LOUDON

ON

LAYING OUT FARMS.

HARDING AND WRIGHT,
PRINTERS,
St. John's Square, London.

Kenton Farm

LAYING OUT FARMS

OF THE

SCOTCH STYLE,

COMPRISING

OF THE DIRECTION

OF THE

Berwickshire Husbandry

TO

WHICH IS ADDED

THE EXPEDIENCE OF ENCLOSING

AND THE

General Improvement of Landed Property.

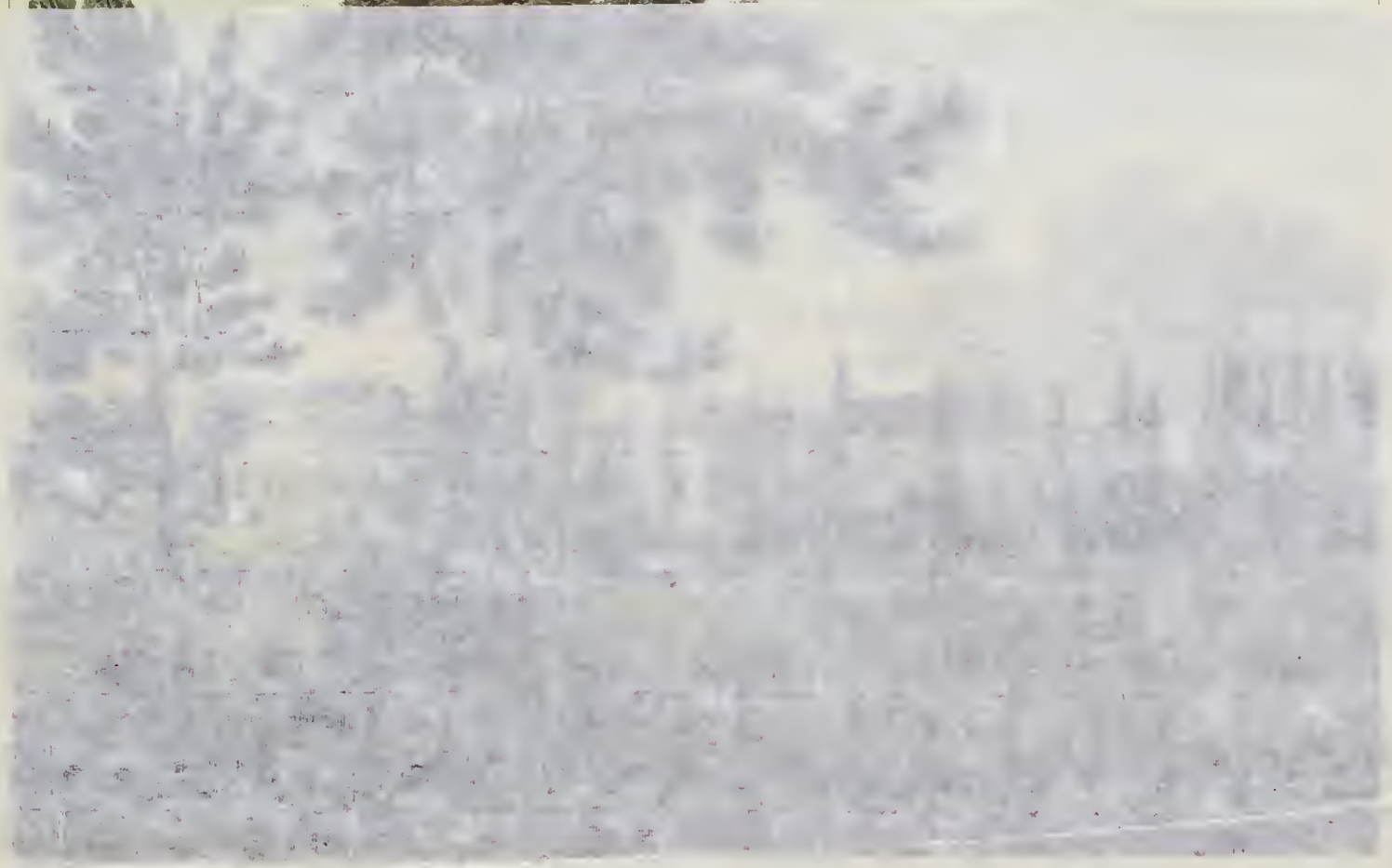
ILLUSTRATED BY

FORTY PLATES.

BY J. C. LOUDON, F. L. S.

LONDON:

1811.



OBSERVATIONS

ON

LAYING OUT FARMS,

IN THE

SCOTCH STYLE,

ADAPTED TO ENGLAND.

COMPRISING

AN ACCOUNT OF THE INTRODUCTION

OF THE

Berwickshire Husbandry

INTO

MIDDLESEX AND OXFORDSHIRE.

WITH REMARKS ON THE

IMPORTANCE OF THIS SYSTEM

TO THE

General Improvement of Landed Property.

ILLUSTRATED BY

FORTY PLATES,

DESCRIPTIVE OF

FARM BUILDINGS, RURAL IMPROVEMENTS, &c. &c.

RECENTLY EXECUTED.

BY J. C. LOUDON, F. L. S.

LONDON:

PRINTED FOR JOHN HARDING, No. 36, ST. JAMES'S STREET.

1812.

TO

HIS ROYAL HIGHNESS

GEORGE AUGUSTUS FREDERICK,

PRINCE REGENT OF THE BRITISH EMPIRE,

This Work

IS

(WITH HIS PERMISSION)

RESPECTFULLY INSCRIBED,

BY

HIS ROYAL HIGHNESS'S

MOST OBEDIENT SERVANT,

JOHN CLAUDIUS LOUDON.

42 *Pall Mall,*
May 30*th.* 1811.

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INTRODUCTION.

WHAT, it will probably be asked, is meant by the Scotch system of laying out farms adapted to England? To this I answer, that agriculture, in Scotland, is conducted upon more scientific principles than in England: that it has attained to a higher degree of perfection, and that, consequently, the buildings, and other adjuncts necessary to its operations, are better calculated for effecting the proposed end.

In selecting the designs now submitted to the public, I have, in the first place, made choice of Tew Lodge, as a farm comprising the *utile* and the *dulce* on the most extensive scale; as uniting almost every variety of agricultural character, and

as being wholly planned and performed by myself. I have entered into the detail both of its design and execution, and have given an outline of its culture and management. This, therefore, occupies the first, and largest chapter of my work.

Farms may be characterised either from their natural indications, as *soil, surface, situation,* &c. or from their accidental qualities, as the *purpose,* or particular sort of cultivation in view, and their *extent*. I have, therefore, in the following chapters given an example of each of the leading characters of farms, and have added just as much discussion to each character as was necessary to illustrate the principles on which it is laid out. In doing this I have studiously aimed at a becoming brevity; for I am well aware, that a self-explaining plate, however small, will communicate more accurate ideas on a subject of this nature, than the most copious details of letter-press description.

If the agriculture of the northern districts be allowed to be superior to what is practised in the southern (and who, that has compared the soil, climate, and rentals of the two countries, can doubt

the fact?) then the advantage of every measure that will promote its introduction will not be questioned by the public.

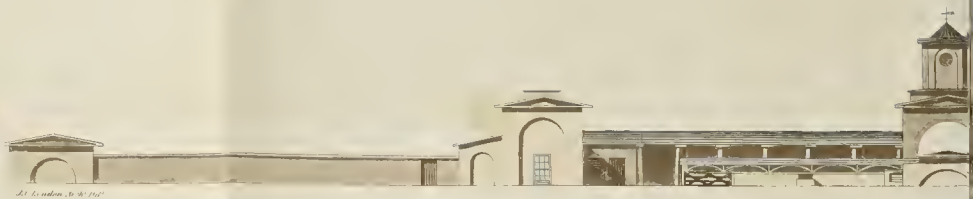
Whether that introduction ought to be effected by precepts issued to the native farmers, or by the introduction of Scotch farmers, as examples; or whether, as seems preferable, by the conjunct operation of both modes, may reasonably admit of a difference of opinion.

Without discussing the merits of this question, or enlarging on the utility of the present performance, it is enough for me to have had the honour of first directing the public attention to the difference between the rental of lands in Scotland and England*; satisfied, also, that while contending interests produce opposite opinions, or casual error incurs radical blame, the examples exhibited, and the stimulus produced by the northern farmers already settled in different parts of England, will, in a few years, decide as to their real effects; and will confirm the prophetic apophthegm of the first

* See Hints on the Rental of Landed Property, &c. published 1808.

natural philosopher of the age, that " agriculture has derived, is deriving, and will derive, more benefit from Scots industry and skill, than has been accumulated since the days when ADAM first weilded a spade*."

* Vide a Letter from Sir Joseph Banks to Sir John Sinclair, requesting him to write a work on Scotch farming; first noticed in the Scotch newspapers about a year after the production of my tract on the same subject. The expectation of this work of Sir John Sinclair precludes the necessity of my entering more largely on the subject of the agriculture of the North. *See Edinburgh Evening Courant for November,* 1809; *and the Farmer's Magazine for the spring quarter of* 1810.



General Elevation of the Farm

Panoramic view of the Farm, & Farm Buildings, at

Panoramic view of the farm, farm buildings, & farm house, a

Buildings at Tew Lodge.

w Lodge, taken from the entrance front of the farmhouse.

Tew Lodge, taken from a field opposite the house.


Swerford
Parish
From Swerford
From Chipping Norton
Swerford
From Chipping Norton
Hamlet of Little Tew
From Enstone

TEW LODGE FARM,

as it appeared
in August 1808

Scale of Chains

the Estate of Tew Park Rented by Mr. S. Wood


Plantations since 1808
Hedges D°
Single Trees & Groups D°
a House
b Farm Offices
c Culinary Botanic Garden
d Botanic Garden
e Orchard
f Walks
g Tower commanding the whole Farm
h Winter Garden cont° Frames &c
i Nursery
k Ballotts Garden
l Gardeners Garden & Nursery

Ten. Lodge

FARM & SUB-FARMS

With the Improvements as completed Mich.ᵃˡ 1820

To GEORGE FREDERICK STRATTON ESQ.ᴿ

This Plate,

Is most Respectfully Inscribed

by his much Oblig.d, most Ob.t Hᵇˡᵉ Servant,

J C LOUDON

		Contents A	R	P	Rent £	s	d
T.	Turnips						
B.	Barley Spring Wheat or Oats						
Cl.	Clover						
1.2	1.st Second Year						
W.	Wheat or Oats						
O.	Oats & P. Perpetual Pasture						
	Sub - Farms						
EG.	Easter Grove Ash						
WG.	Wester Grove Ash Farm						
SC.	Cockhills Farm						
JB.	John Bushys Farm.						
MB.	M.r Burlowe Farm						
N.	Needles Farm						
C.	Carnachat Farm						
BF.	Burlowe Field						
A.	Adams Mill & Land						
L.	Lowes Garden Ground						
V.	Houses to be Let to Villagers						
FS.	Field to be given up to the Proprietor if required						

Scale of Chains.

CHAP. I.

AN ACCOUNT OF THE BUILDINGS AND IMPROVEMENTS EXECUTED ON TEW LODGE FARM, OXFORDSHIRE, IN 1808-9-10:—REFERRING TO PLATES 1 TO 15.

THE estate of Tew is situated about eighteen miles north-west of the city of Oxford, on the border of that elevated tract of country denominated by Mr. Young, in his Survey of Oxfordshire, the "Stone Brash District." One half, indeed, is within this district, and the other in the red earth, or richer division of the county. The former may be distinguished, by a general observer, as exhibiting an irregular surface, a stinted vegetation, and good roads; while the other is marked by undulations more gentle, vegetation more luxuriant, and woods more abundant, and with bad roads, formed of a soft, red stone. Situation.

The condition of this estate, previously to my examination of it, in 1808, was not inferior to that of other estates in the neighbourhood. It was chiefly rented by tenants at will, or on twelve year leases, which were just expiring. The arable lands (comprizing all the stone brash division of the estate, and about a fourth of the red earth, or rich grass land divi- Condition of the Estate in general.

sion) were, very properly, cultivated under a rotation of, 1. turnips, 2. barley, 3. and 4. artificial grasses, 5. wheat, and 6. oats; than which no rotation, except the oats after wheat, could be better for the soil and situation. The rest of the estate, consisting of the park, of 160 acres, and the farms under discussion, was in old pasture and meadow.

Condition of Tew Lodge Farm.

Such readers as wish for a more minute detail, both with regard to the previous condition of the estate and the nature and advantages of the culture introduced, are referred to a pamphlet, containing a statistical account of the whole, by Sir John Sinclair, furnished to him by G. F. Stratton, Esq. the proprietor*.

* In that account it will be found that Mr. Stratton consulted me in the spring of 1808; that, after letting to a Scotch tenant 1500 acres of the arable lands, I took about 1800 acres of the grass land district myself, on a twenty-two years' lease.

At Michaelmas, 1808, I took possession of this tract, and commenced the improvements to be described on what I have called *Tew Lodge Farm*. When the improvements were completed, I purposed turning the whole to account, by subsetting; and having subset three small farms at a very considerable advance, my landlord entered into a treaty for purchasing my lease, stock, and total interest in the concern; which treaty was concluded, very much to our mutual satisfaction and advantage, in February, 1811.

the

FARM BUILDINGS

at

Barn
Granary
Potatoes for Horses and Granary over
Chaff
Unthrashed Corn over
Steam Apparatus
Cart Lodge
2d Fanners
Corn Floor Granary over
1st Fanners
Mill Seat and Watering Place
Pigs
Pigs
Pigs
Pigs
Pigs
Pigs
Straw House
Winterers
Hay Rick
Work Horses
Work Horses
Milch Cows
Work Horses
Work Horses
Stoves to be heated by Dung from the Yard
Hay Rick and Clover in Summer
Work Horses
Pigs
Mould Pots &c.

SECTION I.

GENERAL SCHEME OF IMPROVEMENT.

In that part of the estate of which I took possession, I immediately beheld the embryo resources of individual riches, and of general improvement; and I resolved, with the approbation and assistance of my landlord, whose ardour and liberality in whatever concerns agricultural improvement I can never adequately commend, to expand them into maturity, not only for our own mutual benefit, but for the public advantage likewise.

These improvements may be classed in the following manner, viz.

I. The Agricultural, or such as were necessary to carry on the business of the farm, and to improve the lands in the best manner.

II. The Horticultural, or such conveniences and luxuries in this art, as contribute to the comfort and amusement of a family residing in the country.

III. The Harmonious, or that attention to effect in making improvements, which contributes to the order, elegance, and picturesque beauty of the whole.

1. *Agricultural.*—The theatre of my operations was capable, from its compactness, either of being managed as one farm; or, as it was already in twelve holdings, great part might be advantageously let off to sub-tenants. On considera- Agricultural. *See Plate II.*

tion, however, I resolved to hold 1,000 acres in hand, (the quantity then out of lease and in the centre of the rest,) to form that into one complete farm, and to subset the remaining farms of the tract as they came into possession.

As there was abundance of lime on the estate, I was aware that this circumstance would render it immediately advantageous to break up great part of the meadows and pastures, while a proportion of them might, in a few years, be laid down in a superior state to what they were before; and others, on drier, upland soils, might be kept alternately in corn and tillage with more advantage than always in grass. The arable part was also capable of an improvement, almost incredible, by lime, by avoiding the two corn crops in succession formerly objected to, and by introducing the Northumberland method of cultivating turnips. Every part, also, stood greatly in need of draining, which is one of the most certain, most striking, and most lucrative improvements that can be made on any soil. Roads, likewise, were totally wanting; the fields were shaped in a manner ill situated to the surface; and their soils and fences were crooked and badly disposed as to shelter, surface, drainage, free circulation of air, and general effect.

As two streams passed through the farm, I foresaw that nearly 400 acres might be irrigated, which would increase the manure of the whole 1,000 acres one third part. The same water might also drive a threshing machine, which is allowed to raise the arable land at least seven shillings an acre.

There were, likewise, other improvements of a local nature, and many which are generally applicable in Oxfordshire; such as the introduction of two horse ploughs, one horse carts, and

other improved and simplified implements, which need not be distinctly enumerated.

2. *Horticultural.*—As more or less of planting and ornamental gardening is necessary round every country house, and as I had long wished to realise an idea which my mind had fondly dwelt upon for many years, that of forming a complete collection of vegetables, both useful and oramental, including also a great part of those which are curious, arranging them in groups gradually blending with each other, conformably to the *Systema Naturæ* of Jussieu or Linnæus, I resolved to attempt the project on the present occasion. I was incited, indeed, to the undertaking by some local facilities, for the soil was well adapted to trees and plants, and the surface round the spot on which I fixed for the house having a considerable slope and variety of shape, it was well calculated to exhibit my scheme to advantage.

A Nursery for forest trees and thorns was obviously a desideratum in this part of the country, and I perceived that it might be easily established. I was aware, also, that the person who tended the garden and managed the nursery might also act as a new ground workman; and I was soon able to reduce all my notions on this subject to practice. Nursery.

4. *Harmonious effect.*—The elevated site of the house, and the rising grounds behind, the winding lake and valley below and on each side, the opposite hills, the interesting undulations of the grounds in all directions, the distant prospect, abundance of fine old trees, and an ample supply of water, together with the circumstance that the roads, fences, farm-buildings, plantations, &c. were all to be made according to my own designs, could not but lead me to the hope of blending elegance with utility.

They who have seen the spot, allow that it is difficult to conceive a farm where they have gone hand in hand more completely and effectually. If we except park farms, time only is requisite for the trees and hedges to render Tew Lodge the most magnificent *ferme ornèe* in England.

SECTION II.

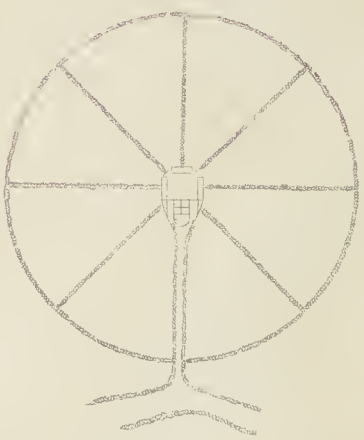
DESCRIPTION OF THE IMPROVEMENTS MADE ON THE LANDS, AS ROADS, FENCES, DRAINS, &c.

As, in most cases, more may be learned by a single inspection of a plan which is self-explained by writing, than by any extent of letter-press relating to it, I have, in this work, had the engravings executed and explained in such a way as will render little of that sort of description requisite, which consists of alphabetical or numerical references from the plate to the printed pages. The business of these sections, therefore, will be rather to discuss than to explain.

Roads.

Direction. In determining the direction of roads, the object in view should be to form a communication between the farm-yard and every field, or at least every *shift* or class of fields of the farm. In heavy soils they ought to touch at every field, but in a large farm of light soil where several fields, lying together, are under one shift or crop, it will be sufficient to touch at that one of them which is nearest the yard. Where a farm is not

Fig 1



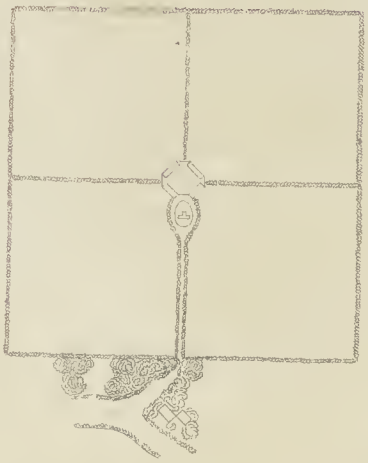
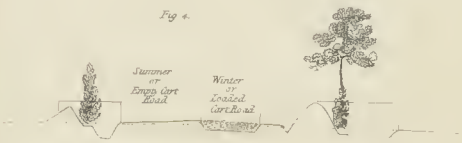


Fig. 3

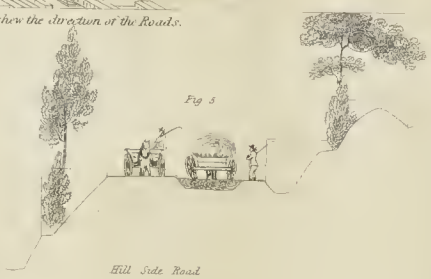
Ideal Skeleton of the Surface of Tew Lodge Farm, made in order to shew the direction of the Roads.

Fig 4.



Level Road

Fig 5



Hill Side Road

Fig 6

Fig 8.

Fig. 7

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hilly these objects are best attained by keeping the roads in the internal part; for a farm in the form of a circle, or of a square, with an angle of each field meeting in the centre, *(as in Fig.* 1 *and* 2, *Plate V.)* would require no farm roads, but merely a lane from the public road to the farmery.

The lands which compose this farm consist of two steep banks facing each other, with a hill at one end, thrust in as far as the centre of the farm; thus forming three vallies, with their respective hills or banks. To have formed the roads, therefore, either in the centre of the vallies or on the tops of the hills, would have been equally improper, though it undoubtedly seemed to be the shortest mode of communication with every part of the farm. But, to have descended from the hills to the vallies, and ascended from the vallies to the hills, with manure or produce, would have been nearly impossible, and at all events unprofitable. Hence the necessity of forming the roads on the sides of the hills, and conducting them nearly on a level, or sloping them only as much as was necessarily occasioned by the different elevations of the public road and farm-yard.

Thus they admit of easy access from the fields on each hand; and though the teams may have a hard pull on entering or leaving a field, yet, in either case, having once gained the road, they then draw with comparative ease. Though these hills were very steep* *(about the proportion shewn in Fig.* 3, *Plate V.)* yet I found no difficulty in carrying out manure and bringing home the corn with single horse

* A raised map, or model of the estate, which may be seen at my office, and at the *National Institution*, will more clearly elucidate the direction of these roads.

carts, using only an extra horse and boy at the entrance to each field. Hence, in this case, an extra expense in roads may be said to save half the labour of cartage.

Keeeping the roads on a level, or on a gentle slope, occasioned a circuitous route, which necessarily made a greater length, but which produced such variety and beauty as amply compensated for this unavoidable disadvantage.

Form. For private roads, the width of twenty-two feet from gutter to gutter is sufficient, and if a width of nine feet on one side be laid with hard materials, it is sufficient. These materials should be sunk so as to be level with the surface, as recommended by Mr. Marshall, and as shewn in *Fig.* 4, *Plate V.* Such roads readily admit of a loaded and empty team to pass; the former, keeping constantly *in one tract* on the hard, or winter road, and the latter *in one tract* on the summer, or grass road.

