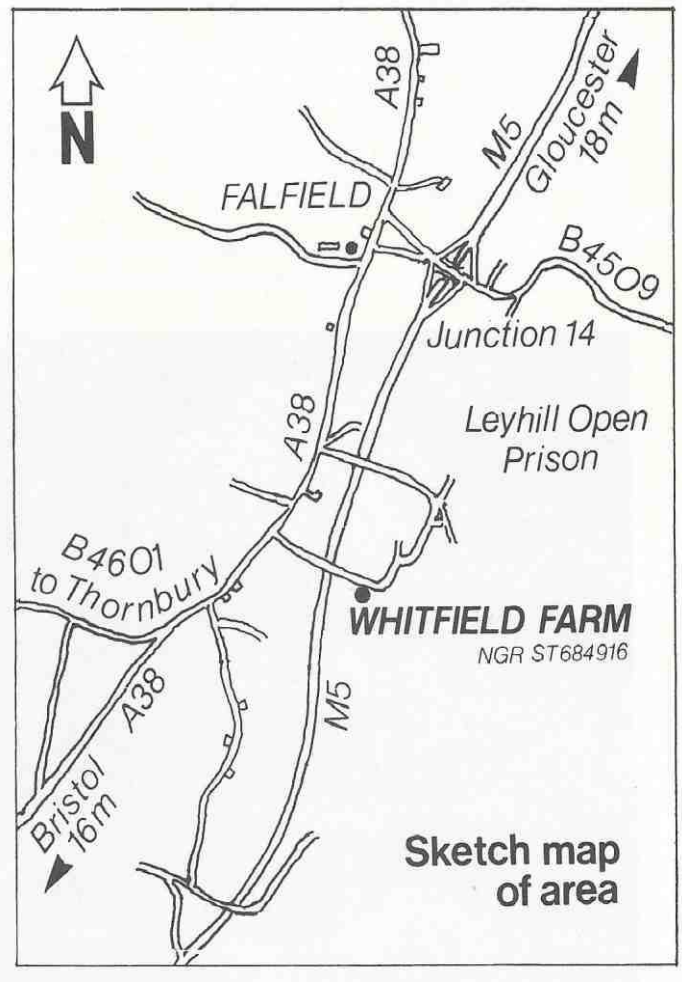
Whitfield Example Farm: A Victorian model

Celia Miller

Whitfield Farm lies just off the A38 Bristol-Gloucester road between Whitfield and Falfield. The compact, factory-like stone farm buildings with their lattice windows speak eloquently of a former importance. This is the farm of which the eminent Victorian agriculturist, Sir James Caird, said in 1850: 'Whitfield example farm has exercised a beneficial influence on the national agriculture'.[1] So it would seem that Whitfield Farm merits more than a passing glance and is of more than purely local interest. it is a fine example of a model farm, a shop window for all that was newest and best in agricultural technique and technology in the 1840s. Model farms of this type, ranging from the modest and practical to the grandiose and bizarre, were built by a number of landowners in the 1840s, 50s and 60s. Gloucestershire has several good examples of the more modest variety, of which Whitfield Farm is the best documented. It is therefore possible to see and understand the architect's concept and his philosophy, and to assess their physical expression.



The model farms of the middle decades of the nineteenth century were frequently the result of attempts made by progressive landowners, farmers, and estate managers to come to terms with a changing economic climate. The classical mixed farming system of the 'agricultural revolution' had been adopted over much of southern and eastern England and was heavily orientated towards corn production, with livestock as a secondary crop whose real function was the provision of manure to encourage still heavier yields of grain. But as early as the 1830s it was becoming evident to the more far-sighted agriculturists that a greater emphasis on the increasingly profitable livestock side of farming was necessary within that system if it was to survive. It was equally evident that farmers would have to become more efficient and increase their levels of production if they were to capitalise on the growing urban market, whose demand could be met through a developing railway network, thereby increasing their own profits and their landlords' rent rolls. But any impetus towards change on the land had ususally to come from landowners, for the bulk of farmers were tenants during the Victorian era. The landowner provided all the fixed capital invested in the land: field drainage, walls, fences, hedges, farm roads, and farm buildings, and frequently dictated the farming policy to be followed by his tenants through leases and game preservation. The model farm therefore provided the progressive, improving landowner with the ideal opportunity to experiment with new or different farming systems, buildings, and machinery and to demonstrate their virtues to his tenants and to other local landowners and farmers. He could also experiment with and assess the potential of particular crops, stock, seed, implements, and methods of cultivation, all of which were part of the tenant's capital investment in the farm.

In January 1839 work was begun on the establishment of just such an 'example-farm' at Whitfield on the 5139 acre Gloucestershire estate of the Earl of Ducie. The guiding spirits behind the concept, the plans, and their implementation were the Earl himself, and his agent, John Morton, a native of Fifeshire who had been appointed agent to the Tortworth estate in 1818. Morton was assisted at Whitfield in 1839 by his 18 year old son, John Chalmers Morton, who was later to achieve fame as editor of the *Agricultural Gazette* and as the author of many books and articles on farming. Morton senior carefully recorded the planning and setting up of the farm and the first three years of its life in a book, published in 1843, and it is this which provides us with an insight into the thinking behind the foundation of a Victorian model farm and the way in which the ideas were put into practice.[2]

