

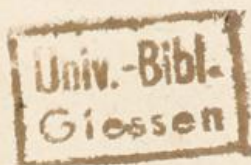
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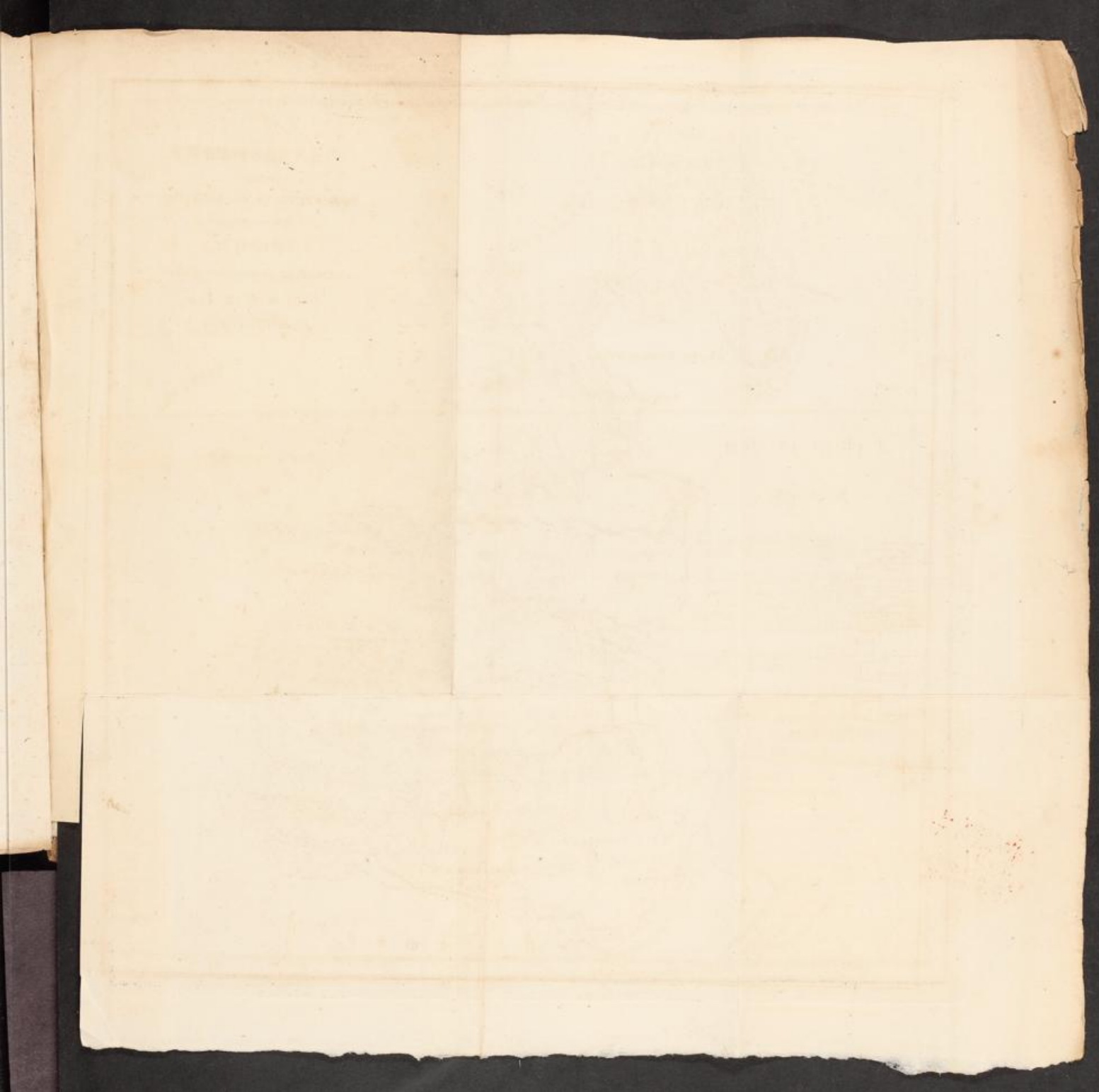
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and sold by Messrs. ROBINSON
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GENERAL VIEW
OF THE
AGRICULTURE
OF THE COUNTY OF
LANCASTER:

WITH OBSERVATIONS ON THE MEANS OF ITS IMPROVEMENT.

Drawn up for the Consideration of the
BOARD OF AGRICULTURE AND INTERNAL IMPROVEMENT,

From the Communications of Mr. JOHN HOLT,
of WALTON, near LIVERPOOL;

And the additional Remarks of several respectable GENTLEMEN and
FARMERS in the County.

*Prima Ceres ferro mortales vertere terram
Instituit ———
Dicendum est, quæ sint duris agrestibus arma,
Quis sine, nec potuere feri, nec surgere messes.*

GEORGICA.

See the sun gleams; the living pastures rise,
After the nurture of the fallen shower,
How beautiful! How blue the ethereal vault,
How verdurous the lawns, how clear the brooks!
Such noble warlike steeds, such herds of kine,
So sleek, so vast; such spacious flocks of sheep,
Like flakes of gold, illumining the green,
What other paradise adorn but thine,
Britannia? Happy, if thy sons would know
Their happiness. To these thy naval streams,
Thy frequent towns superb of busy trade,
And ports magnific add, and stately ships
Innumeros. ———

DYER.



L O N D O N:

Printed for G. NICOL, PALL-MALL,

Bookseller to HIS MAJESTY, and to the BOARD of AGRICULTURE;
And sold by Messrs. ROBINSON, Paternoster-Row; J. SEWELL, Cornhill;
CADELL and DAVIES, Strand; WILLIAM CREECH, Edinburgh;
and JOHN ARCHER, Dublin. 1795.

ADVERTISEMENT.

THE great desire that has been very generally expressed, for having the AGRICULTURAL SURVEYS of the KINGDOM re-printed, with the additional Communications which have been received since the ORIGINAL REPORTS were circulated, has induced the BOARD OF AGRICULTURE, to come to a Resolution, of re-printing such as may appear on the whole fit for Publication. It is proper at the same Time to add, that the Board does not consider itself responsible, for any Fact or Observation contained in the Reports thus re-printed, as it is impossible to consider them yet in a perfect State; and that it will thankfully acknowledge any additional Information which may still be communicated: An Invitation, of which, it is hoped, many will avail themselves, as there is no Circumstance from which any one can derive more real Satisfaction, than that of contributing, by every possible means, to promote the Improvement of his Country.

N. B.—*Letters to the Board, may be addressed to Sir JOHN SINCLAIR, Bart. the President, M. P. London.*

LONDON, June 1795.

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P L A N
FOR RE-PRINTING THE
Agricultural Surveys.

By the PRESIDENT of the BOARD of AGRICULTURE.

A BOARD established for the purpose of making every essential enquiry, into the Agricultural State, and the means of promoting the internal improvement of a powerful Empire, will necessarily have it in view, to examine the sources of public prosperity, in regard to various important particulars. Perhaps the following is the most natural order for carrying on such important investigations; namely, to ascertain,

1. The riches to be obtained from the surface of the national territory.
2. The mineral or subterraneous treasures of which the country is possessed.
3. The wealth to be derived from its streams, rivers, canals, inland navigations, coasts, and fisheries: And
4. The means of promoting the improvement of the people in regard to their health, industry, and morals, founded on a *statistical* survey, or a minute and careful enquiry into the actual state of every parochial district in the kingdom, and the circumstances of its inhabitants.

Under one or other of these heads, every point of real importance, that can tend to promote the general happiness of a great nation, seems to be included.

Investigations of so extensive and so complicated a nature, must require, it is evident, a considerable space of time before they can be completed. Differing indeed in many respects from each other, it is better perhaps that they should be undertaken at different periods, and separately considered. Under that impression, the Board of Agriculture has hitherto directed its attention to the first point only, namely the cultivation of the surface, and the resources to be derived from it.

That the facts essential for such an investigation, might be collected with more celerity and advantage, a number of intelligent and respectable individuals were appointed, to furnish the Board with accounts of the state of husbandry, and the means of improving the different districts of the kingdom. The returns they sent were printed, and circulated by every means the Board of Agriculture could devise, in the districts to which they respectively related; and in consequence of that circulation, a great mass of additional valuable information has been obtained. For the purpose of communicating that information to the Public in general, but more especially to those counties the most interested therein, the Board has resolved to re-print the Survey of each County, as soon as it seemed to be fit for publication; and among several equally advanced, the counties of Norfolk and Lancaster were pitched upon for the commencement of the proposed publication; it being thought most advisable, to begin with one county on the Eastern, and another on the Western coast of the island. When all these Surveys shall have been thus re-printed, it will be attended with little difficulty to draw up an abstract of the whole (which will not probably exceed two or three volumes quarto) to be laid be-

fore His Majesty, and both Houses of Parliament; and afterwards, a general Report on the present state of the country and the means of its improvement, may be systematically arranged, according to the various subjects connected with agriculture. Thus every individual in the kingdom may have,

1. An account of the husbandry of his own particular county; or,
2. A general view of the agricultural state of the kingdom at large, according to the counties, or districts, into which it is divided; or,
3. An arranged system of information on agricultural subjects, whether accumulated by the Board since its establishment, or previously known;

And thus information respecting the state of the kingdom, and Agricultural knowledge in general, will be attainable with every possible advantage.

In re-printing these Reports, it was judged necessary, that they should be drawn up according to one uniform model; and after fully considering the subject, the following form was pitched upon, as one that would include in it all the particulars which it was necessary to notice in an Agricultural Survey. As the other Reports will be re-printed in the same manner, the reader will thus be enabled to find out at once, where any point is treated of, to which he may wish to direct his attention.

PLAN OF THE RE-PRINTED REPORTS.

Preliminary Observations.

CHAP.

I. Geographical State and Circumstances.

SECT. 1.—Situation and Extent.

2.—Divisions.

3.—Climate.

4.—Soil and Surface.

5.—Minerals.

6.—Water.

II. State of Property.

SECT. 1.—Estates, and their Management,

2.—Tenures.

III. Buildings.

SECT. 1.—Houses of Proprietors.

2.—Farm Houses and Offices; and Repairs,

3.—Cottages.

IV. Mode of Occupation.

SECT. 1.—Size of Farms.—Character of the Farmers.

2.—Rent—in Money—in Kind—in Personal Services,

3.—Tythes.

4.—Poor Rates.

5.—Leases.

6.—Expence and Profit.

V. Implements.

VI. Inclosing—Fences—Gates.

VII. Arable Land.

SECT. 1.—Tillage.

2.—Fallowing.

3.—Rotation of Crops.

Chap.

Chap. VII. continued.

- SECT. 4.—Crops commonly cultivated; their
Seed, Culture, Produce, &c. *
- 5.—Crops not commonly cultivated.

CHAP.

VIII. Grasses.

- SECT. 1.—Natural Meadows and Pastures.
- 2.—Artificial Grasses.
- 3.—Hay Harvest.
- 4.—Feeding.

IX. Gardens and Orchards.

X. Woods and Plantations.

XI. Wastes.

XII. Improvements.

- SECT. 1.—Draining.
- 2.—Paring and Burning.
- 3.—Manuring.
- 4.—Weeding.
- 5.—Watering.

* Where the quantity is considerable, the information respecting the crops commonly cultivated, may be arranged under the following heads:

- | | |
|--|---|
| 1. Preparation { tillage, }
{ manure. } | 6. Culture whilst growing { hoe, }
{ weeding }
{ feeding. } |
| 2. Sort. | 7. Harvest. |
| 3. Steeping. | 8. Threshing. |
| 4. Seed (quantity sown.) | 9. Produce. |
| 5. Time of sowing. | 10. Manufacture of bread. |

In general the same heads will suit the following grains:

Barley. Oats. Beans. Rye. Pease. Buck-wheat.

Vetches - - - Application.

Cole-feed - { Feeding, }
 { Seed. }

Turneps - - { Drawn - - - - - }
 { Fed - - - - - }
 { Kept on grafs - - - }
 { — in houses - - - }

XIII. Live

XIII. Live Stock.

SECT. 1.—Cattle.

2.—Sheep.

3.—Horses, and their Use in Husbandry,
compared to Oxen.

4.—Hogs.

5.—Rabbits.

6.—Poultry.

7.—Pigeons.

8.—Bees.

CHAP.

XIV. Rural Economy.

SECT. 1. — Labour — Servants — Labourers
— Hours of Labour.

2.—Provisions.

3.—Fuel.

XV. Political Economy, as connected with or
affecting Agriculture.

SECT. 1.—Roads.

2.—Canals.

3.—Fairs.

4.—Weekly Markets.

5.—Commerce.

6.—Manufactures.

7.—Poor.

8.—Population.

XVI. Obstacles to Improvement ; including gene-
ral Observations on Agricultural Legislation and Police.

XVII. Miscellaneous Observations.

SECT. 1.—Agricultural Societies.

2.—Weights and Measures.

Conclusion.—Means of Improvement, and the Measures
calculated for that Purpose.

Appendix.

PERFECTION

PERFECTION in such inquiries is not in the power of any body of men to obtain at once, whatever may be the extent of their views, or the vigour of their exertions. If Lewis XIV. eager to have his kingdom known, and possessed of boundless power to effect it, failed so much in the attempt, that of all the provinces in his kingdom, only one was so described as to secure the approbation of posterity *; it will not be thought strange that a Board, possessed of means so extremely limited, should find it difficult to reach even that degree of perfection which, perhaps, might have been attainable with more extensive powers. The candid Reader cannot expect in these Reports more than a certain portion of useful information, so arranged as to render them a basis for further and more detailed enquiries. The attention of the intelligent Cultivators of the kingdom, however,

* See Voltaire's Age of Lewis XIV. vol. ii. p. 127, 128, edit. 1752.

The following extract from that work will explain the circumstance above alluded to.

" Lewis had no Colbert, nor Louvois, when about the year 1698, for the instruction of the Duke of Burgundy, he ordered each of the intendants to draw up a particular description of his province. By this means an exact account of the kingdom might have been obtained, and a just enumeration of the inhabitants. It was an useful work, though all the intendants had not the capacity and attention of Monsieur de La-moignon de Baille. Had what the king directed been as well executed in regard to every province, as it was by this magistrate in the account of Languedoc, the collection would have been one of the most valuable monuments of the age. Some of them are well done; but the plan was irregular and imperfect, because all the intendants were not restrained to one and the same. It were to be wished, that each of them had given, in columns, the number of inhabitants in each election; the nobles, the citizens, the labourers, the artisans, the mechanics, the cattle of every kind; the good, the indifferent, and the bad lands, all the clergy, regular and secular, their revenues, those of the towns, and those of the communities.

" All these heads, in most of their accounts, are confused and imperfect; and it is frequently necessary to search with great care and pains to find what is wanted. The design was excellent, and would have been of the greatest use, had it been executed with judgment and uniformity."

will

will doubtless be excited, and the minds of men in general gradually brought to consider favourably of an undertaking, which will enable all to contribute to the national stores of knowledge, upon topics so truly interesting as those which concern the Agricultural interests of their country; interests, which on just principles never can be improved, until the present state of the kingdom is fully known, and the means of its future improvement ascertained with minuteness and accuracy.



PRELIMINARY OBSERVATIONS
TO THE
LANCASHIRE RE-PRINTED REPORT.

IN the course of an address to the Board of Agriculture, when it first assembled, on the 4th of September 1793, I took an opportunity of stating the measures which seemed to me the most likely to promote the objects of that institution; and submitted to the consideration of the Board, whether the first object ought not to be, *to ascertain facts*, without which no theory or system of reasoning, however plausible, could be depended on; that for attaining so important an object, it would be necessary to examine into the agricultural state of all the different counties in the kingdom, and to enquire into the means, which, in the opinion of intelligent men, were the most likely to promote either a general system of improvement, or the advantage of particular districts; that by employing a number of able men for that purpose, by circulating their reports previous to their being published, and by requesting the additional remarks and observations of those to whom such communications were sent, it was probable that no important fact, or even useful idea, would escape notice.

The plan thus chalked out having been approved of by the Board, it was immediately set about with every possible degree

* PRELIMINARY OBSERVATIONS.

of energy. Among other intelligent individuals nominated for that purpose, Mr. Holt, of Walton, near Liverpool, was appointed to take a survey of the county of Lancaster. Those who have had an opportunity of examining his original Report, will see the pains which he took to fulfil the objects of his mission. As soon as his Report was printed, it was circulated throughout the county, for the purpose of obtaining additional information; and though, from the want of the privilege of sending and receiving packets duty-free, (a privilege which, it is hoped, the Board will soon obtain, for the want of it impedes all its operations) the circulation of the Report was attended with considerable difficulty and expence; yet, on the whole, such a number of copies were returned, with valuable additional observations, as to induce the Board to form an opinion, that the work might now be rendered fit for publication; and that it would be desirable to take the sense of the Public respecting the best mode of communicating the information which it had thus accumulated, by re-printing the corrected accounts of two counties, namely, Norfolk on the Eastern, and Lancashire on the Western coast of the island.

There is every reason to believe, that the accounts of the other districts in the kingdom will soon be equally complete; in which case, a greater mass of agricultural knowledge will be collected, in a space of little more than two years, than probably can be found in all preceding publications on the subject of husbandry; and thus the foundation will be laid for a general system of improvement, on that best and surest of all foundations, a knowledge of facts.

Next

PRELIMINARY OBSERVATIONS. xi

Next to collecting information, the improvement of a country must depend upon rousing a proper spirit of exertion, in order that the information thus accumulated may be put into action. By the happy constitution of this country, and the wisdom of its laws, property is better secured here than perhaps in any other state that ever existed, which undoubtedly is a great spur to exertion. But the legislature seems to have trusted too much to the beneficial effects of that security, and to think that no other encouragement or spur could be necessary. Fortunately, however, a new system has commenced. Parliament has already begun to vote some aid for the improvement of husbandry. The legislature has at last taken the plough and the spade under its immediate protection; and those who make any useful discovery likely to be of service to Agriculture, have now every reason to expect attention to their claims, and that encouragement which their discoveries may be found to merit.—As some of the principal improvements which Mr. Elkington, the celebrated drainer, to whom Parliament has lately granted 1000*l.* were made in Lancashire, it was natural to allude to that circumstance, when the Report of that county came under consideration.

Where both skill in agriculture, and a spirit of improvement, exist, there can be but one thing wanting, namely, capital. There is little risk, however, of any deficiency of that nature in these kingdoms, unless our capital should be diverted from its natural means of employment, *domestic improvement*, to remote and foreign speculations. The best mode of preventing such a deviation seems to be, *to make the*
kingdom

xii PRELIMINARY OBSERVATIONS.

kingdom known to its inhabitants, and to point out the benefit which they may derive from improving it. Such are the objects of these inquiries; which, so far as they concern the county of Lancaster, seem to have made very considerable progress, although in some particulars they have not reached that degree of perfection that would be so truly desirable; but which probably will yet be attained, even previous to the conclusion of the present century, when the Statistical Account of Great Britain, that most important of all the labours which the Board of Agriculture can undertake, is completed.

AGRICULTURAL SURVEY
OF
LANCASHIRE.

CHAPTER I.
GEOGRAPHICAL STATE AND
CIRCUMSTANCES.

SECT. I.—*Situation and Extent.*

LANCASHIRE is a maritime county, bounded on the coast by Saint George's channel and the Irish sea.

The dimensions of the county are as follows*.—Its greatest length 74 miles; breadth $44\frac{1}{2}$ miles.—Its circumference (crossing the Ribble, at Hesketh bank) 342 miles; containing 1,765 square miles, and 1,129,600 statute acres.—Total number of parishes, with the additional ones, 62.

SECT. 2.—*Divisions.*

THE county is divided into six hundreds; namely, Salford, West Derby, Leyland, Blackburne, Amounderness, and Lonsdale. There are two districts in it which may deserve more particular mention; namely, the Filde, which is remarkable

* Calculated upon this occasion by Mr. William Yates, who surveyed and published a map of the county of Lancaster in the year 1786.

for its great fertility; and Furness, bordering on Cumberland and Westmorland, where there is a fertile vale. The Filde is peculiarly distinguished for its breed of cattle. Since the circulation of the Lancashire Report there, a new spirit for agricultural improvements has arisen, particularly in regard to draining, watering, making composts, manuring their lands, &c. which cannot fail to be attended with the best consequences.

The shape of the county is somewhat similar to that of England, Wales, and part of Scotland; *e. g.* suppose the parts beyond the sands represent part of Scotland; the river Loyne, and the inlet which runs up to Cockerham, the rivers Mersey and Dee; that tract called the Filde, the principality of Wales; the Ribble, Bristol Channel, and the Severn; and, again, the river Mersey, the southern boundary of the county, by the English Channel, the southern boundary of the kingdom. The indentures upon the eastern parts of the county have a strong similarity to the indentures on the eastern part of the kingdom.