Ditches. In many cases ditches are not requisite; in others, a good ditch at one side, and a small gutter on the other, will suffice. Large ditches should have the hedge-side next the road, to prevent accidents, as in the section referred to.

Hill-side Roads. A road on a bank, or the side of a hill, is somewhat differently constructed from those on a level; and when finished, are in general better roads. *See Fig.* 4, *Plate V.*

Approaches. In approach roads in parks, without fences, under-drains or surface-gutters, at some distance on each side, will easily drain them; or they may be partially raised above the surface, as in the unfenced approach roads near the house, at Tew Lodge.

Materials. Every situation has its peculiar materials. Here, for example, we had a red soft stone on the spot, and a hard white stone at some distance. On those roads which were liable to

be most used, we laid seven inches in thickness of the former, broken into pieces from two to four inches in diameter, and covered with six inches of the latter, in pieces about the size of an orange, filling up the interstices with the dust and fragments produced in the quarry by working them. In the less frequented roads, white stone of smaller size was employed; and on about one half of the whole extent of roads, only the gutters, formed by the wheels, were filled up by these hard and more expensive materials. This mode, when two or three times repeated, renders them almost as durable as iron railways: the gutters in the summer roads we filled up with red stone.

In most cases, both the winter and summer roads were sown with grass seeds; by which means, in those seasons when not much used, (and according to my rotation, the mere farm roads would be little wanted for carts two years out of five,) they became good pastures. Grazing them serves the double purpose of keeping down weeds, and rendering them more agreeable to the eye.

Road Fences.

Hedges were the common fence, with a row of trees on one side (that which inclined most to the north) in level places: in the slopes, on both sides.

Hedge-row Trees.

Oak and English elm are much the best hedge-row trees, both for landlord and tenant. Elm is the most profitable, from its quick and large returns.

Repairs.

In repairing these roads, three things were particularly attended to. To avoid delay in beginning; to suffer no water to stand in any part of the road; and to fill up the rutts to the level of the road only, and not above it. This practice, in one year, will render any road complete, and a trifling annual expense will afterwards keep them in repair.

Fences.

Altering Fences.

In almost every old enclosed farm some alterations are requisite in the fences, to adapt the fields to modern husbandry. In rooting out old fences and forming new ones, the principal objects in view, in this farm, were to regulate the size of the fields, so as to make them from fifteen to twenty-five acres each; to connect them with the roads; to make the open ditches serve as drains; and to place the hedges in such situations as to afford useful shelter, without obstructing the view of the fields from the house.

On the high grounds the fields were made from fifteen to twenty acres each; in the sheltered slopes, and in the hollows, they were from twenty to twenty-five acres. The fences were, in most cases, run in a direction from north to south, in order to shelter the fields from the east and west winds. A plantation also formed the northern boundary of the estate, and already afforded protection from that quarter; and the south winds seldom or never prove injurious.

Shape of Fields.

The two longest sides of a field should be parallel, to avoid short ridges at the angles; and the fences should be laid out so far in unison with the slope of the surface as to admit the descent of the water in the furrows. If an ascent be very steep, the ridges will require to be formed diagonally across it, and sometimes the fences also; at other times, as in adhesive soils, when water does not sink in the earth, both hedges and ridges should be formed directly across the declivity, to cut springs by the ditch, and to prevent the water, in the furrows, from acquiring such rapidity in its course as to wash away the most valuable part of the soil. In altering fences, the separa-

tion of lands of different qualities, or for different purposes, should also be kept in view, as well as supplying each field with water, &c. An inspection of the plan, *Plate II. and III.* will shew, that the alterations that have been made in this respect have gained, independently of all the above objects, more than forty acres of land for the purposes of husbandry, and which were formerly covered with copse, blackthorns, and hedge-rows, and forming a mere nursery for noxious seeds, insects, and birds.

Sort of Fence.

Thorn hedges on the soil at Tew were, unquestionably, the preferable species of fence. The mode of planting them was somewhat different from the common method, and had the advantage of saving nearly all the expense of cleaning. It was extensively practised at the late enclosure in Needwood Forest, and consists simply in laying the thorn below the surface turf, as may be clearly understood by inspecting the sections, *Fig.* 6 *and* 7, *Plate V.*

The protecting fence, which was only requisite two years in five, viz. when the fields were under clover, consisted of hurdles. When under turnips no fence is deemed requisite, as the most improved practice is to fold the sheep on them by netting.

Trees and Planting.

Pollards may generally be considered as ignoble objects compared with trees: they harbour vermin, and injure the fence, by their tops being thicker and at less distance from the ground than trees. Their roots, likewise, are more injurious, because frequent lopping encourages their production. Pollards, also, are of no value but as fuel.

I rooted them out, therefore, over the whole farm, with the exception of such as could easily be trained into timber trees. Trees of every sort I carefully preserved wherever found. Being left in the sites of old hedges, they may be seen more or less in every field on the farm, forming either interesting groups, straggling rows, or single trees, with here and there a thorn or holly, to assist in connecting them.

This is one of the most obvious and pleasing of rural improvements, and though practised by every one who throws down a fence or lays two fields together, it never ceases to gratify both the improver and the accidental beholder. Such, it may be said, is the interest men take in trees; probably from those ideas of power and duration which a large and noble tree presents to the mind, and the variety and beauty exhibited by its foliage, whether in single leaves or masses.

Planting.

The hedge-rows in elevated situations, the acute angles formed by the intersection of the oblique lines of fences, the abrupt spots too steep for the plough, dells favourable for game, or furzy knolls for the fox, we left either wild, or planted as rows, thickets, groups, strips, and masses. To distinguish them from old plantations, they are exhibited, in the plan, with a tint of a yellower green colour.

The sort of trees used in these plantations varied with the situation. In rocky places, the fir tribe, beech, and mountain ash; in deep soils, the oak and chesnut; and in moist places, the birch, alder, poplar, and willow, were prevalent as timber trees. Underwoods were every where introduced, and chiefly the oak and ash. The latter for the potteries in Staffordshire. Many trees (of ten and fifteen years growth), and

thorns, and truncheons of poplar and willows, six or eight feet long, were grouped by the house, farmery, and waters, and in the fifty acres which were preserved as a park. These, particularly when aided by the luxuriant growth of the truncheons, produced immediate effect.

The trees were prepared a year previous to their removal, and in general thrived well.

Draining.

Surface water was unknown on this farm; but almost every field abounded in detached springs, which, not issuing from any common source or vein of water, seldom admitted of a general drainage by tapping in one spot, or by any other *Elkingtonian* manœuvre.

In some cases, however, such as where a whole flat was kept wet by the water issuing from the bottom of an adjoining hill, one drain round its base has dried the whole flat. This was the case where a drain was formed in the direction of the red line, *a—b*, *Plate III.* and at Grove-Ash House, by a drain in the situation of the red line, *c—d*, *Plate III.* The former drain laid dry twenty-eight acres, and the latter thirteen. Both these pieces had been intersected by numerous drains in an opposite direction, by the former tenants, but without any effect.

On the steep sides of the hills the detached springs were carried off by drains cut in a slanting direction across the declivity, so as to prevent the current of water from acquiring such velocity in its course as to wear out the bottom of the drain; a too rapid descent and a level being almost equally ill calculated for durability.

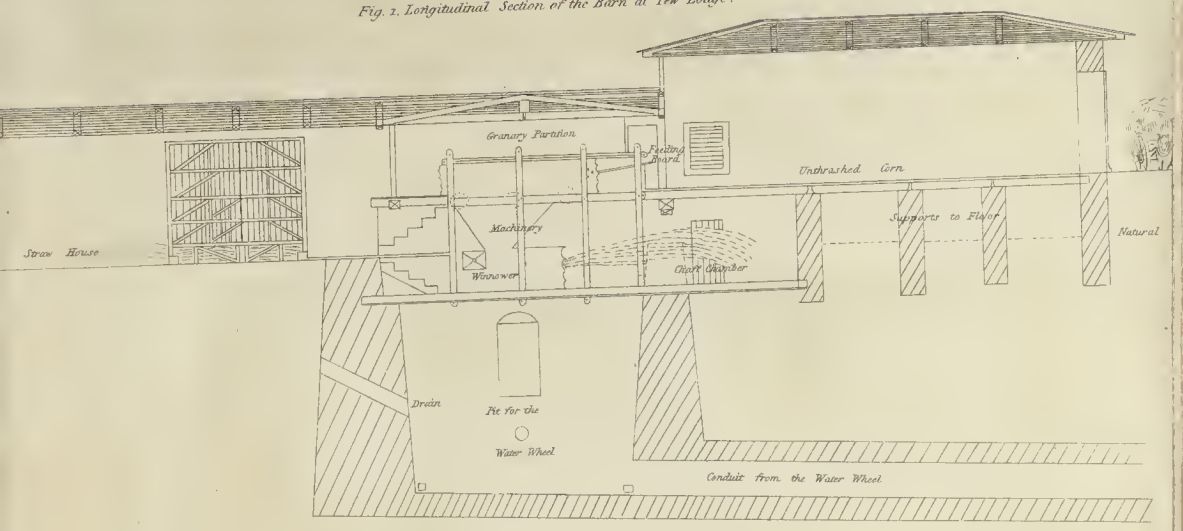
the whole or the greater part of the farm, and be, at the same time, desirably situated as a dwelling, it may then be considered perfect. The views in *Plate I.* shew how completely these advantages have been obtained at Tew Lodge; so much so, indeed, that there are few situations where they can be equalled, and perhaps none where they can be surpassed.

Arrangement. In the general arrangement of a farm-yard, the first object, where water can be commanded, is to adapt the situation of the barn to the proper spot for the erection of a water threshing machine. The next thing is to fix on the place for the rick-yard, contriving it to be near the barn, and yet, at the same time, not to interfere with the farm buildings. In the next place, all the buildings for live stock ought to be placed together, and as near the barn as possible, for the convenience of readily supplying them with straw, chaff, or refuse grain. The next principle of arrangement is, to have the cart-sheds near the stables, and, at the same time, not in a yard where the cattle run loose. The stables, also, should have as little connexion with the straw-yard as possible, as the constant intercourse occasions the gates to be left open. Poultry houses, houses for tools, field implements, carpenters, &c. should be by themselves, and near the steward's or bailiff's house. No straw should be near them, on account of fire; nor any loose cattle, &c. for obvious reasons. Excepting barns and granaries, few farm buildings need be more than one story high.

Detail. After particularizing the different buildings which compose this yard, I shall offer some cursory remarks on their utility and construction.

Barn. The barn has two floors, as exhibited in the section, *Fig.* 1, *Plate VI.* The carts ascend from the rick-yard to the floor for the unthrashed corn, on a gentle slope; and there is sufficient

Fig. 1. Longitudinal Section of the Barn at Tew Lodge.



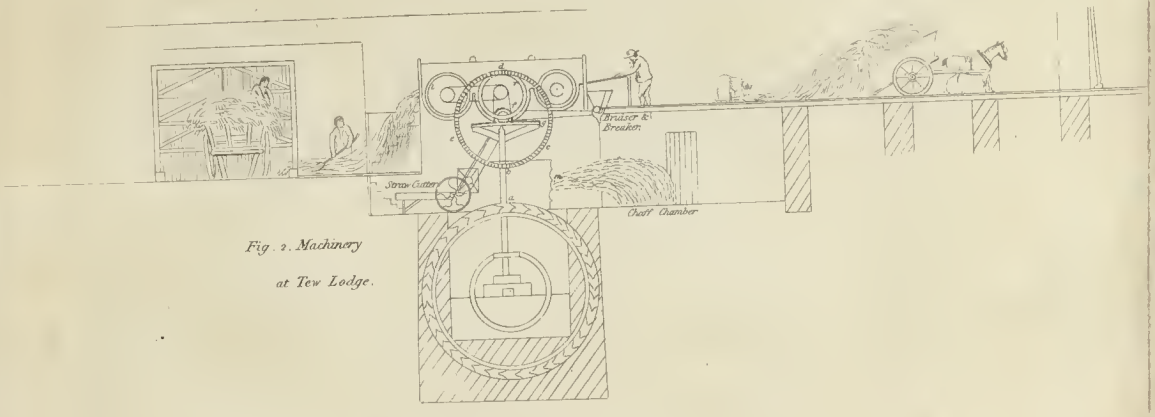
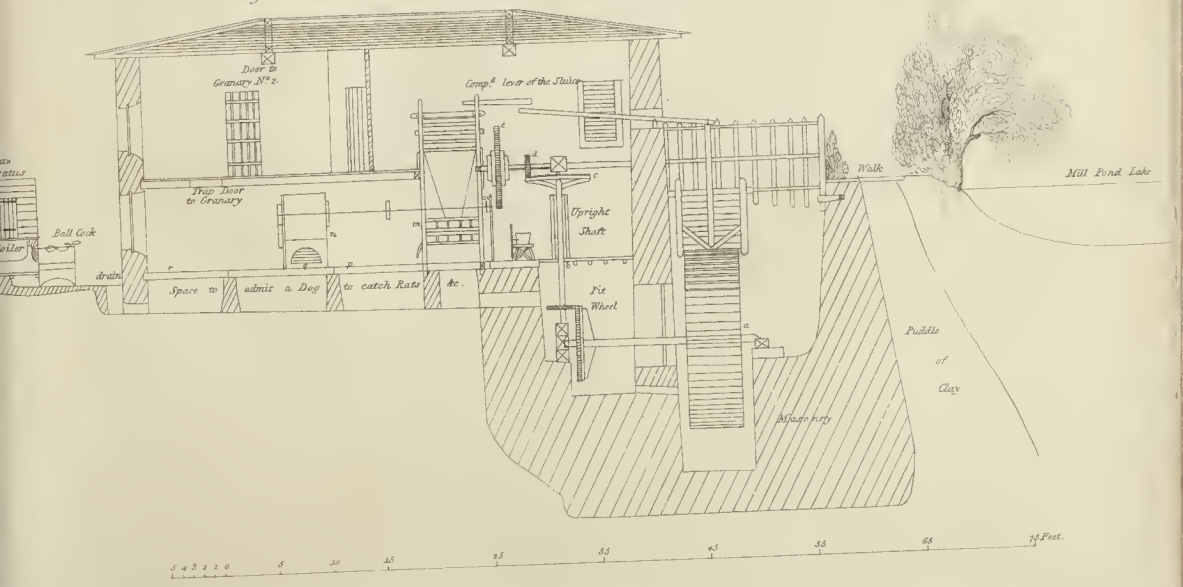


Fig. 2. Machinery at Tew Lodge.

Fig. 3. Transverse Section of the Barn and Machinery at Tew Lodge.



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width in the barn to admit of their turning round and unloading, by which means the corn is laid down close to the feeding board, at *a*, *(Fig.* 2, *Plate VI.)* The corn-floor is partly under the floor for unthrashed corn, and partly under the granary, as may be seen by comparing *Figs.* 1, 2, and 3.

The machine is on *Meikle's* principles, and is, by far, the best yet invented for the general purposes of husbandry. It breaks the straw in some degree, but thrashes very clean, and is not liable to get out of order. There are other machines which thrash loose corn*, and which are useful when the prevailing practice is to mow oats and barley; and Mr. Lister's machine, as far as I know, is the best where the object is to preserve the wheat straw unbroken for litter. By the two last machines, however, (and by most others, Meikle's always excepted,) corn is not thrashed much cheaper than by the common manual operation. Machine.

The machine at Tew Lodge will be understood from *Figs.* 4 and 5, *(Plate VI.)* I contrived it to suit the particular difficulty of having very little fall for the water, and the necessity of having the yard on a level spot, in the centre of the farm. It was executed by a very ingenious young millwright, from Edinburgh†. The motion is communicated by an overshot wheel *(a)*; is raised to the proper height by the upright shaft *(b)*, and multiplied till it reaches the pinion of the drum, or cylinder, by the intermediate wheels and pinions, *c*, *d*, *e*, *f*, *g*, *h*, *i*. It has two straw-rakes, *k* and *l*; one winnower beneath them, *m*, and another attached, *n*. The corn, as it falls down at *o*, is sifted at *p*, and then put in the attached winnowers;

* The best of this species is made by Forrest, of Shiffnal.

† Mr. Henry Lilley, now of Grangemouth.

after passing through which, at *q*, it is measured up, put in bags, and placed at *o*, whence it is either sent to market, or hoisted through a trap door to the granary above.

A bruising machine, bean breaker, and straw cutter are attached, and driven, by belts, from the other wheels, as shewn in the figures.

This machine, exclusively of the fixtures, cost £750. It is worked by seven or eight men, who, on acquiring the use of it, and also of a horse, cart, and two boys, to bring the corn from the rick-yard, produce the corn meted up and tied ready for market at the following rates, varying, however, according to circumstances.

Oats, from 3½d. to 5d. per Winchester quarter.
Wheat, - - 7d. to 11d. per ditto.
Barley, - - 4½d. to 6d. per ditto.
Beans, - - 7d. to 11d. per ditto.

In ordinary cases, it thrashes from eight to ten quarters of oats per hour, even if the straw be of extraordinary length; and of the other grains in proportion. The labourers who worked it at the above prices per quarter, generally made from 2s. 9d. to 3s. 6d. per day, of seven or eight hours, in the winter season. In November, 1809, when the machine was just erected and its powers tried, we thrashed twenty-two Winchester quarters of oats in one hour.

The Granary. The granary, above the corn floor, marked *No.* 1, in *Fig.* 3, *Plate VI.* is used as a temporary deposit of marketable grain, or of refuse grain for home consumption. The second and third for the common purposes of granaries. The windows and inner doors are formed of open work, in the usual manner, so as to create a complete draught of air throughout.

The first two granaries are floored with timber. The third may be floored with pierced earthen tiles*, beneath which, steam flues, supplied from the steam apparatus, may prove useful for drying moist corn in late harvests. At present it is covered with hurdles and mortar, in the Norfolk manner.

There are three other granaries in these buildings for small seeds, over the men's lodge, counting-house, and coach-house; and extensive wool and grass seed-lofts, in one of the old farm-houses, now the gardener's and carpenter's house. *See the references to Plate III.*

Roots. A cellar, or floor, is under the granary, 2, for the temporary reception of potatoes, carrots, or turnips from the fields, or preserved heaps in earth, until they are steamed for the horses or pigs. This cellar communicates with the chaff-room, and may likewise be the receptacle of chaff, for the same purpose, or for being drenched with hot water, for the cows.

Steam Apparatus. The boiler is five feet in diameter, and has seven tubes in the cover for steaming; with seven small barrels, to be lifted off and on, by a crane, in Mr. Curwen's manner. Perhaps a better mode, in regard to simplicity and economy at least, is to have a square chest, to steam four or five hundred weight of roots at once. The roots may be washed on the spot with a washing machine, and thrown in at the top of the chest. When full, the cover may be put on, and so fitted in as to be six inches below the brim, which will admit, in the angles, a luting of clay. When the process of steaming a chest-full is over, and the roots have become cool, they may be taken out by a door in front. Water may be supplied to the boiler by a

* As at Holkham.

syphon, as suggested by Sir George Mackenzie, or by a cistern and ball-cock, as usual. There is a tube at the bottom of the steam boiler, by which hot water may easily be had for drenching chaff, &c. A drain from the angle at the steam apparatus passes under the chaff-room floor, and conveys all waste water to the exit drain of the water-wheel.

Stables. The stables have no lofts; it being more desirable to use the straw directly from the thrashing machine; and hay, when given, immediately from the rick, situated in front of the stables. In place of having corn-bins, or corn-chests, in each stable, I found it better, also, to have the corn for each horse meted out in the barn by one man, and carried separately to every horse at feeding times: by this means there is a certainty of a fair division, without waste. The racks are placed on the ground, like those of cows, but of greater depth, so as to appear like a large grated manger. Thus the horses may eat when lying, and with greater ease than by the common hay-rack, when in any position. A manger of two feet square, and one deep, is placed in the corner of each stall in the rack, and level with its top, which is three feet and a half from the ground. A small compartment is at the ends of every stable for chaff, straw, harness, and stable implements.

Cow-houses. The cow-sheds and calf-pens require no comment. In very cold weather, the cows may be tied up, and a ridge of their litter, &c. thrown up in front of their sheds, to shelter them. But, in general, the run of the yard is preferable, where the object is butter and heifers, rather than milk and veal. A cow-house and calf-pens, where it is desirable to procure milk and veal, should, in opposition to this one, be as warm and dark as possible.

The egress from the pig-styes is into the central yard underneath the open shed; by which means the fatting pigs, when turned out to be littered, can never stray and do any damage, as is commonly the case with stock of all sorts about farm-yards. Their food is supplied to troughs, which are fixed in the back parapet wall, through a longitudinal opening, secured by a falling shutter. Pig-styes.

These piggeries may also serve for what rabbits a farmer may want, or for rearing calves; and, by covering the opening with a hurdle, they will form excellent places for fattening the larger sorts of poultry. Rabbits, Geese, &c.

The poultry houses have an upper and under floor: the ground floor of that next the smithy has a stage and boxes for turkies, the other has boxes for geese and ducks. Over both is a loft and stage, and boxes for common barn-door fowls. It is well aired in all directions, which is essentially requisite for their health. A complete nursery for all sorts of young poultry is displayed on the south side of the west wing. (*See Plate IV.*) Poultry.

The two false chimney tops over the coach-house and stable, (*See the View in Plate I.*) and which are made to correspond with those on the other side, are fitted up as columbaries or dove-cots. Pigeons.

A number of single men being generally employed on a large farm, a house for their use becomes necessary. They sleep, two in each stable, over the horses. Men, thus situated, may have much comfort added to their condition by their master allowing them milk and common vegetables, such as turnips, potatoes, and, if they will use it, oatmeal. By the example of some Scotch plowmen, who lodged in that house, se- Mens lodge.

veral young natives were reclaimed from the ale-house, and its concomitant extravagancies, to the more frequent use of milk, vegetables, and oatmeal, according to the Caledonian custom; and also to a taste for, as well as to the means of, providing better clothing, and the more rational entertainment of reading.

Counting-house.

In the counting-house and room above, are kept all the spare harness, sacks, cord, farm stores, beer in harvest time, small seeds in bags, &c. &c. Payments are made by the steward (in my presence when at home) every fortnight, at a certain hour and at no other time.