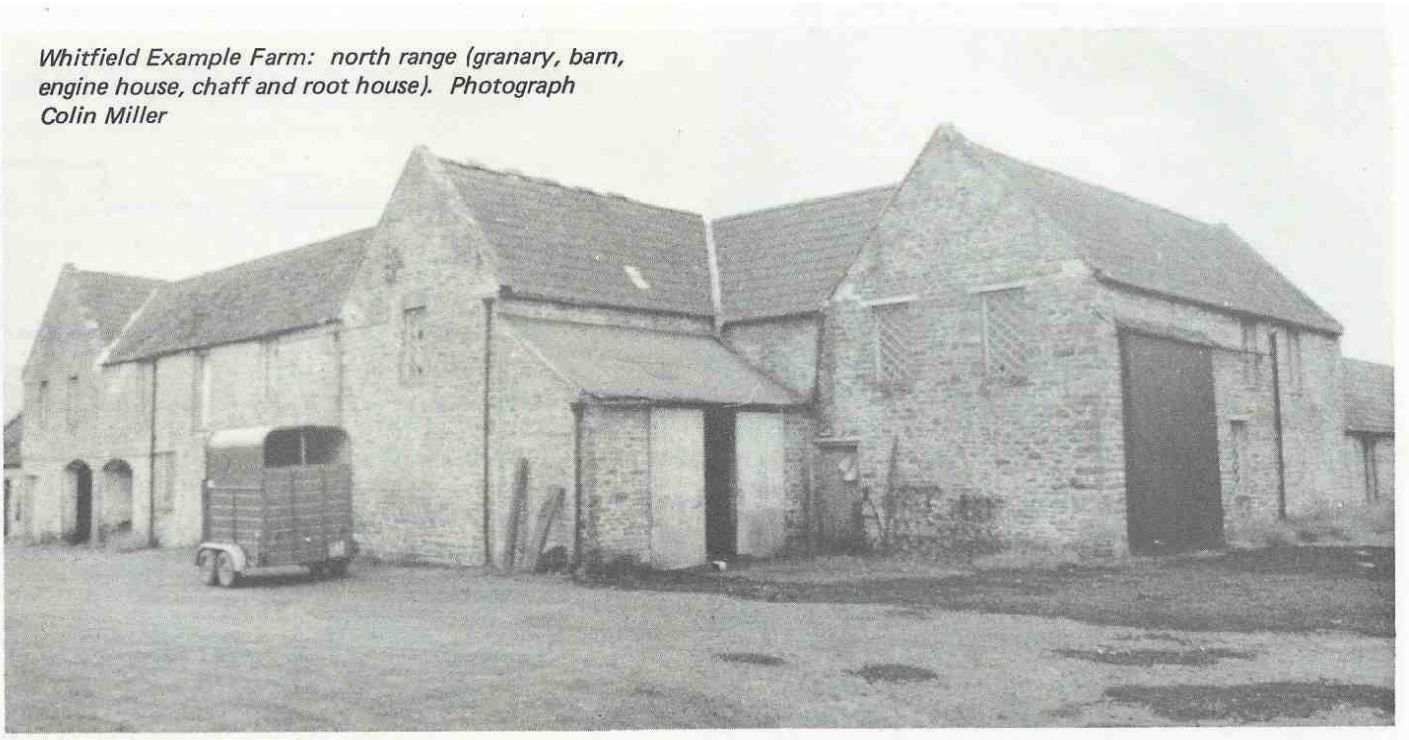
The concept was an ambitious one: 'We have for many years been convinced, that a very great advantage would result from a chain of **example farms** spread over the several Geological formations', wrote Morton[3]. The function of each of the farms would be to demonstrate the best methods of improving and cultivating each type of soil, and the crops best suited to it, with the aim of producing detailed practical costings of each type of farming operation, the relevant capital input required from landowner and farmer, and the return that could be expected on the investment. Morton argued that by increasing the productive capability of the

land through permanent improvement, 'the tenant would have a better chance of secure and ample profits on his outlay of capital, and the landlord of his rent.'[4] The example farms were to be located at 15 or 20 mile intervals and would thus be within easy reach of the local farming population, who would be eager to emulate their success. Their influence would thus spread over the entire country, 'so that the whole agriculture of the kingdom would soon feel, and be influenced, by the power of such an improved system of culture'.[5] Previous experiments of a similar kind had been criticised for their impossibly high cost. The example farms would only be taken seriously by the farming public by demonstrating that they could be set up at a reasonable cost and run as viable economic units, and not simply as the toys of rich men. This was Morton's vision, and Whitfield Farm was the prototype.

The project appears to have been planned during 1838, when a 232-acre farm on the estate was taken in hand by Lord Ducie, and the tenancy transferred to John Morton. Before the transformation the farm consisted of 164 acres of pasture, with 68 acres of arable, and it was run as a dairy unit, the stock consisting of 25 cows and 21 followers, with a few pigs and working horses. The arable acreage raised poor crops of wheat, barley, clover, and potatoes and the farm was run with the labour of 6 workers. The annual net profit was a mere £28.11s.0d, not allowing for interest on the capital invested in the farm by the tenant. Eighteen additional acres of land were then added to the tenancy, bringing the total to 250 acres. A scheme of improvement was mapped out, including tree felling, hedgerow clearance, a complete field drainage system, roadmaking, walling, new hedges, a totally new set of farm buildings, and a new scheme of cultivation, cropping, and stocking involving the labour of 20 workers. The total cost of all this was estimated at £3500 to the landlord, which was to be recouped by adding an element of 5% interest on that capital to the existing rent, bringing it to £375 per year from the £200 per year paid by the previous tenant. The farmer also had to face a substantial initial investment in the farm (live and dead stock, seed, cultivation, labour) of around £3747, quite apart from his yearly expenses of cultivation. But in return for this investment the farmer could expect an estimated £482.15s.0d. per year net profit, even after repaying himself an annual element of 10% interest on his invested capital.[6]