SECT. 3.—*Climate.*

THE ridge of mountains, which bounds this county on the eastern side, from Yorkshire, and which runs not only through Yorkshire, but Cheshire, Derbyshire, and Staffordshire, &c. and called, not improperly, the Back-bone of the kingdom, being the most elevated ground in the island, screens Lancashire more particularly from the ungenial eastern blasts, the frosts, blights, and insects, which infest the countries bordering upon the German ocean; and though the high mountains may cause a greater quantity of rain to fall in this district, (as appears by rain-gauges kept for that purpose) than in the more interior parts of the kingdom; yet this county, fanned with the western gales, or north-west breezes, has a salubrity of air, to which may be attributed the vigour and activity of the inhabitants, who are, if temperate, generally long-lived. The saline particles, with which the westerly winds are loaded, may also not a little contribute to the verdure of the fields. Snow
continues

continues but a short space of time upon the ground, owing to the maritime situation of the county.

The prevailing winds of this county are the West and N. W. winds, which produce a mildness of climate, and salubrity of air and atmosphere, unknown in most districts so far advanced to the north.

Though that part of the county which lies to the south of the river Ribble is in general a low and flat region, perhaps few districts of this or any other kingdom can produce a more healthy, vigorous, or active race of inhabitants; living in general, when temperate, to a great age, and bearing in the whole of their appearance a most ample testimony, to the salubrity of their native air. The beauty of the *Lancashire* *witches* has long been celebrated; and the men are no less distinguished for their military strength and prowess. The neighbourhood of the Atlantic ocean, and the elevation of its mountain boundary, certainly render this county more subject to wet weather than most in the kingdom. These frequent rains, however, have the effect of rendering Lancashire one of the most productive and certain grass-land districts in the island. The soil is peculiarly adapted to grass, and the climate uncommonly favourable for that production.

Perpendicular Height of the RAIN that has fallen at
Lancaster, during the last Nine Years; distinguishing
each Month and Year in Inches and Lines. By
DR. CAMPBELL, of Lancaster.

Years -	1784.	1785.	1786.	1787.	1788.	1789.	1790.	1791.	1792.
Months.	In. Lin.	In. Lin.	In. Lin.	In. Lin.	In. Lin.	In. Lin.	In. Lin.	In. Lin.	In. Lin.
January -	2 8 $\frac{1}{2}$	2 6	2 6	1 7 $\frac{1}{2}$	2 10	4 5	5 11	5 10	3 2
February -	2 3 $\frac{1}{2}$	- 6 $\frac{1}{2}$	1 1	5 -	2 1	4 11	1 2 $\frac{1}{2}$	3 1 $\frac{1}{2}$	3 -
March -	2 7 $\frac{1}{2}$	- 1	- 11	3 7 $\frac{1}{2}$	1 10	- 8 $\frac{1}{2}$	- 8	2 2	5 9
April -	3 -	1 8	- 4 $\frac{1}{2}$	1 3 $\frac{1}{2}$	2 7 $\frac{1}{2}$	4 3 $\frac{1}{2}$	1 3 $\frac{1}{2}$	4 3	5 9 $\frac{1}{2}$
May -	3 -	1 6	1 8	1 4 $\frac{1}{2}$	1 1	4 1 $\frac{1}{2}$	2 1	2 4 $\frac{1}{2}$	5 -
June -	5 9	1 - $\frac{1}{2}$	1 10	3 6 $\frac{1}{2}$	2 - $\frac{1}{2}$	5 2 $\frac{1}{2}$	4 -	- 10 $\frac{1}{2}$	3 10
July -	3 -	2 1 $\frac{1}{2}$	2 9 $\frac{1}{2}$	7 -	6 5	5 7 $\frac{1}{2}$	7 6	3 6	5 1 $\frac{1}{2}$
August -	5 -	10 4	5 -	7 -	2 - $\frac{1}{2}$	- 5 $\frac{1}{2}$	3 10 $\frac{1}{2}$	6 2	8 6
September -	2 7	5 6	7 11	2 -	3 7 $\frac{1}{2}$	4 1 $\frac{1}{2}$	5 5	1 9 $\frac{1}{2}$	9 4
October -	- 8	5 9	1 6	9 9	2 1 $\frac{1}{2}$	6 6	2 9	3 10	4 3
November -	3 -	4 6	3 -	4 5 $\frac{1}{2}$	1 9 $\frac{1}{2}$	4 1	4 6 $\frac{1}{2}$	6 6	4 -
December -	1 6	1 2	3 8	4 5	- 10 $\frac{1}{2}$	6 6	7 4	5 7 $\frac{1}{2}$	8 1
Total -	35 1 $\frac{1}{2}$	36 9 $\frac{1}{2}$	32 3	51 - $\frac{1}{4}$	29 4 $\frac{1}{2}$	51 - $\frac{1}{4}$	46 6 $\frac{1}{2}$	46 - $\frac{1}{2}$	65 10

N. B.—A line is the twelfth part of an inch.

Mean

of LANCASHIRE.

5

Mean heat of the Thermometer at noon at Lancaster - - 51.8.

D° - - at London - - 56.

D° - - at Edinburgh - 50.1.

WINDS blow at Lancaster :

North - - 30 Days.

N. E. - - 67

S. E. - - 35

East - - 17

South - - 51

S. W. - - 92

N. W. - - 26

West - - 47

The mean heat of the Thermometer, and the direction of the Winds, are taken from an average of the seven years from 1784 to 1790 inclusive.

Perpendicular Height of RAIN that has fallen at Liverpool from the year 1784 to the year 1792 inclusive. By MR. WILLIAM HUTCHINSON, late Dock-master.

1784.	1785.	1786.	1787.	1788.	1789.	1790.	1791.	1792.
36 $\frac{1}{4}$ In.	26 $\frac{1}{4}$ In.	26 $\frac{1}{2}$ In.	37 $\frac{1}{4}$ In.	24 $\frac{1}{8}$ In.	48 $\frac{1}{4}$ In.	42 $\frac{3}{4}$ In.	45 $\frac{3}{8}$ In.	54 $\frac{1}{4}$ In.

The seed-time, and harvest, vary a little between the northern and southern parts of the county. Those towards the east, and contiguous to the mountains, are in general later than the south-western parts.

The following Register will shew, that there is a greater difference of season than many may imagine; and if these meteorological registers were multiplied, and kept in different places, and the system more extended, such data would not only be pleasing memoranda, but afford many useful hints.

The following particulars were taken from the memoranda of D. Daulby, Esq. Birch House, Liverpool, respecting some articles produced on the grounds of Mr. Hill, of Wallasey, in Cheshire, about three miles from Liverpool. The articles mentioned were for the Liverpool market, the dates corresponding

corresponding to the two days in the week on which the market is held, Wednesday or Saturday. It may be worthy of remark, that there is a general strife betwixt the Kirkdale and Wallasey gardeners, who can produce the first early potatoe at Liverpool market. They generally succeed both on the same day. In the year 1790 the Cheshire gardener had, however, the start by nearly a whole week.

EARLY POTATOES.

1766.	June 7,	20 lb. fold for 5 <i>d.</i> and 6 <i>d.</i> per lb.
1767.	June 6,	3 lb. fold for 14 <i>d.</i> in the whole.
1768.	May 14,	8 lb. fold for 4 <i>s.</i> 8 <i>d.</i>
1769.	May 13,	2 lb. fold for 1 <i>s.</i>
1770.	May 23,	2 lb. for 3 <i>s.</i>
1771.	May 18,	$\frac{1}{2}$ lb. for 1 <i>s.</i>
1772.	May 13,	1 lb. for 2 <i>s.</i> 6 <i>d.</i>

N. B.—From this period the early potatoes have been regularly fold for 2 *s.* 6 *d.* per lb. when first brought to market.

After this period the Register was extended to the following articles; namely,

ASPARAGUS.	POTATOES.	GOOSEBERRIES.
1773. April 10.	April 7.	May 5.
1774. 3.	30.	9.
1775. 1.	19.	April 26.
1776. 6.	17.	May 2.
1777. 4.	24.	12.
1778. 11.	25.	9.
1779. March 27.	3.	April 10.
1780. April 15.	20.	May 6.
1781. March 31.	14.	April 21.
1782. May 4.	May 11.	May 18.
1783. April 12.	1.	April 30.
1784. May 8.	17.	May 22.
1785. April 23.	14.	18.
1786. 22.	13.	10.
1787. March 28.	April 11.	April 28.

1788.

1788.	April 19.	May 11.	May 7.
1789.	18.	9.	9.
1790.	3.	April 3.	April 24.
1791.	9.	16.	23.
1792.	7.	25.	25.
1793.	May 1.	May 11.	May 18.
1794.	April 15.	April 12.	April 18.

From the above Register it appears, that the difference between an early and late spring is not less than six weeks; e. g.

	ASPARAGUS.	POTATOES.	GOOSEBERRIES.
1789.	March 27.	April 3.	April 10.
1784.	May 8.	May 17.	May 22.

From this Register may also be traced, the improved cultivation of the early potatoe upon common ground: but the potatoe at present may be truly said to be raised the whole year throughout, by the new method of heating the stoves with steam. Mr. Butler, gardener to the Earl of Derby, at his seat at Knowsley, has practised this some time; and Mr. Collins, late his lordship's gardener, who has ground near Liverpool, had, under glasses, forced by the heat of steam, Christmas, 1794, nearly, as he calculated, one cwt. of potatoes, ready to take up. But he observed, that the process by steam was too expensive to afford any profit at the price they were usually sold.

It will at this day scarcely be credited, that when potatoes began to be brought to market so early as June, the gardeners were under the necessity of bringing the stems adhering to the potatoes, for without this no purchaser could be obtained.

A gentleman who has been particularly attentive to this subject, observed that, in this northern district, autumnal seeds require to be committed to the earth one fortnight at least earlier than is recommended by Mawe, in his Kalendar.

SECT. 4.—*Soil and Surface.*

THE features of this county are, in many places, strongly marked; towards the north they are bold and picturesque, diversified with alpine mountains and fertile vales. The north-east part of the county, Blackburn, Clithero, Haslingden, &c. is rugged, interspersed with many rivulets, with a thin stratum of upper soil; the southern part more softened, and the plains are more fertilized: along the sea coast, the land is chiefly flat, and has the appearance, in many places, as if formerly covered by the ocean. In various fields at Formby, near the shore, there is soil above two feet below the sand, which lies beneath the present green-sward. There are the strongest reasons for believing that this soil (which is about four inches thick) originally formed the surface of the ground, and was gradually buried by sand from the neighbouring hills. Few countries produce greater varieties of soil, which yet does not change so rapidly as in some others.

The greatest proportion of that district, which lies between the Ribble and the Mersey, has for its superficies a sandy loam, well adapted to the production of almost every vegetable that has yet been brought under cultivation, and that to a degree which renders it impossible to estimate the advantage which might be obtained, by improved and superior management. The substratum of this soil is generally the red rock, or clay-marle, an admirable sandy loam, perhaps one of the most desirable soils that can be found, equally well adapted to the production of every vegetable. In this district there is little or no gravelly soil, no chalk or flint, no stony land, and very little obdurate clay, for the generality of it (except what is under grass, and indeed much of that) is treated in a manner that does little credit to this æra of improved and enlightened agriculture. There is also a black sandy loam, something distinct from the above description, which has no red rock, but the substratum white sand, under which is clay, and then marle. There are also tracts of white sand lands, and some little pebbly-gravel lands. There are many large tracts which

come under the denomination of *mosses*, and some stiff, but no obdurate clay lands.

There is a kind of land which throws up great quantities of rushes, not owing so much to springs, as to a thin stratum of surface soil, under which lies a bed of matter, principally composed of clay, which does not admit the water to penetrate; therefore, the upper surface, or soil, is kept in a continual spongy state (if not surface-drained) and produces rushes and other four grasses*.

Remarks on this Observation †.—“ This kind of land lying upon clay or marle, is not (I am of opinion) cured, and but little benefitted, by surface-draining; the evil, generally, if not always, is under the soil, occasioned by the ‡ sand-beds, which are of various depths and forms, from the surface of the clay or marle, say from half a yard to $1\frac{1}{2}$ yard deep, like so many basons filled with sand and water, which keep the soil continually moist (except in very dry weather); and as it must be granted by all, that rushes are occasioned by a stagnated moisture, so it is obvious, that the only effectual method of cure is draining the land sufficiently deep, so that the wet cannot be sucked up to the soil or upper surface. If land lies wet in winter, when dried by summer's heat it becomes hard and firmly baked together, so that little vegetation is produced, consequently the propriety of under-draining, to produce crops and destroy rushes, is obvious. And further, to prove this, if a drain is cut across a field of this description into the marle, and through the sand-beds, it will be found, that there is a continual stream all the winter season,

* Upon such land, common rack or gravel sand is spread upon the ground previous to ploughing, as thick as common dunging; and then, after second ploughing or cross-cutting, dung at top, and harrow in the seed, and you will loosen the water-tight soil. If twice repeated, the success is infallible.

† By Mr. James Blundell.

‡ Called here sand-goats.

" Good marle has the property of stiffening light land, and meliorating, and unbinding, (if dry) stiff land. Stiff soil, it is true, for a long time, resists the rain before it is saturated; but when made wet, it longer retains the moisture than a dry soil."

Marle has a good effect upon these lands; for, besides its usual qualities of promoting putrefaction, it renders the soil stiffer, and enables it to resist and throw off the surface water more effectually.

Moor lands which are in a state of nature, and produce heath, and other wild plants, are of various qualities; very extensive indeed, and much more so than might have been expected in a county so populous, and consequently where lands must be so valuable.

These are distinctions, not necessary perhaps, on this occasion, to particularize more minutely, than by observing that the vales are in general fertile, but have less of that fertility as they approach nearer to the higher lands.

SECT. 5.—*Water.*

THE great advantages which this county possesses, both from its having such a range of sea-coast, and also from the numerous streams and rivers it is possessed of (not forgetting the lakes of Windermere and Coniston-water) need hardly be dwelt upon, being so extremely obvious. It may be sufficient to remark, that without those advantages, neither the manufactures of the county, nor the sea and inland fisheries, a matter of no inconsiderable moment to the inhabitants, could be carried on to the same extent.

It is believed, that the only decoy pond is at Orford, the seat of John Blackburne, Esq. member for the county.

S E C T. 6.—*Minerals.*

LANCASHIRE has some local advantages, which have been the cause of rendering the county so famous for its manufactures. These in a great measure depend upon two most material articles, coals and water; the former of which lie in immense beds towards the southern and middle part, and the various rivers, &c. which, together with the springs, in so many places intersect the county, have conjointly had no small effect upon the agriculture of this district, as will be seen hereafter. The north and north-east districts produce lime-stone in abundance, but no calcareous matter except marle is found towards the south; a small quantity of lime-stone pebble upon the banks of the river Mersey is also to be excepted. In the township of Halewood, near Liverpool, lime-stone is found and got at different depths, but in small quantities.

Coals have not been found, as it is said, farther north in the county than Chorley and Colne. The next bed of that useful article, after a long space, appears again in immense quantities at Whitehaven and Newcastle-upon-Tyne. The cannel (a species of coal resembling black marble) lies chiefly at Haigh, near Wigan, and occupies a space, as it is said, of about four miles square.

Near Leigh is found lime of a peculiar quality, which resists the effects of water, and is therefore applied to the construction of cisterns to hold water, and mortar for building under water. Also at Ardwick, near Manchester, not many years ago has been discovered a lime of similar, by some it is said of superior, quality. The tarras-cistern at Drury-lane house is of this lime.

There is said to be coal about Hornby.—“The exportation of coal to foreign countries is now become a great trade, which has encreased rapidly within these few years past. No doubt this trade is beneficial to some individuals, and also to the revenue; at the same time we should reflect, that this avidity for present profit has a deadly sting in the tail of it. We are now eagerly supplying other nations, and frequently our worst enemies, with those coals, which the metropolis and our manufac-

ories will one day stand in need of; and even now, the exportation trade has raised the price of coals so high, as to be exceedingly inconvenient to many of our manufactories, and to many of the industrious poor, especially in South Britain; and this in less than one hundred years from the commencement of an extensive consumption. What may we suppose will be the price of them two hundred years hence *?

To the above may be added, the great consumption of coals by fire-engines, many of which, in the course of years, must stand still for want of that article.

The power of steam is so great, and the mechanism of the engine is so much improved, that in a little time it is probable we may see a small vessel over the kitchen fire with hot water, forcing an engine and working the churn.

Besides coal, this county also produces stone, of various denominations. Near Lancaster (upon the common) is an extensive quarry of excellent free-stone, which admits of a fine polish. The county town (Lancaster) is built wholly of this stone, and, for its neatness, is excelled by few towns in the kingdom. Flaggs and grey slates are dug up at Holland, near Wigan. Blue slates are got in large quantities in the mountains, called Conistone and Telberthwaite fells, near Hawkshead, of which many are exported. They are chiefly divided into three classes, viz. London, country, and *tom* slate, which are valued in a due proportion: London are the best, &c. The best scythe-stones are obtained at Rainford, and well wrought on the spot. Iron ore, in large quantities, is obtained near Lindle, between Ulverstone and Dalton, in Low Furness. Copper mines in the North have been worked, but without much success.

* Williams's Natural History of the Mineral Kingdom, vol. i. p. 171.

CHAPTER II.

STATE OF PROPERTY.

SECT. 1.—*Estates.*

SINCE the introduction of manufactures, property has become more minutely divided. But there remain proprietors who still hold very extensive possessions.

The remark made by Camden, in his *BRITANNIA*, of the number of ancient families bearing the names of the places where they reside, and whence they took their names, is still applicable to this county, *e. g.* Atherton, Bold, Fazakerley, Formby, Hoghton, Hulton, Mawdsley, Townly, Trafford, &c.

The yeomanry, formerly numerous and respectable, have greatly diminished of late, but are not yet extinct; the great wealth which has in many instances been so rapidly acquired by some of their neighbours, and probably heretofore dependants, has offered sufficient temptation to venture their property in trade, in order that they might keep pace with these fortunate adventurers.

Not only the yeomanry, but almost all the farmers, who have raised fortunes by agriculture, place their children in the manufacturing line.—The farmers in this county mostly spring from the industrious class of labourers, who, having saved by great economy a sum of money, enter upon small farms, and afterwards, in proportion to the encrease of their capitals, take larger concerns. Nothing appears more desirable to the proprietors of large estates, than that many cottages should have annexed to them *a few acres* of land, which serve as a school to the occupier in Agriculture, by giving his mind an opportunity of being employed in the management of it. An ob-

serving proprietor may always select from amongst them proper tenants for his small farms, who may rise, as numbers have done, to occupy with advantage the largest farms in their neighbourhood.

Estates are principally under the direction of stewards and bailiffs. A few individuals have attended personally to the improvement of their own lands; and having executed their work in a superior manner, without doubt have found their account in the superior profit derived from such exertions.

SECT. 2.—*Tenures.*

THE Tenures are chiefly freehold. There are some copyhold; leases on lives have been more frequent formerly, than at present; but the practice for granting leases for lives is not entirely discontinued. A considerable estate in the county, is possessed by the tenants in the following manner, which may give some idea of the proportion of leases for lives, compared to those for a determinate period.

	Statute Measure.			Present Rent.			Estimated clear Yearly Value.		
	A.	R.	P.	£.	s.	d.	£.	s.	d.
Amount of Leases for one Life -	297	3	27	79	6	5	515	0	0
Ditto - - - for two Lives -	322	3	19	30	14	7½	458	13	0
Ditto - - - for three Lives -	222	0	13	80	2	4	352	3	0
Ditto - - - for years -	1,742	2	4	3,910	2	8	4,212	1	2
	2,495	2	1	4,100	6	0½	5,537	17	2

CHAPTER III.

BUILDINGS.

SECT. I.—*Houses of Proprietors.*

THERE are not many noblemen's seats in the county, and those have been already sufficiently described in former publications.—In regard to the seats of the gentry, Ince Hall, belonging to Henry Blundell, Esq; deserves particular notice, having been much improved by its present possessor, not only by the addition of excellent offices, hot walls, green-houses, and paddock, but also on account of its being ornamented with many excellent paintings by ancient and modern masters, foreign and English; many marble statues, rich tapestry, and other articles, have been selected to embellish this seat, in a style so as to become a place of resort to the young artist, the virtuosi, and the curious traveller.

The buildings of the merchants and tradesmen dispersed over many parts of the county, and particularly in the vicinities of large towns, certainly merit notice*.—Considerable expence having been laid out of late years in the erection, finishing, and embellishing many of them in a superior style—many of which are furnished with hot walls, green-houses, the rarest plants and finest fruits: the adjoining grounds have been improved, laid out in various styles, and fringed with plantations.

* Some gentlemen tradesmen's houses in Manchester are erected upon a site of land, which pays a sum no less than 50*l.* per annum ground-rent.

A taste for the fine arts has also gone forth, and a great number of expensive paintings have been purchased to ornament the walls, and engravings to fill their port-folios.—There are more readers amongst the lower class of people, it is supposed, than in any part of the kingdom.