Boiler and Brew-house.

Behind is a boiler which serves the stewards family for washing, &c. and also for brewing for the farm: forming also, occasionally, hot draughts for sick cattle, &c.

Another boiler is opposite the carpenters' shop for their purposes. It was used for boiling and preparing the composition for the roofs.

Killing-house.

Two or more sheep were consumed every fortnight by the labourers on the farm. By selling it a halfpenny per pound under the market-price both they and I were gainers.

Carpenters' Shop and Manufactory.

The manufactory of implements has been hitherto carried on in the carpenter's shop and yard, and was intended to be so, till one of the farms adjoining the village fell in. The houses of this farm I purposed devoting to the factory, and adding the land to another small farm adjoining.

Feeding-byre.

I have given the plan and view of this building to render the design, as a whole, more complete; but it was not intended to be built till this spring, and perhaps not at all, as the cow-houses of the old farms supply its place by a very trifling alteration. The space for turnips, and openings for moving

them to the cattle, are evident on inspection of the plan. The place of a wall on the yard side of the byre is more economically supplied by a ridge of manure, and the pillars suit better for the sheds for winterers, when no cattle are put up to feed. When the dung is removed, pillars have also a more elegant effect.

The pond, for washing the horses as they come in from labour, required to be well laid with hard stone. It, as well as the drinking-trough, steward's house, &c. are supplied by a perpetual spring, which rises at the house.

Liquor Drain.

A drain was intended to be carried through the centre of the three yards to a pit, in the plantation, by the pond, marked "Pit," in *Plate III.* There it was proposed to admit two parts of common water, from the pond, to one of liquor; and, from this reservoir of fluid manure, to issue arteries and veins, so as to irrigate twenty adjoining acres.

Rick-yard.

The rick-yard contains two acres, fenced by hurdles on two sides, and by fixed fences on the others. By these means, as the outer rows of ricks are removed, the hurdles can be placed nearer, so as to admit of the space being grazed. A road surrounds the rick-yard, and other roads intersect it; and there are others, also, between every two rows of ricks, for the easy removal, to the barn, of any particular rick. The spaces on which they are built are first raised ten inches, and then staddles, or basements, are placed in the usual mode.

The staddles I was obliged to purchase from the outgoing tenants; otherwise I should have preferred walls, with deep projecting coping, as at Holkham. Some rows of ricks furthest from the barn, being constantly the first thrashed, have no staddles. There are some fine old trees in the rick-yard, and also in the farm-yard. I had them preserved while the

buildings were erecting, and they add greatly to the view of the yard, from the house and every part of the farm. *See Plate I. and XV.*

Steward's House.

The situation of the steward's house is such as to give its prospect a general command of the yard, and more especially of the stables and the clock: it is near the men's lodge and the counting-house for the steward, and also near the poultry-houses for the stewardess.

Fire.

It happens that the lower half of the centre yard, and the whole of the two wings are four feet under the centre of the mill-ponds; consequently, by stopping the arch under the clock with a board and a few spadesfull of earth, the whole could be inundated in a few seconds, in case of fire.

Walls.

Materials employed for the Walls of these Buildings.—The coarse soft stone of the spot is employed; and, as they are chiefly one story high, and the roofs of the slightest construction, they are carried up as narrow as workmen can execute them with such rough materials.

Floors.

The floors of the stables are causewayed; those of the barn are laid with two-inch oak plank, with sufficient vacuity below to admit a dog for the rats. All the others, as well as the yard, are laid with white hard stone, blended with quarry chips and dust.

Doors and Windows.

The doors and windows have nothing peculiar. The latter, except in the steward's house, men's lodge, barn, &c. are chiefly after the manner of malthouse and granary windows. They are all coated over with a mixture of tar, ochre, and pitch, for preservation.

Roofs.

The only peculiarity of construction and materials, which is remarkable in these buildings, will be found in the roofs.

Construction.

These are made very flat, and instead of tile, thatch, or slate, are covered with paper, prepared by repeated immer-

sions in a mixture of tar and pitch. The detail of this sort of roof is as follows.

1. The couples are formed as in the sections in *Plate VI.* allowing one inch of rise for every foot of base, and of a thickness in proportion to the width of the house, and the sort of wood employed. Couples.

In these buildings, where the base of the couples was twenty-two feet, we used elm, six inches square*. We placed these couples from six to ten feet apart on the walls, according to the length and strength of the rafters, which we had to lay from the one to the other.

These rafters were generally young larch trees, from two to three inches, sawn in two, so as to have one even side; and placed from twelve to eighteen inches apart, according to their strength. On these, in a direction from the eaves to the ridge, (contrary to the mode used for slate, that the warping of the thin stuff may not form hollows, and retain water,) were nailed boards, a quarter of an inch thick; and on these were nailed the paper, generally two sheets in thickness, (though one sheet will suffice) the one overlapping the other, in the manner of slating. Rafters.

In some cases we used closely-wrought hurdles, instead of boards, plaistering them over with mortar before laying on the paper; and then fastening the paper down by strips of wood, two inches in width, placed six feet apart, and in a direction from the eaves to the ridge. This mode answers very well, and only requires the couples and rafters to be about a fourth part stronger.

Another mode, which we adopted, was to use common plaisterer's laths, instead of thin boards or hurdles. They

* It was used in a square form, to prevent twisting; otherwise, in fir and oak, every body knows it is depth that gives strength.

were nailed on the same as the boards, in a direction from the eaves to the roof, and succeed almost as well, where there is no risk of people attempting to walk on the roof, or thrusting a fork, or any pointed instrument, through it from below. In this case, and in all the stables, only the thickness of one sheet was used.

The granaries, *No. 2 and 3, Plate VI.* the shed for winterers, and part of the upper, or central roof of the house, were likewise covered in this way, and are no less water-tight, durable, and elegant, than those done with thin boards and hurdles.

Paper. 2. The next thing is the *sort* of paper, and its *preparation*. Any coarse paper will answer; but that which is used by button-makers seems to be the best. I had a cheaper sort made on purpose by Messrs. Swann and Co. Ensham, Oxon. It is commonly in sheets, two feet by twenty inches.

Preparation. In preparing the paper, a boiler, three feet wide and two feet deep, must be placed over a furnace, in the open air, and either coal or vegetable tar and pitch put in it, in the proportion of three-fourths of tar to one of pitch. The fire being lighted, as soon as the mixture boils dip the paper in it, sheet by sheet, and afterwards lay it out on a board to drip, putting a little grease of any sort between each sheet, to prevent their adhesion. In a day or two they may be dipped a second time, in a similar mixture, and afterwards, when dry enough to be conveniently handled, they are fit for use. Begin at the eaves, and, in laying the first sheet, make it overlap the the ends of the boards, nailing it underneath. The rest is precisely the same as in slating. *(See the Section where the thickness of the sheets is represented beyond its real size, for greater perspicuity.)* The number of nails required is about four to each sheet. They are made on purpose with large

heads, and are about an inch in length, very similar to what carpenters call brads. I covered some of the roofs without nails, except at the eaves and ridge, and I found them answer equally as well; so adhesive, indeed, is the tar to the wood, and one tarred sheet to another, that nails are scarcely necessary. The coating of pitch, in the manner to be described, forms the whole into one body.

3. The paper being put on, it is next to be coated over with a mixture of tar and pitch, about two parts of tar to one of pitch, thickened with powdered charcoal, and whiting or lime. One coating is sufficient. It is laid on at boiling heat, with a mop; and when it becomes dry and hard, (which, from the quantity of pitch, it does almost instantaneously) it will be found encrusted about an eighth of an inch in thickness, quite smooth, and the joints of the paper and every crevice totally covered. If smithy ashes, forge dust, or sharp sand be strewed over it, while hot, it will not readily catch fire from sparks or flame, nor melt by the heat of the sun. Outer Coating.

The advantages of this species of roof are, *economy*, *durability*, and *elegance*.

The economy results not merely from the lightness of the requisite timbers of the roof, but from the comparatively slender walls which will suffice for supporting it. At Tew Lodge, I found that it cost from fourpence to tenpence per square foot, all expenses included A square foot of a roof so flat as this, is reckoned to cover as much level surface as one foot and one-tenth of roofs raised to the ordinary pitch; so that, besides being cheaper per foot than the common roofs, one foot in ten is saved altogether. What the saving must be Economy.

on walls of buildings so roofed, will be according as stones, brick, stud-work, or weather-boarding be employed. The smallest saving will, of course, be made where the walls are built of stone, and the height only one story; as, from the coarseness of the materials, the walls must, unavoidably, be made of considerable thickness.

Durability. Their durability may be inferred from the nature of the surface exposed to the air. We have no common substance, indeed, more durable than pitch, except it be lead. Proofs, however, can be had from different buildings erected and roofed in this way, many years ago; such as the Church at Dunfermline, the prepared roof of which has stood forty years, without requiring any repairs; the roofs of several warehouses at Greenock, Deal, Dover, Canterbury, &c. which have stood from ten to twenty years. Farm-houses in Scotland are frequently roofed with it*. The extensive mills, offices, and dwelling-house, at Ensham, have also been covered with it, by Mr. Harris, of Oxford; a gentleman whose judgment in architecture and building is undoubted, and who ranks too high in his profession to sanction, by his practice, any uncommon material not preferable to those in familiar use.

Elegance. The flatness of those roofs being greater than that of slate, their resemblance to that material, in colour, and their projection at the eaves, communicate ideas of lightness and Doric simplicity, unfelt in viewing any other species of roofs. In this respect, and in every other, my opinion is so decidedly in their favour, for *farm buildings*, *churches*, *warehouses*, and

* See Farmer's Magazine for 1808.

such edifices as do not require constant fires in them, that I should not use tile, even if it were to prove considerably cheaper. For slight moveable edifices, such as sheep-houses*, field barns, field-racks, &c. no roof can be more appropriate.

The only objections I have ever heard made to these roofs are, the danger of their being blown off by high winds, and their liability to accidents by fire. With regard to the last objection, they seem to me *not* so liable to catch fire as thatch. Pitch, especially if coated with sand or smithy ashes, will not be ignited by a spark, nor even by the application of a slender flame, as will that material; though, on the other hand, when lighted, it will unquestionably burn with greater fury and velocity than any species of thatching. Objections.

The other objection may easily be prevented by the builder.

Before these roofs were finished, and through the carelessness of a worthless man, who undertook part of them by the job, I had an accident from a high wind, but none whatever since they were completed.

In the steward's house and men's lodge, wood is constantly used as fuel; which, though more dangerous than coal, on account of emitting sparks, yet no accident has happened, or is likely ever to happen. In the house, where coal is chiefly used, the chimnies have been repeatedly set on fire, to clean them, without the least accident happening to the roof. I have never, indeed, heard of any paper roofs having caught fire. They are insured at the rate of *simply hazardous*†.

* For illustration, a model of a sheep-house, roofed with paper, may be seen in my office, and at the National Institution.

† Convinced that it would contribute much to lighten the expense of agricultural buildings, and improve their effect among rural scenery, I am anxious to make these

Repairs and Additions on the old Farm-buildings, &c.

These are executed in conformity with the original style of the buildings. Such as could not be repaired from decay were erased, and the materials used for roads, new buildings, or as manure.

SECTION IV.

THE FARM-HOUSE, GARDENS, AND PLEASURE-GROUNDS.

It is observed, by Columella, that the most desirable situation for a house is near a spring of water, on the south-east side of a hill, at a sufficient distance from its base to command a view, and avoid damps, and far enough from its summit to be sheltered from the north and west winds, and to admit of its being embosomed in woods.

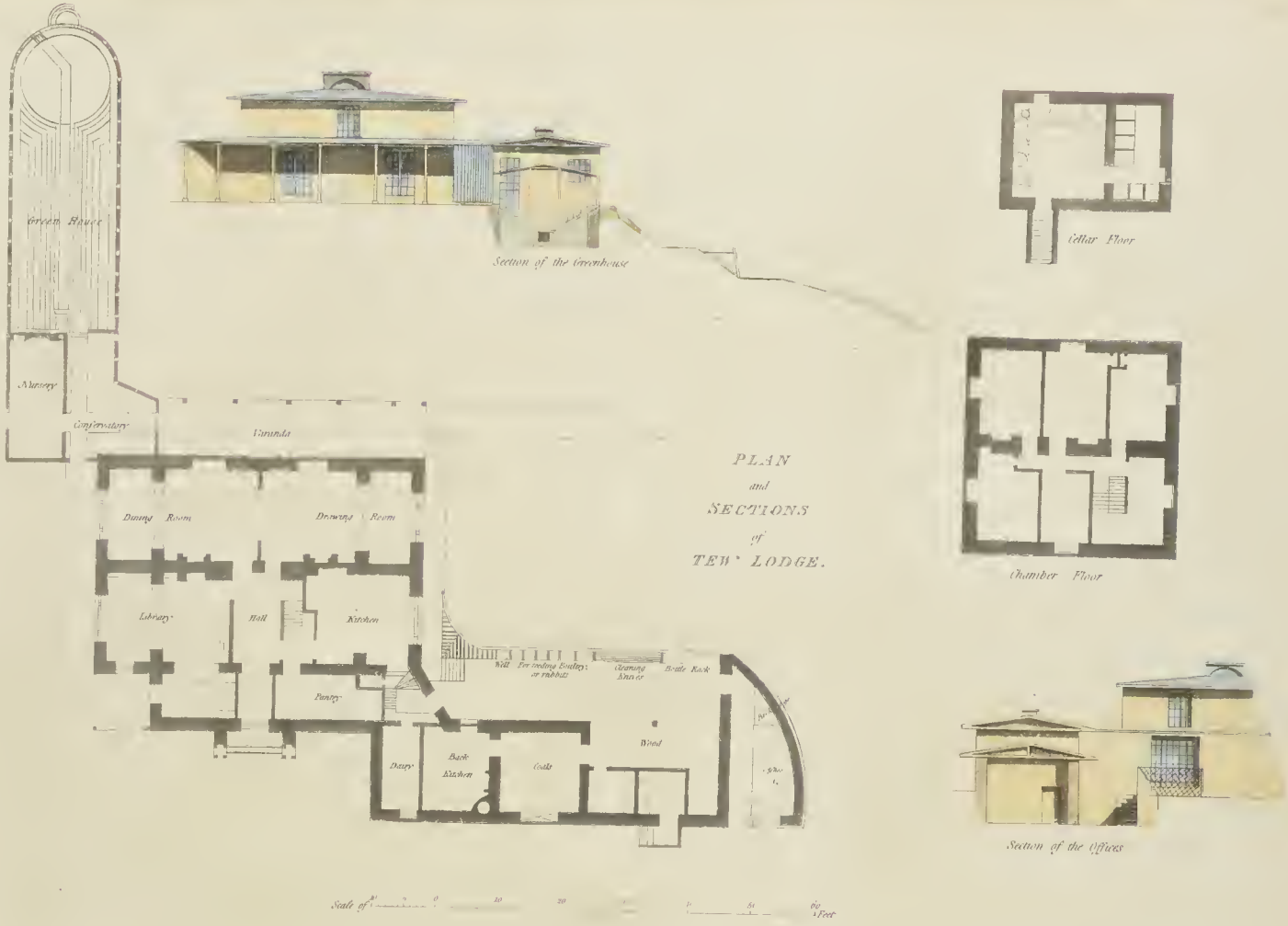
To this may be added, in the case of a British farm-house, that it should command a view of the farm and farm-offices. The situation also will be rendered still more interesting, if the country beyond the farm boundaries be varied and picturesque. The plans and sections of the house are given in *Plates VII. and VIII.* and require no explanation. The bed-room, with fold-

roofs as extensively known and as easy of adoption as possible. For this purpose I have published an account of them, with more detail than above, in the form of a pamphlet, for country builders.

Published for the Proprietor, May 10 1811.

Entrance Front of Tew Lodge

Published for the Proprietor May 10. 1811.



Published for the Proprietor May 1811

ing-doors off the library, may, to those not so infirm as myself, be made a study, dressing-room, or business-room. The porch, with which it communicates at the angle of the house, I found singularly convenient, as my steward could, at any time, have instantaneous communication with me, by coming directly to the windows (or rather doors) under this porch. From the bed-room, and from almost any part of the library, the whole of the farm buildings, and nearly one half of the farm, may be viewed without any change of position. By this means the farmer, when he sees any thing amiss, or which requires his notice, has only (uninterrupted by weather) to walk out under the porch, and with a French horn first direct the attention of the party, and then give orders through a speaking-trumpet. These instruments I had constantly placed in the porch, and I could not only communicate, by this means, readily with any person at the farmery, but give directions to servants at half a mile distance.

It may be requisite to notice, that the principal female servant, while seated in the recess by the kitchen fire-place, commands, through the windows and passage, what is going on in the back-kitchen, dairy, servant's rooms, open yard, coal and wood-house, cleaning place and back entrance; and the mistress of the house, while either in the dining or drawing-room, may, by looking through the glass-door of the conservatory, observe what passes in the nursery and the green-house. All the chimnies, except that of the back-kitchen, green-house, and nursery, are carried up the middle wall, which, by thus being constantly heated, keeps the whole house warmer, and supplies the place of fires in the bed-rooms.

Several other advantages, partly designed and partly resulting from situation, need not be pointed out. The leantos

which surround the whole, add greatly to the size and convenience of the ground-floor, and the singularity of effect produced in the inside of the principal rooms, by the arches supporting the walls of the central house, when neatly fitted up and furnished in the cottage style, is at once pleasing and uncommon. The roof of these leantoos being nearly flat, forms a walk completely round the house, and serves as a common balcony to the bed-room windows.

In the green-house are placed a complete collection of vines, but there was not sufficient time to roof it in with glass.

The conservatory was finished, and completely and luxuriantly covered with creepers the first year. The green-house may easily be turned either into a large nursery, a billiard-room, or bed-rooms. The hot-beds and hot-houses were only partly finished; in situation they are contiguous to the farm buildings, for the convenience of litter, by which they also are all heated.

Gardens and Pleasure-grounds.

Culinary Botanic Garden.

The principal kitchen garden is fenced with tarred pales to the north, east, and west, and an open espalier to the south, in order to admit the sun both to the trees and border. The arbours, at each end, are planted with hops, to be succeeded by vines. This garden contained, when I left it, a specimen of every sort of fruit tree, fruit shrub, and culinary vegetable, known in Britain, with a very few exceptions. Flowers or plants, merely ornamental, were not admitted.

Common Culinary Garden.

An outer garden, for common culinary purposes, and in which less order and neatness are requisite, is placed so as not to be conspicuously in view from the general walks.

Garden Front of Tom Lodge

J. C. Loudon del.

Greig fc.

East Front of Fern Lodge

Published for the Proprietor May 1st 1811

NG
of the
GARDENS & PLEASURE
at
TEW LODGE
1810.


Kitchen Garden
For Kitchen Crops
Flower Garden
Evergreens
Aquatics
Terrace Walk
× Represents Trees.
· Shrubs.
Classes or order of Plants in the Syst.
Class & order second in the Syst.
Hedges.
Baskets of Flowers
Old Trees.
Feet.

In the orchard, the fruit trees and fruit shrubs, such as gooseberries, raspberries, filberts, &c. are grouped together, and the turf is composed of strawberries, cammomile, thyme, cowslips, violets, and other fruit plants, herbs and useful flowers. Orchard.

The botanic garden is employed to preserve those rarer species of plants, which are too delicate for the general pleasure-ground, or *systema*. It contained a complete collection of British grasses and bulbous roots, and many scarce species of almost every class of plants. Botanic Garden.

The flower gardens, American grounds, garden of evergreens, rock-work, pond for aquatics, &c. require no description.

The pleasure ground comprises the whole of the scenery round the house, and, of course, includes these gardens. Its chief feature was the *systema*, formed nearly on the same plan as that attempted by Dr. Darwin, at Lichfield. The relative proportion of hardy plants and trees reared in Britain, in each class and order, is indicated by the size and group devoted to it. Their shapes and relative position are, in some respects, governed by the propriety of throwing a sufficient quantity of trees in the central parts of the scene, for distant effect, shelter to the house, shade to the walks, and character to the whole. This *systema*, by the aid of my botanical friends, I realised to a considerable extent, and was highly gratified by its effects. Pleasure Grounds. *Plate IX.*

Independently of its other beauties and advantages, this mode of botanical arrangement is preferable to any other, for a private collection; because whatever new acquisitions are made, they can be added in their proper place, according as they are procured, without disturbing the order of the rest. When, as in my case, the variety commenced with is small, it

is only requisite to plant a considerable number of common articles among them for immediate effect, and to root them out as opportunities may occur of inserting better species in their room. The glades between the groups and masses are of pasture, intermixed with the lower herbaceous plants, creepers, &c. of the classes and orders immediately adjoining. Those parts of the ground which are not occupied in any of the modes above specified, consist of lawn, diversified by groups and thickests of forest and fruit trees, shrubs, thorns, &c.

Few walks can be more interesting, whether to a farmer, botanist, or admirer of inland scenery, than the terrace leading from the right and left of the house. On the one side is this botanical shrubbery, rising on a steep bank of turf, and every step presenting new dispositions of groups, new shapes of glades, and (to the discriminating eye) new instances of the endless variety of nature. On the other, a sudden and continued steep, covered or varied, by groups of trees and shrubs, till it descends to the lake. In the middle distance, the lake, the buildings, roads, pasture stocked with cattle and sheep; and arable fields, undergoing the agricultural operations of twenty teams. In the distance, a continuation of rich pastures, wooded hills, farm-houses, churches and villages; terminating in woods and hedge rows, which retire from the eye as they diminish in brilliancy, till they are lost in the mist of the encircling horizon.

Nursery, Seed-garden, &c.

Nursery. The oval nursery, near the lake, is solely devoted to the propagation of fruit-trees; that at the farm-house, near the village, is allotted to seedlings of every description.

Transplanted articles were, in the mean time, grown in the newly made plantations, till, by the growth of more seedlings, it should become requisite to enlarge the nursery for their reception, when fit to be transplanted.

Thirty thousand currant cuttings were planted in the nursery in 1810, for removal to the site for the plantations in the autumn of 1811. They are grown extensively in Worcestershire, for the British wine manufacturers. Currant Plantations.

SECTION V.

THE GENERAL PLAN OF EXECUTING THE IMPROVEMENTS.