The execution of this plan took 4 years and cost a great deal more than Morton's estimate. Land clearance began in January 1839 and 1771 trees were felled, their sale yielding a profit of £3109.17s.0d. The removal of hedgerows and tree roots lasted until spring 1842 and cost £576.15s.7d. but a startling 26 acres of land was gained from the exercise. New farm roads were built and the cleared land was drained: a new course was cut for the brook and over 32000 perches (or 100 miles) of field drains were dug at a total cost of £2066.6s.11d., some £669 more than Morton's estimate. The farm was then divided into 24 fields of between 9 and 10 acres, leaving a field of 16 acres in the lower part of the farm. Previously, the farm had been divided into 46 fields of between 2 and 8 acres, only 3 of them more than 8 acres in area, typical Vale field sizes. Even Morton found himself struck by the appearance of the reclaimed land when contrasted with the surrounding area: 'The contrast between the richly wooded country round Whitfield, and the bare open space constituting the farm itself, tells much to the disadvantage of the latter when it is seen from a distance. The blankness of the picture is all the more apparent from its being surrounded by a beautiful framework. The apparent infertility of the spot is, however, not real; when the farm is at length arrived at, after being viewed from a distance, it is found to be most productive, compared with the land in its neighbourhood, which it formerly resembled.'[7]

After drainage much of the land was subsoil-ploughed, and



Whitfield Example Farm: north range (granary, barn, engine house, chaff and root house). Photograph Colin Miller

all of it was ploughed, harrowed, rolled, and limed. A rotation including wheat, clover and temporary grasses, carrots, mangolds, swedes, turnips and potatoes was then planned for the 24 fields. The fate of the 16 acre field left over is not stated but it seems likely that it was the only area of the farm left under permanent pasture. The rotation was scientifically designed, together with the application of farmyard manure and available organic fertilisers, to promote the fertility of the soil and increase crop yields. A large proportion of those crops would ultimately be returned to the soil as fertiliser - the classical 'manure cycle'.

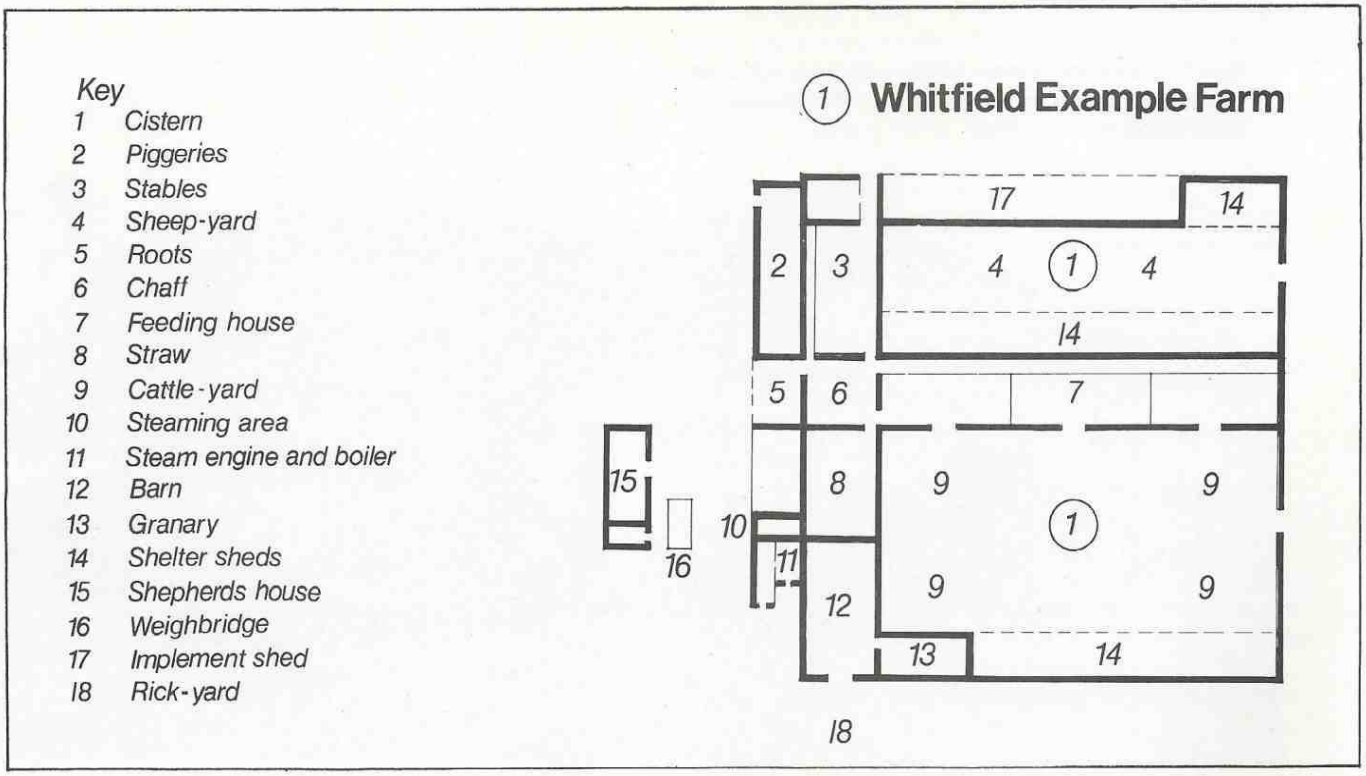
A completely new set of farm buildings was designed and built, located nearer to the centre of the farm than the old buildings, of which only the house survived, situated on rising ground above the new buildings and in a position to overlook them. The new steading was carefully designed, each building having a precise function in relation to the one adjoining it, in order to minimise handling and make the most efficient and economic use of labour. The philosophy behind the planning shows that progressive agriculturists saw farming on a par with industry. With the exception of the house, Morton thought that: 'The position of the rest of the buildings should be as nearly as possible in the centre of the farm, for they may be regarded as the buildings of a factory, and it is of essential importance that such buildings be placed as near as possible to the source of the raw material, which is there converted. This raw material . . . is either, as in the case of grain, prepared for the use of man, or, as in the case of turnips, clover etc, it is converted into beef or mutton; or, as in both cases, when consumed in the stables, it is converted, by means of its nourishing properties, into that strength which, properly directed, tends to its reproduction.[8]