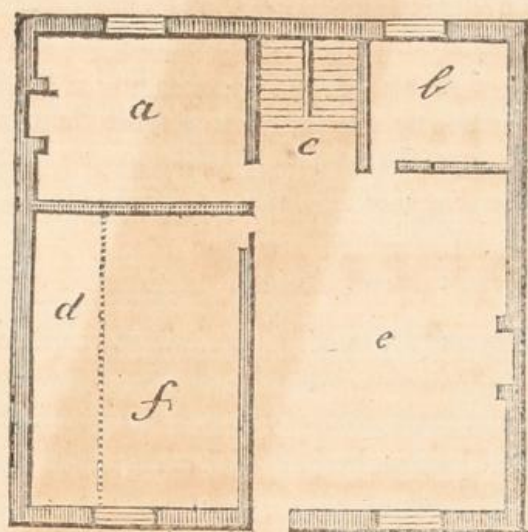
SECT. 2.—*Farm Houses and Offices;
and Repairs.*

SOME of the old built farm-houses are ill constructed; and (which may appear extraordinary, in a county where slate abounds, and straw sells at an advanced price) are still thatched, and the preparation of the straw for thatch is but ill managed. Fern is said to make the best covering, being naturally dry, and not apt to ferment like straw.

The more modern buildings, belonging to the Earl of Derby and many others, are useful constructions; and in general sufficiently spacious to contain the crops both of hay and corn.

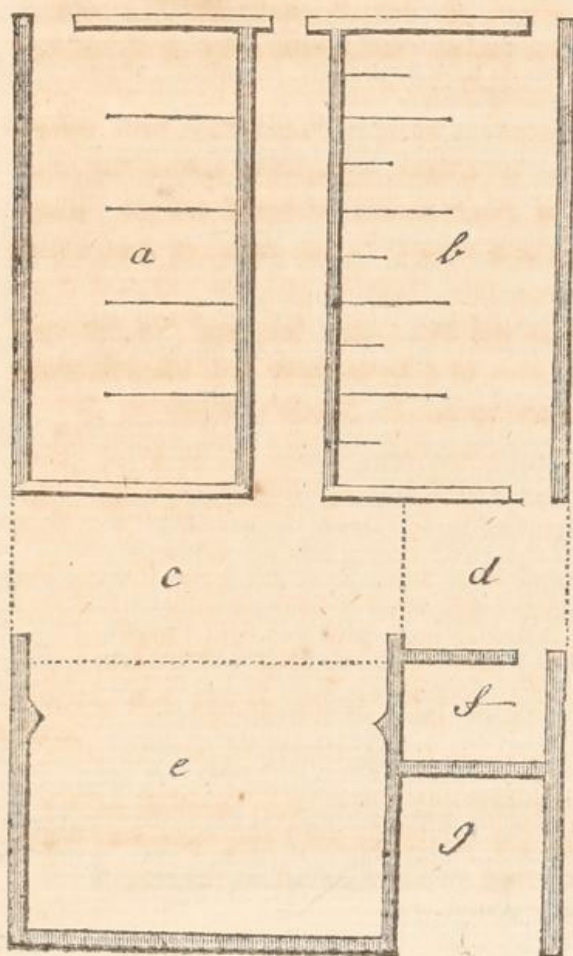
Farms of sixty pounds a year, in Lancashire, have offices frequently as large as would be thought to suffice, in other counties, for farms of three or four hundred *per ann.* where it is the custom to stack their corn, which is not the general practice in Lancashire.

Mr. Boyer, of Lathom house, has favoured the surveyor with the following plan of a farm-house and offices, which have been lately erected upon Mr. Bootle's estate.



HOUSE.

- a. Parlour.
- b. Dining-room.
- c. Staircase.
- d. Milk-house.
- e. Kitchen.
- f. Pantry.



OFFICES.

- a. Stable.
- b. Shippon, or cow-house.
- c. Thrashing-bay, or barn.
- d. Shed.
- e. Corn-bay, or barn.
- f. Calf-crib.
- g. Cart-house.

In forming buildings, convenience is the first thing to be considered: this is the only plan that has yet been erected in this county upon this construction; it will soon be allowed by the intelligent farmer, that two front parlours and front door are unnecessary, two out of the three are seldom or ever used. It is easily conceived from the plan annexed, how much more room is gained, and with what snugness every apartment joins. Many a farmer's wife would think herself in paradise in such a kitchen—these buildings are large enough for farms

Repairs have been frequently left to the tenant, as by covenant stipulated; but they are in general so ill performed, under these terms, as to prove no security to the landlord. Some landlords provide materials, and the tenant is to cart them to the place wanted; which practice seems the only service in repairs by the tenant that proves of real utility to the landlord.

SECT. 3.—Cottages.

THE cottages are of different kinds, for the common labourer in agriculture, and the different artificers, and with accommodations accordingly, with separate rooms, to hold the utensils of trade in their various occupations;—near large factories, being frequently built in long ranges adjoining together, and near the works, and sometimes accommodated with small gardens*.

farms of £. 100 a year, but may be reduced or enlarged at pleasure. The house ought to stand with the kitchen and pantry to the north: a porch is also necessary, and serves as back kitchen, to put milking vessels in, &c. and break off the north-west winds.

The set of offices may be varied many ways, and also be useful and convenient; the one laid down appears to be the best adapted for farms not exceeding £. 100 a year; it will hold five horses and ten cows: you pass to suckle the calves under cover, and they are clear and convenient to the shippon, for it is well to keep the sucklings at a distance from the cows. Over the calf-crib and cart-house is the granary, into which you ascend out of the barn, and have no steps to the outside of the building; you may load the cart under cover with ease through a trap-door into the cart-house. In large farms I would add a stable to one end, and convert the present stable into another shippon, or cow-house.

* Where the cottager has a small garden, the following mode of laying potatoes may be of particular use to him:

From every eye in each potatoe-set, will proceed different stems; which when they are about nine inches above the surface of the ground, should be spread out in a circular form, bent down, and covered all over (but just the ends) with earth. The following rude sketch may probably render it more intelligible: a pit of earth nine inches diameter, about one foot deep, dunged, then covered with a little mould, upon which is deposited the potatoe whole, that is uncut. From this set may arise several stems, which when of length sufficient, then the stems bent down thus: and from the stems thus covered a few inches deep, and rounded up in the shape of a mole hill, new fibres will strike, take root, and potatoes be produced in large quantities.

This mode may be useful to the cottager, as the practice requires but little dung, some additional labour; but as the pits may be varied, the same ground may be repeatedly and repeatedly planted.



Many

Many of these kind of dwellings have been erected by building speculators, as they generally (if the rents are paid) are calculated to yield an interest of £. 10 *per cent.* to £. 20 *per cent.* The modern buildings are chiefly of brick, and covered with slate; rents from one to five and six pounds *per annum.* The old cottages of the county, of which some are yet remaining, are of unhewn stone, or post and plaister, clay floors, and thatched roofs.

The gardens attached to such cottages are found of the greatest utility, both for the means of healthy exercise they furnish, and as enabling the cottager to raise a considerable quantity of food at a small expence.

CHAPTER IV. MODE OF OCCUPATION.

SECT. I.—*Farms.*

IN most townships* there is one farm, still distinguished by the name of the Old Hall, or Manor House (the residence formerly of the great proprietor of that district) which is of larger extent than any of the adjoining or neighbouring farms. Few of these farms, however, exceed 600 statute acres; many do not extend to the amount of 200. But the more general size of farms is from 50, 40, 30, down to 20 acres a-piece; or even so much only as will keep a horse or cow only; or one of these, as is most convenient.

Farmers in general are charged with being stupid, obstinate, and attached to old customs. In this county they do not altogether merit these harsh accusations—we have all our prejudices and attachments. They are, in general, a laborious, and certainly a most useful class in society. The hazards they have to encounter, from seasons, and other causes, leave little room for trials of uncertain experiments. After the grain has been deposited in the earth, the ground being previously prepared to receive it, in the most husband-

* The parishes of Lancashire are again subdivided into townships.

man-like manner, still the successful issue entirely depends on a favourable season to vegetate and mature the grain. Mildews and blights, under these favourable aspects, may yet intervene; but should not any inauspicious appearance happen, and should the reaper be prepared to gather the produce of the loaded fields, yet how often does the howling blast scatter and disperse the hopes of the husbandman!

Again, the labours of the farmer are toilsome; his gains cannot be great, upon the most favourable calculations; namely, that from his grounds he should be enabled to raise three rents—one, of course, his landlord demands; more than another is requisite to maintain his family, pay the hire of servants, and support contingencies; the third and last, toward paying interest of the capital advanced for stock, and afford an annual surplus to reward his labours.

A spirit of ingenuity and improvement amongst the inhabitants of this county, has been frequently proved, and is yet, every day, manifesting itself; but this is most apparent amongst the manufacturing class; and the reason is obvious—reward immediately ensues. The Glasgow manufacturers, till of late, have exceeded the Lancashire in muslins. Stimulated by emulation, in the neighbourhood of Bolton, they now boast that they have at last, and but very lately, surpassed the Glasgow muslins and fancy-works. The same flame would equally shine amongst the farmers as well as amongst the manufacturers, were the reward equally certain: still it remains to enquire how a spark of this flame may be kindled. The farmer is not such a novice, and so totally blind to his own interest, as to be incapable of viewing the effects of skilful cultivation, however novel; and if on repetition this new practice be found beneficial, the great incentive to action, INTEREST, will operate equally upon one individual as on another.

But how is the farmer to be convinced? He is told such are the customs which succeed in other districts; but these assertions do not convince. Soil, climate, or other causes, may operate—he waits an example nearer home. Herein the landlords, the gentlemen of property in the county, should interfere and set the example; and several spirited gentlemen have

have made great exertions in the introduction of many novel practices, and under great disadvantages; for not being able to execute, but only to direct, they have had both prejudice and ignorance to encounter. Their labour is always procured upon worse terms, probably by $\text{£. } 50$ per cent. than can be obtained by the farmer or gardener, who can say to his workmen, "*Come, let us go dig together;*" even if the labourer be hired to work by the piece upon the usual terms, it will often be slightly performed.

How many good effects, and what superior cultivation, has been produced within the space of half a century, by these means, in a slow and almost imperceptible manner! The very village in which this account is written*, half a century ago, was not able to supply from its own meadows an inferior number of cattle, with a sufficiency of hay for winter stock. What was wanted of this article was generally purchased from the Seston meadows.

There is a greater quantity of live stock at present kept, and yet no small surplus of hay remains to be sent to the Liverpool market.

It was in the memory of a worthy and experienced farmer†, who only died the present year, that the first load of night-soil brought from Liverpool towards the north was by his father; who was paid for carting the same the price that heretofore had been paid for carting away this nuisance, and throwing it into the river Mersey.

The good effects upon the land, which experience has proved dung to have, have caused it, at this period, to be sold at an advanced price, and carted to a considerable distance. The varieties of potatoes, their diminished value to the purchaser, in comparison to the price they fetched twenty or thirty years ago, under an advance of land, dung, and labour, proves superior cultivation, and much greater produce of this excellent vegetable, from the same quantity of soil. The introduction of clover, the varieties of seeds of grain, both oats and wheat, prove some degree of atten-

* Walton, near Liverpool.

† Mr. John Harper, late of Bank Hall.

tion; as does also the introduction of the turnip, although the cultivation at present be not so extended, nor treated in the most husbandman-like manner. Yet this, and all the above examples, are introduced to prove that a Lancashire farmer, though not a complete agriculturist, is not without some spirit of improvement.

SECT. 2.—*Rent.*

THE rent of lands is very variable in the different parts of the county, from ten shillings to ten pounds *per annum*, the large acre, of eight yards to the rod; the latter enormous sum, being frequently paid in the vicinity of large towns, for particular accommodation. The price paid by the farmer is from ten shillings for some barren lands, up to twenty, thirty, forty, and some (but not many) as high as eighty shillings *per acre per annum* (large measure.)

SECT. 3.—*Tythes.*

THE tythes are in many places collected, one *eleventh* of the corn—the hay is frequently converted, five shillings *per acre* for old meadows, six shillings *per acre* for first year's clover (acre large measure.)

SECT. 4.—*Poor Rates.*

POOR rates are at Liverpool 2*s.* 6*d.* *per lb.*; at Walton 12*d.* *per lb.*; at Manchester 6*s.* *per lb.* at a highly-valued rental, but taxed at only half value, they are therefore at 3*s.* *per lb.* on the rental; at Bolton 6*s.* a late assessment, but would be 4*s.* of full and present value; Rochdale about 4*s.*; at West Houghton 16*s.* the pound; Ashton 5*s.* *per annum*; Oldham 5*s.* *per annum* on the full rental.

SECT. 5.—*Leases.*

MANY farms are held by leases on three lives*, on which a fine has been paid, and a small annual rent reserved; and

* When a lease is granted for three fresh lives, on an average the term lasts upwards of 50 years.

sometimes an addition of *boon services*; which last system seems much on the decline. These leases are generally estimated at about fourteen years purchase.

The leases upon years are, from seven, eleven, to fourteen; but chiefly seven*. Covenants in some to pay the rent the day the tenant enters upon the premises. This covenant for the security of the landlord, but not exacted except on emergencies. The time of entering upon the lands is Candlemas; and on the buildings, May-day. Usual covenants are, the landlord to repair buildings, the tenant carting the materials. The tenants severally to discharge all taxes, serve all offices, and all the duties charged upon the farm.

Tenants are restrained, by covenant †, to the quantity allowed to plow, sometimes to one-third, sometimes to one-fourth, of the whole; and also, of late, to the number of crops to be taken at one breaking up of the ground—sometimes to our crops; and sometimes only three are allowed. Tenants are restrained, by covenant, from sowing wheat upon bean stubble ‡, or any other stubble from which a crop has been taken

* Short leases, where farms are arable, and upon an improving plan, such as marling, and any other sort of improvement, manure, &c. being so dear, would greatly check the spirit of improvement, whence of course in time the land must decrease in its value, when farmers have to do at their own expence. If the proprietor was to improve at his own expence, and finds there is an advantage in short leases, it is but just so to do; but when the farmer has to improve at his own expence, and upon a short lease, and cannot pay his way, the farmer is often ruined, and the proprietor a loser; for when the farmer is poor, the farm is sure to be made poor also.

Leases of a reasonable fair length of time, and the covenants not so strict at the beginning of the lease, would greatly encourage the spirit of the farmer to improve, when he has to do it at his own expence, and the covenants to be such as to bind the farmer by forfeitures, over and above the yearly rent, so as to have the premises in a high state of cultivation at the expiration of the lease, and to give his management of manures, &c. in writing, and his account of stock every year of the term to the proprietor or his agent, or as often as it may be required; and if found in an error, the covenants to be such as to bind him in a sum, according to the rent and largeness of his farm, over and above all forfeitures, and likewise to forfeit his lease.—*Mr. Harper.*

† Tenants are *very much restrained* in plowing, and not improperly, unless they could be induced to cultivate green crops, as turnip, cabbage, &c.

‡ Bean stubble, in some counties, is almost the only and best tilth known for wheat; and probably, with proper culture, might be so in this county.

taken the same year. The tenants, by covenant, restrained from paring or burning, except moss lands.

The tenants sometimes restrained, by covenant, from selling either hay or straw, but are bound to consume the whole upon the premises.

The tenants, by covenant, restrained from selling off their stock till the close of the year, at the expiration of their term, that the greater quantity of dung may be raised from the produce consumed.

The tenants allowed to take off three-fourths of the wheat growing upon the premises at the expiration of a lease. The succeeding tenant to have the remaining quarter *.

A succeeding tenant to have permission, after Candlemas, at the expiration of a lease, to occupy certain portions of the out-buildings, by clauses founded for the accommodation of his horses, hay, &c. necessary for the spring feeding, on the new tenant entering upon his farm.

Upon the estate of that intelligent landlord, Mr. Bayley, of Hope, whenever a tenant wishes for the whole of his farm, or any particular field, to be improved, by draining, marling, liming, dunging, or laying down to grass in a superior manner, the landlord takes the field into his own possession, during the process; and, when completed, returns it again to the tenant, with an advanced rent of ten *per cent.* upon the capital laid out upon the improvements; by which steps Mr. Bayley has advanced the rental of his estate, since the year 1768, very considerably—his

county. At any rate it is wrong to prevent the tenants from making trials, and still more so to prevent them making one of the first of agricultural improvements on poor land, and turf-burning.—*Mr. Boys, of Kent.*

This covenant, to the ear of a Kentish farmer, seems the most extraordinary that can be. It is by them supposed to be almost the best preparation that can be for wheat. Nothing can justify it, but inattention to the bean crop, by which the land is in too foul a state to be sown: but it must be foul indeed, if a Kentish farmer could not find ways to clear it properly for wheat. No man can be surprized that corn is so dear in this county, when he knows that such covenants are to be found in leases.—*Mr. Dann, of Kent.*

* The custom of the off-going tenant taking three-fourths of the wheat left growing on the premises is much upon the decline in this district, for it is generally allowed but one half; and many lease not to leave any at all. I myself, for one, am not to leave any growing.—*Mr. Harper.*

tenants

tenants are thriving, and getting money. Mr. James Balmer, who accompanied the surveyor in this excursion, and is a good judge of cattle, declared he never saw, upon any one estate, so large a stock of cattle, uniformly good, being the Lancashire long horn, and what he termed the right sort.

A certain method to excite improvement would be to let farms to men of industry, ingenuity, and property, upon reasonable terms, and give leases for 21 years, free from arbitrary covenants; without this nothing can excite a general and effectual improvement. For suppose a farmer to lay out a few score or hundred pounds upon his farm in useful improvements; his landlord sees the advantage he is making, sends a valuer to look over his farm; who, never considering (nor being told) what he has done, lays a tax upon his industry, and makes him pay interest for his own money. Daily experience proves the truth of this assertion, and will ever operate to the destruction of improvement, and of course to the great disadvantage of the public.

Another improvement which here suggests itself, is by a revival of the covenants in leases; and adapting them better to the present improved system of agriculture; many of them at present militate against some approved practices, nor has an ingenious cultivator scope to act, being restrained under covenant. There wants a spirit of liberality in the general tenor of leases. Instances might be produced to prove that if indulgencies were upon some occasions granted, the tenant would be benefited, and the landlord enriched; and this only by a new modelling of the covenants, whereby the lands, if managed under a certain cultivation, must return, at the expiration of the lease, into the hands of the possessor, in a better state than they were in at the beginning; and of course, would bring an advanced rental to the estate; and again, the tenant, if industrious, might be enabled, by his advanced capital already gained by his former lease, and the superior state in which he now finds the lands upon the same farm, to give the advanced rent to his landlord with greater profit to himself, than upon his former rent, under the impoverished state in which farms are generally entered upon.

Leases upon lives only act as checks to improvements; they are, in general, only beneficial to the first purchaser, who secures an income on three lives, for fourteen years purchase—the fee simple of which would have required double the sum. The successors, elevated by possessing an estate under a small annual quit rent, instead of full rent, *live up to the height*, as the phrase is, and are but ill-prepared to renew the lease, or pay the fine required when a life drops. The lease, through inability of the tenant to renew, or some other cause, is suffered to run out, under the uncertainty of life, and the lands (there being no provision made by covenants to prevent it) are harassed and abused to such a degree, as to require a length of time to restore them.

Theory and practice, it must be confessed, are perpetually at variance, as well in Agriculture as many other pursuits. It might at first sight appear, that the custom of granting leases for three lives (a tenure that gives such probable security to a tenant) would excite a degree of spirit of improvement amongst the holders of these tenures. Experience however proves the contrary fact—For leaseholds upon lives are generally under the most wretched cultivation.

Easy rents may have produced a careless indolence, and hence an aversion to enterprize. The landlord having but little interest in such estates, and less power over such tenants, is himself checked from any spirit of improvement upon such contingent property. Those proprietors who look a little towards the welfare of posterity, are come to a resolution of running these tenures out, and, of course, the tenants are not behind in exhausting and every way impoverishing the land.

The ancient custom of granting leases for three lives is beginning to disappear: It should seem probable that this tenure, which grants so much security to the tenant, would naturally excite a liberal and enterprising spirit of husbandry: fact however proves the reverse of the proposition; the ancient leasehold estates being almost universally in a wretched state of cultivation, beyond all comparison less productive than those held upon shorter tenures. Easy rents, secure possession, and good land,

land, have lulled the leaseholders into a careless indolence, an aversion to enterprize, which have been productive of much ill to themselves and their connections, and, above all, to the public; much ill has accrued to the leaseholders from the power of borrowing money upon this ideal species of property.—These observations hold good to the custom of half *rent* and half *fine*. Upon such tenures the immediate landlord can have no inducement to advance money for the amelioration of his estate, and but little interest and less power either to prevent his land being exhausted by wretched husbandry, or to oblige his tenants to keep upon their farms a due proportion of stock. Whoever will take the trouble of examining the estates of this county held upon three lives, will find the arable worn out by a perpetual succession of exhausting crops, and the grass little more than a collection of rushes and beggary, the whole unditched, undrained, and unmanured. Landlords have at length become sensible to their own interests, and are suffering their leases to run out, which, though a wise policy, is destructive in its immediate effects: in fact, the country is at this time suffering extremely in consequence.