After having matured, in my own mind, the design of the preceding improvements, the next thing was to plan the mode of their execution. A well regulated arrangement in this respect is eminently necessary in every case, but peculiarly so where the master has occasion to be often from home, as I had.

The improvements naturally divided themselves into four classes: 1. The farming operations; 2. the ground-work, such as roads, drains, &c.; 3. the erection of the buildings, machinery, &c.; and, 4. the formation of the garden, pleasure-grounds, lake, and plantations. I therefore procured a proper foreman for each of these departments, obliging each to work according to plans and written instructions; a method which, besides habituating managers to accuracy and precision in their operations, admits of an intelligible cor-

respondence taking place when the parties are at a distance from each other.

When the improvements were nearly completed, I of course discharged the foreman of the buildings, and of ground-works, and retained only the steward, and gardener (Mr. Alexander M'Liesh), whom I still keep for the execution of similar improvements.

Expense.

A minute detail of the expenses incurred by these improvements could serve little purpose; even less, if possible, than giving the rates of labour per day or job, which is already done in the report of the county. I shall state, therefore, only the total expenses under the principal heads of improvement, viz.

Buildings	£6,212	8	9¾
Roads	2,261	12	2½
Draining	1,465	3	3¾
Moving fences	331	15	2½
Clearing from incumbrances and levelling	366	19	7½
Forming fences	324	14	0
Repairs	59	8	10
Lake, and exit drain for the threshing-machine	565	18	5¼
House	1,050	18	4
Gardens	695	12	4
Total	£13,434	11	1¼

The whole of the above sum, excepting the expense of the house and gardens, was laid out by Mr. Stratton, whose liberality, in this respect, is above all praise of mine; and for whose encouragement and assistance, from first to last, I am proud to acknowledge myself deeply indebted.

SECTION VI.

GENERAL SCHEME OF FARM MANAGEMENT.

The soil of the farm may be classed in three divisions.

1. Moist soft hollows, best adapted for general pasture.

2. Gentle slopes and levels, having such a command of water as to admit of their irrigation: and,

3. Dry uplands, better adapted for arable and pasture alternately, than either constantly.

The ultimate object of the farm culture was to form these classes, and to apply them to their proper purposes. In doing this, I had to commence by practices which, apparently, indicated very contrary intentions: for, though great part of the lands adapted to perpetual pasture and water-meadow was already old turf, they were, in general, so deteriorated by neglect of draining and other evils, that they consisted chiefly of sedge (carex) and other coarse grasses, rushes, furze, bramble, broom, moss, and ant-hills. *See Plate II.* These I broke up; and after taking one or two crops, was proceeding to treat them with fallow, lime, dung, and then to lay them down with a proper mixture of grass seeds.

Whenever the lands were sufficiently dry to admit the alternate or convertible system of husbandry, as it is called, I intended to preserve them for that purpose, the grounds round the house excepted; holding it as a general principle, that all dry soils, when easily worked, will yield more produce under

a system of alternate pasture and tillage, than under either of these systems alone.

The general practice was to break up old turf by the plough, and sow oats the first year. However, I tried paring and burning with three fields of different descriptions; and from the result of the experiment I am decidedly convinced that it is the preferable mode, where the lands have been more than five or six years under grass. The great evil which results from breaking up by the plough is, that only spring corn and green crops can be sown with success; the abundance of undecayed vegetables throwing out wheat and clover in the winter season. Even fallow and liming will not destroy these roots for three or four years, as I have experienced in the case both of Wood-Hall and Kenton farms. On the other hand, the system of paring and burning admits of sowing wheat and grass seeds immediately, if desirable; and the vegetable ashes and burned earth, by acting in the double capacity of lime and dung, induce the most powerful and certain vegetation.

I proceeded to cultivate the arable lands in the following rotation:

1. Turnips, or other drilled green crops. In the first year, where the lands were foul and in want of draining, I made fallow in some spots destined for green crops in every after rotation.

2. Barley, spring wheat, or oats.

3. Clover fed, excepting what might be requisite for the horses.

4. Clover, fed entirely.

5. Wheat. *See the references to Plate III. which exhibits the actual state of the farm at Michaelmas*, 1810.

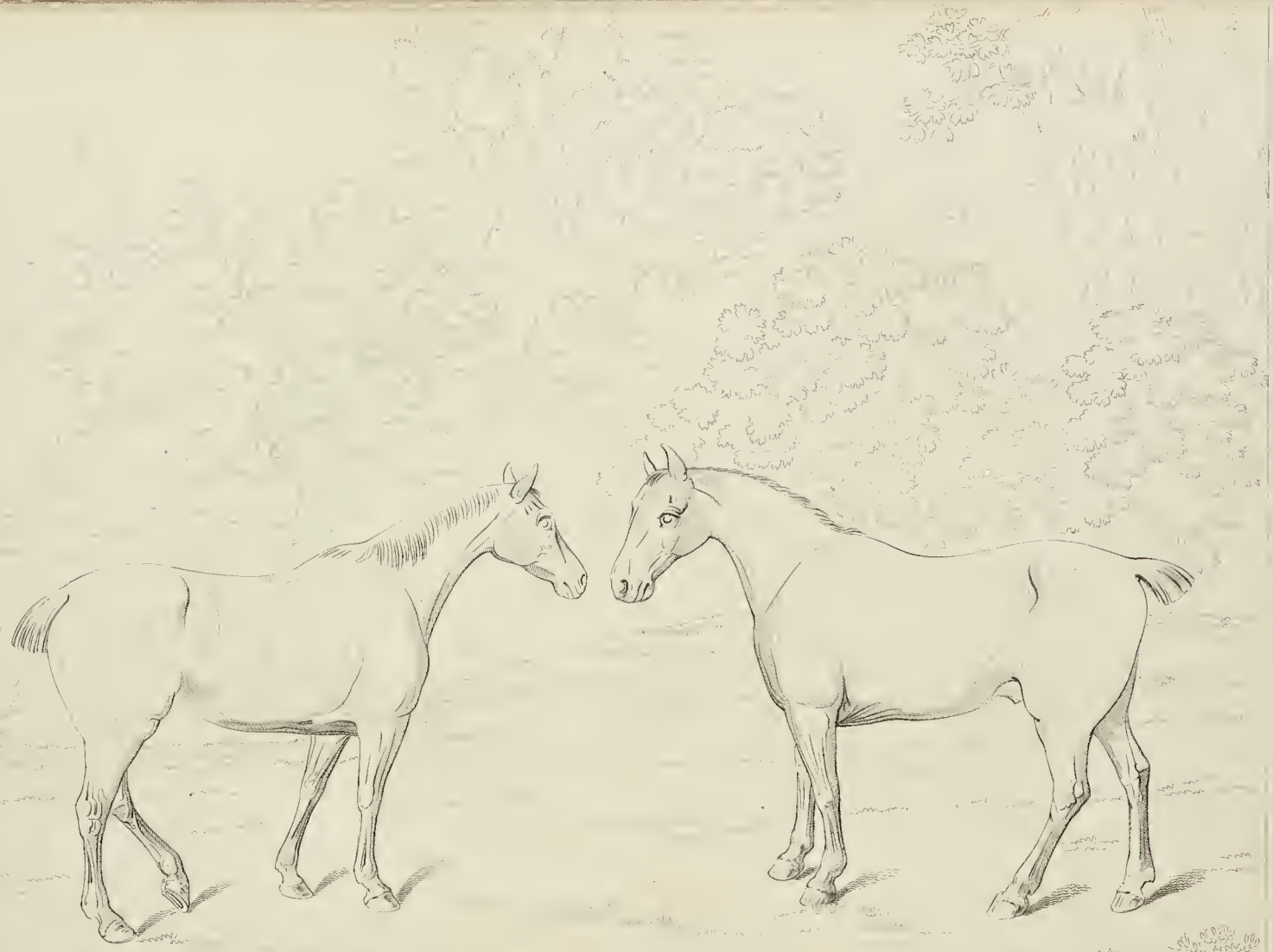


Fig 1

Fig 2

Of the turnips, I carried off every third row for stall-feeding, and consumed the rest on the spot with sheep. The clover I ate off, chiefly with Scotch bullocks, (previously made half fat in the yard, by turnips,) so as to send them to market early in August. I had not tried oxen in draught; but certainly should have done so, had I remained a year or two longer. The horses I used were of the Cleveland breed *(Plates XLII. and XLIII.)* from the North Riding of Yorkshire; and I found, that for less prime cost, and with less food, and care from servants, they did one third more work than the heavy horses of the country, and were much less frequently laid up, either from accident or fatigue. I have since tried a pair of these horses on the heavy clay at Kenton farm, and find the breed answer there equally well; with this obvious difference, however, that they require to be stronger than for such light lands as those at Tew.

I conclude this account by stating, that in adopting the Scotch implements, and pursuing the Berwickshire system of husbandry, I did not neglect such variations in both, as experience and observation had taught me to adopt from the practices of different parts of this country. That the Scotch system, or that of alternate grass and tillage, is decidedly superior to all others for land under aration, will not admit of a doubt by any scientific agriculturist of liberal information and experience. The application, however, of this system to ancient grass lands, on strong clays, alluvial flats, or marsh lands, ought to be made with the greatest caution, for though all

grass lands (irrigated grounds excepted) that are sufficiently dry to admit of tillage, will furnish more produce under alternate grass and corn, than under either alone, yet mixed husbandry in general requires more capital, greater skill and attention, and is attended with more risk, than either grass or corn alone. Lands also, which have been in grass for twenty years and upwards, when first broken up, are sometimes deficient in regard to quantity of produce, and generally so in regard to quality—because tillage acting as a stimulus on the dormant powers of the soil, produces what may be called a violent ebullition of corn, weeds and insects reciprocally acting upon one-another. But this exuberance is soon reduced, and then the crops are as certain and good as on the best arable lands, while in effecting this reduction a quantity of manure will be obtained from each acre broken up, capable of invigorating double the extent of those lands constantly under tillage. If old tillage lands, or lands recently broken up, after being subjected for two or three years to corn crops, are laid down to grass, or sown with clover for one or two years, more hay per acre will be obtained, or stock supported, than from the richest meadows;—when the hay or grass declines, break up for corn;—when the corn declines, lay down with grass: thus alternately applying *tillage* as a stimulating, and *laying down with grass* as a recruiting, quality.

As hints to proprietors of old grass lands, I beg leave to submit my opinion:—

1. That all light free working soils, adapted to the culture

of turnips or potatoes, and all upland grass lands, of middling quality, may advantageously be broken up, in whatever situation; as on such soils three times as much produce will be obtained by an alternate course of grass and tillage, as by either in perpetuity.

2. That, till the effect of breaking up grass lands of the above description, on the prices of produce is known, and especially on the price of artificial hay, it will be prudent to preserve all meadows of the best quality, especially on strong clays and near large towns. This caution becomes necessary, as it is probable that artificial hay will fall, and natural hay rise in value as aration comes to be better understood, and also, that if the practice of breaking up grass lands were suddenly to become general in a country, the markets would be glutted with produce. Farms changed from grass to alternate husbandry by employing more capital in their cultivation, would, independently of low markets, occasion a fall in the price of land, from the want of capital to occupy it. Doubtless all these evils would soon effect their own cure; but it is desirable to avoid them as much as possible.

3. All lands that have been above ten years in grass, will be most advantageously broken up by paring and burning—as the surest mode of destroying the seeds of weeds, and the larvæ of insects. My late father in proceeding to improve the meadows of Kenton farm, began by breaking up with the plough for oats: experience has taught me to begin by paring and burning, and the first year sowing wheat. His ro-

tation was intended to be, 1. oats; 2. fallow; 3. wheat; 4 to 9. grass; 10. oats; 11. fallow; 12. wheat; 13 to 18. grass. Mine, 1. after the first crop of hay is removed, pare and burn for wheat; 2. wheat; 3 fallow; 4. wheat; 5 to 10. grass; 11. oats, or wheat; 12. fallow; 13. wheat; 14 to 19. grass, &c. reserving, however, in both cases, a considerable portion of rich old meadow as such, to be used both for hay and pasture.—Three reasons may be given why paring and burning would not occur to a Scotch farmer, as the best mode of breaking up old grass-lands; first, there are few, if any old grass-lands in Scotland; second, insects are not so luxuriant and pernicious in that climate; and third, oats thrive better in the colder and more moist atmosphere of that country, and are more valuable when brought to market.

In concluding this account of Tew-Lodge, I have only to add, that the system pursued by the tenant who succeeded me, as occupier of the principal part of that farm, is in every respect anomalous, and must not be confounded with the Berwickshire husbandry now practised on a different part of the same estate, with what is described above, as my system while there, nor with my present practice at Kenton farm, as related in a succeeding part of this work.

Woodhall Farm as it appeard in 1807.

Woodhall as in 1810.

CHAP. II.

CHAP. II.

A CONVERTIBLE FARM NEAR LONDON, EXEMPLIFIED IN WOODHALL, MIDDLESEX:—REFERRING TO PLATES 16, TO 20.

THIS farm is situated in the clayey elevated district of Middlesex, bordering on Hertfordshire; it is in the parish of Harrow on the Hill, and within fourteen miles of the Metropolis. The soil is a loamy clay; but the fields have each so favourable a declivity as to prevent their being injured by surface water, and to admit of bringing the whole under a system of alternate husbandry; more particularly as such a system can be aided by extraneous manure. The farm contains 350 acres; and in 1807, before it was entered upon by my late father, 150 acres were arable, 150 meadow and pasture, and 50 in copse, border pastures, and hedge wastes. These wastes are shewn in the plan, *Plate XVI.* by a brownish green.

Situation.

Former State.

The arable lands were cultivated agreeably to the conditions of the lease, and the general custom of that part of the country, in three shifts, viz. fallow, wheat, and beans.

The pastures were of an inferior description, and grazed by sheep and milch cows. The object of the sheep was wool and lamb; that of the cows, veal.

The meadows, containing about 100 acres, were mown once, and the hay sent to the London market; afterwards, they were grazed by sheep, or any accidental stock.

Though the defects of this system, especially on the arable lands, will best be pointed out by the opposite practices recommended, yet it may be observed here, that the fallow on such soils, as indeed is the case on far the greater number of occasions, was completely superfluous. Introduced every third year, it must have prevented even a local farmer from giving the full value or rental for the use of those lands, by at least *one fourth*. With regard to that part of the system, which consists of growing lambs, it may be observed, that they can be produced in equal perfection three or six times the distance from London, where lands are much cheaper; consequently, it can never be the best mode of turning grass lands to advantage to occupy them in a mode liable to so general a competition. Grass lands, within twenty miles of London, that do not admit of being mown, must either be managed in a very improper manner as such, or radically unfit for grass. If they be not naturally adapted to grass, they ought to be reduced to arable; if adapted, no lands will better repay being enriched by draining, manure, or other beneficial processes.

Woodhall was let on a twenty-one years lease, seven of which were unexpired at Michaelmas, 1807; the rent 13s. per acre, poors-rates 2s. 9d. per acre, and the tythe £77 per annum, liable to be increased every fifteen years, according to the variation in the price of wheat. The tenant did not covenant to perform repairs, or manage the grass lands in any particular manner; but bound himself to the three-course shift above-mentioned, for the arable lands, and not to break up the pastures or meadows under a severe penalty. The other

clauses and conditions of this lease were such as are common to all leases.

The remaining seven years of this tenant's term were purchased from him for £1500, and the farm was then let to my late father for nineteen years, from Michaelmas, 1807, at £2 per acre, the tenant paying all taxes and parochial burdens*. The premises, fences, gates, and water-courses, were to be put in repair or renewed, where necessary, at the landlord's expense; but kept in, and left in repair, by the tenant. Permission was granted to break up the pastures and meadows, if deemed requisite; and the rules as to cropping were, never to have above half the arable lands under white, or corn crops, at one time. Satisfactory evidence was to be produced to the landlord, that dung was brought equal to the straw and hay sold; and during the last four years of the lease the tenant covenanted, that the green crops should either be drilled pulse or roots, artificial grasses, or naked fallow; and that in the last year the landlord or incoming tenant should have liberty to sow grass and clover seeds among the corn crops, &c. The other clauses and conditions were similar to those contained in other leases.

The following are the improvements commenced by us, and which are now completed by the present sub-tenant, without any essential deviations. Improvements.

* Unfortunately for his family, my father enjoyed but a few months health after settling on this farm. In the first season he completed the alterations on the fences, roads, barn, &c.; but in the second he was unable to proceed, and through the negligence and villany of servants, even the common operations of husbandry were delayed or totally neglected. Yet the improvements begun, so effectually shewed what might be done, that after my father's death, in December, 1809, I subset it for the remainder of our term, at £1000 a year, the tenant (a Lincolnshire farmer) paying the tythes and all rates and taxes.

It may be premised, that adverse as English surveyors are, in general, to the breaking up of grass lands, yet it is a principle admitted by all the most respectable agriculturalists among them, that upland grasses, on free soils, may be broken up, and cultivated under the convertible system with superior advantage. This holds true in every situation, but more especially in the vicinity of a large town, where roots, green crops, and clover hay are in constant demand. The ultimate object of the alterations on the fences, roads, and buildings of this farm, was to render it better adapted to this alternate husbandry. Hence, the first thing was to regulate the size, shapes, and connection of the fields, by rooting out such part of the old hedge-rows and hedge-wastes as interfered, and planting such new lines of single hedge and ditch as became necessary.

Hedges.

Plate XVI. shews the state of the fences previously to their being altered, and the borders and angles of the fields, coloured with brownish green, shew the extent and situations of the wastes.

Fields 13, 19, and 21, are the fallow break of the farm.

Fields 23, 24, 25, and 2, the wheat break.

Fields 3, 4, and part of 9, the bean break.

The meadows 5, 6, 7, &c. are coloured of a dark grass-green; and the pastures, 16, 18, and 20, lighter.

The scattered and irregular distribution of the farm buildings, and the unsuitable size and shapes of the fields for aration, and for being connected by roads, are evident from inspection; but it requires to be pointed out, that the lines of these fences were so ill calculated for carrying off the surface water, that in one half of the fields there were open gutters for the discharge of the water in the hedge-row ditches.


WOODHALL FARM
near
Pinner
MIDDLESEX
16
15
9
8
7
6
18
19
14
10
4
20
13
3
11
22
12
25
2
1
21
26
27
23
To Stanmore
From Pinner
From Uxbridge 21 miles

In the centre of field 25, for example, above an acre was rendered waste by the water from fields 19, 20, and 21, which water, it is curious to remark, might, if led over the same acre agreeably to the principles of irrigation, have produced annually at least two and a half loads of good hay, in place of annually rendering the produce of this acre unmarketable. The water of 16, 18, and part of 19, ran in a diagonal direction through 15, two acres of which might have been irrigated by it to advantage. Field 9 is intersected by the water from the north boundary fence in a still worse manner; but enough has been stated to shew the importance of attending to the proper position of fences, with regard to the inclination of the surface, as well as to their direction with regard to the size and shape of fields. A reflecting mind will draw important inferences from the fact of water proving so baneful or advantageous, according to the manner of its application. This fact is very well known, indeed, but so little attended to, that I am of opinion there is not one field in ten irrigated that might be. Wherever there are three or four fields lying together, it rarely happens that one or two of the lower of them, if under grass, might not be improved by introducing, in times of much rain, the superfluous water from those on the higher level*.

Plate XVII. exhibits the whole farm as it appeared when altered. The fields are now more uniform in shape and size; their sides are parallel, and better adapted for plowing the lands in straight ridges. All the surface water is carried off by the open fence drains. Access is had to every field by the shortest possible road from the farmery. Only two-thirds the

* I have been able to do this with great success on Kenton farm. *See Chap. III.*

number of gates formerly required are requisite. Fifty acres are rendered useful which were formerly lost, or pernicious, by occupying space for which rent was paid, and by harbouring insects and noxious weeds; and as much rich vegetable earth is obtained from the old hedge banks as, spread abroad in every direction, may be said to manure at least ten acres. The whole is more open and healthful; and, from the number of single trees thrown into the fields, more elegant, and bearing a greater resemblance to a park.

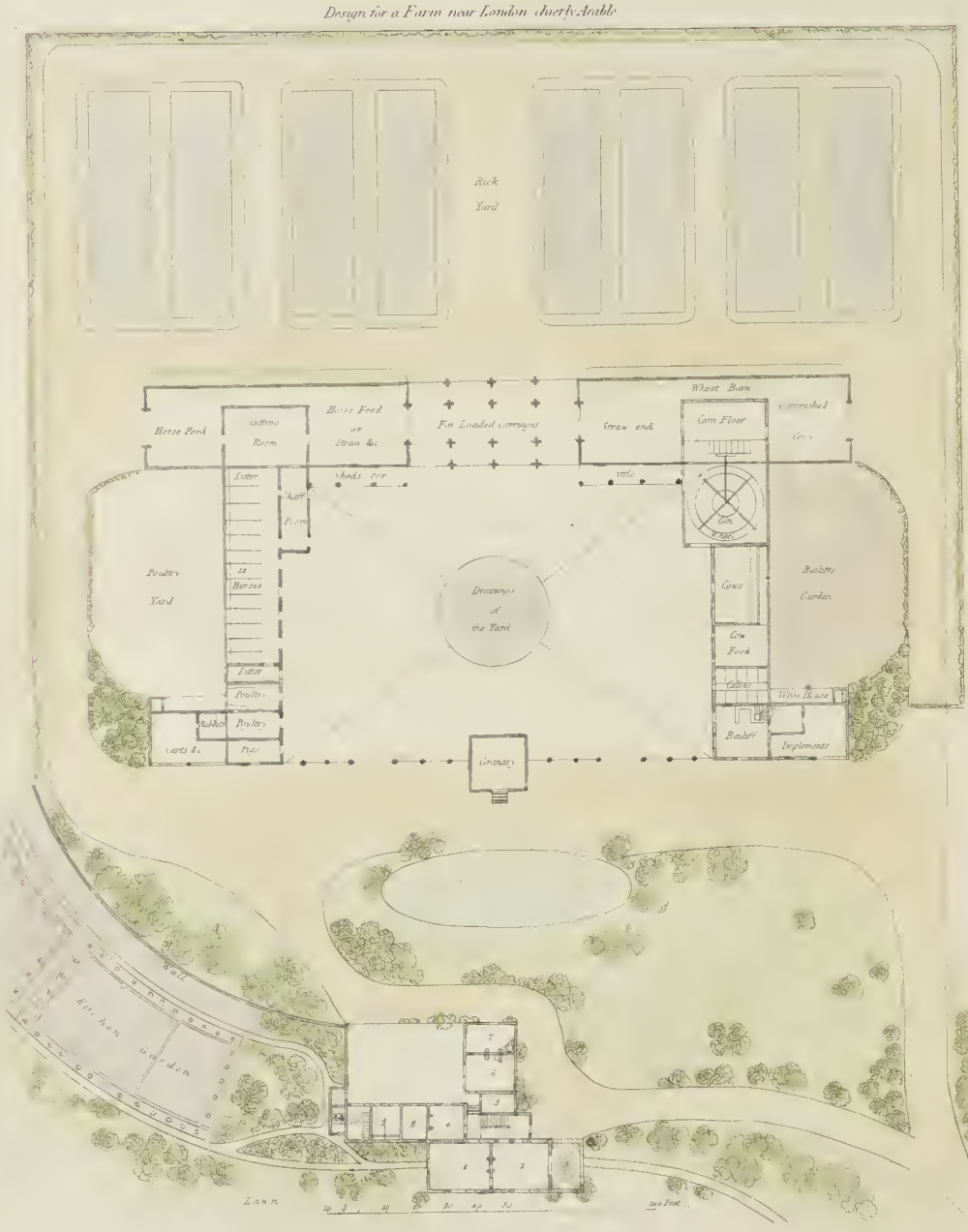
In this plan *(Plate XVII.)* I have also shewn how the water from the upper fields, 15, 16, and part of 17, and also that from 7, 8, 9, 10, 11, 12, 13, and 14, may be made use of to irrigate the field, 1, on a lower level; and also, that the small meadow field, 3, is peculiarly well situated for using the superfluous water from fields 2, 4, and 5, which would otherwise be lost. By the mode thus pointed out every drop of superfluous water may be turned to account; a circumstance of the greatest importance where that water comes from arable lands, as it is commonly highly enriched with particles of earth and manure, all of which are thus preserved on the farm, and turned to account*. I need hardly state, that the blue lines in the fields 1, 2, and 3, shew the principal cuts or arteries for effecting this purpose, which is, in all respects, conducted according to the common and well-known principles of catch-work irrigation.