Morton's design was faithful to these principles, and represents a fluid circulation of raw materials from one area of the steading to another. It was also a practical and simple design with none of the extravagant features sometimes associated with model farms. John Bravender, the Cirencester land agent and author of a prize essay on farming in Gloucestershire printed in the *Joumal* of the Royal Agricultural Society in 1850, described them as 'plain but useful'.[9] The walled rick-yard, large enough to accommodate a double row of ricks, had an elevated road way running down the centre, straight in through the facing barn door. Corn for threshing was conveyed along this roadway into the barn, a 3-storey building (40 ft long, 18 ft wide, and 27 ft to the eaves), where it was processed by a threshing machine and 2 winnowing machines ready for storage in the granaries. The residual straw was passed from the threshing machine into the adjacent straw barn, a 2-storey building of the same dimensions as the barn, where straw was stored and cut into chaff, and various milling and mixing operations took place. At the intersection of the mixing house barn range with the feeding house stood the chaff and root houses, with a granary on the floor above. Here the food for the stables, piggery, feeding house,sheep and cattle yards was prepared and distributed. The intention of Morton's design was to economise on the use of labour within the buildings by providing direct and easy access between:

a) the rick-yard, barn, straw barn, and chaff house

b) the chaff/root houses and the stables, feeding house and yards.

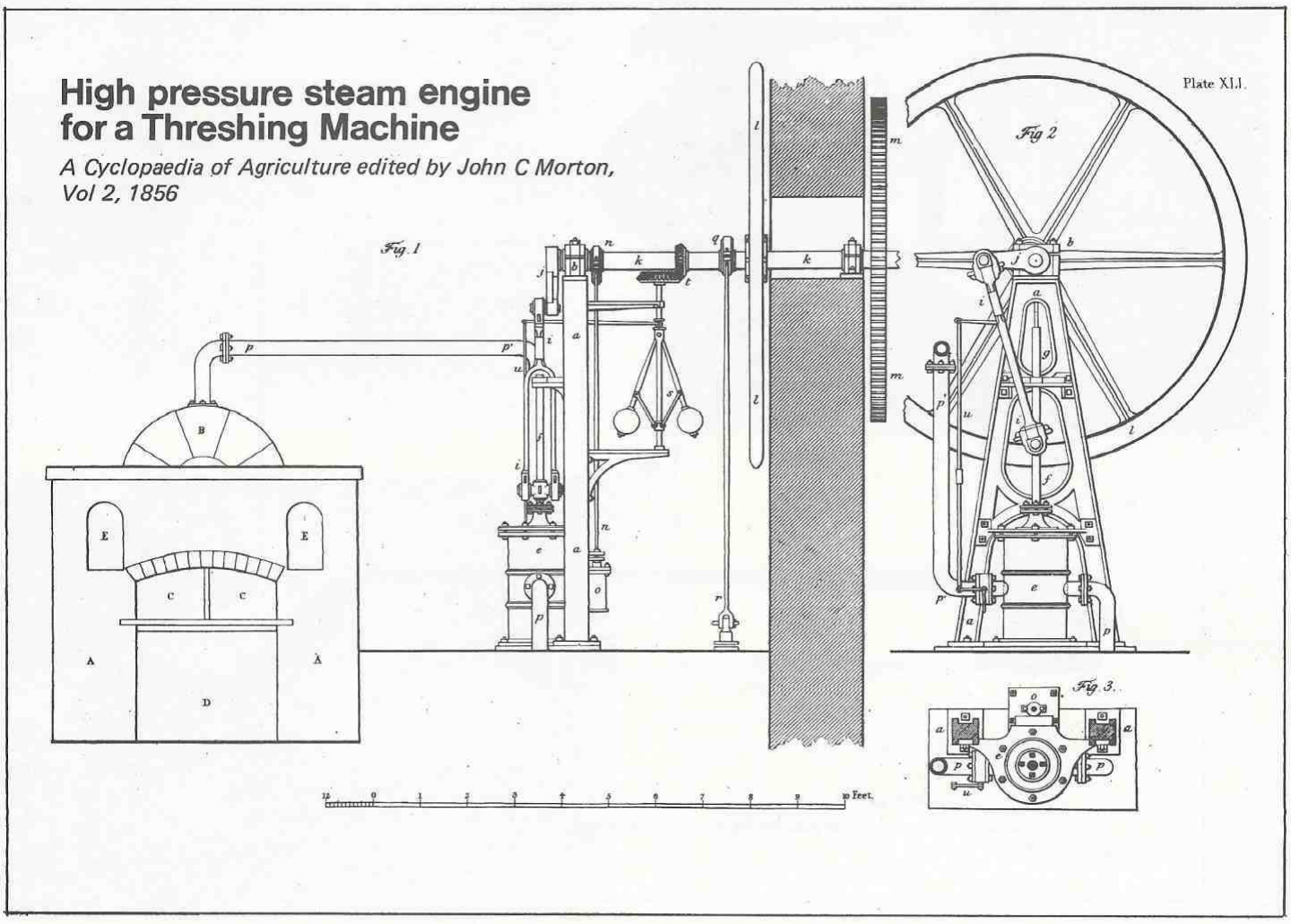
Strict attention was paid to manure conservation. The liquid manure from the stables and, presumably, the piggeries, was conveyed by drainage channels to a cylindrical cistern outside the stables which has survived to the present day. The 2 stock yards were also drained by cylindrical cisterns 7 ft deep and 9 ft in diameter, but these