Modern leases upon land in high condition are from seven to eleven years;—upon improveable land fourteen to twenty-one:—But landlords in this county will never adopt the system of granting *long leases free from all restrictions*, such as are recommended by the surveyors for the West Riding of York.—To recommend such a system to a manufacturing county would be absurd.

The first purchaser of leaseholds is generally a sensible industrious man, who understands his business, and attends to it. His successors are often both ignorant and idle, but their tenure is secure, and they cannot be disturbed in their possessions by any thing but their own folly; this often induces them either to harass their estate themselves, or let them off at rack rent to some poor devil, without any capital or means of procuring one.

I know that the contrary may be, and often is the case, and that the abuse of a good custom is no argument against the custom itself: but I also know that there are no poorer or more wretched people in the county than the occupants of leasehold estates, and that the sons and grandsons of most of the original leaseholders are not to be found upon such estates—A middle man is the devil—all the world knows the consequence of this custom in Ireland—the *little lords* of this country are in the same predicament.

Differences between Landlords and Tenants.

The justices might settle all differences* and disputes betwixt the landlords and tenants, instead of the present expensive mode of courts of judicature. The differences are generally of a trifling nature, and easy to be comprehended. The tenant would be more likely to obtain redress under this mode of judicial enquiry, and the landlord would prevent abuses to his land: he may now be withheld, under certain circumstances, from correcting a refractory tenant, which might be too heavy for any redress the landlord could obtain; and the damages given too grievous for a tenant to bear.

SECT. 6.—*Expences.*

Authentic Statement of a Farm, communicated by MR.
HENRY HARPER, of Bank Hall.

		£.	s.	d.	£.	s.	d.
Yearly Rent	-	270	0	0			
Taxes	-	45	0	0			
					315	0	0

* With a *proper jury* perhaps they might. But how would such summary proceedings operate on the pockets of a most numerous tribe in this country, the gentlemen of the law?—*W. D.*

Outgoings for one year			£.	s.	d.	£.	s.	d.
Sugar	-	-	7	10	7			
Tea	-	-	1	17	5			
(1) Bread	-	-	4	7	2			
(2) Butchers meat	-	-	6	0	11			
Currants	-	-	0	19	9			
Vinegar	-	-	0	8	4			
(3) Soap	-	-	1	19	8			
(3) Candles	-	-	1	5	11			
Starch	-	-	0	2	5			
Mugs	-	-	0	7	6			
Flax and wool	-	-	3	2	0			
Salt	-	-	2	12	8			
Malt and hops	-	-	6	10	0			
Liquors	-	-	5	10	0			
Cheefe	-	-	31	10	0			
Coals	-	-	6	16	0			
						81	0	4
Nine servants' wages, who live in the house	-	-	66	0	0			
Three labourers	-	-	78	0	0			
Mowing and haymaking	-	-	20	0	0			
Reaping corn	-	-	12	0	0			
Manure	-	-	100	0	0			
* Tythe hay	-	-	7	10	0			
Blacksmith	-	-	25	0	0			
Wheelwright	-	-	25	0	0			
Collar-maker	-	-	5	0	0			
Cooper	-	-	1	0	0			
						339	10	0

(1) Wheaten bread purchased for tea, and on extraordinary occasions.

* Corn is collected (tythe) in kind.

	-	-	<i>£.</i>	<i>s.</i>	<i>d.</i>	
(1) Provender	-	-	50	0	0	<i>£.</i> <i>s.</i> <i>d.</i>
Farrier	-	-	3	3	0	
Miller	-	-	3	0	0	
Weeding	-	-	2	0	0	
Repairs of gates and building			5	5	0	
Timber for rails and fences			3	3	0	
Mole-catcher	-	-	2	12	6	
Rat-catcher	-	-	0	10	0	
Store pigs	-	-	3	3	0	
(2) Cloaths and extra expenses			31	10	0	
Loss in cattle	-	-	20	0	0	
Bad debts	-	-	20	0	0	
			144	6	6	
						<i>£.</i> 879 16 10

Stock kept upon the Bank Hall from March 1794, valued by a sworn appraiser, for the use of the Lancashire Report.

Ten draught horses, 15 l. each	-	150	0	0
Three three-year old colts, 15 l. each		45	0	0
One two-year old colt	-	10	0	0
Two year old colts	-	10	0	0
A hack horse	-	10	0	0
A poney	-	3	3	0
Twenty-five milch cows, at 7 l. 10 s.				
each	-	187	10	0
Seven in calf heifers, at 8 l. each		56	0	0
Nine heifers barren, 4 l. 10 s. each		40	10	0
Fourteen one year old, 3 l. 10 s. each		49	0	0
Ten rearing calves	-	10	0	0
Two bulls	-	15	0	0
One brood mare in foal	-	20	0	0

606 3 0

(1) Malt-dust, bran, &c. purchased to give to the cattle, mixed with potatoes or turnips.

(2) Mr. Harper is a bachelor; his family consists only of himself and nine servants.

Three

	£.	s.	d.	£.	s.	d.
Three carts, at 15 <i>l.</i> each - -	45	0	0			
Three smaller carts, at 6 <i>l.</i> each - -	18	0	0			
One water-cart, pump, &c. for conveying water from dunghills -	15	15	0			
Three single ploughs, 15 <i>s.</i> each -	2	5	0			
Three pair harrows, 15 <i>s.</i> each -	2	5	0			
One large harrow - - -	1	10	0			
				84	15	0
Four sets of horse gears for 3 horses	16	0	0			
Nine spades, at 2 <i>s.</i> each - -	0	18	0			
Twelve dung forks, at 1 <i>s.</i> 3 <i>d.</i> each	0	15	0			
Twenty-four pitch forks, 6 <i>d.</i> -	0	12	0			
Twenty rakes, at 3 <i>d.</i> - - -	0	5	0			
Forty chains and hoops to fasten cattle	1	0	0			
Marling hacks and hedging tools	0	12	0			
Marling piles and lumber - -	1	0	0			
Two wheelbarrows - - -	0	18	0			
Dairy utensils - - -	8	0	0			
Winnowing machine - - -	3	3	0			
Forty sacks, at 1 <i>s.</i> 3 <i>d.</i> - - -	2	10	0			
Riddles and sieves - - -	0	5	0			
One bushel measure - - -	0	7	6			
One half bushel and peck - -	0	7	6			
One winnowing sheet - - -	0	5	0			
One machine for cutting straw -	1	5	0			
Six cart ropes for binding - -	0	18	0			
Harrowing geers - - -	1	0	0			
Threshing machine - - -	50	0	0			
Building for gangway - - -	30	0	0			
				120	11	0
				£. 811	9	0

N. B.—The household goods not brought into this account.

Rent,

			£.	s.	d.
Rent, with taxes	-	-	315	0	0
Outgoings	-	-	564	16	10
Interest of stock	-	-	40	11	5 $\frac{1}{4}$
			920	8	3 $\frac{1}{4}$

Three rents, with taxes	-	-	945	0	0
Three rents paid to the landlord	-	-	810	0	0

The Bank Hall estate was, in the year 1793, under the following cultivation.

The acres are given in the customary measure of eight yards to the rod.

Bank Hall estate	-	-	69	acres
Bootle Marsh, improved 1780	-	-	53	
Bootle Marsh not yet improved	-	-	25	
			147	

Distribution of crops.

Old meadow for hay	-	-	40	acres
New meadow, clover and grafs seeds	-	-	12	
Wheat	-	-	10	
Barley	-	-	6	
Oats	-	-	6	
Beans	-	-	3	
Potatoes	-	-	2	
Fallow	-	-	8	
Turneps	-	-	2	
Pasture	-	-	33	
Pasture, unimproved land	-	-	25	
			147	acres

CHAPTER V.

I M P L E M E N T S.

USEFUL INSTRUMENTS IN HUSBANDRY.

ABOUT thirty years ago, the Rotheram or Yorkshire plough was introduced into the southern part of this county*. The plough formerly in use was almost a load of itself for a draught horse. In the north of Lancashire a plough, called the Cumberland plough, invented in that county, is generally used. A trench plough has been lately introduced by Mr. Duckett, son of the celebrated Duckett of Esher, in Surrey.

This plough has a skim coulter, by which the surface (if foul) may be turned under, and fresh soil brought up; as it is capable of bringing up the land from six to ten inches, and is usually drawn by three horses. Another instrument has been lately introduced, which Mr. Eccleston, with propriety, calls the *miner*; which is a plough-share fixed in a strong beam, without mold-boards, and drawn by four or more horses, and follows in the furrow the plough has just made, and, without turning up the substratum, penetrates into, and loosens the soil, from 8 to 12 inches deeper than the plough had before gone; which operation, besides draining the land, causes the water to carry along with it any vitriolic or other noxious mat-

* By the late J. Atherton, Esq. Walton Hall.

ter; by the substratum thus loosened, the roots of plants may penetrate the deeper; and, in course of time, that which is but a barren substance may become fertile soil.

There is a greater variety of carts in this county than in the same given space in any other part of the kingdom. In the neighbourhood of Liverpool they are of very large size; those employed in the coal-trade within the town are gauged to 36 bushels Winchester.

The country dung carts, in the same neighbourhood, are also of a very large size, and generally will hold thirty-six Winchester bushels, and carry two tons of dung; they have six-inch wheels. In the interior parts of the county, the carts greatly diminish in size, and have variety of forms; in the northern part the size is very small; the clog wheel, as it is termed (three planks of ash), which was formerly much in use in the north, on account of cheapness, has yielded to the spoke wheel; the clog being more clumsy, and the cart more liable to upset—in these carts the wheel did not move upon the axis, but both turned round together.

Single carts are in more general use*. Mr. Jenkinson of Yealand says, “that a gentleman, in his neighbourhood, made a fair trial in the hay field between the large and small carts, or what is often called double and single carts, in which the latter had much the advantage, in dispatch of business; and the consequence was, that the double carts were little used afterwards.” Mr. H. Harper observes, that for a small distance, *e. g.* half a statute mile, the single cart has certainly an advantage; but at a further distance, he prefers the double cart for dispatch of business; because the same strength or number of hands is requisite to unload the small, as the large cart.

Although Lancashire is not a corn county, yet, labour being dear, there are several thrashing machines already introduced; one of which belongs to Colonel Mordaunt of Halfall, which

* The encouragement of these can alone preserve the roads of Great Britain.—See *Annals of Agriculture*, Vol. XVIII. p. 178, &c.

moves by water, thrashes, winnows, and grinds (or crushes the corn for provender), all at the same time. Many of the neighbours apply to this machine, for the use of which the colonel takes or charges one twentieth part *. Hand machines are also introduced, and are useful to the farmers, chiefly made by John Naylor, at Ashton, near St. Helen's †.

This machine requires two men to turn, a boy or girl to feed, and another to take away the straw ‡. The price of these hand machines are about six pounds each.

A churn has been lately introduced, which seems very useful for its neatness, cleanliness, and economy (as it occasions less waste of milk). The churn, or vessel, instead of being round, has four corners, and the milk is put in motion by turning a handle, upon which are fixed boards which move horizontally in the manner of a reel within side the vessel,

* The average price paid for thrashing in the district.

† On this it is remarked, on the margin of one of the Reports, that "The surveyor has been wrong informed of the above; for I have seen three or four different ones of the said John Naylor's make, and never any that would do as much as the information given. From all the enquiries I could make of them, there was little or no benefit arising therefrom beyond thrashing with flails. One of his make, in particular, I saw at work at the honourable Mr. Jones's, of Blackley-hurst, in Billinge, from which I could see no advantage.

"Mr. Steevens of Chorley, who erected Colonel Mordaunt's of Halfall, made one for Mr. Blundell of Ince, to be worked by hand, which would have taken as many men to have worked it as would have thrashed the corn with flails; for which reason it was returned to the maker as per agreement. Mr. Steevens I have since seen, who said it was impossible for one to be erected to any advantage to be worked by hand; it must either be by water, steam, or horses."

	£.	s.	d.	
† Hire of two men - - -	0	3	4	} who can, with this machine, thrash about 30 bushels of wheat per day, which
Boy and girl - - -	0	2	0	
	0	5	4	

would come to 11s. 3d. at the present price paid for thrashing: about 70 bushels of oats also per day, which would cost 9s. 6d. according to the present price paid. But hand machines will be found insufficient for this heavy work. Mr. Henry Harper, of Bank-hall, has contracted for a thrashing machine, to be made for 40*l.* which will require one horse, and is to thrash out from eight to ten bushels per hour, according to the length of straw, and quantity of grain contained.

by which the operation of churning is something easier, and the work expedited.

A hay-cutter, in the form of a spade, straight, and sharp at the point and upon both sides, performs the work with much more ease and expedition than the common hay-knife. This tool was introduced from Yorkshire by Mr. Ecclestone.

*The following is a Description of MR. HARPER's Mill;
drawn up by himself.*

"MY thrashing mill will thrash all kinds of corn, and any kind of small seeds, perfectly clean*; and in wheat that is bad to thrash by the flail, will get from two to four quarts out of a thrave, more than it is possible to get out by the flail; and if it is good to thrash, generally about a quart; and gets a deal more chaff of all kinds than the flail, which is useful upon a farm if properly applied, the merits of which belong to the mill; and it does not damage the straw more than the flail; and if the corn is not well got, it does not damage the straw so much.

The following is the description of the mill: First is the horse-wheel, which is fifteen foot diameter; in which there are 204 cast iron coggs, and at the end of a tumbling shaft is a cast iron wheel, which contains 20 coggs, which work into the horse-wheel; and at the other end of the tumbling shaft within the barn is a spur-wheel, seven foot and a half diameter, which contains 100 wood coggs, which work into a cast iron wheel of 18 inches diameter, containing 14 coggs, which is fixed on the end of the shaft that comes through the cylinder. The cylinder is six foot long and three foot diameter, and has fixed upon it twelve wrought iron beaters, all at an equal distance; these beaters by the cylinder running round meet two

* The surveyor purchased twenty thrave of barley straw, 1794, from a tythe barn, thrashed with the flail in the usual manner of the county, and at the usual price paid. When he got it home, he caused it to be thrashed over again, and from this small quantity, which was made up into small sheaves, he obtained one and a half bushel of good corn.

wood fluted rollers five inches diameter and six foot long, which are fixed so as to be right in the center of the cylinder as it runs round; and under the cylinder is fixed a playboard, which is the whole length of the cylinder, and goes about one third of the way round the cylinder, and is made so as to fit to the shape of the round of the cylinder; and at one side it is fixed close up to the under roller, and the other side of the playboard is where the corn and the straw come out, only some little that drops through the playboard, which is made with ribs of an inch and a half broad, and two deep, and half an inch distant one from another: the playboard is fastened to the frame that supports the machinery, where the corn and the straw come out on a swivel, turned by two wood pins; and at the other side up to the under roller it is supported by two wood levers, one at each end; which, by weight being hung on the levers, forces the playboard either nearer or farther off the cylinder: if the corn comes out foul-thrashed, the play-board must be forced nearer the cylinder by more weight.

The rollers are worked by the spur-wheel, which has a cast iron wheel of two foot diameter, which contains 72 coggs, and is fixed right in the center of the spur-wheel, which works into another wheel of the same diameter and the same number of coggs, which is fixed to a strong upright piece of wood that supports the spur-wheel, and this works into another cast iron wheel of one foot and a half diameter, and contains 52 coggs, which is fixed to the end of the under roller: these rollers draw the corn in from off a feeding board, which is as broad as the rollers are long; the top roller is fixed in wood levers, at each end one, which are fastened into the frame by a swivel turn at one end, and the other ends of the lever lie loose upon the frame, which have weights hung on them as occasion requires for drawing in the corn more or less.

Now as these different motions are all connected together, they appear to be simple, and only take up eight foot square in the inside of the barn, by ten foot high. The gangway is eight yards square, which the horse-wheel works in at the outside of the barn. The horses travel at the rate of 2 miles
and

and $\frac{7}{8}$ in one hour, and at that rate the beaters on the cylinder strike the corn 3,000 times in one minute: by the motion of the machinery, the rollers draw the corn in at the speed that the beaters strike it, full four times in one inch of length of the corn drawn.

Expence of one day's work of eight hours of thrashing corn, &c. by the mill when kept in full work.

To thrashing 16 quarters of wheat.

To 3 horses one day	-	at 2s. 6d.	0	7	6	£. s. d.
To 2 men ditto	-	at 2s.	0	4	0	
To 4 boys ditto	-	at 1s.	0	4	0	
To extra charge for winnowing	-		0	2	0	
						0 17 6

To thrashing 24 quarters of barley.

To 2 horses one day	-	at 2s. 6d.	0	5	0	
To 2 men ditto	-	at 2s.	0	4	0	
To extra man for one day	-		0	2	0	
To 4 boys ditto	-	at 1s.	0	4	0	
To extra charge for winnowing	-		0	2	0	
						0 17 0

To thrashing 32 quarters of oats.

To 2 horses one day	-	at 2s. 6d.	0	5	0	
To 2 men ditto	-	at 2s.	0	4	0	
To 4 boys ditto	-	at 1s.	0	4	0	
To extra charge for winnowing*	-		0	2	0	
						0 15 0

* The charge for winnowing seems trifling; but it should be understood, that when corn is thrashed by the flail, and paid for by the score, the thrashers always assist, without any additional expence paid for their labour.

To

To thrashing 24 quarters of beans.

To 2 horses one day - at 2s. 6d.	0	5	0	£.	s.	d.
To 2 men ditto - - at 2s.	0	4	0			
To 4 boys ditto - - at 1s.	0	4	0			
To extra charge for winnowing -	0	2	0			
				0	15	0
				3	4	6

Expence of thrashing different kinds of corn
on my farm by the flail.

To thrashing 16 quarters of wheat at 2s. 10d.	2	5	4
To ditto - 24 ditto of barley - at 1s. 6d.	1	16	0
To ditto - 32 ditto of oats - at 1s.	1	12	0
To ditto - 24 ditto of beans - at 1s. 6d.	1	16	0
	7	9	4
To expence of thrashing the same quantity of corn by the mill - - - -	3	4	6
	4	4	10

Hence it appears that the mill clears 120 per cent.

To expence of the mill, and fixing up - -	50	0	0
To ditto of gangway that contains the horse- wheel, which is at the outside of the barn -	30	0	0
	80	0	0
To the average of corn thrashed on my farm by the flail per year - - - -	30	0	0
To 120 per cent. saved by the mill, of thirty pounds - - - - -	18	0	0
To 10 per cent. for 80 pounds, for interest and repairs - - - - -	8	0	0
Clear per year towards paying off the principal -	10	0	0

The

The extra charge of two shillings per day for every day's work of different kinds of corn, &c. thrashed by the mill, for winnowing, is a charge that belongs to the mill.

For the thrasher that thrashes the corn with the flail, either by the score or quarter, is always an assistant hand to the winnowing, without any additional charge on the corn thrashed.

Improvements on the thrashing mill to be made. The first of these I am under with my mill, for I have a man now making models to my own direction for cast iron wheels, with four different rows of cogs in every wheel, for to either quicken or slower the motion of the rollers that draw the corn in from the man that feeds it off the feeding board; for although the mill thrashes all kinds of corn, &c. perfectly clean, let the corn be good or bad to thrash, as the motion of the rollers are now fixed, it all gets thrashed alike.

2dly. Gaining power in the horse wheel, which will quicken the motion of the spur wheel, and ease friction from the horses.

3dly. Small friction wheels for the cylinder to work off.

4thly. To have canvas fixed upon rollers, to draw the corn in more regularly.

5thly. Stones to be fixed to grind corn.

6thly. To cut straw.—7thly, to wash clothes.—8thly, to churn, and pump water.

Now the ten pounds per year, that appears to be saved by the mill towards paying off the principal, as a farmer I do not mean it for that purpose, nor to deprive the labourer so much of his employ, but am happy in finding myself so situated as to get my corn ten *per cent.* cleaner thrashed, and with so much dispatch, and in so little time that I can take my labourers to any business the farm may require, such as pruning fences, close or open draining; and so much cash that is saved by thrashing, laid out yearly in the employ of labourers for that use on the farm, will pay me fifty *per cent.* better, and improve the farm more than keeping one man ten months in the year *batting* * in the barn, or even to half the time, and thrashing with the flail. There is not one labourer in twenty but what would rather do any labour on the farm, than thrash; and if he thrashes it clean,

* *Batting*, a provincial phrase for thrashing.

it is well; and if foul, and you find fault, the answer is "Get some body else;" and he mostly quits your employ.

Mr. Johnson, of Wilmflow, whose machine is not so large, and consequently not so powerful as Mr. Harper's, winnows corn, and grinds oats or beans at the same time.

Mr. Johnson has the friction-wheels Mr. Harper means to adopt.

The following is a description of the Reverend Croxton Johnson, rector of Wilmflow's, thrashing-machine :

Diameter of the horse-wheel—twelve feet.

D^o tumbling shaft nut—two feet.

D^o of iron-wheel at the end of the tumbling shaft within the barn—three feet eight inches.

D^o of the nut—one foot two inches.

D^o of the drum—four feet two inches.

D^o of the pully fixed on the thrashing cylinder—six inches.