Buildings. The farm buildings were chiefly wooden edifices: they were altered, removed, and added to, so as to form a farmery nearly such as exhibited in *Plate XVIII.* The house, from a large,

* It is proper to state, that I am by no means certain that the present sub-tenant will carry this part of our plan into execution.


WOODHALL FARM,
as Altered
in 1809
To Stanmore
from Pinner

Design for a Farm near London chiefly Arable



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comfortless, ill-arranged dwelling, is altered and repaired so as to be a neat and commodious residence. It contains two good sitting-rooms, 1 and 2; a small conservatory is shewn, 3, which might be used as a study or business room. There is a house-keeper's room, or butler's pantry, 4; a dairy, 5; a kitchen, 6; and back kitchen, serving for a wash and brewhouse, 7; a a coal-house, 8; a small stable, 9; and coach-house, 10. There are men servant's beds over the stable, and cellarage under the two sitting-rooms.

The kitchen-garden is open to the lawn, on the south-west, but with a good wall on the north and east. The poultry-yard may be used as a drying-yard or as additional garden-ground, should poultry not be an object.

The rick-yard, and most of the farm buildings, require little more explanation than what is obtained by an inspection of the plan. It may be observed, that the barn for horse food is appropriated to the reception of such wheat straw as may be too much broken by the thrashing machine for market; of bean or pea haulm, refuse hay, mown oats, or any thing else proper for being passed through the chaff-cutter for horse food. In winter, such food may be mixed with refuse potatoes or turnips; and in summer, with clover or other green food. Cutting being generally performed at so much per quarter, to prevent the cutter from mixing the chaff measured up with what he is cutting, the chaff-room is added, in which all that is cut can be locked up once a day, when measured up under the master or bailiff's inspection.

The thrashing machine in use at Woodhall is one of Meikle's construction; that shewn in the wheat barn of this plan is

supposed to be Lester's, as better adapted for the neighbourhood of London, where it is an object to preserve wheat straw unbroken for the market.

The sheds for winterers (whether horses or cattle) contain racks, which are supplied directly from the barn through the side wall, so that no straw need be lost in carrying it about the yard. As little litter is used both in the yard and stables as possible, unless when straw is below the average price.

The pig-stye for feeding is placed so that either refuse or prepared food from the house may be readily thrown in. Light is supposed to be entirely excluded from the pigs; a circumstance which contributes, more than is commonly imagined, to induce sleep and accelerate their fattening.

The elevation of this farmery, which is roofed with tile to correspond with the old part allowed to remain, is in *Plate XIX. Fig.* 3. *Fig.* 4 is the elevation of the house.

The two views in *Plate XX.* shew the difference between the effect of the buildings and scenery in 1807, and at present (1811). Both the views are picturesque; but that of 1811 combines more elegance.

System of Cropping, &c.

In regard to the system of culture proposed to be pursued on this farm, the fields, 1 and 2, near the house, were proposed to be laid down in perpetual meadow; field 17 in lucerne, and 16 in st. foin. The remaining fields were to be cultivated in the following rotation:

1. Potatoes, turnips, or other drilled green crops, or drilled beans. Dunged.
2. Wheat, with a few oats for home use.
3. Clover, mown twice; top dressed after cutting.
4. Ditto, ditto.

Fig. 1.

Elevation of the House in Pl. 25

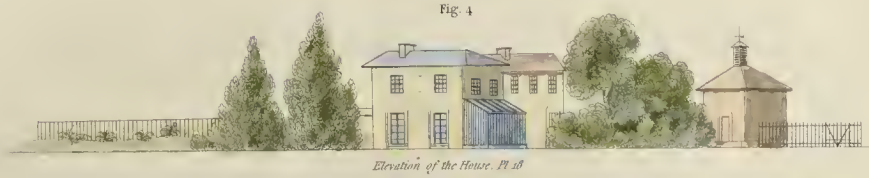
Fig. 2.

Elevation of the Farmery Pl. 25.

Fig. 3.

Elevation of the Farmery Pl. 28

Fig. 4



Elevation of the House. Pl. 28

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Where this rotation can be pursued, it will be found, near London, to return more profit than any other; the lands being only plowed and sown once in four years, the number and keep of horses are greatly reduced, which, so near town, is of material consequence. Of course, in preparing for this rotation, as for any other, it became requisite, in the first instance, to fallow some spots, in order to level old hedge-rows and other inequalities, straighten ridges, &c. &c.

The stock, live and dead, requisite for such a farm, so managed, is the following:

Tenant's Expense.

8 Work horses - - - - - - -	£ 480
6 Scotch ploughs for two horses - - -	30
6 Ditto carts, with frames before and behind, in the Middlesex manner, for one or two horses	150
6 Pair of harrows - - - - - -	30
1 Waggon for three horses - - - -	30
2 Bean-drill ploughs - - - - -	6
2 Rollers - - - - - - - - -	20
Saddle horse, three cows for milk, for home use and local demand; pigs, ditto, ditto; poultry, and all other live stock - - - -	150
Thrashing machine (Lester's) - - - -	150
Harness, spades, shovels, forks, hay-knives, rakes, wheel-barrows, sacks, rick-staddles, sieves, &c.	154
	£ 1,200

The capital employed in the farm, in the form of labour, manure, sown wheats, clovers, &c. not tangible till the end of the lease, may be estimated at - - - - - £1,200

The annual farm outgoings, exclusively of rent, taxes, and household expenses, will amount to - - - - -	£ 1,500
Add £20 per cent. for tear and wear on live and dead stock - - - - -	240
Add £5 per cent. on capital employed on the soil - - - - - - -	60
Sub-tenant's rent and taxes - -	1,200
Total annual expenses	£ 3,000
The average of the disposable produce of this farm, managed as above, may be fairly estimated at - - -	£ 4,000

Thus leaving a balance of £1000 a year, to enable the tenant to support his household and personal expenses, for the tear and wear of furniture, &c. and (which is often of as much consequence) to replace the sum he may have been out of pocket the first three or four years through want of success in common practices, inexperience respecting new ones, or other unforseen drawbacks, or permanent expenses and alterations, which are unavoidable to a new tenant. On a fair calculation, this unavoidable loss will, under any management whatever, reduce the sum for family support, wear and tear, &c. to £500 or £600 a year.

Landlord's Expenses.

With regard to the expense of the buildings and alterations on the fences, the following very judicious mode was agreed on between the landlord and tenant:

1. The farm was taken by the tenant, subject to the landlord's putting the buildings and fences in repair, and making

such additions as were necessary for an arable farm, provided their amount did not exceed a certain sum; but, that any sum required, beyond the sum fixed, should be advanced by the landlord to a certain extent, and paid for by the tenant, at the rate of £6 per cent.

2. On the tenant's getting possession, a more full estimate of the expense of executing these repairs and alterations, was made by the tenant and surveyor: the estimated sum was laid out under the surveyor's inspection; and, for any additional improvements required by the tenant, not contained in the estimate, money was advanced by the landlord, at the rate of £6 per cent. to an extent not exceeding £500; to be laid out under the surveyor's inspection, agreeably to a clause to that effect inserted in the lease. The sum allowed for repairs was as follows, viz.

House and farmery - - - - -	£ 1,800
Fences, gates, &c. - - - - -	200
Required by the tenant, at £6 per cent. and laid out on barn, cottages, and fences - - - - - -	300
	£ 2,300

This mode of executing improvements is calculated to free the tenant from the risk of beginning a plan which he cannot complete to his satisfaction, and the landlord from buying an increase of rent at too high a price. According to the foregoing amount of permanent expenses, the landlord's account of Woodhall farm will stand thus:

Dr. *Woodhall, let to a Scotch tenant.*		*Contra*, Cr.	
Interest on £2,000 - -	£ 100	By rent - -	£ 700
Ditto, on £300 - - - -	15	By £6 per cent. on £300 -	18
Ditto, on sum paid the outgoing tenant for the remainder of his lease, viz. on £1,500 - - - - -	75		
Net annual produce of the land - - - - - - - -	528		
	£ 718		£ 718

Another mode of stating the account is as follows:

Dr. *Woodhall, let to a Scotch tenant.*		*Contra*, Cr.	
Annuity £1,500 will produce for nineteen years	£ 124	By rent - -	£ 700
Interest on amount of permanent expences, viz. on £2,300 - - - - - -	115	By interest on £300 at £6 per cent. -	18
Net annual produce of the land - - - - - - - -	479		
	£ 718		£ 718

This last appears the fairest mode, as the £1,500 paid to the outgoing tenant cannot, in a strict sense, be said to be laid out on the land; though it may certainly be called a part of the price of the improvements, being paid for liberty to

make them seven years sooner than they otherwise could have been made. In 1807, Woodhall would have produced £500 a year to a local tenant on a ninteen years lease, from which must be deducted the value of the £1,500; also £500 for new roofing the house and old cart-lodges, and £20 or £30 per annum, which necessarily would have been laid out in repairing the rest of the buildings; in which case the account will stand thus:

Dr. *Woodhall, let to a local tenant.*		*Contra*, Cr.	
Annuity £1,500 will produce for nineteen years	£124	By rent - -	£ 500
Interest on £500, for necessary repairs - - - -	25		
Annual repairs, say - - -	25		
Net produce of the land -	326		
	£ 500		£ 500

Difference in favour of the Scotch system, £153 per annum.

It is proper to state, however, that a local tenant will generally give as high a rent for a lease of twelve or fourteen as for one of nineteen years endurance, which will make the difference in favour of the Scotch system rather less than what is stated above.

At present (1811) owing to the rise which has taken place in lands, partly, if not chiefly, from the introduction of Scotch farmers in some counties, and of new opinions, and a general attempt to raise rents every where, Scotch and English tenants are nearly on a par in point of rents, leaving in their favour only

the difference as to management. This also, it may be hoped, will soon be done away; as there seems a general inclination to adopt the simplified implements, the more compact and better arranged buildings, and the more economical management of arable lands, as practised in the northern counties of England, and in Scotland. The prejudices against North Britons among country people are so strong, that I have, of late, found it preferable, when a better system of farming is to be introduced on an estate, to bring in farmers of more enlightened ideas from the same, or from some adjoining counties; and though the desired improvement be not made so rapidly by this mode, still it *is* made, and that too with less unpleasant feelings to both landlords and tenants.

CHAP. III.

A MEADOW FARM NEAR LONDON, EXEMPLIFIED IN KENTON FARM, MIDDLESEX:—REFERRING TO PLATES 21 TO 25.

THIS farm, containing 300 acres, is situated in the parishes of Harrow and Stanmore, nine miles from London. The surface of the whole has a gentle declivity from north to south; the soil is a tenacious yellow clay, of inferior quality; and the lands consist chiefly of old inclosed fields, of which 230 acres were in meadow, forty in arable, and forty were unenclosed and interspersed in common field. It was let to a tenant at will, at 13s. per acre, the tenant paying all tythes and taxes; but was taken, by my late father, in 1808, for seventeen years, at £750 a year, tythe free (*i. e.* the tythe or modus to be allowed out of the rent). The covenants of the lease were the same as in that granted for Woodhall; the taxes in this farm, exclusive of tythes (supposing them to rise as they have done during the last seventeen years, which is a fair ratio) will amount, on an average, to £250 a year.

Situation.

Former state.

With regard to the system of farming practised by the former tenant, on the meadows and common fields, it can only be said, that it had those defects which are unavoidable in a

tenant at will; little or no manure had been put on the lands for nearly twenty years, and they were, in consequence, so much exhausted, and overrun with noxious grasses and plants, as not to produce any single article which could deserve the appellation of good or marketable commodities. Of course, had the meadows been well manured during half that period, their produce would have been more than double what it was when we took possession; viz. at an average, *half a load of hay per acre.* The enclosed arable lands were rather better managed than the meadows or common field. Like the latter, they were subjected to the common three-course shift of the country, fallow, wheat, and beans. About fifteen acres were occupied with superfluous hedges, extending in some places to a width of forty and fifty feet, and composed chiefly of black thorns, hazel, dogwood, maple, briar, bramble, willow, docks, thistles, &c.

Object in view.

The final object of the improvements which were made on this farm is, to render the greater part excellent meadow, a considerable part catch-work, water-meadow, and to retain the forty acres, now in aration, in the same state, for corn and green crops. It is in contemplation also, to enclose the common fields; and as, in the event of that taking place, the proprietor has ornamental improvements in view, which would interfere with the original farm offices, and as these offices are ill situated with regard to the farm, the site of them has been removed to a greater distance from Stanmore Park, and to a more central situation for the lands. To render the farm more compact, some small fields round the former offices have been taken away near the new farmery. *(See Plates XXI. and XXII.)*


KNOTTON FARM
with the fences
Scale of 10 5 0 10 Chains
Published for the Proprietor, May 10 1821

KENTON FARM

as

now altered.

Published for the Proprietor, May 10 1811

PLAN
of the
FARM YARD
of
KENTON FARM
Stanmore
MIDDLESEX

Pub.d for the Proprietor May 1.1811

The farm now lies very pleasantly on each side of a public lane, so that when the portion of common-fields belonging to it is enclosed and laid down to grass, not a furlong of farm-road will be requisite for its culture.

Improvements.

The first operation, in commencing the improvements, was to fix on the situation for the farmery, and to design and direct the buildings. This situation was, indeed, so self-evident as not to leave a doubt on the subject; and the plan was the joint efforts of my father and an eminent surveyor*.

Buildings.

Plate XXIII. exhibits, so completely, the different purposes of the buildings, that no explanation of them is deemed requisite. The rick-yard is small, because in a meadow-farm it saves carriage, and risk from fire, to have a field-barn, either fixed or moveable, and thus to form the principal hay-ricks in the fields.

Plate XXV. shews the effect of the house and offices.

Fences.

The next radical improvement was the alterations in the size and shape of the fields, by the removal of superfluous copse and hedges; though this, indeed, is not so absolutely requisite in a meadow as in an arable farm. It pays the tenant, however; as he not only gains a few acres that would otherwise occasion an annual loss, according to their annual rental and taxes, but he removes a copious harbour for vermin and noxious weeds, gains a quantity of rich earth, formed by the deposition and decay of spray, leaves, weeds, &c. and which, when spread on grass-lands, proves nearly as efficacious as rotten dung. A very considerable quantity of this vegetable earth has been gained on Kenton farm; and either wheeled out at

* Mr. Robert Abraham, of Keppel Street, who erected the farm buildings at Woodhall, Pinner Green, &c.

once, and spread over the meadows, or thrown up in ridges, and mixed with chalk or dung, to be in readiness for a future occasion. Even the thorns are chopped and mixed with earth in some cases; and in others, covered with earth, and burnt in the manner of charcoal, thus forming an excellent manure, consisting of calcined clay-alkali and carbon.

The operations on the fences, ditches, &c. on this farm, were performed solely at the tenant's expense. The work is recently concluded, and the account is as follows:

Dr. *Hedges on Kenton farm.*			*Contra*, Cr.		
To expense of removal, &c.	£414	18	By the present value of the rent and taxes of the 15 acres gained, viz. £50 for 14 years - -	£494	18
To present value of what those hedges and wastes would have produced as fuel; say 10s. per acre per ann. or £7 10s. per ann. for fourteen years - - -	74	5			
Certain gain by the operation - - - - - - - -	155	15	By value of fuel, manure, &c. gained, and of gates saved - -	150	0
	£644	18		£644	18

This is given independently of the profits a farmer may be supposed to make on land; and, if we estimate these at £20 per acre, which is about what ought to be the average on a farm of this description, there will be the present value of

£15 per annum for fourteen years, to be added to the above £155 15s. which is £148 8s.; making the total gain by removal of fences, £304 3s. or about £7 per cent. on the capital employed. This per centage, however, is rather too small, and clearly demonstrates, that the operations leading to it, and the advantages of which are of a permanent nature, should be performed at the expense of the landlord. It is to be remarked, indeed, in this case, that if the tenant had not laid out £484, he would have lost £420 in the course of his lease, by paying £50 per annum for fifteen acres, which only produced him £7 10s. per annum.

Meadows.

As the best mode of improving meadows in general, and as the cheapest mode of preparing them for irrigation, a number of the worst of them have been broken up. These we are proceeding to fallow, chalk, and manure, to form the surface into ridges, with gutters at top and bottom, in such as are suited to irrigation; and to lay them down again with a proper mixture of grass seeds. Four fields, containing fifty acres, broke up in 1808 for oats, are now (third year) under wheat after potatoes and summer fallow. They were sown in March last with the following sorts and proportions of grass and clover-seeds, viz. per acre:

	£	s.	d.
1lb. Red clover - - - - -	0	1	0
1lb. Solid-stalked clover - - -	0	1	6
6lb. Perennial red clover - - -	0	9	0
2lb. White clover - - - -	0	2	2
4lb. Burnet - - - - -	0	5	0
Carried forward - -	£0	18	8

	£	s.	d.
Brought forward - -	0	18	8
1 lb. Rib grass - - - - -	0	1	0
In all, 15 lb. of Clovers.			
¼ lb. Timothy grass - - - -	0	2	0
1 lb. Fescue - . - - -	0	7	0
½ lb. Meadow foxtail - - - -	0	4	0
¼ lb. Crested foxtail - - - -	0	3	0
2 Pecks perennial rye-grass - -	0	3	0
2 Pecks common meadow-grass - -	0	1	4
In all about 1½ bushel grass-seeds.			
Total expenses - -	£ 2	0	0

Had the lands been naturally of better quality, the following mixture would have been more proper for hay, viz.

	£	s.	d.
6 lb. Perennial red clover - - -	0	9	0
1 lb. White clover - - - - -	0	1	1
2 lb. Burnet - - - - -	0	1	3
2 Pecks fiscue - - - - -	0	10	0
2 Pecks foxtail - - - - -	0	17	0
1 Peck perennial rye-grass, for immediate use - - - - -	0	1	8
	£ 2	0	0

And, for constant irrigation, two bushels (40s.) of foxtail, without either burnet or clover, is preferable.

The blue lines in *Plate XXII.* shew the cuts for irrigation already executed over eighty acres, and are to be executed

(when more of the fields are laid down) over two hundred more. The principal dependence for water is from a stream, which passes through the pond, shewn at the old farm-house. Our right to use this stream is now in dispute; but, in time of floods, a considerable supply is had from the lane, and from the boundary fences, as the surrounding lands on the north and south-east are higher than those of the farm. The cuts which are executed were finished in February last, and they have already occasioned an evident increase of produce. Should the common-field lands be inclosed, and the forty acres belonging to this farm be added, as shewn by the dotted lines in *Plate XXII.* it will then be practicable to irrigate the whole farm, with the exception of the arable lands and about thirty acres of meadow, situated, as appears in the plan, above the level of the source of water.

Neither the expense nor the advantages of catch-work irrigation are so great, as where there is so abundant a supply of water as to admit of a regular system of water-meadow; but still the profit is such, as to pay the tenant better than any other practice which, in the present state of agriculture, he can possibly introduce.

The only defect in the above system of improving meadow-lands is, that of breaking up by the plough, instead of paring and burning. By the latter mode, crops of corn or green food are obtained with greater certainty and abundance, and the lands are sooner fit to be laid down with grass-seeds. By the former, and in a stiff soil, the first two or three crops are extremely uncertain, and none need be attempted to be grown excepting beans and oats; the soil being too stubborn for potatoes, and so full of undecayed vegetable matter, that wheat or clover, if sown, is infallibly thrown out by the winter's

frost. Lighter soils, however, such as Woodhall, and a farm of Mr. Drummond's, which is adjoining, may be broken up and reduced without paring and burning, by repeatedly cropping with potatoes, and, after two or three crops, sowing down with the wheat crop, according to circumstances. By preferring ploughing to paring and burning, we have sunk, unnecessarily, above £3,000 on this farm.

In some cases, where meadows are to be improved, they are pared and burned, and sown down in the same year; but it may be confidently asserted (for it is consistent with agricultural experience) that, in most cases when meadow-lands are broken up, they will be laid down to greater advantage if kept in an arable state three or four years, that the soil may derive the full advantages of a change of culture before being replaced in its former state.

Landlord's Expenses.