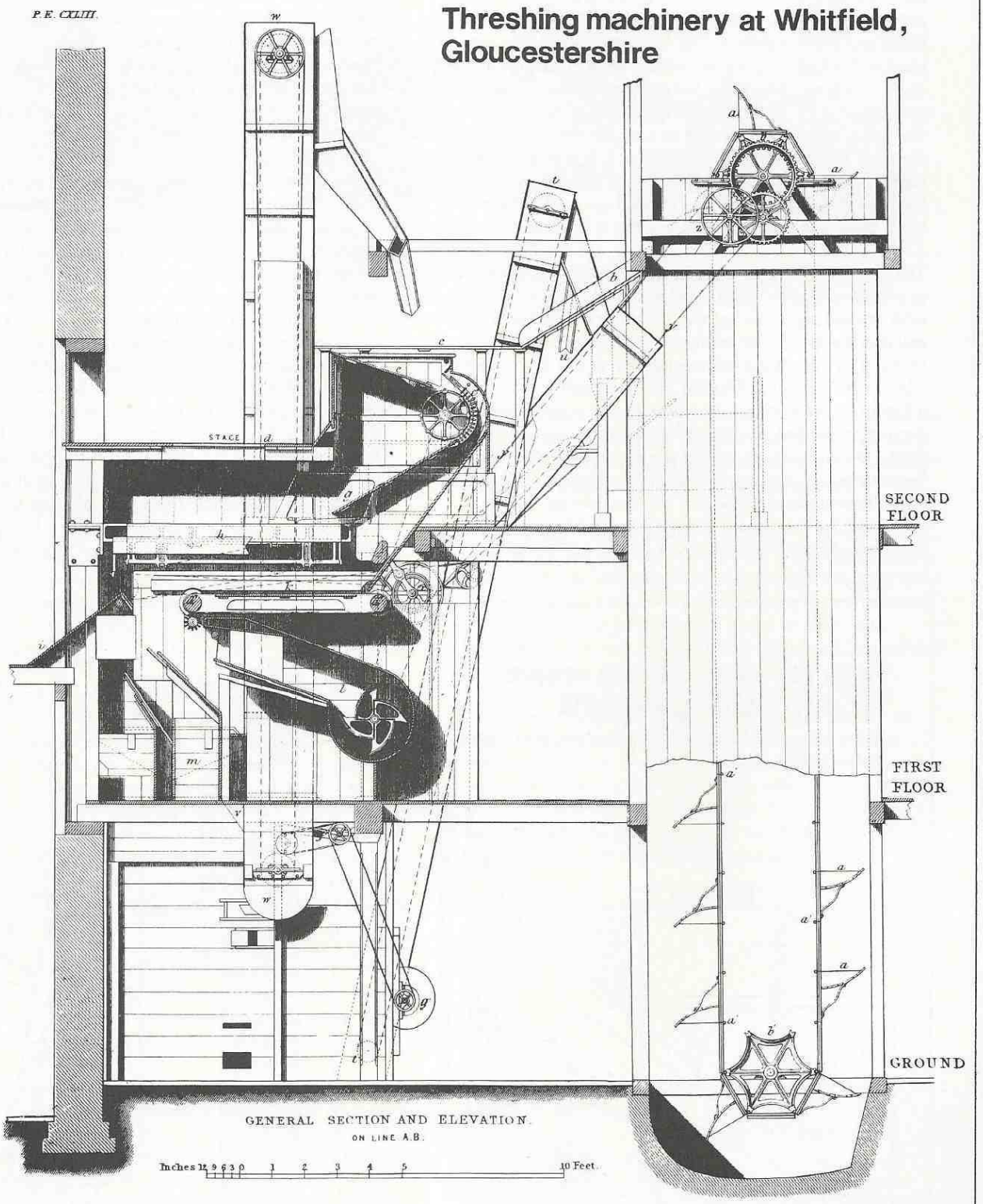
have long since disappeared. The dung from the piggeries, shelter sheds and feeding house was removed only at intervals and was then conserved in a conventional midden. The animal housing was extensive by the standards of the day: the stables were 18 ft wide by 66 ft long and had stalls for 11 horses, with a storage area at the end. The feeding house had stalls for 30 fattening cattle arranged in blocks of 10 along its length, with a feeding passage in front of the cattle and a series of holes in the wall through which the roots cut for the sheep in the yard next door were thrown, channelled by spouts to troughs standing at right angles to the wall, and sheltered by a hanging roof which formed a shelter for the sheep. On the other side of the feeding house there were doors opening into the cattle yard, through which the dung and the refuse was carried out.