The diameter of the thrashing cylinder—two feet.

The diameter of the feeding rollers—two feet six inches.

The iron wheel on the feeding roller—two feet six inches.

The nut on the thrashing-cylinder—five inches.

The tumbling shaft turns the iron wheel within the barn, which iron wheel turns the nut, on the axis of which the drum is flaked.—The machine is turned by a strap from the drum round a pully fixed on the end of the axis of the thrashing cylinder.

A nut is flaked on the same axis, which turns a wheel flaked on the lower feeding roller.

Under the thrashing cylinder there is a semicircular board, on which the ears of corn are beat by the six beaters of the cylinder.

The space occupied by the thrashing-machine is six feet by three feet eight inches."

A swing-harrow has been lately introduced, and seems coming much into vogue.

G

A nut

Hurdles, of an improved construction, merit notice. They are fastened by a wooden pin, through a strong piece of oak, in a manner so as to be loosened and removed with less trouble, and less injury to the hurdle, than the old forms. These were observed at Mr. Bayley's, of Hope.

Winnowing machines, of an improved construction, have been introduced, and gain ground: they dispatch work briskly, and save the chaff.

This machine cannot be too generally recommended, nor spoken of in too warm terms. It is admirable for its expeditious and neat manner of winnowing; and in the cleansing of smutty wheat it is invaluable. I will venture to predict, that in a few years it will be in the hands of every farmer in the kingdom, who plows 20 acres of land. It is made at Ashton, near Newton. Price £. 5. 5s.

A machine for cleaning corn from small stones, or earth, of which foreign cargoes are, sometimes, too full, and invented by Mr. Whiteside, of Lancaster, should not be unnoticed: as also an invention of the same ingenious person, for opening, shutting, and bolting the doors of granaries, or corn-rooms. He imagined, that treading upon, and walking over the corn, to shut the door, or window, which admitted the air, was injurious; he therefore contrived a bolt, which opens the window, and shuts it again, by only pulling a cord, which runs upon a pulley, and communicates with the shutter. The contrivance has both simplicity, neatness, and security.

CHAPTER VI.

OF INCLOSING.

THE ground work of improvement must be a general inclosure bill*.

Mr. Elkington's principles of draining, if publicly known, would be of most material service in all new inclosures; as from his knowledge in discovering springs, he could place the fences in such situations, that each ditch would answer the double end of fence and effectual drain, which hitherto, from want of his knowledge, has always required both operations.

There are but few open, or common fields, at this time remaining; the inconvenience attending which, whilst they were in that state, have caused great exertions to accomplish a division, in order that every individual might cultivate his own lands, according to his own method; and that lots of a few acres, in many places divided into small portions, and again separated at different distances, might be brought together into one point.

The inclosures, or fields, are in general very small; so much so, as to cause great loss of ground from their number, and from the space occupied by the hedges, banks, and ditches. This great number of fences too, prevents the air from freely circulating, by which the crops, both of corn and grass, are deprived of the salutary effects of the sun and air, and, after the grain is reaped, the process of drying, healing, &c. is materially delayed.

There are objections to very large fields, which are, the cattle lying in them are more exposed to the weather, and cannot lie out so long in the autumnal months. In stormy weather, nature and self-preservation teach them to seek the best shelter. And with respect to corn land without shelter, ex-

* This idea seems so generally to prevail, that I am sure it cannot fail of being one of the objects that will be recommended to the legislature by the honorable board.—*W. Dann.*

posed to the sea (as a great part of this county is) the winds blowing from thence, strongly impregnated with salt water, would greatly injure the young crops, and shake the growing corn ready for the sickle, as we but too often have experienced.

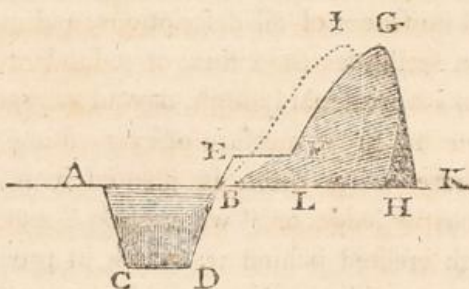
Besides, the banks are full of weeds, which often remain unmolested, the seeds of which are dispersed by the winds over the adjoining fields, to their no small injury. The hedge-rows are but too frequently neglected, and permitted to spread their branches upon the lands. Plashing is almost all neglected, except only by a few spirited gentlemen. Many hedges seem fast upon the decline, and must in a little time be renewed. Durable as hedge-timber may be, a length of years brings on old age, and, at last, decay. The newly-planted hedges are chiefly of thorn, which must be the best, without intermixture, as formerly, of hazle, alder, willow, holly, &c.* The hedge-rows, which the surveyor has planted, are thorns upon the plane, without either ditch or bank, secured by rails, till grown up, and then trimmed, so as to meet in a narrow point at the top. These fences are neat and secure; and are preferable to hedges, cut square at top, which are generally thin in the bottom. Many fences, particularly in the northern parts, are made of stone, some from quarries, and some of pebbles. Buildings are frequently erected with the latter, uncouth and misshapen as they may appear.

The banks being liable to weeds (so are all other lands that are turned up) can be no objection to making them, as a mower would clean a new-made bank in a short time; and this mowing would not be requisite above a year or two (if care is taken that the banks be made of soil only) by that time the bank grasses over, and becomes good herbage.—Railing may answer gentlemen's purposes, but it is too expensive for common practice, or farmers.—I have always considered thorn

* The young shoots of the new-planted thorn are liable to great injury, if not well secured from cattle, who eagerly nip the tender sprouts, and greatly injure the stem. The hair from a raw hide, with all the impurities adhering, if laid in small quantities, near the roots of the thorn, have been found sufficient security from the teeth of cattle. The cows will not approach near hedges thus defended.

quicks as best adapted to fences, as they are both durable, and make the best fence: and as the common method of planting them is liable to many objections, shall give a method I have practised with success; and for the better description have made the figure below, where A B C D represent the ditch; E F the water-table, upon which the quicks are to be planted; L F G H the cop, to defend the quicks.

The land, B L, is first dug up one spade deep, and near two in breadth; care being taken not to come too near the side of the ditch, B, for fear of its falling in: then the bank is begun by taking out of the surface of the ditch, A B, one spade deep, and placing them at E, green side in: then clean soil may be got to form the water-table, E F, which ought to be eight or ten inches above the surface A K; upon the middle of which the quicks should be planted, with some old rotten dung, five in a yard: then proceed with the remaining part of the ditch, to form the bank E G H.



Nothing more is necessary, except a dead hedge at the top of the bank, and keeping the quicks clean from weeds two or three years, when they will have grown so as to make a tolerably good fence. The advantage of making a broad water-table is, that the quicks receive the benefit of the rains, by every shower penetrating to the roots, which greatly invigorates the young plants, inso-much that as good a hedge will be formed in three years as would have required ten or twelve by the old method, which is, by making a narrow water-table, as from E to the dotted line, and planting the quicks up to the dotted line (E I forming the front of the bank); the point E, by frosty weather, and weeding, &c. falling away, makes it one continued slope as B I, which acts like the eaves of a house, carries off the rains which should refresh and invigorate the young plants, and is the reason so many new planted hedges miscarry.

Another method of planting quicks, which I think not a

bad

bad one, is planting them at the top of the bank; but the bank in this case should not be made so high, and broader at the top; and the bank and ditch making one continued slope, it is necessary to take care that nothing but good soil be put into the bank, and the quicks dunged as before.

In the first method it is sometimes a practice to dig the bank sloping down (after the quicks are become a sufficient fence) to dung and set it with potatoes; and a great part of it afterwards is carted to the meadow or pasture land, as manure, but so much of the bank is left as to prevent the cattle from treading upon the roots of the quicks.

Inclosures in this country are, for the most part, infinitely too small; from two to ten stat. acres may be the medium size.— This unnecessary multiplicity of fences causes much useless expence, destroys vast tracts of excellent land, harbours vermin and nuisances of all descriptions, and in reality rather prevents than facilitates the efflux of redundant moisture; the hedgebanks unreasonably high, devoid in general of timber trees, and even in a great measure of every thing that can form a fence. Where white thorn is planted it is generally placed upon a narrow ledge or “water table,” and an immense mound of earth erected behind it, which in process of time drives the plants into the ditch below; if the ditch be marle, the action of the frost speedily undermines the heavy bank, and by this means are produced those irregular and unsightly divisions equally ill adapted to the purposes of utility or ornament.

Many parts of the county are very flat and wet, such consequently require good ditches; from this has arisen the multiplicity of ditches, and from that cause neglect.

If such ditches as are absolutely necessary were properly attended to, and care taken to secure a proper communication with the brooks and rivers, nine-tenths of the present fences would be unnecessary, as under-draining would amply provide against all defects.—At present, most of the ditches are nearly navigable, and no attention paid to gain an outfall, so that they are full of putrid water, and are a perfect nuisance. Many hundred acres of excellent arable and pasture land are sacrificed to this stupid rage for small inclosures. I believe they may be of service

service in keeping up the breed of water-rats, but I know of no other advantage to society arising from them.

In every answer received to the question, Whether inclosures have increased or decreased population? the reply has universally been—increased.

And how can the fact be otherwise upon rational grounds? In consequence of inclosures and division, every occupier has unquestionably the means of cultivating his lands to the best advantage to himself; but he cannot effect this without affording advantages to the public at large. Superior cultivation requires more labour, which requires a greater quantity of hands. The lands yield increased returns; and produce both means to increase population, and give food to the increase upon better terms.

As to increase of rent, the lands formerly in common fields but now divided, have doubled, in many instances trebled, their rents immediately to the landlords; have yielded greater profit to the tenant; and have afforded more means of subsistence to the public.

The commons, or uncultivated lands, which heretofore have not yielded profit either to the proprietor or public; have increased in their value from—nothing, if starving a few geese, lean kine, producing—weeds, heath, &c. can, with propriety, be called nothing, or, to give some better *ratio*, from one to thirty *per cent* *. In many instances, the cultivated wastes have proved more fertile and productive than the old lands; if, therefore, the foregoing premises be well founded, the public have gained 30 *per cent.* of additional employment and additional produce, by the improvement of wastes and commons; and the proprietor has gained, not indeed 30 *per cent.* for he has the expence of the improvement first to deduct; but, on a moderate calculation, an addition of 10 or £.15 *per cent.* to his estate, on the capital advanced.

* Mr. Wilkinsons improved moss land, was, before draining, worth from 7 to 10 *s.* *per* acre, is now worth from 4 *l.* to 5 *l.* *per* acre of the large measure.

Warbreck Moor, in Walton, inclosed in 1761, was not worth 1 *s.* *per* acre in its uncultivated state, is now well worth 30 *s.* *per* acre. After the inclosure act was obtained, and a division made the fee simple of several lots was sold after the rate of 3 *l.* *per* acre, large measure.

The

The surveyor has been informed of only one instance where an attempt to improve waste lands has failed.—Elland Moor, near Lancaster, notwithstanding lime has been laid on, and the ground treated according to the usual custom of improving wastes; yet, after a few crops taken, seems verging back towards its original state of poverty. But this was owing to its being overplowed at first, and it is now coming round again.

Hedges.—When hedges grow thin at the bottom, Mr. Harper has the following practice. He cuts the wood very low, leaving the young and vigorous shoots; after cutting away the old wood, he takes a hand-saw, and cuts away again that part of the old stump, so far as was shaken by the hatchet in the first separation, and saws the top level, so that the water may not remain. By this practice, he says, the shoots will grow stronger, and more in number, in one year, than they would by the common practice in three years. When the shoots are half a yard, or two feet long, he bends the young shoots down, and, where room permits, makes a hole in the bank with a shovel, in which the shoots are closely tied down with hooked sticks, and covered up again with earth; when these young branches, with a little nursing, will, by taking root afresh, form a new hedge.

Gates.—Are in general made of oak, and with five bars; some are inferior, and made up of the materials, which the estate may produce, and put slightly together, at a small expence. There are gates also made of deal, and painted. In some places rails only to hang up, and take down are made to suffice. About gentlemen's seats, there are gates frequently of superior construction, and made in different forms.

CHAPTER VII. ARABLE LANDS.

SECT. 1.—*Tillage.*

THE ploughmen are supposed to be as complete workmen as in any part of the kingdom, the tillage of their lands being in general performed in a masterly manner. There is no general rule without some exceptions; and it must be acknowledged that specimens of great slovenliness might be produced.

In laying down either for corn or pasture, particular care should be taken to throw the butts or ridges as near north and south as possible. Instances are known where they have been laid east and west, and in large round lands, when the south side has yielded double.

SECT. 2.—*Fallowing.*

IN some intelligent letters, which the surveyor has received, in answer to the queries which have been circulated by the Board, very opposite opinions have been held upon this subject. According to some, fallowing is too little, according to others, it is too much practised.

From what has been said before, it is evident, that fallowing is here understood, as preparatory for wheat. The tenant being generally under a covenant, restraining him from sowing wheat upon clover, * whence a crop has been, the same year, previously gathered, or from a bean stubble, &c. as a practice tending to exhaust, and rendering the ground foul, which, by way of reproach, is called stubbling †. Upon the system of

* To restrain a tenant from sowing wheat upon clover-lay is the greatest absurdity that can be, because it is the best tilth known on most soils.—*Mr. Boys, of Kent.*

† In many parts of the county the ground is not broken up for a fallow till spring seedings are over: the absurdity and want of success arising from such management, forms no argument against fallowing upon proper principles. But there is a very strong argument against fallowing at all in this country, which is, that nine-tenths of the county are a sandy loam, capable of producing uncommon crops of turnips, cabbages, potatoes, &c. &c. and that manure is every where to be had in plenty.—What is the use of a fallow upon such land?

green crops preceding wheat, by way of saving one year's rent, and the labour of fallowing, the potatoe crop should seem to claim a superiority; both from the dung given, and the clean state into which, under good management, the land is brought. Yet the neatest farmers seem at present not very partial to this mode of agriculture. They say the succeeding crop of wheat is more feeble and worse fed; and the bad effects of these two, potatoes and wheat in succession, are evident upon successive crops for years afterwards.

Fallowing may undoubtedly be avoided, by a well conducted variation of crops; and so that the grounds may be kept clean by a full produce. Since every plant and fruit only extracts from the soil such substances as are required for its peculiar nature, and rejects those which are proper for the nutrition of others, *e. g.* the pungent taste of an onion must require very different juices to those which are necessary to yield the mild flavour of a potatoe. Therefore by a well-regulated change the earth may be said to have repose equal to the fallow year. Gardens have been successively cropped, or it may be doubly cropped, every year for a succession of fifty years together.

Others assert that fallowing is a good preparatory for wheat, if the land is inclined to clay or a strong nature; but if, on the other hand, the land is of a light nature, such as a hazle loam, sand, or gravel, in that case fallowing is not preparatory to wheat, but would endeavour to come at clover roots to sow wheat upon. There is much fallowing for wheat in this county upon light sands, which is the height of folly.—A clover root is the best preparation for wheat upon such soils. Beans are always sown in this county broadcast, generally when the land is foul sowed with previous crops of corn.—Can the landholders be censured for discouraging a succession of wheat after beans neither hoed nor weeded?

Mr. Henry Harper prefers potatoe land for wheat, to that from whence a crop of turnips has been taken. But he prefers a good summer fallow to either preparation. The grain produced from the fallows being of superior quality, and not so subject to blights.

The

The fallowing, as it is sometimes practised, is not performed in the neatest manner. The lands not being broken up, till too late in the season to partake of the influence of the frosts, and to furnish a proper opportunity for the cross cutting, or stirring (as it is called), this work being the grand operation; and it is requisite, that a dry season be caught whilst the land lies open, and a large surface exposed to the influence of the sun and air. But if greater attention were paid to the turnip culture, with proper hoeing and dressing, fallows would become less necessary; and, according to the present advanced rent of land, they are too expensive for the tenant.

SECT. 3.—*Rotation of Crops.*

OATS are universally sown towards the north-east and south-east of Preston for years together, except this chain be broken occasionally by a crop of potatoes, and afterwards wheat, or wheat on a summer fallow. In the Filde, which, from its fertility, has been called the Granary of the county, the soil has been still worse abused. Certain fields have been kept under cultivation, it is asserted, for more than a century, without intermission, under the following rotation. After marle, 2 or 3 years oats; beans or barley, each one year. If beans, barley the year after; but, if barley, then beans, and this alternate change of beans and barley continued for a few years. The eighth year from the first marling is generally reckoned a period, from which the land is upon the decline, and a complete summer fallow is given, and some *till** (as it is called) is added, upon which, wheat; after the wheat, two crops are taken, one either of oats, beans, or barley; and then another fallow, with the addition of *till*, and two more crops of grain, above specified; and the practice, it is said, may be advantageously followed for the space of 20 years, but is often continued much longer. Upon such courses it is unnecessary to dwell longer, as they can afford neither pleasure, nor instruction, to the experienced cultivator.

* A compost of earth and lime mixed. Yard dung, and sea-muscles, have been used, but this last article is not found in sufficient quantities, nor is it durable.

I shall proceed to some other practices, which are followed in other parts of the county*.—Oats, fallow, and next year wheat; if for barley or oats, the land to be manured and laid down with red clover and grass seeds. 2. Oats or barley with dung, if rich, another crop, barley, then fallow for wheat; afterwards barley, with dung, and then laid down with clover and hay seeds. 3. Wheat, with one furrow, barley, with dung; fallow, for wheat; barley, or oats, laid down with clover, &c. 4. Potatoes, wheat, barley, with dung, and laid down. 5. After wheat, fallow for turnips, with dung, laid down with well dressed hay seeds, from the cleanest and best meadow lands, with a mixture of white clover. 6. Early potatoes, after which a crop of turnips, then wheat or barley. 7. Early potatoes, and sown with grass seeds, and white clover, without any corn; the hay suffered to stand, till the seeds become ripe, to drop and fill up vacancies, the ground well dunged after the first crop of hay. 8. If the land be full of rushes, by only taking a single crop of oats in the following manner; by plowing one furrow with a good dressing of dung, harrowed in, upon which the crop of oats, with grass seed only: by which the rushes are destroyed, but the grass roots are preserved, and the grass meliorated by exposing the soil to the air and sun, by turning it once over.

Nothing can be so barbarous as the rotation of crops in this district; if that can be denominated a system of rotation which depends merely upon the caprice of the cultivator, or upon what he thinks the land is capable of producing for the moment. Near Preston, the general plan is to grow as many crops of oats in succession as the land can produce, then fallow for wheat, by way of cleansing the land; and then oats again, while oats can be produced; after which weeds and rushes, 'till rest again

* In a note, however, take the following wretched rotation, which has been frequently practised, and which has reduced both farmer and soil to an equality of poverty.

An old poor pasture broke up without being previously marled: 1. oats, 2. fallow, 3. wheat, 4. oats, 5. vetches and wheat, 6. oats, 7. fallow, 8. wheat, and this last crop probably footed; in which state the land is suffered to remain till again restored by that Power which can not only restore, but create.

produces grafs.—An occasional crop of potatoes sometimes intervenes, after which wheat.

Wherever green crops, such as turnips or cabbages, have been attempted, they have yielded immense returns, and such as ought to encourage the cultivation of these useful plants. But the application of them to sheep has been little attempted, though there is every reason to imagine the introduction of sheep would be attended with the happiest effects.

Distribution of Crops of a Field of Three Acres, of Eight Yards to the Rod, for the Years 1791, 1792, and 1793; shewing the Amount of all Out-goings, Rent, &c. and the Quantity of different Produce of each Year, and the Amount it sold for: first Beans and Turnips, second Vetches, third Wheat.

By Mr. HENRY HARPER.