The expenses of the permanent improvements on this farm were as follow:

Dr. *Kenton farm.*		*Contra*, Cr.	
Interest of £2,500 expended on the house, offices, and an allowance for bridges and repairing gates - -	£125	By rent - -	£750
Interest on additional sum (£200) advanced for a threshing machine - -	10	By £6 per cent. on £200 -	12
Tythe, great and small, paid by the landlord - - -	50		
Net produce of land - -	577		
	£ 762		£ 762

The following is an estimate of the requisite farming stock, and tenant's expenses and profits: Tenant's Expenses.

6 Horses - - - - - - - -	£ 300
4 Ploughs - - - - - - - -	20
4 Carts, finished with frames in the Middlesex manner, for carrying hay to market -	100
1 Waggon for three horses - - - -	30
4 Pairs harrows - - - - - - -	20
1 Bean drill - - - - - - - -	3
3 Rollers - - - - - - - -	30
Saddle horses, cows, pigs, poultry, &c. - -	150
Harness, spades, shovels, forks, rakes, sieves, sacks, wheelbarrows, rick-staddles, &c. &c.	147
Total of live and dead stock - -	£ 800

When this farm is once got into condition, the capital employed in the farm, in the form of labour, manure, sown wheats, clover, &c. will amount to about £800.

The annual farm outgoings, exclusively of rent, taxes, and household expenses, will amount to - - -	£ 1,000
£20 per cent. on live and dead stock - -	160
Add £5 per cent. on capital employed in the soil	40
Rent £762, taxes £250: in all - - -	1,012
Total amount of annual expenses - -	£ 2,212
The average of the disposable produce of this farm, supposing 100 acres submitted to catch-work irrigation, will amount to - - -	3,000
Thus leaving a balance of - - - -	£ 788

per annum, to enable the tenant to support his household and personal expenses, to balance the tear and wear of household furniture, and of life itself; and, what frequently happens to be of great consequence, replace the sum the tenant may have been out of pocket the first three or four years in matters of taste, in improvements of a permanent nature, or, through want of success in common schemes, and experience in new ones, and otherwise bringing the whole into a condition to be subjected to the above calculations. I can safely state that the sum, in the case of Kenton, owing to my father's illness, and his mistaken mode of breaking up the pastures, has exceeded £4,000. The annuity this sum would produce in fourteen years, is £404, which deducted from the £788, leaves, for the support of the family, tear and wear, &c. only £384.

The calculations of this sort for Woodhall, are from opinion; these are taken chiefly from the farming-books at Kenton.

Another suitable Farmery for this Farm.

As this description of farm is very common in the neighbourhood of London, and as the buildings at Kenton, from being erected with brick and covered with tiles, in the best manner, are more expensive than many proprietors would agree to, I have added the plan, *(Plate XXIV.)* the farmyard of which may be executed for £750. It will suit a farm of three hundred acres.

The chief object of culture on such a farm is supposed to be meadow-hay, with not more than twenty or thirty acres in aration for straw, clover, potatoes, &c. for home consumption. These acres in aration, like those at Kenton, may be cultivated in four shifts, viz.

1. Potatoes, beans, &c. dunged.


Hay Rick with Moveable Roof to Protect the Hay while drying
Hay Rick with Moving Roof
For Hay
Loaded Carts
Unthrashed Corn
For Carts
Loaded of Hay
Room for Cutting Chaff
Floor for Hand Thrashing Machine
Straw
Stalls
Horses
Work Horses
Cows
Pigs
Rooms for Cattle &c
Carts
Open Shed
Rabbits
Poultry
Granary over
Dairy Room
Brewing Room
Bakehouse
Wood
Yard
0 5 10 15 20 30 40 50 60 70 80 90 100 Feet.

2. Wheat and oats; clover seeds, sown in spring.

3. Clover (the solid stalked, as that sort lasts two, and often three or four years); mown twice, and top-dressed afterwards.

4. Clover; mown twice, and ploughed in autumn, to prepare for the potatoe crop next season.

The quantity of oats and beans which are grown need be no more than what is requisite for the support of the live stock, in the winter and spring months, when green clover cannot be obtained.

Such a farm, once put in proper condition, may be managed by three team-men, with six horses, one day-labourer constantly for odd jobs, and harvest and hay people according to circumstances.

The singular shape of the buildings, besides a great saving in the walls and roof, enables the farmer, from his parlour, to command every door, and every operation going on in the yard, and at the doors of the different buildings. He may, also, by walking along the central passage, inspect all the stock, horses, barn, and cutting-rooms, without the least trouble, as none of the division walls are above four and a half feet high. The parlour is supposed to be three feet above the level of the stable-floor; so that, throwing the coach-house and the distant barn-doors open, the farmer may see every thing from one end of the pile to the other, while sitting at table. The whole edifice is supposed to be erected with timber, coated with tar and ochre, and roofed in the paper manner; and the horse-ponds are made winding, and the trees added for better effect from the house. *Figures* 1 and 2, in *Plate XIX.* are elevations of the farmery and house.

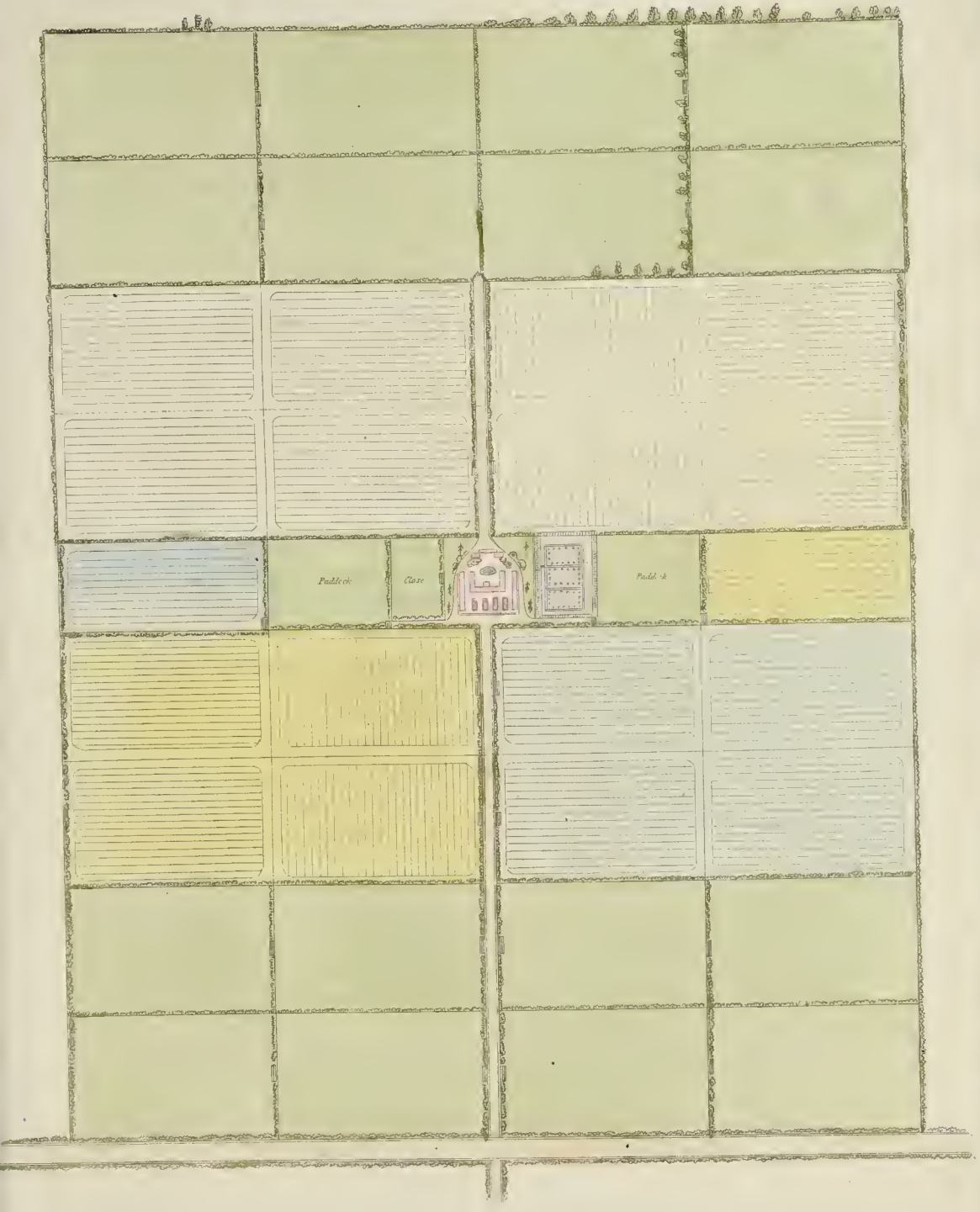
CHAP. IV.

OF FORMING FARMS FROM RECENTLY ENCLOSED COMMONS, AND COMMON-FIELD LANDS:—REFERRING TO PLATES 26 TO 29.

WHEN a common is divided, that portion of it which is allotted to an individual, is formed, if not added to ancient holdings, into distinct possessions or farms. The size of these farms must always depend upon a number of circumstances, such as soil, situation, local demand, and those indications of nature which, when followed, will generally lead to the adoption of holdings of various extent and shape. After enumerating a few principles, generally applicable in forming farms from commons or wastes, two designs shall be described suited to particular situations.

1. A particular *purpose* in view, will justify a departure from natural indications. If a plantation of trees, for example, to complete a domain, be much wanted on a spot adapted to the growth of wheat, or a lawn where a water-meadow is attainable, then what is best for part, must not be put in competition with what is best for the whole.

DESIGN for a FARM, containing 350 Acres (180 Arable) to be formed from an Unenclosed Common



Publ[d] [illegible] Nov[r] 1811

2. The *situation*, such as the vicinage of a large town, or extreme distance from it, or a limited or peculiar market, will prescribe a style of farming not otherwise indicated.

3. The *soil* will often entirely guide the sytem of farming: a barren sand or gravel, a chalky subsoil, a retentive clay, a moss or morass, a fen, &c. have each their suitable systems of culture, appropriate buildings, and situations for placing them; roads, fencing, mode of fencing, size of fields, &c.; but examples of each would lead me beyond those limits which I have assigned to myself in this publication.

4. The *surface*, whether level, hilly, mountainous, abrupt, or irregular, must, of course, have an effect on the system of culture nearly as great as that of different soils.

5. The *climate*, both in regard to warmth and exposure; and moisture is also a guide for the agriculturist, and will unquestionably, in many cases, give a decisive tone to the style of farming, and, consequently, to the mode of laying out lands for that purpose. Climate and surface, more than either soil or situation, direct as to the use of plantations for shelter.

Plate XXVI. is a design for laying out the roads and fences of a farm, in commons or waste grounds, of three different characters.

The first character is that of a flat surface, a strong, retentive clay soil, a moist climate, a situation distant from markets, with no other object in view than that of making as much of the lands as possible.

The size of farm deemed proper is 350 acres; the most profitable mode of occupation is, 180 in arable, and the remainder in pasture. The arable subjected to a rotation of

1. Beans, drilled, or naked fallow; dunged.

2. Wheat.
3. Clover and rye-grass, fed off or mown for soiling cattle.
4. Wheat or oats; if the clover was mown, dunged.

The grass-lands are supposed to be wholly fed off chiefly with cattle; but also with ten cows, for butter and breeding, and a few sheep.

The buildings and roads are placed in the centre of the farm, agreeably to the principles noticed in *Chapter I.*

The farmery contains stabling for four work-horses, and open sheds for eight oxen; 130 feet of sheds for thirty fatting cattle; a barn, with thrashing-machine impelled by wind; and houses for ten cows, and other conveniences in proportion.

The arable lands are preserved in the centre, to save carting to and from the farmery; and the enclosures are four times the size of the grass-fields, each shift forming one large enclosure, containing four fields, divided only by open ditches for carrying off the surface water. The two small central fields shewn under aration, are supposed alternately in turnips, potatoes, cabbages, &c. for cows, &c. and wheat. The paddocks and closes are for calves or colts.

The grass-fields contain only ten acres each, to admit of the great advantage of shifting the stock from one to another. They are most distant from the farmery; because requiring least cartage, and some of them being in the lowest part of the farm, they may be irrigated. Trees are avoided in the fences, as injurious in flat surfaces and adhesive soils.

The chief, and almost sole products of this farm will be wheat and beef; the former best worth sending to a distant market; the latter easily transported to any distance; and both staple commodities.


Design for
a Farm at
Wretham Norfolk
Containing 1500 Acres
Wretham
Meadow
in all 200 Acres
Pasture
200 Acres
Barley
Acres
Clover
100 Acres
Clover
100 Acres
Wheat & Oats
200 Acres
Field Barn
& cottage
Lane

The second character is that of a soft light soil, a surface nearly flat, climate moist, and situation exposed near a sea-port *. On the arable lands for beans, as in the former character, substitute potatoes and green crops, the former to be sent to the London market by sea, the latter for supplying breeding stock in the winter months. Where the soil is too soft, or the green crop too late of removal for winter wheat, sow spring wheat, barley, or oats. Endeavour to irrigate some of the lower grass fields.

The third character is that of a hilly surface, the ridge or highest part in the centre of the farm, the soil a friable loam, on a retentive bottom, and the situation distant from markets.

Pursue the same rotation on the arable lands, as for the first character, and irrigate the grass-lands at the boundaries with the superfluous water from the hilly arable. Plant trees in the hedge-rows round the grass-lands.

Plate XXVII. affords an example of adding part of a newly enclosed common-field to a small anciently enclosed grass farm. The instance alluded to is on the estate of W. Colhoun, Esq. Wretham, Norfolk.

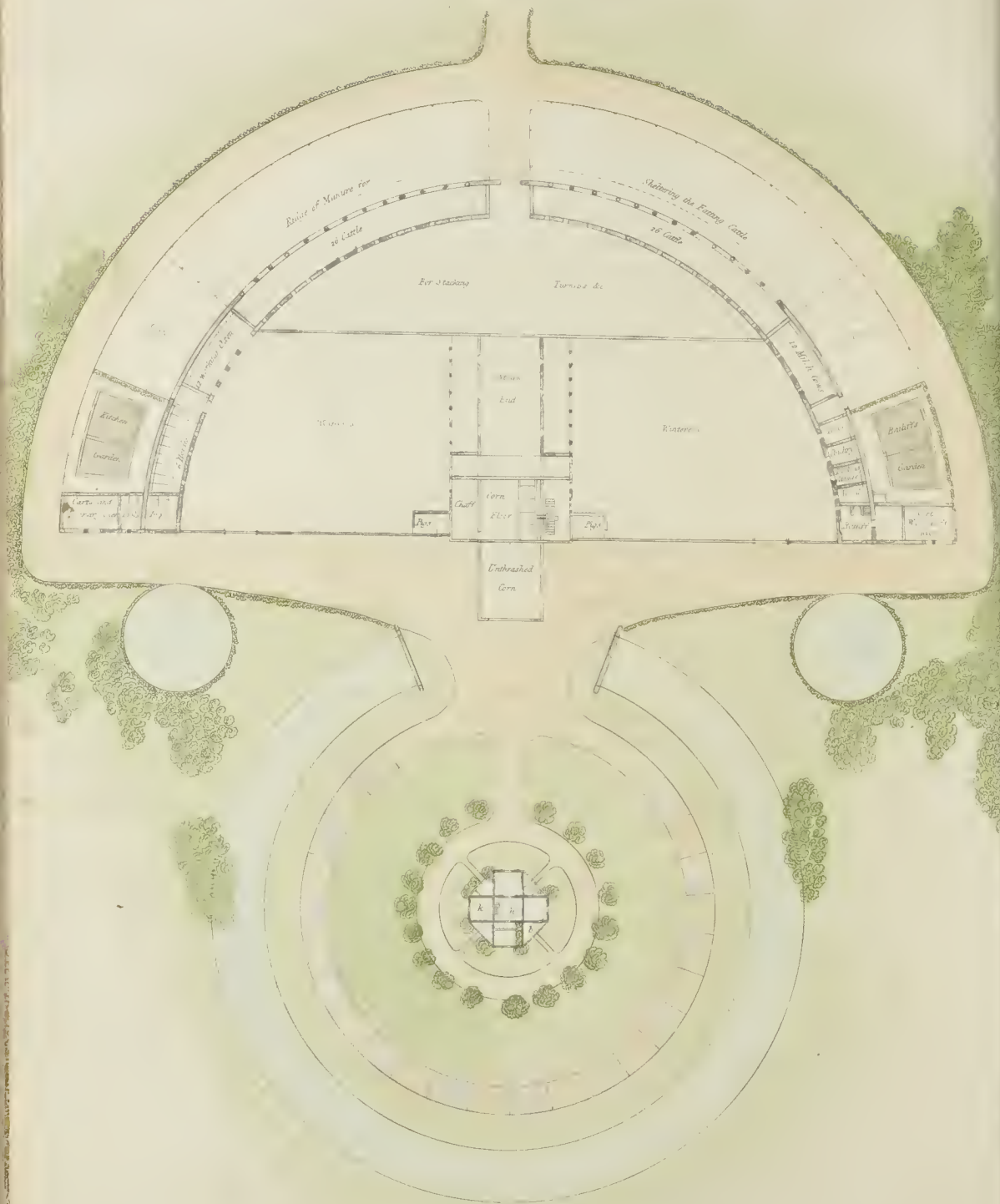
The ancient enclosed fields and the farmery are separated from the common field by a road, and bounded on the other by a lake, shewn in the plan. Their soil, a soft black earth, on a gravelly subsoil; their surface a gentle slope towards the the lake. The farm-house is supposed to be already placed in this ancient part; and the object in view is to unite a large portion of the common field, when enclosed to each ancient farm, so as to get a fair rent for the lands at the least expense.

* Part of the common on the Sneaton estate, near Whitby, is here alluded to.

The soil of this common field is a light poor sand, with nearly a flat surface. The circumstances of the country is favourable to large farms, the climate is dry, and the situation such as to require shelter. The number of acres to be enclosed and added to this farm is 1,200. These will be most advantageously cultivated in six shifts of, 1. turnips, 2. barley, 3. artificial grasses, 4. and 5. ditto, 6. wheat or oats. Each shift is proposed to be separated by a plantation, for shelter, and no inferior divisions are made. In two of the plantations are field-barns, sheds, &c. where the corn grown on one half the arable lands is thrashed by a moveable thrashing-machine, and the straw consumed by cattle. There are cottages at each of these barns for labourers to attend to the stock, &c. The ridges in each of the breaks or shifts are supposed to extend their whole length; or they may be ploughed as if the whole break were only one ridge, by which means not a moment is lost in turning at the ends, &c. Hereford or Devon oxen are supposed the beasts of labour on this farm.

In place of the above rotation, wheat may be added after the second year of artificial grasses, and one shift kept entirely under st. foin. This st. foin division must, of course, be changed every sixth or seventh year. I am of opinion, however, that if a proper mixture of artificial grasses are sown, such as red, white, and yellow clover, rib-grass, burnet, st. foin, timothy, cocksfoot, rye grass, and soft grass, the produce will be superior to that from either st. foin or lucerne alone, on a soil such as this, or even, perhaps, on any soil. Every agriculturist of observation must be aware that the efforts of annual and biennial plants are powerful for a few years, at first, and that they uniformly produce a greater bulk than perennials,

Designed for a Farm in Norfolk of 300 Acres



Pub.d for the Proprietor May 1.st 1811

which seem to compensate for this temporary bulk, by a steady durable produce.

The old pastures near the house, I have supposed to be irrigated from the upper part of the lake, by a cut passing near the house. These pastures are particularly advantageous for early lambs, milch cows, &c. and for stock in general, in seasons of great drought.

The buildings suitable for such a farm as this I have shewn in *Plate XXVIII.* The ricks are placed on frames, with small cast-iron wheels, and may be easily pulled into the barn on a railway, by means of a windlass attached to the thrashing-machine. An endless canvas sheet on rollers is attached to the straw-rake, which conveys the straw to the other end of the barn, and drops it in the yard for the cattle. This machine is supposed to be worked jointly, or severally, by water and wind.

The pond for water to the machine surrounds the rick-yard, which encircles the farm-house, containing the usual accommodation for a small family. There are two green-houses, *a* and *b*, heated by the parlour and kitchen fires; *a* serves as an entrance porch. The upper room looks in every direction over the whole farm. The vane, on the top, may communicate with this chamber by an upright spindle, to which may be attached an Eolian index.