The yards, which were macadamised, each had a southern exposure, and were surrounded on three sides by buildings, with the mixing house barn/stable range across the northern end and the feeding house forming the division between them. The sheep yard was completed on the third side by a block of implement housing, facing outwards (and adjacent to the stables for conveniencing of harnessing and moving horses and implements to the farm road and the fields) and more sheep shelter sheds, for the loose stock. Some supervision of the buildings was deemed necessary, as the farmhouse remained on the original site, and so a house was built for the shepherd in front of the main entrance. Attached to the house was a small building housing a 'weighing engine' - a weighbridge, which was used to weigh produce and, quite often, stock. Water was piped to the buildings from a spring on the western side of the valley just below the farmstead. The engine house was attached to the northern side of the barn and housed a fixed high-pressure steam engine which drove all the machinery in the barn by means of belts, or straps, from a shaft which stretched across the barn driven by the spur wheel on the fly wheel shaft of the engine. To the side of the engine house was a steaming house where the waste steam was used to cook animal feed.[10]

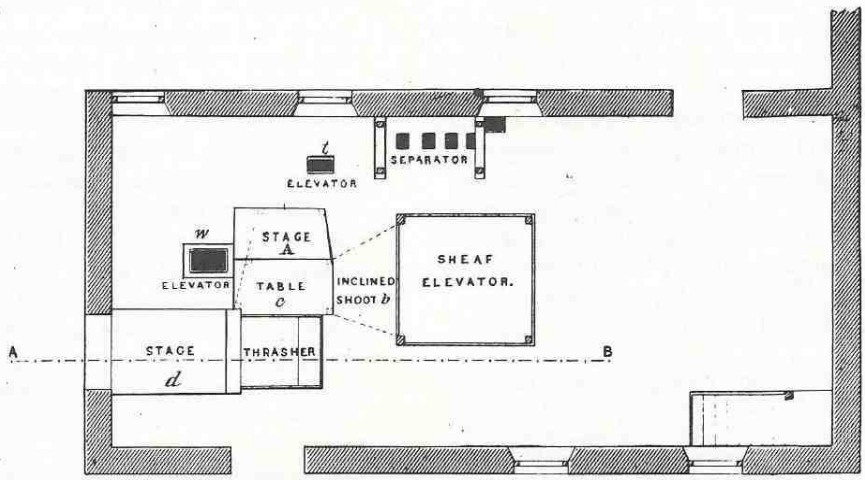
The principal piece of machinery driven by the engine was the combined barn thresher and winnower, which took up all three floors of the barn and consisted of a threshing machine on the top floor and two winnowing machines, one on top of the other, on the ground and first floors. The winnowing machines were adjacent to and designed to act in conjunction with the threshing machine; a drawing of the machinery and the barn plan is reproduced here. it was developed by Richard Clyburn, the Uley engineer, and George Parsons of West Lambrook, and manufactured by the Earl of Ducie at his Uley Iron Works. The corn was fed through the feed rollers into the drum of the threshing machine, where it was scutched off by the revolving action of sets of rotating beaters against the side of the drum. Separation of the chaff from the grain was further achieved by a blast of air, generated by the rotary fan, being passed through the drum.[11] This machinery may well have been



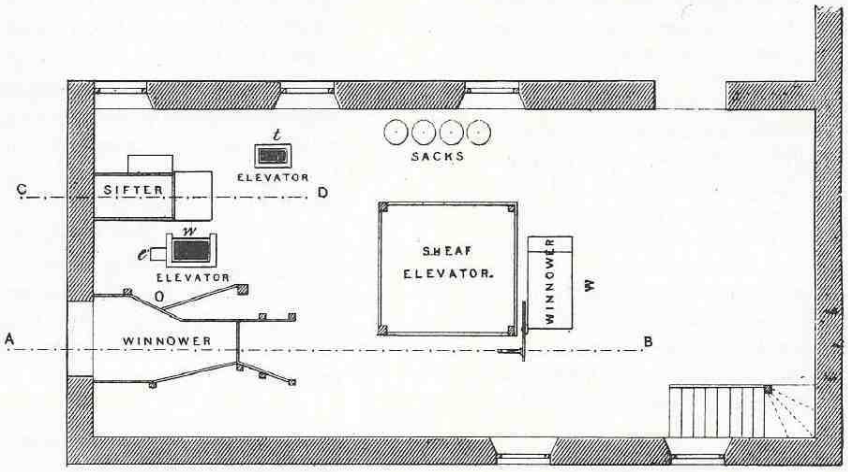
Threshing machinery at Whitfield, Gloucestershire