	£.	s.	d.
Rent for three years, at £. 4. per acre - - -	36	0	0
Taxes for ditto, church, king, poor and constable, highways - - - - -	4	19	0
Manure for ditto, 60 tons per acre, at 15 s. per ton - - - - -	45	0	0
Cartage and putting on the land, at 3 s. 6 d. for every ton and a half, and spreading in the drills	21	5	0
Seed beans 2 quarters, at 36 s. per - - -	3	12	0
Twice ploughing for ditto - - - - -	4	4	0
Drilling and covering - - - - -	1	1	0
Sowing beans in the drills - - - - -	0	10	6
Horse-hoeing twice - - - - -	1	1	0
Hand weeding - - - - -	0	2	6
Reaping beans - - - - -	1	16	0
Cartage home - - - - -	0	14	0
Pitching to the cart - - - - -	0	3	4
Thrashing beans - - - - -	2	5	0
Cleaning for market - - - - -	0	3	0
Carting to market - - - - -	0	4	0
			Seed

	£.	s.	d.
Seed turnips - - - - -	0	6	0
Horse hoeing for ditto - - - - -	0	10	6
Sowing turnips broadcast - - - - -	0	3	0
Covering seed with horse machine - - - - -	0	10	6
Hand-weeding turnips where too thick in the beans - - - - -	0	2	6
Drawing 400 bushels of turnips - - - - -	0	8	0
Cartage home - - - - -	0	8	0
Seed vetches - - - - -	3	3	0
Twice ploughing for ditto - - - - -	4	4	0
Sowing broadcast - - - - -	0	3	0
Harrowing ditto - - - - -	0	15	0
Mowing ditto - - - - -	0	18	0
Making them for hay - - - - -	0	18	0
Cartage home - - - - -	0	18	0
Pitching to the cart - - - - -	0	6	0
Seed wheat 1 quarter and half, at £.2. 12s. 6d. per - - - - -	3	18	9
Four times ploughing for ditto - - - - -	8	8	0
Sowing broadcast - - - - -	0	3	0
Reaping ditto - - - - -	1	16	0
Thrashing ditto - - - - -	3	3	0
Cleaning - - - - -	0	4	6
Cartage home from field - - - - -	0	18	0
Pitching to cart - - - - -	0	4	0
Carting to market - - - - -	0	5	0
Tythe for vetches, at 6s. per acre, all others taken in kind - - - - -	0	18	0
The average profit of three years crops, after all expences are deducted, at the full costs - -	30	10	4
	187	2	5

By three acres of beans, at $8\frac{1}{2}$ quarters per
acre, 36s. per - - - - - 45 18 0
By straw from ditto, 80 thrave, at 1s. per - - 4 0 0
By

By 400 bushels of turnips, at 8 <i>d.</i> per bushel, at	£.	s.	d.
90 lb. per bushel - - - -	11	13	8
By vetches, 500 stone per acre, at 8 <i>d.</i> per			
stone, £. 16. 13 <i>s.</i> 4 <i>d.</i> per acre - -	50	0	0
By three acres of wheat, at 8 $\frac{1}{2}$ quarters per			
acre, at £. 2. 12 <i>s.</i> 6 <i>d.</i> per quarter - -	66	18	9
By straw from ditto, 22 thrave per acre, at			
2 <i>s.</i> 6 <i>d.</i> per thrave £. 2. 15 <i>s.</i> per acre -	8	5	0
By light wheat, 2 bushels, at 3 <i>s.</i> 6 <i>d.</i> per - -	0	7	0
	£.	187	2 5

This was a poor run-out field, that had been ploughed, &c. for near a century, and without any improvement at all only since it came into my hands. For the first, I marled it, at 8 rod to the acre, of 64 cubical yards to the rod, nine years since which it has never done any great things: then the last three years before described, for which I must give the merits of the crops to drilling and hoeing, by keeping the land clean; and, in the first place, producing three bushels for two if they had been sowed broadcast, this I know by dear-bought experience: and, in the next place, 400 bushels of turnips, which were worth £. 11. 13 *s.* 8 *d.* and all the expences of seed, hoeing, drawing, and carting home, is only a discount of £. 2. 8 *s.* 6 *d.* which is accounted for in the outgoings before mentioned, and the crop of beans even as luxuriant and as proveable as where there were no turnips, and the land left in better condition.

The manure was all put on the land for the beans and turnips; and after producing the other two crops, vetches and wheat, the land appears to be left in a deal better condition than before it produced these crops, and if the rotation of the same crops had been continued, 40 tons per acre would have answered as well as the 60 tons had done for the before-mentioned crops, which would have been a saving of £. 22, which is an object worthy of notice; but as through convenience

nience have changed the rotation of the same crops to another old ploughed field.

One acre of the three had been pared and burned about thirty years since, which, from that time, after producing two crops, never gave scarcely the seed again, and never would give any grass; and since it has been in my hands, if the crops were ever so luxuriant in straw, the corn was never so well fed as the other part of the field, nor so much in quantity according to breadth; only these last three years it appears to have come round according to the other land.

The soil is a black sandy loam of a regular depth of about ten or eleven inches, under which there is a hard pellet of four or five inches thick, which is commonly called red ore, and under that, good marl six or seven yards deep.

The field is called the Fernel, lying up to the township of Orrel, about half a mile north of the Greavehouse, in the township of Bootle.

SECT. 4.—*Of the Crops commonly cultivated.*

THE grain principally cultivated is oats, which, when ground to meal, is the food of the labouring class, particularly in the northern and eastern borders of the county; it is made into bread-cakes, of which there are various kinds, prepared by fermentation with four leaven; others without leaven, and rolled very thin; also water, boiled and thickened with meal into porridge; and this, eaten with sweet* or butter-milk. Small-beer sweetened with treacle, or treacle only, was in many families, about forty years ago, both the breakfast and supper meal. The general use of tea, especially among the females, has lessened the use of meal at breakfast; and the influx of wealth has induced numbers to indulge, upon many occasions, with the wheaten loaf. Notwithstanding the

* Sweet milk is a provincial term, in contradistinction to the butter-milk, which in this country is four, and therefore sometimes called four milk.

consumption

consumption of oat-meal is not so general at present as it was formerly; yet the quantity still used is very considerable; and the growth of oats is greater in proportion, than that of any other grain. There are some excellent wheat lands, *e. g.* Low Furness, the low lands near the shore beyond Lancaster, the Filde, and the S. W. part of Lancashire; but wheat does not succeed well, when bordering upon the moor-lands; neither does barley, which seems, of the two, more delicate in soil, and there is a greater diminution in the cultivation of this grain, than of either wheat or oats. Beans, peas, &c. are also cultivated, but seldom drilled; a small quantity of buck-wheat also, for the use of poultry, or to be ploughed in previous to a crop of wheat, but very little rye is at present sown.

The tartarian, or reed oat, for some years past, has been the favourite species of this grain, in the neighbourhood of Liverpool. Its produce is great, but the grain inferior, and not yielding an equal proportion of meal with the early or Dutch oat. The straw is luxuriant, and seems well adapted to lands exhausted under bad management; nor is the grain so liable to be shaken out with the north-west gales, to which this county is exposed, as the other sort.

Potatoes.—Lancashire was the first county in this kingdom in which the potatoe was grown: and as it is able at this day to boast a superior cultivation in that important article, in which it still stands unrivalled, it may be requisite to descend to particulars in regard to the management of that crop: 1. A sward, or fresh lay, is desirable, but not always to be obtained. Good crops have been frequently raised from lands exhausted. The ground being previously cleaned by ploughings, and planted (if the ground can be got into condition) in April, in drills *

* I am confident that this method of planting either the early or late potatoe, is not so productive as that of setting them in beds of five feet wide, and covering them, when the shoots begin to appear, with mould dug from a trench between the beds. This is the general mode in the neighbourhood of Frodsham, in Cheshire, where the planters of this most valuable root have tried all possible methods, for many years, and are generally allowed to produce a greater crop on a given quantity of land, than any other people in the kingdom.—*T. Wright.*

about 3 feet distance, and from 12 to 9 inches asunder, in each drill, the sets * placed immediately upon long dung from the yard, &c.; but dung from the great towns produces a wonderful effect upon lands not formerly accustomed to that article; and it is supposed, will generally enrich twice as far, with equal effect, as the manure formerly used from the farm-yard, &c. This is experienced in the lands bordering upon the canals. The great quantity of corn, and different kinds of provender, given to cattle kept in towns, must tend to enrich the quality of the dung, which depends upon the food taken, whether of man or beast.

2. Although April be the prime season for producing a crop of good potatoes for the table, because this vegetable requires a certain portion of time, to acquire that degree of maturity, which renders it peculiarly mellow and farinaceous, yet it is frequently planted as late as May, or even June; and yet produces abundant crops, but not of the same matured quality, as those planted at a more early season.

3. The apprehension of frosts (by which, if the tops are caught, after breaking the surface, they pine and sicken, and the hopes of the husbandman are blasted,) sometimes operate against planting at this early season; yet good planters risque the chance of frosts, in order to obtain superior quality.

4. The crops are kept clean from weeds by the plough, first by turning a furrow, left for that purpose, towards the young plants, as soon as they appear; and afterwards by turning the same furrow back from each side of the drill, and which is sometimes, if very foul, harrowed by a small triangular harrow, running through each drill. After the weeds have been so exposed, the furrow is turned back again, and sometimes the same plough, or a double-wristed one, runs up each drill once

* The surveyor has made some experiments to ascertain the best mode of cutting the sets; for, if the potatoe be set whole, putrefaction does not always ensue; and a set of a large size, to a certain degree, is better than a small one. The best method he has yet discovered, is taking off the sprout, or nose end, and the umbilical, or tail end, of the potatoe, leaving the middle entirely for the set; the worst method of cutting the potatoe, as has been proved, is cutting the potatoe down the middle, from nose to tail end; a practice but too common.

more; besides the destruction of weeds, the soil, by these operations, is loosened, exposed to the sun and air, which contributes greatly to improve the crop.

5. There are various kinds of seeds in use.—The ox-noble, and cluster potatoe are planted for the cattle*; the pink-eye, and a variety of others, with different kinds of kidney-potatoes for the table. The old winter red, as it is sometimes called, ought to be mentioned for its peculiar goodness in the spring, when other kinds have lost their flavour; this potatoe is then in its best perfection; it has another quality, that of never having been known to curl. There are also great varieties of early potatoes, and great attention is paid to raising new sorts of the best qualities from seeds, of what is called the crabs, or apples, which grow upon the stems. Mr. G. Green observes, that after many experiments he invariably found that the watery potatoe (of which there are great varieties) have fallen far short of the purpose intended. That he has several times, both through necessity as well as for the sake of experiment, given the ox-noble to milch-cows, after the more farinaceous sort, *e. g.* the pink-eye, when the decrease of both milk and butter has been evident in a very short space, and the beasts themselves seemed much dissatisfied with the change.

6. Great attention is paid to changing the seed occasionally, to prevent the curl†, the practice of obtaining fresh seed from Scotland

* Of the cluster potatoe, the surveyor had an opportunity of viewing the produce of a crop, lying upon the surface of the ground, after being just taken up, belonging to Colonel Mordaunt, of Halsall, in this county. He, and an intelligent farmer, were both of opinion, that they never saw so large a crop; and yet, as they were informed, raised without dung.

The cluster, or conglomerated, or Suffolk (for so it is called by Mr. Howard, who first introduced it to notice) was cultivated in this county 25 years ago (a) from sets left by that gentleman with the Society for the Promotion of Arts and Commerce.

Vide *Dossie's Memoirs*, vol. X. It has since been produced from seed, and, though much improved in shape, retains the red colour and saccharine taste.

(a) By the Rev. Mr. Heathcote, rector of Walton, and Mr. William Haliday, Anfield.

† The surveyor had the honour of receiving a premium from the Society for the Promotion of Arts and Commerce, in the year 1789, for a letter on the Lancashire method of preventing the curl. He has the pleasure

Scotland (as was the custom a few years ago), is not now so frequent; a change from the moss lands, and *vice versa*, being generally sufficient. A change of land is also desirable, but not always practicable: crops have been successfully taken, for a succession of years, from the same land.

7. The produce of a crop is, on a medium, from 2 to 3 hundred measures, or bushels*, the statute acre. The early potatoes are generally planted in beds, in rows about 8 inches distant, and the sets 4 or 5 inches separate, because the early potatoes, being of a less size, require a smaller space; but the advanced price these early crops obtain at market, render them a profitable article to the cultivator†; who, besides reaping a profit from this early produce, has his ground prepared for another crop the same season. Mr. Waring, steward to the Earl of Derby, gave to Major Atherton the following account of the produce of one acre of indifferent land in Knowsley.

1793—700 bushels of potatoes, pink-eyes.

1794—92 bushels of wheat, 70lb. to the bushel, sold at 7s. 6d. per bushel. 3 months later they would have fetched

sure to observe, that the fact seems to be confirmed, from the general opinion and practice of the county; nor did he observe a single diseased potatoe in the whole of his survey—the crops were universally luxuriant. This thought is improved upon by Mr. Thomas Wright, gardener to John Fazakerley, Esq. Prescott, who has sent some favourite plants which had caught the disease of curl, to the moss lands, which change of lands he expected would effect a cure.

* By a bushel of potatoes, is generally meant 90lb. before they are cleaned.

† Mr. Eccleston took the surveyor to view a piece of ground, 30 perches (8 yards to the perch) the early potatoes raised upon which had been sold for 30*l.* in the present year 1793; after which a crop of turnips had been grown, which, at 6*d.* per bushel, were worth 50*l.* per acre; after which the same land was to be cropped with wheat.

Remark on this Fact.

“The gross amount of the account of the potatoes appears to be great, that of 20*s.* per rod of 3 yards; but if all expences of sets, and preparing the land, and getting them up, and afterwards marketing them at the different markets, Liverpool, Manchester, &c. were deducted, it is a query but the outgoings would be considerably more than the gross amount given, although the land must be perfectly well prepared for the turnips; but the account given of the turnips, at the rate of 2000 bushels of thirty-six quarts or ninety pounds per bushel, is more by 800 bushels per acre than ever I knew or heard of for either large or small lot, either by hoeing, or any other advantage to be taken.”—Mr. Harper.

10s. 6d. per bushel, cone wheat. Mr. Waring says, the live crops were equal to the fee simple of the land. He is confident that *marle* would have produced 20 bushels more wheat. The markets of Manchester, Oldham, Rochdale, and the neighbourhood, are supplied with great quantities, not only from Warrington, but as far as from Rufford, Scarsbrick, &c.

Upon the same ground, from which a crop has already been taken, the early feed potatoes are in some places afterwards planted; which, after being got up about November, are immediately cut up into sets, and preserved in oat shells*, or saw-duft, where they remain till March, when they are planted, after having had one spit taken off, and planted with another, of a length sufficient to appear above ground in the space of a week.

But the most approved method is, to cut the sets, and put them on a room-floor, where a strong current of air can be introduced at pleasure, the sets laid thinner, viz. about 2 lays in depth, and covered with the like materials, (shells or saw-duft) about 2 inches thick: this screens them from the winter frosts, and keeps them moderately warm, causing them to vegetate; but at the same time admits air to strengthen them, and harden their shoots, which the cultivators improve by opening the doors and windows on every opportunity afforded by mild soft weather: they frequently examine them, and when the shoots are sprung an inch and a half, or 2 inches, they carefully remove one half of their covering, with a wooden rake, or with the hands, taking care not to disturb, or break, the shoots. Light is requisite as well as air, to strengthen and establish the shoots; on which account a green-house has the advantage of a room, but a room answers very well with a good window or two in it, and if to the sun still better.—In this manner they suffer them to remain till the planting season, giving them all the air possible by the doors and windows, when it can be done with safety from frost: by this method the shoots at the top become green, leaves are sprung, and are moderately hardy.

* Vulgarly called meal shudes.

They

They then plant them in rows, in the usual method, by a setting-stick, and carefully rake up the cavities made by the setting stick; by this method they are enabled to bear a little frost without injury. The earliest potatoe is the superfine white kidney*; from this sort, upon the same ground, have been raised 4 crops; having sets from the repository ready to put in as soon as the other were taken up; and a fifth crop is sometimes raised from the same lands, the same year, of transplanted winter lettuce. The first crop had the advantage of a covering in frosty nights.

The above excellent information was communicated by J. Blundell, Ormskirk, and has hitherto been known only amongst a very few farmers.

8. The manner of taking them up varies. The three-pronged fork is in general use—the soil turned over, the weeds picked out, the potatoes gathered and separated, according to their size, by the same person. Another practice is, for a strong man to take a three-pronged fork, but crooked (the same which is generally used to pull dung out of the cart) which he strikes down between every root, and pulls it over, laying the roots bare, which are taken up by two children that follow. Another practice is to turn a furrow from the potatoes, with a Rotheram plough, and then with another plough, furnished only with a share, to turn up the potatoes, which are afterwards gathered.

After the potatoes are gathered, and sufficiently dried, they are put together in heaps, in the shape of the roof of a building, covered closely with straw, which should be drawn straight, and to meet from each side in a point at the top, about six inches in thickness, and then covered with mould, closely compacted together, by frequent applications of the spade; after which Mr. Eccleston makes holes in the mould, at the sides and tops of these repositories, as deep as the straw, and about three yards distant, to permit the air, which, he says, visibly arises from the fermentation, to escape: after the fermenta-

* The early potatoe is a distinct species, of which there are yet great varieties.

tation has ceased, the holes are closed to prevent the effects of frosts or rain.

9. The utility of the application of potatoes to feeding stock, is sufficiently known, but not sufficiently practised. Converting the produce into immediate cash, by taking it to market, is a stronger temptation than waiting the more tedious process of purchasing stock, and fattening the cattle; but a source of improvement to the land, and consequently of superior profit in the issue, is by this means done away.

10. From the amazing quantities consumed by stock, it may not be amiss to mention the manner of boiling, &c. which is almost universally by steam, in a large hamper, or tub, perforated at the bottom, and placed over the water: in this way they are readier for use than by being immersed in water; after which they are given either warm or cold, mixed with chaff, bran, hay seeds, barley, or oatmeal.

The method of boiling potatoes by steam, has been adopted by some for culinary purposes as an improvement, thinking by this process they must imbibe less water from their not being immersed in the substance. But immersion in water causes the discharge of a certain matter, which the steam alone is incapable of doing, and by detaining of which the flavour of this root is injured. The cottager understands this kind of cookery: having poured off the water, he evaporates the moisture by replacing the vessel in which the potatoe was boiled, once more over the fire. Potatoes do not admit being put into a vessel of boiling water like greens. If America*, whence this choice vegetable was first imported, had yielded nothing else to the researches of the European, the present generation would have reason to be thankful for the acquisition, and to be grateful to the planters in Lancashire, for their spirited attention to the cultivation of this excellent root.

* A note in a common-place book that I wrote several years ago, informs me, that John Hawkins, a dealer in slaves, got in 1565 the first potatoes for ship provisions from the inhabitants of Santa Fé, in New Spain; he introduced the root into Ireland, whence it was farther propagated through all the northern parts of Europe.

— *An old method of cooking potatoes.*—Boil, and let them grow cold, then eat them, mixed with oil, vinegar, and pepper.

Parkinson's Herbal.

Turnips.—

Turnips.—It must be acknowledged, that turnips are not cultivated but on a very contracted scale*, and even then but seldom hoed; and yet there are not many articles more adapted to the soil and climate, there being seldom a crop destroyed, or lost, by the slug (or whatever that is which destroys the tender plant). The turnips find a ready market † if near a great town, whilst the inferior crops generally pay well, if applied wholly to feeding cattle; and they leave the land in so clean a state, as to be fit for most kinds of grain, and generally taken, by the best farmers, as a previous crop, to lay down to grass or crops of clover.

Mr. Eccleston not only sows his turnips in drills, but every other seed, and was the first who introduced this vegetable into a system of crops in his own neighbourhood.

Clover.—This sort of grass is cultivated generally with success; being greatly preferred to the white hay, by those who keep horses in the great towns for the draught; containing, it is supposed, more nutriment. If opportunity offers, instead of sending their horses to graze upon a field, which is difficult to obtain, a lot of green clover is purchased, and brought in that state to the consumer, who soils his horses in the stable for a few weeks in the year, and it acts both as food and physic, and enables them to stand work the better. Some few farmers keep their cart horses in the house throughout the year, and soil them in summer entirely with clover.

The lands upon which clovers have been frequently grown, it is said, do not yield such plentiful crops as they did some years past; second crops, in this northern climate, are seldom worth the risque of being made into hay, and, besides, are thought to exhaust the lands, therefore are generally pastured. But marle will always insure clover; when it fails in this county it is the fault of the husbandman, not the land.

* Turnips, to the amount of eight acres, were cultivated in the neighbourhood of Wrightington, by William Diconson, Esq. about 30 years ago: before this period none had been sown but in the gardens.

† To raise an expensive crop of turnips merely to sell, may be good management with a gardener, but not with a farmer. The crop that is not consumed upon the premises, I cannot allow to be a meliorating crop.—*T. W.*

Other green crops.—Vetches are sometimes cultivated as a smothering crop, and a preparation for wheat, but not very generally. Lucerne has been attempted, but at present not much, if at all, cultivated. Scotch cabbages have been planted, and good crops raised, but not to any great extent. Carrots are successfully cultivated upon sandy loams, in the neighbourhood of Kirkby, Scarisbrick, Burfough, Rufford, chiefly for the supply of the Liverpool market, and sometimes purchased to be given to horses (particularly wind-broken)—They are generally sold about 2s. 6d. or 3s. *per* cwt. and are reckoned a profitable crop on suitable lands.

TIME OF SOWING.

Wheat seeding is from the middle of September to the end of October. Mr. Eccleston, of Scarisbrick, says, "The best crop of winter wheat I have seen this year, or, indeed, ever recollected, was sown after a crop of potatoes, as late as the 20th of last March. I mention this as an extraordinary fact."

The time of reaping wheat, from August to September.

Beans are usually sown early in March, and reaped in September.

Common oats in April. Early oats in May and June, and reaped in August, September, and October. Barley is sown in April and May, and reaped in August and September. These are the general seasons.

But there are always exceptions to general rules; *e. g.* the present year the produce of several fields, both barley and oats, was not put into the barn, in the south-west part of the county, the second week in November; and there was a certain field of barley in Toxteth Park, not cut the third week in November.