The elevation of the farm buildings and house is in *Plate XXXV. Figs. 2 and 3.*

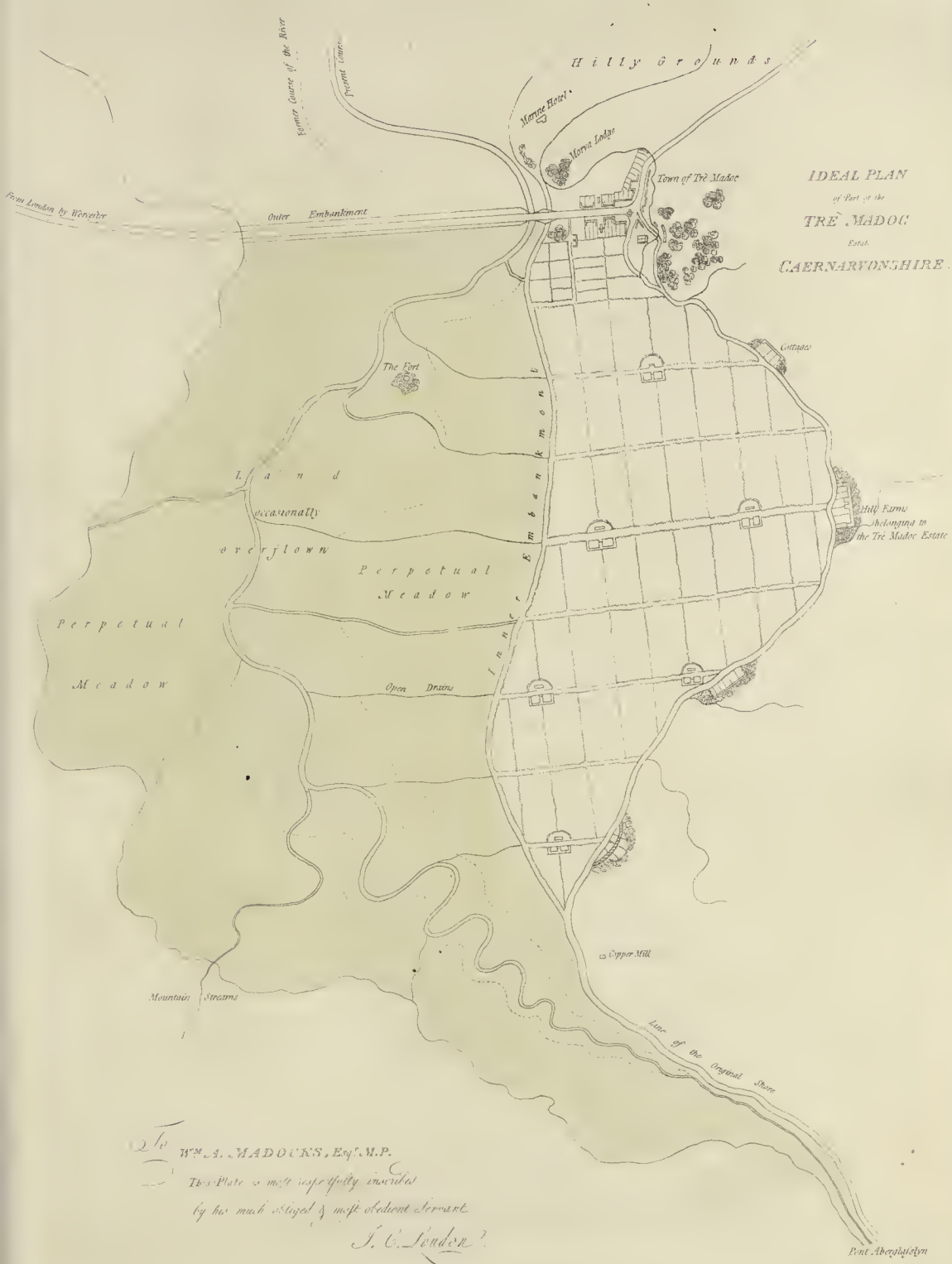
CHAP. V.

OF FORMING FARMS FROM LANDS EMBANKED FROM THE SEA :—REFERRING TO PLATE 29.

IT commonly happens, that lands gained from the ocean, or from large rivers, are of so confined an extent, as merely to be added to the surrounding farms. But in the extensive marshes on the Thames, the Humber, and on the coast of Lincolnshire, tracts are enclosed by sea-banks, so spacious as to form several farms of themselves.

For such subjects I purpose offering a few of the leading principles which ought to guide the surveyor in laying out the fences, roads, and water-courses; and I shall refer to an example, in which an extensive tract of lands is embanked, and laid out in a manner truly scientific, and highly gratifying to the admirer of stupenduous improvements; I mean the estate of Trè Madoc, in Caernarvonshire, where an embankment of an estuary of upwards of 4,000 acres is nearly completed *.

* This extensive tract is the property of W. A. Madocks, Esq. M. P. by whose genius and rapid execution, more varied and extensive improvements have been carried into effect in ten years than are done in most estates in an age. I am proud to be able to add, that I have had some share in contributing ideas for these magnificent undertakings.



To
Wm A. MADOCKS, Esq.r M.P.
This Plate is most respectfully inscribed
by his much obliged & most obedient Servant
J. C. London

Published for the Proprietor May 10 1811

1. When lands are embanked from the sea, one of the first operations is to intercept the inland streams from the surrounding country, so that no more water may pass over the embanked lands than what falls on, or originates with them. Large rivers, especially from hilly countries, cannot easily be cut off, and must therefore pass through the embanked lands; but all smaller streams, and surface water, are easily conveyed into the sea, by a cut or canal formed along the margin or shore of the lands to be embanked. Such a cut is shewn in *Plate XXIX.*

2. The next operation is to provide an outlet for what falls on, or oozes out of the embanked lands; and also for a river, if it should pass through them. This is done by a sluice, or floodgate, in the lowest part of the lands, so constructed as to shut by the flux of the tide, and thus prevent the sea from entering; and to open also by its ebbing, and thus admit the exit of the waters within. The plans and executions of such sluices and gates need not be here described. The sluices at Trè Madoc, Boston, and Lynn, are equal to any in the kingdom.

3. The next thing to be considered is, what system of farming will be best calculated for adoption on the lands when embanked. Whatever mode is commenced with, it will generally be found, that the most suitable, for a permanent application, is that of grass, especially as there is commonly every opportunity of irrigation, or flooding, and even the formation of salt marshes, by occasionally introducing the sea.—The system adopted will naturally direct the conduct of the roads, buildings, and fences.

4. In contriving the direction of the roads, when the lands are to be kept in pasture, little more is requisite than a tract

from each farm-house to the connecting or main-road. This main-road should be formed on those lands which were originally above water-mark ; and it may either surround both sides of the bay or estuary embanked, or it may be a public road, formed, or to be formed, at some distance from it. The connecting farm-roads within the bay, where the system is pasturage, need only be grass-tracts from one farmery to another, connected and arranged in such a way as to admit a proprietor or manager to make a regular tour of the lands embanked. In the case of Trè Madoc, the connecting main-road is also a public one, formed along the original shore ; the connecting farm-road is on the top of the inner embankment ; and the proper, or essential farm-roads lead from the one to the other, through, or past the farm-buildings, as in the plan.

5. The buildings for embanked lands do not differ in any respect from those which are calculated for similar farms in common cases. Their situation should be central, and their designs suitable to the system of farming meant to be pursued.

6. *Fences.* As embanked grounds are nearly level, excepting a gentle declivity towards the sea, bed of the river, or centre of the estuary or bay, the fields may hence be made of any size or shape, according to the purpose in view, there being no natural indication as to either.

A small size, however, will be found preferable, on account of getting the surface-water readily into the ditches ; and an oblong shape, running north and south, admits the sun, and shelters them from the east and west winds, better than if the hedges and length of the fields were placed in a contrary direction. Main drains, for carrying off the

water to the lowest part of the lands, and so to the sluices through the embankment to the sea, should be so contrived as to form part of the fences. Where the arable system is to be pursued, no other fence is requisite than these open cuts, as in many parts of the fences, and in flat clayey districts.

In an extensive bay it commonly happens that the surrounding lands are the property of different individuals; a circumstance which not only prevents embankments from being undertaken, but is calculated to frustrate any regular scheme of enclosure and improvement, even after the lands are gained. In the case of Trè Madoc, the greater part of the estuary is the property of Mr. Maddocks, who, several years ago, enclosed 1800 acres by a bank, designated, in the plan, "inner embankment." The lands which were enclosed by this bank are, comparatively, dry, elevated, and fit for aration. Part of those, which lie between it and the bed of the river, have a greater slope, and may occasionally be overflown; whence they are intended to be kept in perpetual pasture, and to be thrown into divisions suitable to the farms within the inner embankments.

To each of these farms belong, also, a part of the mountain grass-lands, by which means these three descriptions of lands are rendered more valuable than if let in separate farms.

Near the town a number of small enclosures are shewn, which are let to the townsmen at rents so high as £3, and £4, per acre. The whole of the 1800 acres within the inner embankment is let, at an average, above two guineas per acre, owing to the great value of such lands to hill-farmers, to their natural fertility, and to the demand con-

stantly created for their produce, by the establishment of manufactories, and a market, &c. in the town. A town which, together with these rich grass-lands, are situated where, a few years ago, the waters of the ocean rolled undisturbed.

PLAN OF THE ESTATE OF
MIMBURY FORT
in the
Parish of Ramsbury
WILTS.

CHAP. VI.

MISCELLANEOUS EXAMPLES:—REFERRING TO PLATES 30 TO 36.

HAVING, in the preceding examples, pointed out the general principles of laying out farms and farm-building, I here propose submitting some remarks on less distinct characters.

1. *A Hill Farm.*—By a hill farm, I understand one where the fields are so steep as either to render aration impracticable, or to require particular management in performing the ordinary operations on the soil, such as ploughing, carting, &c. Where aration is practicable, and likewise desirable, the characteristic efforts of art in laying out the fields, must be directed to alleviate the fatigue of labouring them. This can be effected only by laying them out so as to have a part of the surface of each either comparatively level, or with different inclinations of declivity; a circumstance generally practicable, as there are few hilly tracts of country that have not vales, or slopes of various degrees of steepness and aspect. The position of the roads and buildings is of importance in this point

of view; and, as shewn in the case of Tew Lodge, should be placed between hill and valley.

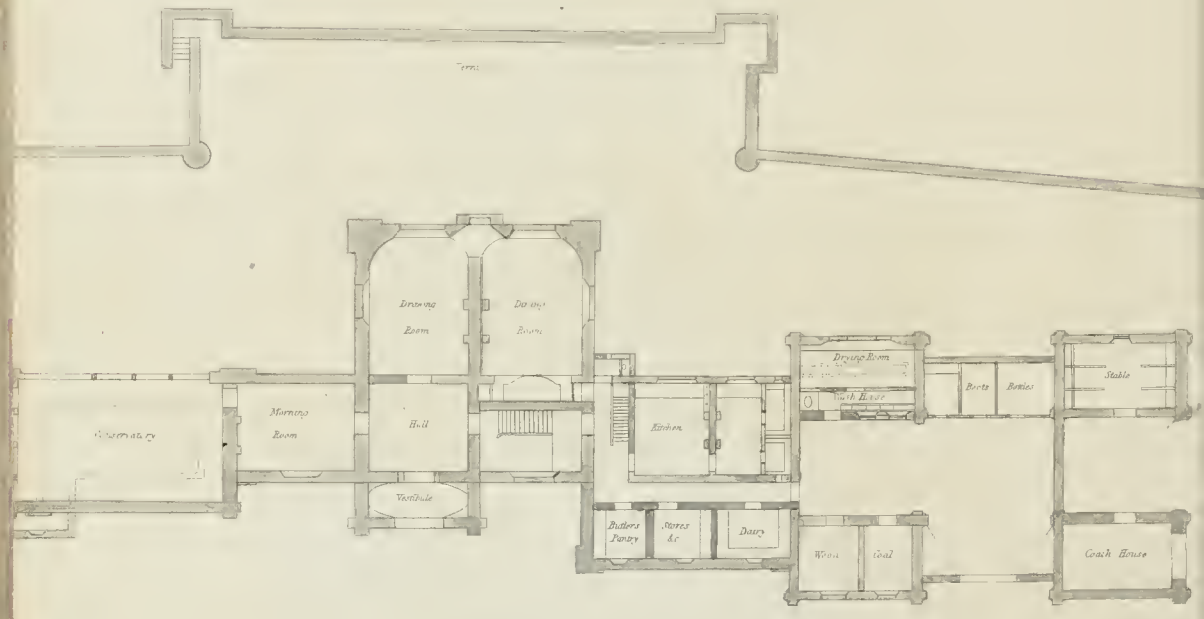
No farming subject affords better opportunities of introducing hedge-rows and strips of planting than hill-farms. Mimbury fort, *Plate XXX.* is an example of a hill-farm, chiefly, but in my opinion erroneously, kept in arable. It consists of nearly 370 acres; and is situated in an elevated, picturesque part of Wiltshire. The soil is partly a flinty loam or chalk, and partly a strong rich soil, incumbent on clay. The strips of timber and copse are delineated in the plan. I purchased this property in 1809, with the intention of improving it; and the alterations and additions proposed, are exhibited in *Plate XXXI.* All the most hilly and distant spots are shewn as permanent pasture; and woods, chiefly oaks for copse, and beech for timber, in the exposed and abrupt places, angles, &c. as shelter, and as the most profitable mode of occupying these spots. The arable part is confined to the best soil and most level part of the surface. Near it is placed the farmery, supposed to be removed from its present improper situation, close to the mansion. The fields, in aration, are eight, and proposed to be cultivated in the following manner, viz.

1. Green crop, dunged.
2. Barley or spring wheat.
3. Artificial grasses.
4. and 5. Ditto.
6. Oats.
7. Pease; dunged.
8. Wheat.

On a chalky bottom, some of the fields near the arable lands, are proposed to be laid down with st. foin, and to be


to Hungerford
MIMBURY FORT
As to be Altered
From Marriage Hill

Entrance Front of the Design for Nunbury Fort.



Principal Floor of the Design for Nunbury Fort.

broken up every six or seven years, and refreshed by being a short time under common pasture, or arable.

The grass-lands are intended for breeding Merino sheep; they are in ten different enclosures, and yet so managed, by the introduction of masses, concealment of the fences, and appropriate position of the surrounding woods, as to give the appearance of a park of unlimited extent. A new approach, house, gardens, and pleasure-grounds, are shewn in the plan; and opposite to them, a plan intended for a collection of cottages, a Lancasterian school, and a chapel.

Plate XXXII. contains a plan for altering, and adding to the house. The ground-floor and conservatory are supposed to be heated by steam* from the kitchen; a mode by which much fuel is saved, and a degree of warmth obtained which is free from the noxious effluvia arising from flues, and the unpleasant dust of fires. Fire-places are added, to gratify the eye, and carry off the smoke, dust, and unwholesome air of the rooms†. The elevation of this house is in the castle style, as corresponding with the features of the country, the situation, and the name.

2. *Mountain Farms* have their buildings in sheltered hollows,

* Among the newest and most ingenious applications of steam to the promotion of domestic comfort and luxury, may be reckoned that of heating dining-tables, and preserving them hot during dinner, the invention of a very ingenious friend of mine, Mr. Jennings; and which he has carried into effect, on an extensive, scale in the Holborn Coffee-house, London. This invention is perfectly applicable to private houses, and promises fair to be a cheap and permanent source of gratification to all those who know the difference between a lukewarm dinner and a hot one.

† There is a very complete invention, for this purpose, called "the purifying air-stove," which at once carries off the foul air and cures smoky chimnies, by Merriman, of Crutched Friars, London.

and require, in general, neither farm-roads nor fences to any extent. Being almost wholly under pasture, the principal thing is to contrive such extensive masses of plantation as shall occupy the most unprofitable soils, shelter the exposed lands, and produce the noblest effects; uniting, to use the language of Mason—"Hill to hill, with sweeping train of forest, and prodigality of shade." Southwick*, from its natural features, presents a noble example of a mountain residence, park, and farm.

3. The characteristic improvements on *Marsh*, *Moss*, and *Heath Farms*, are made, as their names imply, on the soils; by draining, levelling, burning, &c. The principles for laying out the roads, fences, buildings, &c. which are applicable to other farms of similar surface, are applicable also to them.

4. *Hop* and *Cyder Farms* require some peculiarities in the buildings, such as kilns, lofts, bruising-mills, &c. Cyder farms admit a considerable display of picturesque beauty, besides that pleasing character peculiar to themselves, and so gratifying and novel to a stranger entering Herefordshire or Kent. Hopton Court† is an example, in which the trees were planted in a regular quincunx. At a romantic seat among the Malvern Hills, near Ledbury‡, the fruit-trees and hops have been planted both in quincunx and in natural form, like groups and thickets, through the park.

5. On *Dairy Farms* a certain portion of old pasture and meadow is requisite; in other respects there is little peculiarity of

* The seat of General Dunlop, in Dumfrieshire, laid out by me in 1804-5.

† A seat of T. Botfield, Esq. in Herefordshire, laid out by me in 1805.

‡ In Herefordshire, the property of H. M. Barrett, Esq. where extensive improvements on the house and grounds are now executing from my designs.

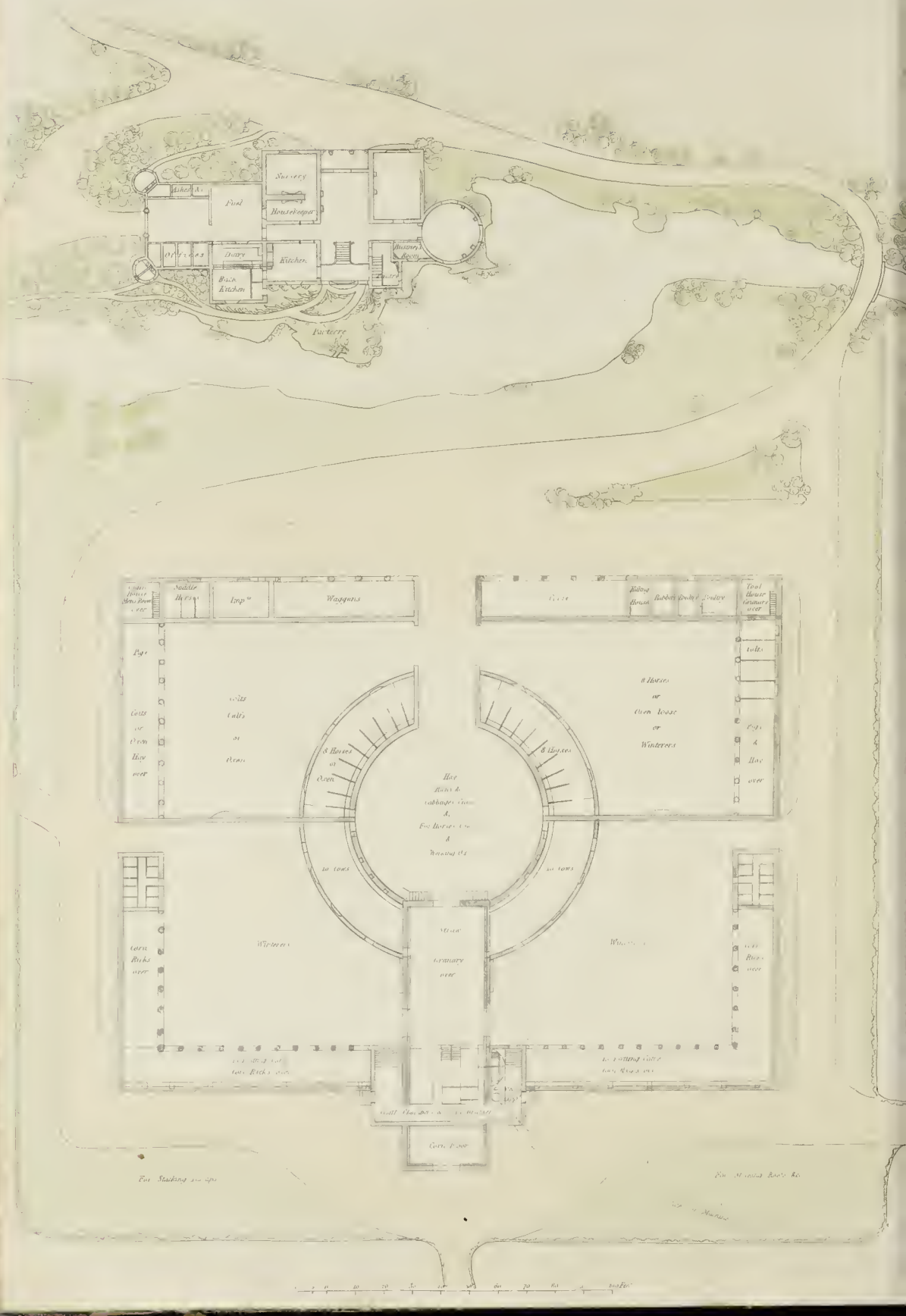

Nursery
Housekeeper
Parlour
Dairy
Kitchen
Parterre
Saddle Horses
Waggons
Cattle
Calves or Oxen
8 Horses or Oxen
Hay
Wintering
Granary over
Cart Shed

Fig 1

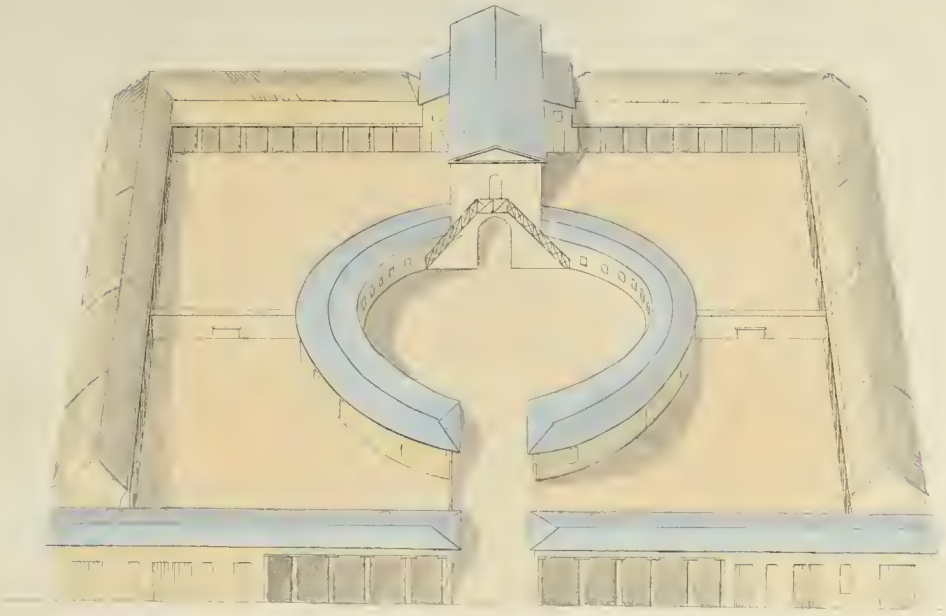


Fig 2

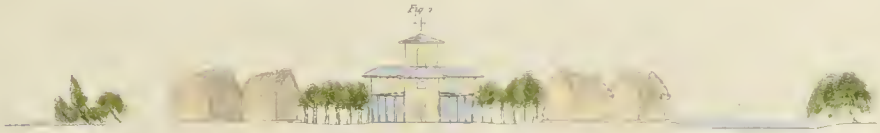
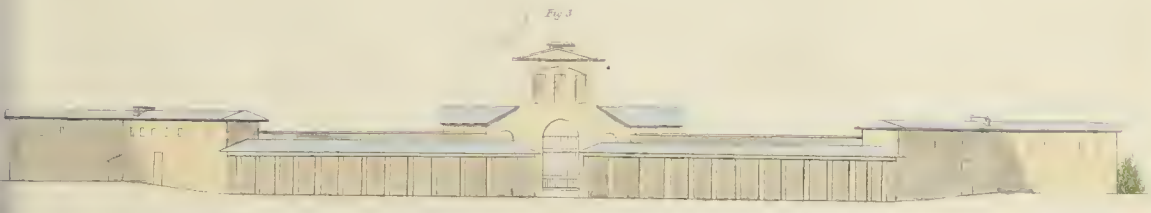


Fig 3



design, except in the construction of the dairy. *Plate XXXIV.* is a plan designed for an extensive dairy, breeding and arable farm, intended for a charming spot near Tunbridge Wells, on the Birchden and Hamsel estate. It is proposed to be placed on a flat, gently sloping towards the water. The sheds for winterers and stall-feeding (a practice which still becomes more general as the Northumberland mode of growing turnips is introduced) are roofed by building ricks over them; and, of course, there is no other rick-yard. The grounds, without, are raised, with a gentle slope, to the base of the ricks, in order to facilitate their building. The form of the stables and cow-houses is calculated to contain more stock in a given extent of ground than any form whatever, and also to admit of their being fed in the easiest possible manner from the food in the centre.