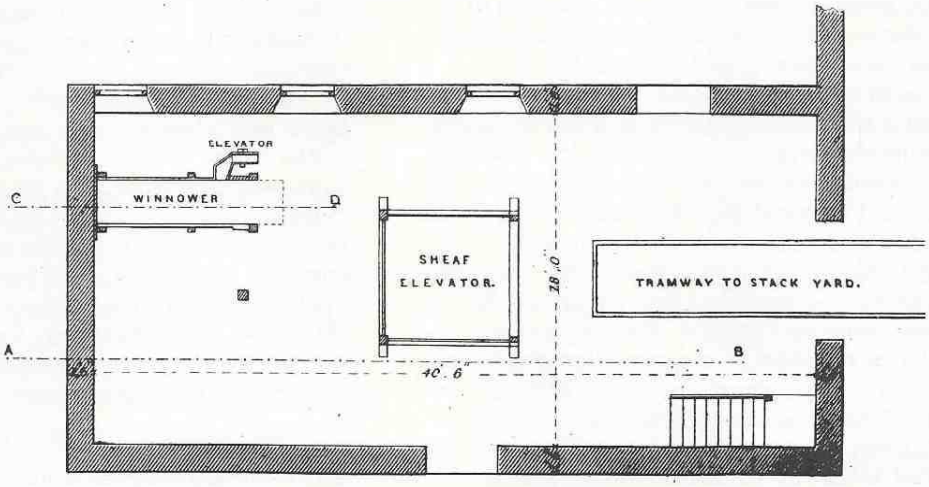
A Cyclopaedia of Agriculture edited by John C Morton, Vol 2, 1856



SECOND FLOOR PLAN



FIRST FLOOR PLAN



GROUND PLAN.

A Cyclopaedia of Agriculture edited by John C Morton, Vol 2, 1856

a direct relative of the 'machinery for beating, cleansing and crushing various animal and vegetable materials and substances' patented by Clyburn and Parsons in 1843.[12] The 'combined Threshing and Dressing Machine' developed by Clyburn and Parsons and exhibited by the Earl of Ducie at the Royal Agricultural Society's Shrewsbury meeting in 1845 was another likely descendant. This machine retailed at between £80 and £115 and was awarded a premium of £10 by the judges and described as 'the only machine to which the judges deem it necessary to advert as possessing merit or novelty in this class', although they went on to say that it was more 'adapted to the very large rather than the moderate-sized farm'. [13] The whole system was seen in action at Whitfield by John Bravender in the late 1840s:

> The threshing is done by steam; the engine is a snug piece of machinery; it takes an hour and a half to get up the steam, and in the morning, whilst this is being done by one party, others are stripping the rick and preparing for carrying into the barn. This is done by laying down a wooden railway on the elevated road, which is in the middle of the rick-yard, between the two rows of ricks, to the machine inside the barn; and a carriage with wheels and axles to fit the rails is taken from the barn to the rick and loaded. When the engine is ready the business commences, and the loaded carriage is moved down the railway into the barn and unloaded, by parties who place the sheaves on the teeth of a revolving rake, by which they are elevated and placed on the floor above, The sheaves are taken by women and handed to the feeder who serves the machine, and this is uninterruptedly continued till either the rick is out or the usual meal-time causes a temporary cessation. The machine not only threshes the corn, but shakes the straw, winnows the corn and causes it to pass down a spout to the ground floor, to which spout a bag is attached, which, when full, is removed by an attendant, the corn being winnowed, screened, cleaned, bagged, and ready for the market. A register of the performances of the machine is kept.'[14]

But although the buildings were so efficient and the machinery so innovative, the cost of building them was much higher than had been estimated. The total cost of buildings and machinery was £2978.9s.8d. some £2119 more than Morton had estimated. Included in this sum was £628 for the machinery, which had not been accounted for in the original estimate, a high proportion of this cost having arisen from 'experiments which necessarily accompany the erection of new machinery'.[15] The gross cost of permanently improving the farm amounted to £7828.11s.3½ .[16] Against this could be set £3109.17s.0d. the net produce of the sale of timber after the land clearance in 1839, although it was certainly not taken into account when the new rent of the farm was calculated: £504 per year, an increase of £304. This increase was accounted for by the addition of a permanent element of interest at 3½ on the landlord's investment of £7828. On the basis of the farm accounts published in his book, Morton calculated that, as tenant, he had made a profit of £161.16s.3½ . in the year between Lady Day 1841 and Lady Day 1842, despite the fact that much of the land on the farm had still to be brought into full cultivation. But it should be noted that a reduced rent of £417 had been charged in that year, as opposed to the full rent of £504. No rent at all had been charged in the two previous years, owing to 'injuries done to the land in hauling away timber [17]

Morton's calculations ended in May 1842, at a stage when it was difficult to assess how accurate his estimates of the profits to be derived from the improved farm had been, He was certainly of the opinion that the farm had been a resounding success and, as proof, pointed to the fact that more than 1000 people, mainly from within a radius of 20 miles, had visited the farm between January 1839 and July 1842. The farm, he said, had been the means of improving the agriculture of the area in three ways: by the introduction of better implements of cultivation; by offering an example of a better system of cultivation; and by proving that the permanent improvement of land was a viable financial proposition. Field drainage seems to have been one of the great success stories of Whitfield, if Morton is to be believed, for he claimed that the example given there had provoked considerable response in the locality, creating such a demand for drainage tiles at nearby Oldbury, that a new tile factory had been erected.[18]

But in sober fact, the example farm does not seem to have been attended by the success that its architect claimed for it. His son, John Chalmers Morton, writing in 1864, complained that the amount of land under arable cultivation in south Gloucestershire had not increased during the period since 1840 and that little change in cropping had taken place. As Whitfield Farm had been an example of conversion from inefficient dairying to a system of highly efficient mixed farming with corn predominating, it would therefore seem to have had no effect. Morton junior also pointed out that dairy farms in south Gloucestershire had neither increased their productivity nor changed their system of farming in the 30 years since 1834.[19] So if Whitfield Farm did exert any influence on the type of farming practised in the area, unless it was to improve the quality of existing arable management, it must have been extremely localised.