On the moss lands, where paring and burning is practised, both seed time and harvest is very late; owing to the uncertainty of the weather—if wet, the burning proceeds but slowly; the seed time is consequently retarded, and the crops are by these means so late, as to become precarious from the advanced season, being frequently exposed to frosts and snows. If the barley from the moss lands be well housed, it is in high estimation: and obtains an advanced price from the farmer, who

K

prefers

prefers corn raised upon those lands for his feed. Mr. Eccleston sowed one year a field of barley about the middle of June, which he housed the following year, January 1. Barley is generally sown too late in this county—much of it even in June, but the greatest part in May—in the moss lands, where paring and burning is the preparation for this grain, this practice may have its foundation in necessity; but the imitation is absurd on good barley lands.

HARVESTING.

The grain in this county has been usually reaped by the sickle, the quantity grown being but small, and the labourers abundant. In the year 1794 several farmers however mowed their corn, amongst whom was Mr. H. Harper, who fetched the surveyor to see his process, which was neat, and in the following manner.

The wheat was mown *in*, that is, thrown towards the standing corn, immediately gathered and tied up into sheaves; the set was two mowers, two women gatherers, and one man binder. The barley and oats were mown *out*, into swathes, and gathered at convenience. The advantages of this method were, a saving of expence about 14*d.* per acre, less danger of the corn being shook out of the ear, and gaining nearly one-third more straw; no trifling consideration under several heads, especially since it does not appear that what stubble is left in the field is of the least service, in some cases evidently does harm, *e. g.* to clover or other young grasses, by retaining moisture through the winter, and starving the tender plants, or injuring the hay when mown, and which, when wet, it has a tendency to render putrid.

After the corn was gathered, the ground was gone over with a rake, to collect what straggling ears might remain, which are generally the heaviest, and of superior quality.

A wooden rake, with teeth about one inch longer than the common hay-rake, was preferred to the drag-rake, and did its work much neater—a woman could rake about two statute acres per day.

The scythe for cutting the corn had an addition of a bow, made out of a piece of rod-iron, fastened into the pole, and ex-

tending three inches over the scythe-heel, from whence it rose about nine inches in height and about two feet in length, and which formed a kind of cradle. The rod was supported by an upright prop from the pole about the centre, and which was furthermore braced and kept tight by a string.

The Lancashire method of setting up corn, after being reaped, and whilst it continues in the field, may merit to be noticed; which if barley or oats, and in a greenish state, is set up in four standard sheaves only, with one cover called a hooder, that is, a large well-bound sheaf is selected and opened, with which the four standard sheaves, with the grain uppermost; are covered, the grain of the hooder hanging downwards, but free from the ground. This shape is provincially called a *pricket*. But the most general method is, six sheaves standards placed against each other, spread out in their butt ends, and closed tight at their tops, when a couple of sheaves are opened, each about one half, clapped over each end of the standards, and meet with their butt ends together in the centre, thus forming a roof or cover for the standards. This form is provincially called *Hattocks*, and their covers *Riders*.

P R O D U C E.

Where the land is well cultivated, instances of a great increase might be given; but the general produce of the county cannot be stated at more than 24 bushels of wheat, 30 of barley, and 40 of oats.

PRESERVATION AND MANUFACTURE OF CORN.

Corn is kept both in barns and stacks: the last is considered to be preferable. There are mills belonging to the Free grammar-school at Manchester, granted by Hugh Bexwick, Clerk, and Joanna Bexwick, widow, in 1524, where a great quantity of grain is manufactured. In the neighbourhood of Liverpool, mostly windmills, but there is one tide-mill lately erected there, which does considerable work. The mills in general, are private property; and, except in few cases, the tenants are not bound to grind at particular mills. Where they are bound, great indulgences are granted.

SECT. 5.—*Crops not commonly cultivated.*

LIQUORICE,

Is not cultivated in this county, in any sufficient quantity, as an object of profit; although upon many grounds, it might flourish, and be worthy of attention.

The surveyor has a number of plants interspersed amongst other shrubs; when the root is wanted for decoctions, or other use in the family, a quantity is taken up, and it has been found to be as well-flavoured, rich, and juicy, as the Pontefract.

RHUBARB,

Also, has been planted in this way, a number of years, and the root cured and made use of; some pounds were lately presented to the Liverpool Dispensary. This plant, when in bloom, has a majestic appearance; its growth, at a certain period, a little before the seed appears, is amazing. The stem has grown, in length, three inches in twenty-four hours*.

The surveyor, has, at present, a most vigorous plantation. Having destroyed an old hedge planted upon a bank with a

* Growth of a rhubarb plant, N^o 2, belonging to the surveyor, and measured by him in the year 1789.

		Morning.				Evening.		
		Feet.	Inches.	Tenths.				
May	11	3	6	5	-	-	3	7 9
	12	3	9	8	-	-	3	10 5
	13	4	2	5	-	-	4	3 4
	14	4	5	9	-	-	5	0 0
	15	4	10	8	-	-	5	5 5
	16	5	2	8	-	-	5	7 8
	17	5	6	4	-	-	5	10 1
	18	5	8	2	-	-	6	1 0
	19	5	10	3	-	-	6	2 7
	20	6	1	2				
	21	6	4	5				
	22	6	7	5	-	-	6	7 8
	23	7	0	1	-	-	7	1 6
	24	7	3	1				
	31	8	2	0				
June	5	8	8	0				

1795, a rhubarb plant of the surveyor's, which broke ground April 1st, was, June 15, 52 inches long; 16th June, in the space of 24 hours, grew 4 inches 6 10ths; from the 22d of the same month, 4 inches 9-10ths.—*Vide Gent. Mag. June 1795.*

ditch

ditch on one side, a new thorn hedge was again planted where the old bank had formerly stood, and the ditch filled up with rich earth, in which the plantation of rhubarb was made, secured on one side by the hedge, on the other by rails,

CHICORY.

Mr. Wakefield speaks highly of the heavy crops of chicory he has mown, from the same land, and with which he has foiled his horses, viz. ten horses, the space of ten weeks at hard work, upon this plant, and without either hay or corn, from two statute acres; and was cut 3 times in the season; first time about the 20th of May; that which remained for seed grew to the size of 8 or 9 feet high. The root of chicory is made use of as coffee in Germany, &c.

MADDER.

It was observed, by an ingenious gentleman*, that madder, he imagined, might be successfully cultivated, and with advantage, upon moss lands, since the art of dying cottons a Turkey red has been discovered, for which purpose madder, in the root, is absolutely necessary. Madder, which previous to this discovery was of little value, is now worth 50 s. per cwt.; and, if of prime quality, worth 120 s. per cwt. This root was attempted to be cultivated in this county some years past, under the encouragement of a premium, by the society for promotion of Arts and Commerce, but failed of success under the expensive process of drying, by artificial heat, the difficulty of grinding, peeling off the bark, &c. But of late the sun has been found sufficiently powerful to cure it, and the grinding and peeling process is better understood.

RUTA BAGA.

Mr. Taylor kept six brood mares, and two young horses 3 years old, upon the Swedish turnip and straw, in a fold-yard.

* Leigh Phillips, Esq. Manchester. A specimen of dying with madder of his own growth has been transmitted to the Board of Agriculture, and been viewed with much approbation.

They

ground April 1st,
of 14 hours, grew
inches 9-10ths—

With

They appear healthy, and in fair good condition, to each he gives half a bushel a day.

The Ruta Baga, or Swedish turnip, has stood the severe frost of 1794 and 1795, whilst the English turnips of almost every species have suffered, and upon the wet lands have been totally rotted and destroyed. The tops of the Swedish turnip it is true, have shrunk; but the root stands quite firm. This turnip is a valuable acquisition.

HEMP AND FLAX.

The culture, neither of hemp nor flax, was ever carried to any great extent in this county. It is proper to remark that a crop of hemp is supposed to be an excellent means of destroying couch, let it be ever so abundant.

Mr. Fazakerly observes, that couch should always be destroyed upon the land, by smothering or withering; and if either carried off the land, or even burnt upon it, the ground is injured. He contends, from experience, that though the couch, whilst living, be injurious, yet it should never be taken from the lands whence produced, but the roots by some means there destroyed by putrefaction.

CHAPTER VIII.

GRASS.

SECT. I.—*Natural Meadows and Pastures.*

ALTHOUGH there is a mixture of arable and grass land, yet the latter must greatly preponderate, and that to such a degree, that it has been frequently asserted, that the corn raised in Lancashire would not support the inhabitants more than three months in the year; so that the easiest way of obtaining corn, until the county is improved, is to purchase it at other markets.

The lands in the immediate vicinity of the great towns are chiefly employed in pasturage; at a remoter distance, in pasturage and meadow, immense quantities of hay being requisite for the number of horses and cows kept therein. Near some places, such as Bolton, besides the demand for lands under hay and grass, a great number of acres are occupied as bleaching grounds; and throughout the whole of the county there are, in different places, many acres of rich land, covered with yarn, or cloth, under various operations.

These several causes have had a tendency to change the system of the agriculture of the county, and to convert the arable grounds into grass lands; and this system of management seems yearly increasing, even in those parts which were formerly considered as the great corn districts; such as that fertile soil under the denomination of the Filde, a tract of land from the north of the Ribble along the coast as far as Cockerlands, to the turnpike road on the east.

At this period, (1795) the diminution of arable land is likely to become a serious calamity to the nation at large. The conversion of arable land into grass in this county may be imputed to seven causes.—1st. The enormous and immoderate wages to be obtained in the manufactories, which has wrested the arm of industry from the plough.—2d. The consequent encrease of the poor rates, because the manufactories do not support their own poor; and the manufacturers, if out of employment,
when

when sick, or infirm, or aged, are supported by *taxes levied upon agriculture*.—3d. By all capitals being vested in the working cotton instead of raising corn.—4th. To the very absurd rotation of crops used throughout the county.—5th. To the barbarous custom of keeping the same land too long under the plough.—6th. To an opinion, originating in the consequence of the two last reasons, that grass is more valuable than corn. Good grass probably may, but not such grass as is to be found through a great part of this district.—And, 7th. To the exaction of tythes in kind.

SECT. 2.—*Artificial Grasses.*

THE mode of laying down grass for hay, is after having taken a few crops, cleaned and dunged the land, along with barley and oats, to sow the red clover, with the hay-seeds which fall off in feeding, which are collected; sometimes trefoil is added. Ray-grass of late years has not been in much estimation. Mr. Eccleston, Mr. Wilkinson, and Mr. Philips have each of late sown chicory or succory. The last has already kept his coach-horses three months upon this plant; they look well—the chicory is already sufficient to mow a second time—this plant causes his horses to stale much.

Pasture lands are, in general, most miserably laid down, they being in many places left to nature, to supply the ground with whatever seeds remained in the earth, or came from other quarters, carried by the winds or other accidental causes; and in the Filde particularly the lands have, on many occasions, been so exhausted by repeated plowings, that they are rendered incapable of yielding any useful herbage; seeds that have hitherto been tried upon these lands have sickened and died away, and some have not even vegetated; and the surface remains covered with weeds of various kinds, for a succession of years. White clover, and the cleanest hay seeds, have been the best system of laying down pastures, hitherto practised; but in attempting this, many of the farmers have been too inattentive to the choice of their seeds, which have been promiscuously collected as they dropped from the hay, without regard to the species of
grass,

grafs, the crops being free from docks or other spontaneous weeds, which were permitted to grow. But the lands in general abound with varieties of natural grasses; and, if in tolerable condition, in a very little time will be covered with a good sward; among which, white clover, growing spontaneously, is not unfrequent.

Instead of the old method of laying down land in small ridges (called *butts* in Lancashire) particularly in wet lands, of late the best farmers have adopted the size of six or eight yards broad, with but shallow intervals; if for mowing, the lands are in a better state for the scythe; if for pasture, the cattle not so liable to be overthrown in the deep drains. In very dry lands, which require no drains, the surface is laid as smooth and even as can be effected; the whole being united into one plane, if possible; which not only renders the surface of the land more agreeable to the eye, but in every respect of agricultural management superior. To prevent these butts being too high in the centre, the land is drawn out into breadths of half the size of the intended butt, then a furrow is thrown together from each side of the two, which are to be formed into one for the centre part.

Red clover is sown also, but not as a matrix for wheat, to which the land in some places is adapted*. After two years crop of red clover, although hay seeds have been added, there is generally but a scanty crop, the clover disappearing; and, unless an ample dressing of manure be also given, the produce of hay seeds will be very scanty; this mode of manuring is by good farmers frequently practised. Some experiments have been made upon the *Alopecurus pratensis* and *Festuca pratensis* with great success; as also the wild endive or chicory (*Cichorium intybus*); but these trials are yet in their infancy, and the scale but small. Trefoil, cinque-foil, rib-grass, and rye-grass, have been frequently sown, but in no great quantities, but this last is seldom found to answer here. But the same soil, in different seasons,

* If for pasture, red clover is omitted, white clover and seeds collected from the hay-lofts, are alone used. Some fields have been laid down to pasture, with grass-seeds only, without any corn, and have been found to succeed. There is said to be an evident superiority in lands thus treated, although twenty years ago: but the experiments have been few. A gentleman at Bolton Moor has an excellent pasture the present year, with white clover, sown with vetches.

produces different kinds of grasses, *e. g.* white clovers, which may probably arise from the application of different manures, or the seasons being more congenial to this or that species of grass.—The seeds must be originally lodged in the earth, the great storehouse where nature has deposited her treasures; for none have been fabricated, they have been only collected and selected by the industrious cultivator to whom they offer their liberal aid. Tufts of knot grass, which scarcely any beast will touch, have been removed by spreading a little lime over them. Another species of grass has succeeded this operation.

The great abundance of natural grasses in this country, supersede, in a great measure, the necessity of having recourse to artificial ones. Sainfoin and lucern are unknown, or nearly so. The land naturally produces white clover, especially when kept in high condition; the application of the root of red clover as a matrix for wheat, is scarcely ever practised, though admirably adapted to the lighter land of the county. It is however sown pretty generally when land is intended to be laid down to grass; by this means the farmer obtains two very large crops of hay the first year, but his land is much impoverished for the next two or three, as the clover disappears, and the natural grasses do not push forward, as the land has been generally harassed by the previous crops of corn and clover. This result is in some measure obviated by an ample dressing of manure being given to the clover root, for manure is to be purchased in this populous country in vast quantities. Upon the whole, the manner of laying down land to grass is by far the most reprehensible part of the management of this county. After land had been many years under tillage, the old plan of the country was to fallow for wheat, and leave the stubble of little narrow wheat butts to produce whatever weeds and trumpery it might please Heaven to send: of late years, the stubble has been well manured, and sown with barley and clover, and the refuse of the hay ricks. The manure, and the additional breadth of the barley butts, and the grass seeds were an improvement; but in general this advantage was much diminished by the foulness introduced by the additional crop, the vigour and abundance of the couch grass, and the foulness of

of the hay-seeds. By the time the clover had been twice mown, the lands were in miserable condition, little but couch grass and weeds to be seen: but rest from the plough, and the natural fertility of the soil, by degrees brought it into condition to be *ploughed again*. Such management has been productive of much loss both to landlord and tenant, and is the reason that gentlemen of property are so desirous of having the *tillage of their tenants* so much *restricted*. We are, however, beginning to adopt a more enlightened method of laying down our lands: fallowing for turnips once or twice, if the land is very foul, and then sowing barley and well-dressed hay seeds, from known good meadows, and white clover. Another method is, to manure land very well for early potatoes, which ought to be off the land in June, July, or August at latest, and sowing grass seeds and white clover, without any corn; the hay ought to stand until the hay seeds are pretty well ripened the subsequent year, and the eddish or after-grass to be well manured as soon as the hay is carted off.

SECT. 3.—*Hay Harvest.*

IN the management and curing of clover, which, from the quantity of moisture to be evaporated from the plant, before it be cured sufficiently to keep, is attended with considerable difficulty, the following method has been practised by Thomas Eccleston, Esq. that spirited gentleman so frequently mentioned.

Hay, without doubt, cures faster the more it is raked, as by this, more surface is exposed to the influence of the sun and air, by frequent turning and shaking:—but, in my method, a very little labour, will suffice when the weather is good. The only difficulty is to cure hay, so as to preserve its nutritious juices, scent, and other qualities, when the season is wet, and the grass, through its different stages, is repeatedly caught with showers.

Mr. Eccleston's mode.—The clover is collected together into small sheaves, and kept straight; then twisted together, in the top part, to admit the sheaf to stand upon its butt, or bottom end, when spread out, in the same manner that horse-beans

have been frequently treated; and if these little bundles are not thrown down by the winds, they will resist more rain, if it should fall, than when lying on the surface of the ground; and if the weather be fine, having more surface exposed and open, the clover will cure the faster.

In making hay-stacks, besides a chimney * in the stack, by a basket placed in the middle, and drawn up by a cord, in order to suffer the air, generated by heating, to escape, and to prevent the stack taking fire, as mentioned in the "Survey of Middlesex," Mr. Eccleston cuts gutters in the ground, lengthways, and covers them across in that place whereon a stack is to be built. Through these trenches, in different directions, the outward air may enter, pass through, then ascend the aperture left in the stack; and this continued circulation takes away the generated heat or foul air, which, if confined together without any vent, might produce damage to the hay, or worse effects; and, by these useful precautions, he is enabled to collect his hay together at a more early period, and in a more juicy state; by which good practice, time is saved, and the quality of the hay improved.

I have observed stacks of clover hay, made with layers of wheat straw, at certain distances, from the bottom to the top, which I think a good method, particularly when it has had bad weather upon it, and was got in rather damp, as the damp heat is conveyed through it by means of the straw from one side to the other, and a greater circulation of air might still be procured by a chimney in the centre being filled with straw.

Hay-barns have of late been erected in many places, standing upon pillars, and covered with slates; sometimes with a bottom boarded with planks, open in the joints, perforated with holes, and lying hollow a space above ground, to admit a free circulation of air all under the hay. These buildings are useful, cheap, and by their great convenience in bad weather, and

* "When hay is *properly prepared* to be put together in a stack or rick, a chimney ought never to be made; it is a great evil, never to be adopted but when there is absolute danger of the rick taking fire. Rather let an ox-feeder in North Wilts be consulted in the art of hay-making, than a farmer in Lancashire."—T. W.

the great preservation they afford to the hay, will soon repay the first expence.

It is a good practice with hay in buildings, as soon as it is become solid enough to bear the knife, to cut a passage round the walls, about half a yard in breadth. The hay which comes from the passage thus cut, may be put on the top of the mow: by this method, a free circulation of air is obtained, and the tainted smell which is contracted by the hay which lies up to the walls through the winter, is by this method prevented.

SECT. 4.—*Feeding.*

THE common average of the best lands, is one statute acre per cow, for the summer's acre; but there are some thousands of acres that will fall greatly short, some pastures being so very poor as to require three, nay four times that breadth of land, not to feed, but barely keep alive, those poor beasts who have the hard fate to be doomed to the great labour of collecting their food so scantily and widely dispersed.

Lands under the highest state of cultivation will keep and fatten even more than one beast upon an acre.—The surveyor's summer pasture in 1794, was about five statute acres, which plentifully supplied five tolerably sized cows, two large horses, and one of a smaller size, and seven pigs, regularly turned out to pasture twice every day, between their meals. These pigs consumed a considerable quantity of grass, were admitted into the styes when their meals were prepared, and after having taken their rest, were regularly turned to pasture again. This seems no bad practice in the management of hogs; they grow fast, and their flesh is rendered remarkably sweet, which cleanliness and fresh air might probably be the means of contributing towards.

The hay consumed by this stock was the produce of about six statute acres.

The following information is from a respectable farmer upon a large estate about six miles from Manchester. He says, that it will take two Lancashire acres to summer a milch
cow

cow about Chorton, and along the river Mersey, for eight or ten miles; but that one Lancashire acre in other places will produce not only summer grafs, but also hay to keep a cow all the winter, if the summer be moderately kind. In the north of Lancashire it will take three acres for each cow.

CHAPTER IX.

Of GARDENS and ORCHARDS.

IN the neighbourhood of the large towns, there is a portion of land appropriated to Gardens.

Upon the banks of the Irwell, in the township of Barton, about five miles from Manchester, there are sixty-four statute acres of land planted with apple-trees. The plants are upon borders of three feet wide, and seven yards distance from each in the rows, and from each other every way. The intervals in the rows, and between each apple-tree, are planted with pears, plums, cherries, and gooseberries, which are intended to be removed as soon as they are found to incommode the apple-trees; and the borders are moreover dug, and cropped again with potatoes, beans, cabbages, &c. The intervals between each of these borders are under the following management: a part is appropriated to nursery ground, for raising forest and fruit-trees; another large part is for meadow land, the grass is mown for hay, and the eddish for soiling, and lets after the rate of 4*l.* 10*s.* per large acre. The plantation included in this acre some part sown with grain. The plantation was begun about ten years ago, but was not completed till 1794, when the whole remaining was planted with crab-stock, to be ingrafted the ensuing spring. The trees look healthy in general, and if the kinds are well selected, and adapted to the nature of the soil, will most likely prove a beneficial concern in the issue, since Manchester and its environs will afford a ready market for an article much wanted, and but little cultivated.