There are, under the troughs for conveying the water to the machine, an apparatus for steaming, a turnip-washer, and a whin-bruiser; the two latter are moved by cranks from the wheel, and the former is conveniently supplied by water from the troughs, and by chaff and refuse corn from the chaff-chamber, &c.

The dairy is not shewn: it is supposed to be placed on an isthmus, in a narrow part of the lake, to the left of the house, near a waterfall, which turns a churning-machine, and ventilates the apartments in warm weather. In other respects it is constructed on the general principles of the dairy shewn by *Figures* 1 and 2, *Plate XXXVII.*

The house is placed on an abrupt rocky bank across the lake.

A bird's-eye view of the farm-buidings is in *Plate XXXV. Figure* 2.

CHAP. VII.

OF PARK FARMS, OR DOMAIN LANDS, FERMES ORNÉES, &c.

THE farm held by a proprietor in his own hands, ought to be distinguished by excellence in every department; not only excellence of design with regard to roads, fences, and buildings, but in culture and management likewise. This gives pleasure by its *fitness*, and its consistency with the order of things; while, at the same time, it is *useful* as an example to tenantry, and as conferring dignity on an art of all others the most important to society. The improvements that have of late taken place in every branch of husbandry, through the patronage and individual exertions of public characters and scientific men, need only be mentioned, to shew how much it is in their power to effect. The topics which I have prescribed to myself in this chapter are, to point out and illustrate those principles which dignify and ennoble the farming of an independent gentleman or noble agriculturist:

1. That alone which can be said essentially to dignify and distinguish one human being from another, is MIND and WEALTH.

We discriminate and characterise not only our fellow creatures, but inanimate objects, by a reference made, perhaps unconsciously, to these qualities. What, for example, constitutes the difference between a pile of stones in a quarry, and the same pile formed into a house, but the *mind* displayed in the latter? Where is the difference between a house built of mud and one built of stone, but the display of wealth in the more durable edifice? The proper application of these principles to the farmery of an independent gentleman, will effect that becoming distinction from those of his tenants, which is suitable to his rank and consequence.

2. *Mind*, or *dignity*, is transfused through the buildings, fences, and roads of a farm, by a superiority of design, by exhibiting a plan sufficiently extensive to attain, with ease, what in common cases is rather attempted than attained; and, so complete in its parts, as not only to comprise every thing necessary and useful, but every thing convenient and agreeable.

3. *Wealth* or *distinction* is readily conferred by a superiority of execution; by employing durable, in place of temporary, materials; by selecting them from principles of taste rather than of economy; and by displaying in their use, *abundance* rather than *scarcity* or penuriousness. The same principles are readily transferred from the design of a farm to its culture and management.

Holkham* and Woburn† are instances of park farms, in which these ideas have been carried into effect in the grandest manner. The extent of the grounds under cultivation at these

* William Coke, Esq. Norfolk. † Duke of Bedford, Bedfordshire

places, the excellence of the buildings (especially at Holkham) the style in which every thing is conducted, and the patriotic exhibitions of agricultural skill and produce, are magnificent examples of farming. A proper *ferme ornée* is Holkham, on a smaller scale, where elegance takes place of magnificence, and beauty of extent.

Having mentioned these instances, I may perhaps be allowed, in the way of detail, to refer to a design which I had the honour of projecting for forming a park and farms at Scone*, to consist of upwards of five thousand acres.

This property is an accumulation of purchases made by the present proprietor and his ancestors; it contained, in 1804, not only the ancient palace, park, and gardens, but the old town of Scone; and, in the distant parts of the estate, the remains of several ancient castles, mansions, and villages. These, together with extensive fir-woods, mosses, heath, commons, and a large tract of rich arable lands, composed this domain.

* In Perthshire, one of the ancient palaces of the Kings of Scotland, and now the seat of the Earl of Mansfield. It is proper to observe, that the idea of this design, made by me in 1804, and here delineated in *Plates XXXVI.* and *XL.* is given from memory, and may possibly contain a number of inferior additions, with some omissions. The general character, however, of the improvements then proposed, is, I hope, carefully preserved. They have been since gradually executing, as far as respects plantations, roads, fences, draining, approaches, removal of the town of Scone, formation of a new one, &c. &c. In regard to the plan of the house, and the introduction of a branch of the river through the park, these have not been acted on. Indeed, the design for the house (as in *Plate XL.*) was not submitted, but is given here chiefly to record the idea of an ancient Scottish palace, and to suggest, for the advantage of those who may have old buildings to add to, or to alter, that it would have been better to have preserved this ancient fabric, and added a new building to it, than totally to have erased it and built another on the spot.

For forming a Park on the
EARL of MANSFIELDS
Estate at Scone
To Contain 5000 Acres

The general extent of lands not to be let on lease, and the site of the palace being fixed on, the arrangement of the component parts of a complete place very naturally followed.

1. The town of Scone is shewn in *Plate XXXVI.* removed from the palace to a distant part of the estate, and placed on the Angus road, at the Perth entrance; an operation of much expense and difficulty, and, in some respects, not completed, as the churches and church-yards, and some of the cottages, whose owners could not be induced to sell, are shewn surrounded by woods, and with openings and private roads to the highway, and New Scone.

The inconvenience to the proprietor from having these cottages so situated is more imaginary than real; and the churches and yards may justly be considered as instructing ornaments in a park.

2. The surface of this tract of country being singularly grand and rich, and that part of the soil which is fit for culture being as profitably occupied in grass as tillage, while the rocky spots, heaths, and commons, are very peculiarly adapted for the growth and effect of timber, it was deemed a desirable circumstance to form the whole into a park, so contrived, that one, two, or three thousand acres could be held and farmed by the proprietor; and the remainder, under the character of a park, let for pasture to tenants at will, or on short leases. The variations of the surface indicated this idea, their being, at different distances from the palace, three irregular ridges of hills, accompanied by hollows, containing streams, either of which could be made the boundary of the home park.

The farm-buildings were already placed favourably to the occupations of as much land as might be let off; or for being used as cottages for labourers, field-barns, or sheds for the land held in hand. The old castle of Ardgillan, heightened in effect as a ruin, and containing the necessary accommodations of a farmery, may be seen in the distance of *Plate XL.*

3. A large portion of the park is intended to be cultivated as a farm; but (excepting near the farmery) without being divided into fields, or exhibiting any other enclosures than hurdles, natural brooks, and plantations.

4. The kitchen garden, approaches, &c. are, as far as necessary, explained on the plan.

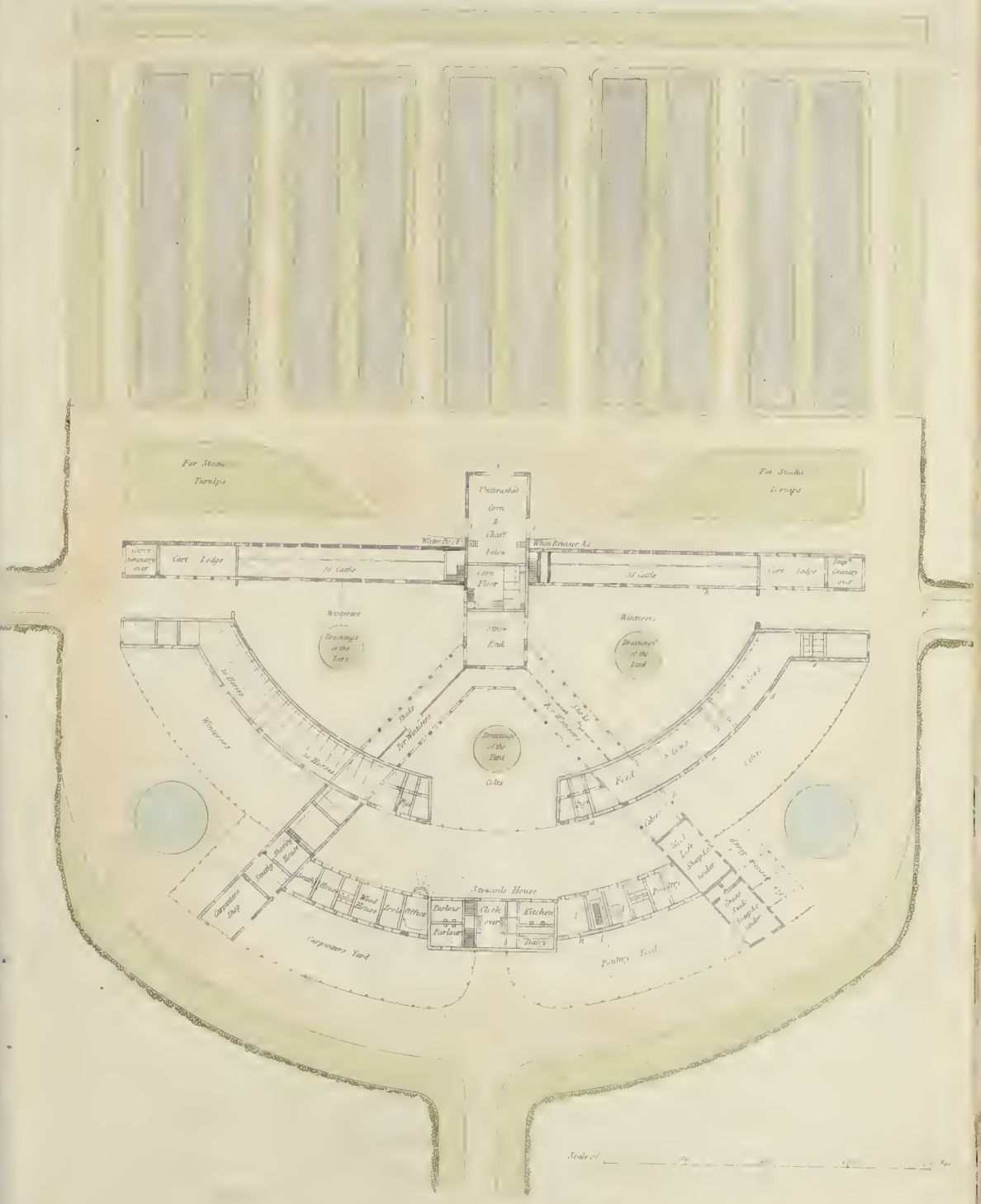
5. *Plate XXXVII.* (2) contains a plan of farm-buildings suitable for such a farm. They are intended to be of simple architecture, of substantial execution, and commodious as a farmery for one thousand acres of convertible lands. The steward's house and office are so situated as to command, through the open sheds, a view of all the principal scenes of the yard; and by opening the two end barn-doors, he may inspect every part of the barn, from one end to the other.

Over the sheds and feeding-byre he may perceive the ricks, either building or thatching, and the carts, loading and unloading corn, as they enter or leave the barn.

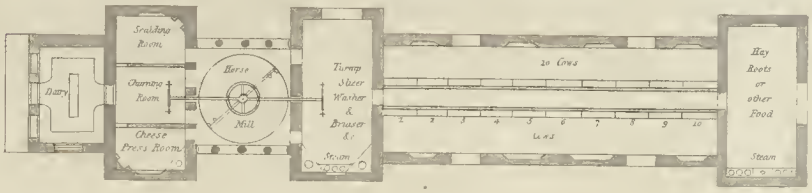
Plate XXXVII. contains a bird's-eye view of this farmery and rick-yard.

As an example of a farmery and stables, with their architecture in character, so as to admit of their forming a component part of the elevation of a mansion, I have given the plan, *Plate XXXVIII.* and its elevation, *Plate XXXIX.* now

Design for the Farm of a Nobleman Agriculturist.

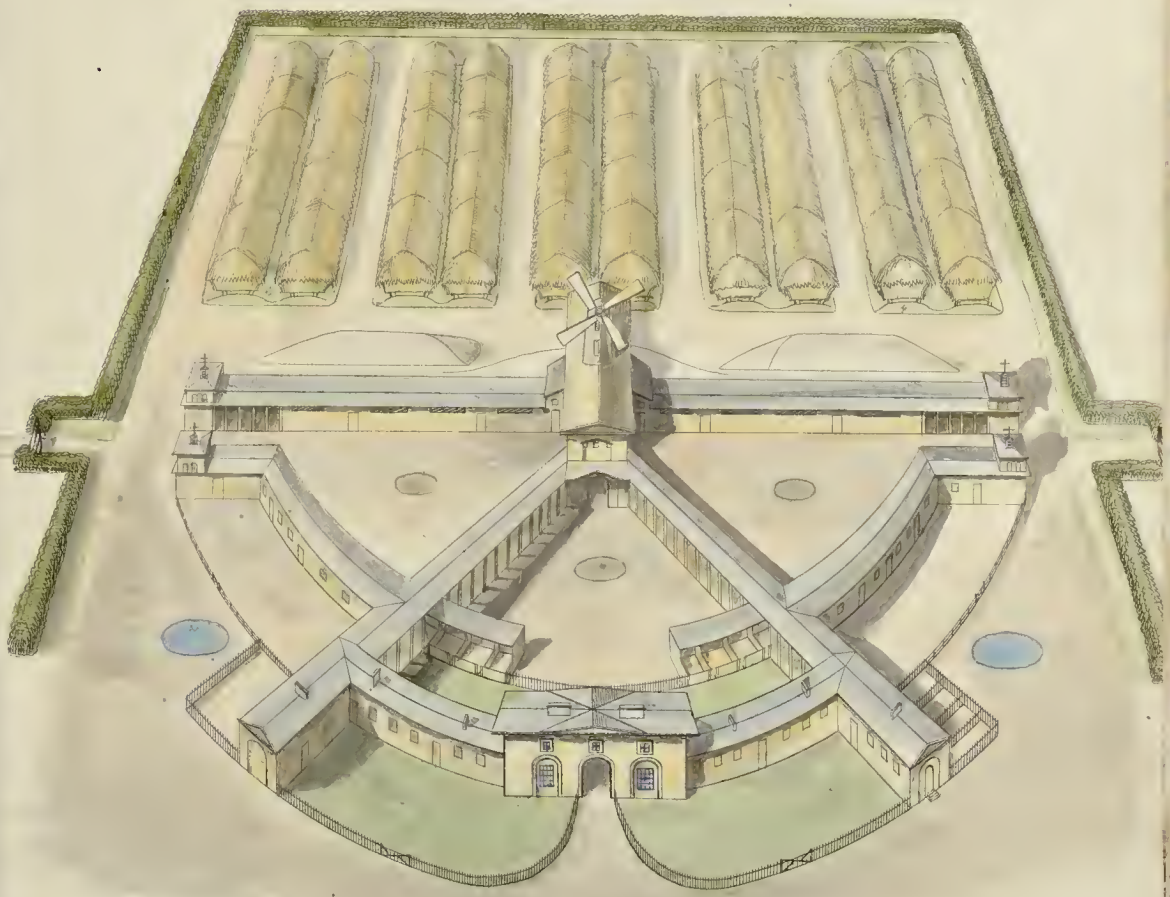


DAIRY
Establishment
for 20 Cows.



Birds eye View of the Design for a

NOBLEMAN AGRICULTURIST.



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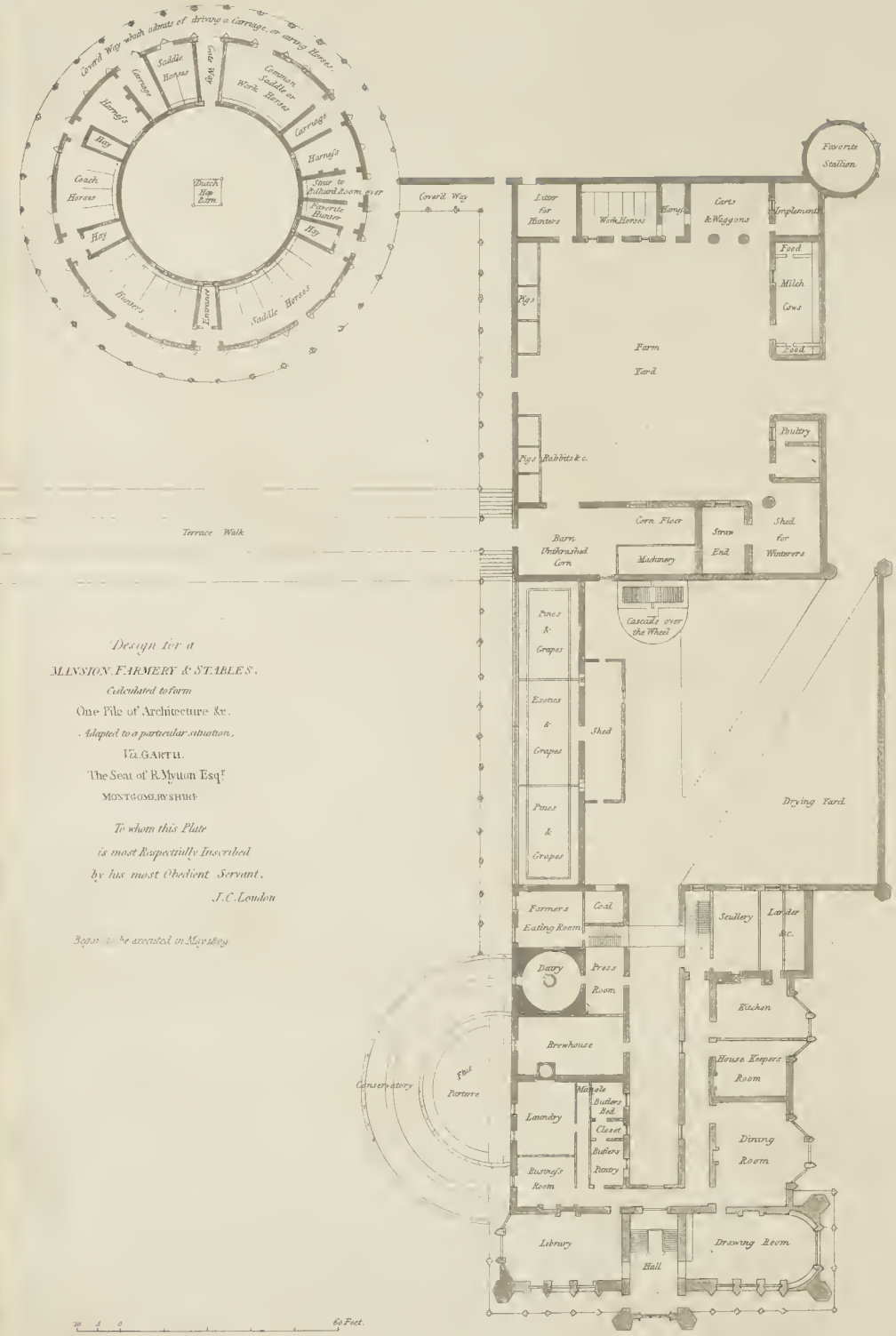


Design for a

MANSION. FARMERY & STABLES.

Calculated to form

One File of Architecture &c.

Adapted to a particular situation,

Va. GARTH.

The Seat of R. Myton Esq.r

MONTGOMERYSHIRE

To whom this Plate

is most Respectfully Inscribed

by his most Obedient Servant,

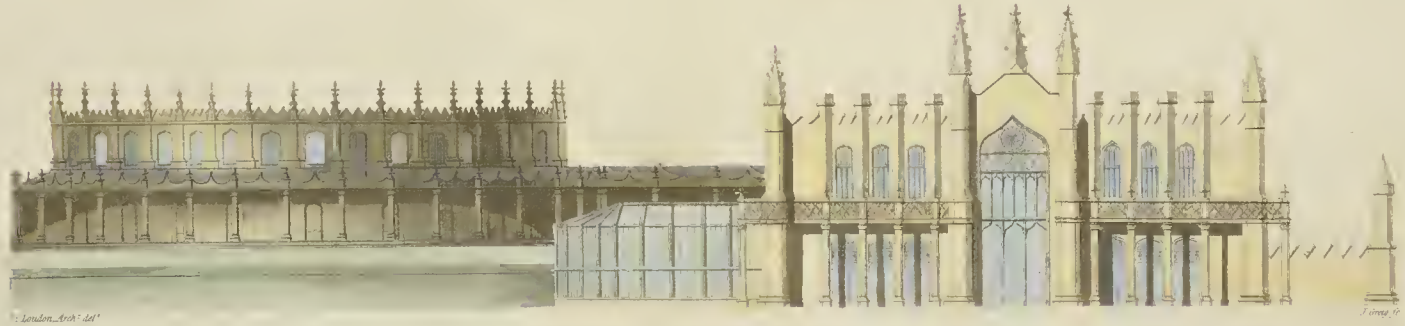
J.C. London

Begun & he arrested in May 1809

Publ.d for the Proprietor, May 10 1812

Diagonal Elevation of Tea Lodge from the North East

Scale of 70 60 50 40 30 20 10 5 0 5 10 20 30 40 50 60 70 80 Feet



J. London Arch.t del.t

J. Girtin sc.

Entrance Front of a House now building at Garth Montgomeryshire

The Seat of Richard Myttun Esq.r

Scale of 10 5 0 10 20 30 40 50 100

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exeeuting in Montgomeryshire. The eireular stables, it is presumed, those at Brighton exeepted, will be the most eomplete in the kingdom. The spaee under the verandah, besides answering for airing horses, will admit of a earriage.

The farm-yard is on so limited a style, as by no means to prove a nuisanee. The overshot water-wheel, whieh is three-fourths above the surface, and seen through the entranee-hall, will have a singular effeet. When not at work, the water is turned off, and falling over its eentre, fronting the house, will form an imposing caseade, in a situation ealeulated, like all the features of the romantie seenery around, to exeite a pleasing astonishment in the mind of a stranger entering the house.

FINIS.

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