Despite Morton's figures, the economic basis of the example farm project was also somewhat doubtful. The whole experiment revolved around the high farming doctrine of high capital input in order to achieve high output and higher profits. The capital input was extremely high for landowner and farmer alike and it is difficult to envisage either the landowner investing £4000 or more in every farm on his 5000 Gloucestershire acres, or that every tenant farmer would have at his disposal the £3700 investment capital needed to stock and equip such a farm. The high output was achievable, given the facilities of this farm and stable or rising market prices for the produce of the mixed farming system; but any hiatus in the stability of corn prices was apt to point to the flaw in this system: too heavy a reliance on corn crops. Whilst recognising the importance of livestock within the system, high farmers still placed their faith in corn and merely increased their production levels to compensate for falling profitability.

It could be argued, in some instances, that 'model farms were essentially a fashion in that they were expensive, trivial and, ultimately, ephemeral.'[29] But there can be no doubt that some model (or example) farms were honest attempts to improve the quality of farming in a particular area. Certainly, the dairy farmers of south Gloucestershire appear to have been far from efficient in the middle decades of the nineteenth century.[21] Perhaps what was wrong with Morton's example farm and its management system was that it attempted to introduce a mixed

farming system that was alien into most Vale farms. If he , had concentrated on demonstrating practical improvements in grassland management and livestock and dairy systems at Whitfield, improvements relevant to the large number of small dairy farms in his area, his example might well have been more widely followed.

But the importance of Whitfield Farm lies mainly in the fact that it displayed to the farming world of south Gloucestershire all the great advances made in agriculture during the first half of the nineteenth century. A showcase of this type enabled the saner and more practical aspects of agricultural progress, such as improved implements and machinery, new crops, improved seed, better methods of animal management, and the more efficient processing and handling of crops, to reach a wider audience than they might otherwise have enjoyed. Some examples of the Victorian model farm were certainly little more than expensive games played by rich men, but Whitfield Farm was a true Victorian model: it genuinely attempted to demonstrate a system of farming in a practical manner. What was questionable, in this case, was the relevance of that type of farming to the local area and the cost of its introduction, rather than the validity of the model itself to the type of farming it served.

Some two-thirds of the buildings of John Morton's original Whitfield Example Farm are still standing to-day, together with other buildings added according to the needs of later phases of farming progress. The feeding house and sheep yard were demolished some years ago and have given way to wide span buildings more able to cope with the storage and mechanical handling problems posed by modern farming methods. The remaining buildings illustrate only too well the dilemma of the landowner and farmer in relation to redundant farm buildings: cramped accommodation with inadequate headroom for modern machinery, and a courtyard layout which frustrates the efficient handling of crops and materials within a management system bearing no resemblance to the system for which the steading was designed. It is difficult to justify maintenance costs on unused or unusable buildings and it is equally difficult to find an alternative use for many of them. Some Victorian farm buildings have already disappeared, unrecorded, from the landscape; many more will be threatened in the future and will be lost to us in the same way unless their significance in the historical record is recognised and their presence recorded.

References

1 James Caird, *English Agriculture in 1850-51*, second edition, 1968, p 46.

2 John Morton, *The Nature and Property of Soils*, fourth edition, 1843, hereafter referred to as Morton. The portion relevant to Whitfield Farm is contained in two reports, to be found in the Appendices, pp 237-432.

3 Morton, p 224.

4 *Ibid*, p.228.

5 *Ibid*, p.232.

6 *Ibid*, pp 241-310.

7 *Ibid*, p 384.

8 *Ibid*, pp 410-11.

9 John Bravender, 'The Farming of Gloucestershire', *Journal of the Royal Agricultural Society,* XXV, I, 1850, p 167.

10 Morton, pp 412-15.

11 John C Morton ed, *A Cyclopedia of Agriculture*, Vol II, 1856, pp 966-7.

12 *The London Journal and Repository of Arts, Sciences and Manufactures*, XXIV, July 1844, pp 393-4. The patent was sealed on 10 July 1843.

13 *Journal of the Royal Agricultural Society*, VI, 1846, p 307.

14 Bravender, *op cit*, pp 166-7.

15 Morton, p 416.

16 *Ibid*, pp 415-17.

17 *Ibid*, pp 418-427.

18 *Ibid*, p.379.

19 J C Morton, 'On the Farming of Gloucestershire', *Journal of the Bath and West of England Society*, XII, I, 1864, pp 3, 21.

20 Stuart MacDonald, 'Model Farms', in G E Mingay ed, *The Victorian Countryside*, Vol I, 1981, p 224.

21 Caird, *op cit*, pp 40-45.