It is generally believed, that there is not a town in the kingdom, London excepted, better provided with vegetables, roots, &c. than the town of Liverpool *.

* There are always some reasons for distinguished superiority; and it has been said, that the French neutrals (who were brought over from Canada in the war of 1756, and who resided some years in Liverpool) required so many vegetables in their soups, &c. as to raise the market price of these articles, which excited a spirit of growing greater quantities than had before been usually raised. As a sea port, the quantities of cabbage, and other vegetables, taken out for the use of shipping; the quantities of dried herbs carried to Africa; and onions exported, may act as stimulatives.

Besides the vegetables brought in by the milk-carts, and which really amount to a considerable quantity; there is a certain farm in Kirkby, about eight miles north-east from Liverpool, the soil of a small part of which is a black loamy sand, and which produces great quantities of early, and strong, asparagus; and another farm, a part of which is of the same nature, at a place called Orrel, about four miles north-west of Liverpool; both which produce this plant with less attention, and less dung, than requisite in the rich vale of Kirkdale, about two miles from Liverpool, where the greatest quantity of land in any place of this neighbourhood is appropriated solely to horticulture. In lands not favourable to the asparagus plant, might not this unfavourable disposition be corrected by soil brought from lands more genial to its production, especially to grounds bordering upon the canals?—Forty tons would be probably sufficient for a plantation for a moderate-sized family, and which when once matured continues for a number of years. This plant, in its wild state, is said to grow upon the Bidstone Hills in Cheshire. The number of acres under horticulture in Kirkdale is about 28 of the large measure*; and upon which are only employed about one male to each acre for the year, and one female to weed, and gather the crops of peas, fruits, &c. The masters, it is true, are all workmen, and join with the labourers in their tasks; by which is effected, what otherwise would not have been accomplished, without a greater proportion of hands to the quantity of acres; and yet, small as this number at first sight may appear, it is almost as wonderful how the master is enabled to pay his landlord, his labourers, and his seedsmen, their respective claims, upon this portion of land, when the calculation is begun; and 25% a year is allowed the man for his yearly labour; the half of that sum for the woman's; about 15% more for rent and dung; besides the expence of marketing, and the profits that should arise to the master for his attention, skill, and superintendence, and towards the maintenance of himself and family, with a small accumulating surplus, to support the infirmities of

* Eight yards to the rod, or to the pole or perch.

old age. In the amount of these several particulars enumerated, a sum of money will appear, that would have been sufficient to have purchased the fee simple of the same lands, half a century ago.

The horticulture of this county is in many instances superior to its agriculture. The mechanic is generally furnished with a small patch of ground adjoining his cottage; and from this little spot is extracted not only health, but derived pleasure, and which may not a little contribute to sobriety; intemperance not unfrequently proceeding from want of recreation to fill up a vacant hour. This small space is devoted to nurturing his young seedlings, trimming his more matured plants, contemplating new varieties, in expectation of honours through the medium of gained premiums. Thus starting at intervals from his more toilsome labours, the mechanic finds his stagnating fluids put in motion, and his lungs refreshed with the fragrant breeze, whilst he has been thus raising new flowers of the auricula, carnation, polyanthus, or pink, of the most approved qualities in their several kinds, and which, after being raised here, have been dispersed over the whole kingdom.

Not only flowers but fruit have been objects of their attention. The best gooseberries now under cultivation had their origin in the county of Lancaster; and to promote this spirit, meetings are annually appointed at different places, at which are public exhibitions of different kinds of flowers and fruits, and premiums adjudged. These meetings are encouraged by master-tradesmen and gentlemen of the county, as tending to promote a spirit which may occasionally be diverted into a more important channel.

At these meetings, gooseberries have been produced which have weighed singly 15 dwts. 10 grains, *e. g.* *Lomax's Victory* *. *Woodward's Smith* * has weighed 17 dwts.; and the *Royal Sovereign* *, grown by George Cooke of Ashton, near Preston, at a meeting held 1794, weighed 17 dwts. 18 grains.

A single gooseberry-tree, the Manchester rough red, in a garden belonging to Mr. J. Sykes, in Gateacre, in the year

* Names of gooseberries.

1792, yielded twenty-one quarts of fruit in their green state, when they sold at 3*d.* per quart. The whole quantity weighed twenty-eight pounds avoirdupois *. The space this tree occupied was three yards, and allowing an equal space to walk round, and supposing an acre of eight yards to the rod planted with the same kind of trees, and producing the same quantity of fruit, and sold at the same price, the produce would amount to £. 426. 16*s.*

Requiring but little attention, the gooseberry has less paid to it than it deserves; and the fruit being rendered in such abundance, with so little trouble, makes it of trifling estimation. But since it may be improved in flavour, increased in quantity, and its duration prolonged, by being allowed a solitary corner in a wall, *e. g.* on each side the nectarine or peach whilst in their infancy, and they only occupy a small space; the gooseberry may be nailed down, trimmed, and trained as their companions; but removed as soon as ever they appear to incommode these ancient tenants of the walls; for the first cost of a gooseberry-tree is so trifling, that it is not worthy of notice.

These facts have been already proved by Daniel Daulby, Esq; of Birch House, near Liverpool, who for some years has had them planted against the walls, besides his other plantations of standards. Besides the advantages above noticed, the fruitage season may be advanced or prolonged according to the different aspects of the walls; and an increase of crop was thoroughly proved by this treatment in the year 1793, when there was a general failure throughout the kingdom, and gooseberries sold at the advanced price of 6*d.* per quart. Those trees which had the advantage of walls were loaded as fully as in the most plentiful years.

* To ascertain the weight of this fruit in different states of its growth, the surveyor made the following experiments upon the Manchester red gooseberry.—1794, May 3, one ale quart weighed 18½ ounces troy.—July 25, again from the same tree 20 ounces.—July 15, 21½ ounces.—July 29, 22 ounces.—August 4, 21½ ounces.—*N. B.* He has to regret that he did not number the fruit.

Except

Except the orchard on the banks of the Irwell, in the township of Barton, containing about sixty-four statute acres, there no orchards worthy notice.—There is no cyder made in the county. The importation of apples from the cyder countries, and even from America, has of late been very considerable.

To cause fruit-trees to bear, particularly pears, cut a circle through the bark round the principal branches.—This operation stops the growth of the wood, alters the system of vegetation, and gives the tree a tendency towards bearing fruit instead of making wood.

The off-shoots of pear-trees should be taken off in August.

Lime dissolved in water, and made into a white wash, applied to the branches and stems of trees with a brush, effectually destroys moss*.

It is unfortunate that orchards are not more attended to in this county, as cyder, with the assistance of honey, might be made into a vinous liquor, as strong and as palatable as Madeira. The following is reckoned the best receipt for making it.

“Take new cyder from the press, mix it with honey till it bears an egg, boil it gently for a quarter of an hour (but not in an iron pot), take off the scum as it rises, let it cool, then barrel it, without filling the vessel quite full; bottle it off in March. In six weeks afterwards it will be ripe for use, and as strong as Madeira. The longer it is afterwards kept the better.”

Honey also renders hard crab cyder palatable. Colour and flavour are easily added. Honey from the flower of the buckwheat may be made use of, if a dark hue is wanted.

There is every reason to believe, that currant, gooseberry, and other home-made wines, treated in the same way, would equal what we are at such an expence in importing from foreign countries. The art of making it, with the assistance of Father De San Martino's experiments on the fermentation of vinous liquors (see Dr. Scandella's Addenda to the Chapter on Manures) might soon be brought to such perfection, as to make us independent on foreign nations for this important article.

* In gardens where shallots are sown, to prevent the grub eating them, they should be planted very ebb.

CHAPTER X.

WOODS AND PLANTATIONS.

THERE are no natural woods of any consequence to merit attention. The plantations are in general intended as embellishments for gentlemen's seats, cover for game, or shelter from the blast, rather than with a view of supplying the country with timber, and preventing importation.

Towards the coast it is with great difficulty that wood of any kind can be raised: the tops of the trees, hedges, and even the corn in the fields (in general) bend towards the east, as if shrinking from the western gale, brought over the Atlantic ocean; yet, near the shore at Formby Hall, several acres of land have been planted with forest and fruit-trees, which are in so flourishing a state as to afford general encouragement to the inhabitants of the sea-coast, to fence against the wintry blast, and to raise wholesome fruits for their tables. The forest trees were originally planted in holes when very small, and were sheltered by fods from the winds till they had taken firm root in the ground. A mixture of rich soil and moss was put with no sparing hand beneath their roots. The Scotch fir, the sycamore, the platanus, and the ash, seem most congenial to the soil, which is of a sandy nature, and are least injured by the inclemency of the climate. In the northern part there are many acres of coppices cut down every fifteen years, and burned into charcoal. Toward the central part of the county there are some good woods; the timber healthy: there is also a considerable quantity grown in hedge-rows; but as sun-shine is generally preferred to shade—timber wood seems on the decline. There are many excellent plantations about gentlemen's seats and pleasure-grounds, well attended to, secured, and in a thriving state.

Mr. Leigh Phillips observed, that the alder was of late years become an article of great consequence, from the demand for its wood, which makes the best poles whereon to hang cotton yarn to dry, that wood acquiring a fine polish by frequent use, nor does it splinter by exposure to the weather, and its bark also sells at nearly one penny per pound, as an article for dye.

dye *. He added, that the alders planted on the side of the Duke of Bridgewater's canal, upon the loose grounds, for a certain distance, by way of security to the banks, had not only answered the original purpose, but had proved a profitable plantation—the alder admitting of being cut down every fourth or fifth year. There are many acres of land, at present of little value, which, if planted with this wood, might probably turn to a good account.

The osier willow is at present in such demand for hampers, &c. and there is such a scarcity of that article, that more than twenty pounds a year have been made out of a single acre of land planted with it; and though very few acres are at present planted with them, there are some thousands proper for their growth, but the management of them seems not to be understood at present.

On the sea-coast there are some acres of land planted with forest-trees, which are flourishing and ornamental to the country. They were originally placed in holes (with a mixture of sea-slutch and broken pieces of turf at their roots) four inches beneath the surface of the ground; and fods were raised round them, to guard their tender shoots from the wintry blast. Its violence is least injurious to the sycamore, the ash, the alder, fir, and platanus.—This observation is communicated by the Reverend Mr. Formby, of Formby, who has succeeded in raising plantations so near the sea, that it was hardly thought practicable till he effected it.

* In Sweden they make beautiful tables of the root of the alder.

CHAPTER XI.

OF WASTE LANDS.

IN this county there are large tracts of waste lands, not less than one hundred and eight thousand five hundred acres, according to Mr. Yates's statement, who took the pains to calculate the number for this particular purpose.—He makes the lands, under the denomination of moss, or fen lands, to be twenty-six thousand five hundred acres. Moors, marshes, and commons, to amount to eighty-two thousand acres. Why seek out distant countries to cultivate, whilst so much remains to be done at home?

At Lancaster there is an excellent salt marsh, adjoining the banks of the river Lune; and of which about 500 statute acres belong to eighty of the oldest freemen of the corporation of Lancaster, or their widows, and the trustees of this charity, the corporation. This marsh is pastured, and divided into what are termed *orl grasses*; that is, a privilege of turning one horse or two cows of any size to summer upon this common; so that a poney is reckoned equal to two oxen, however small the horse, or large the ox. The number of grasses or gates is equal to that of privileged burghesses, namely 80, and two more to the trustees of the charity, or 82 gates; and which, if let, are worth at present from £. 1. 10 s. to £. 1. 11 s. 6 d. per summer.—Seven years ago they would not let at twenty shillings a gate.

Now this marsh, if divided into fields of a proper size, is so fertile, that it would immediately be worth three pounds per acre; and, if improved, worth five pounds per acre per annum.

The present value is 82 summer grasses, at £. 1. 11 s. 6 d.	£.	s.	d.
	129	3	0
And suppose the winter herbage worth	—	—	—
	50	0	0

Total	—	—	179	3	0
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But,

But, if inclosed, its annual
value would, at £. 3. per
acre per annum, be —

	£.	s.	d.
—	1,500	0	0
Excess	1,320	17	0

If improved, at £. 5. per acre,
would be —

—	2,500	0	0
Excess	2,320	17	0

Such statements cannot require any comment to recommend them to public attention, and that too in a neighbourhood of a town distressed for inclosed land; being bound up on one side by this marsh, and on the other side by a moor, which extends to the very borders of the town; a moor too, which manifests itself capable of being rendered fertile land, as is evident from small inclosures under cultivation, which the industry of some cottager has improved from the waste.

In the neighbourhood of Preston lies Preston Moor, about 500 acres of good land, and abounding with excellent marle, but which at present lies under water, which might be easily removed. Fullwood Moor, too, in the same neighbourhood, about 1000 acres, and Caddesley Moor, which belongs to the crown, with many more which might be enumerated, and which remain in a state that disgraces the county.

Many of these lands are incapable of tillage—some consist of mountainous tracts, craggy, steep, and barren; these are employed for sheep walks, though not the most fertile: others consist of low swamps, overcharged with stagnant water; from which a sufficient fall has not yet been discovered for draining them. Many of the wastes are covered with underwood, and others have been planted with various kinds of forest trees. Sir Harry Houghton proposes to plant Withnell Moor, a tract of about eight hundred acres, with such trees as upon trial shall be found to agree with the soil. Several parts are allotted out in what are termed dales, for the purpose of paring the surface for fuel—a pernicious practice, which injures the land, and affords but a very indifferent fire.

There are many thousand acres capable of being cultivated, and made into either arable, pasture, or meadow land, of a very good quality, provided those wastes were inclosed, di-

vided, and improved; and, to effect this, there is neither want of inclination nor spirit amongst the inhabitants. But there is a want of a general inclosure bill to facilitate that troublesome business, and render it more expeditious and less expensive.

A great improvement has been suggested by Mr. Wilkinson, of Castle-Head, of embanking upon the sands, and gaining thereby 30,000 acres. This great attempt has been already noticed in the Annals of Agriculture; but these patriotic and public attentions are at present defeated, by a difference of opinion amongst individuals, claims of the lords of the manors, &c.

Mr. Wilkinson also, by turning the course of some brooks, has recovered lands from the sea; by which the flux of the tide, in the space of about eight years, has raised the lands near six feet; so that, after the water is kept in narrower bounds, by the opening of a new channel, the tide alone does the work.

OBSERVATIONS ON THE EMBANKMENT OF LANCASTER SANDS.

“IT is a fact, consonant to reason, and proved by experience, that when the course of a river where it enters the sea, or rather tide mark, is turned another way into the ocean, the former channel, and adjacent sand, is, from the perpetual influx of sand, mud, &c. brought and left there by the tide, raised gradually, till, in the course of a few years, it becomes out of the reach of, at least, ordinary tides; because the fresh water ceases to prevent the accumulating of these materials, which it formerly did, by constantly removing them to the sea.

“If that is the case, there must exist a possibility of recovering from the dominion of Neptune that extensive tract called Lancaster and Milthrop Sands; as also, part of the Ulverstone, and Dudden or Millam Sands, by a diversion of the rivers.

“The first question naturally arising in the enquiry is, Whether an effectual removal of the rivers is practicable? and, secondly, Whether, in that case, the probable expence would not over-

overbalance the advantages that might be expected to arise therefrom?

“ In regard to the first: an ingenious and respectable gentleman in that neighbourhood, Mr. John Jenkinson of Yealand, had, for many years back, given the subject much attention, and minutely explored the track proposed for the new channel of the Kent and other rivers running through the Lancaster and Milthrop sands, as pointed out in the plan. Some years since he communicated his ideas on the matter to Mr. Wilkinson of Castlehead, a gentleman of fortune, patriotism, and universal knowledge. The scheme attracted the notice of Mr. Wilkinson; he examined the ground, and was immediately struck with the notion that it might be carried into execution without much difficulty. A subscription was proposed, in which Mr. Wilkinson offered to lead off with 50,000 *l.* if the neighbouring gentlemen would make up the rest (having previously estimated the whole expence at 150,000 *l.*) or, if they would begin with any sum, he would produce the remainder, it being understood that each should receive of the profits in proportion to his subscription. The project being thus apparently pretty forward, a person was appointed to take the levels, &c. which he did; and his plans are now in the possession of Mr. Jenkinson, who also himself made an actual survey of Lancaster and Milthrop sands, from whose plan I copied part of mine.

“ Notwithstanding these preparations, the projectors unfortunately met with such opposition from the proprietors of some trifling fisheries, who were nevertheless offered an indemnification for the loss they might sustain; and certain lords of manors, who, though they refused to contribute any thing towards recovering the sands, were yet unwilling to relinquish any part of their claims to the ground when improved—that the matter was dropped at that time.

“ The principal river to be taken off Lancaster and Milthrop sands is the Kent. I examined with attention the ground proposed for the new channel, as marked in the plan, and found it remarkably adapted for the purpose. The whole length, where it runs inland, is a range of low mossy or soft land, except a

N

small

small tract of rocky or gravelly ground, the highest part of which is not more than 10 feet 5 inches above level; and I believe the average height of the whole cut would not exceed 3 feet 5 inches above level. In short, I do not entertain a doubt of the practicability of diverting the course of the rivers, and taking them into the Loyne, below Lancaster. The fall in that course is small, yet sufficient for the current of the water. Neither do I find a difficulty in believing that the ultimate consequence would be the gaining a very large tract of sand, which would become the finest land. This method of recovering ground from the sea is now, where it is practicable, universally allowed to be a much surer, and often less expensive, means than that of wholly depending on embanking on the sand with any materials whatever.

“ Whether it would be best to follow exactly the plan I have prescribed, in diverting the rivers, is the province of an experienced engineer to determine. Equal knowledge and abilities are required to make a tolerably exact estimate of the expence in the execution of such a design. I shall, however, from all the knowledge I could possibly acquire of the business, endeavour to make out an estimate, which may, at least, convey a general idea of the scheme; but which, my inexperience in these matters bids me add, must not be too implicitly relied on in particular.

“ Mr. Wilkinson, as observed before, calculated the whole expence at £. 150,000; but in the opinion of many well-informed gentlemen 50 or perhaps £. 60,000 less might do. Various plans have been proposed by different people; but it would seem best, in my opinion, to commence the work a little below Dallam Tower (as shewn in the plan) by throwing a bank of stone, or stone and brushwood, across the channel there: plenty of these materials being at hand, on a common. The bank would serve for a road, and a bridge at the S. E. end would admit the fresh water. The sand here is near thirteen feet deep, which it would be necessary for the stones to bottom; that would require little or no labour, more than tumbling in; as the weight of the stones and washing of the tide would soon bring them to the channel. This bank would

be

be about 880 yards long, and should I believe be 7 yards high, 10 yards at the base, and 6 yards at top, and would consequently contain 49,280 cubic yards, which, allowing each yard to cost one shilling, would amount to £.2,464. The bridge I should state at £.1,000. The whole length of the cut from hence to the Loyne is about 21,340 yards: to contain the greatest land floods it should not, I presume, be less than 34 yards wide, and the average depth 4 yards; the number of yards, upon that position, to be excavated, would, therefore, be 2,902,240, which at $4\frac{1}{2}d.$ per yard would cost £.54,417. Where rocks or high ground upon the coast renders it necessary to keep within the tide-mark, the earth to be taken out will form a bank on the sea side of the cut. A number of bridges might be necessary to erect; however, till the profits of the land to be recovered should enable the proprietors to build them of stone throughout, I should propose temporary bridges of wood, except one, for the principal road; the expence of which we shall call £.1,000, and that of the wooden ones £.3,600.

“The next thing to be considered is the diversion of Lindlepool, which might either be brought into the Kent, as shewn in the plan, or taken the contrary way into Cartmel sands. In either case, as it is an inconsiderable rivulet, and the ground generally very low and soft, I shall not state the expence at more than £.5,300, including the necessary bridges.

“Afterwards, when the sea had nearly embanked itself, it might be found convenient to raise sand banks a few feet high, in order to keep off high spring tides: the expence of which, added to that of purchasing ground for the new channels of the rivers, I shall state at £.13,000.

“These sands are the principal objects of attention, but should their recovery be effected, it would be found very convenient, as well as practicable, to use similar means in obtaining part of the Ulverstone sands. A bank might be thrown over the channel, as marked in the plan, with a bridge at the end of it, the fresh water then confined to the shore till it entered Ulverstone mofs, through which an easy cut would bring it to the sands again either at Plumpton Hall, or at the mouth of the new

canal, where there is plenty of rock at hand to secure it. At the latter place it might be of service to the shipping, by opening the channel.

" By that operation, about 1,600 acres would be gained. Every expence attending which I estimate at £. 20,000.

" The acquisition of at least 4,600 acres may also be effected by the same means upon the Dudden or Millam sands. A long strip of marsh land extending along each side renders the task of diverting the rivers, comparatively, an easy one. The Dudden might be conveyed along the north side, and fixed, at its entrance into the sand, with limestone rock: while the rivulet called Kirby-pool might with little obstruction be taken down the other side, if we except the intervention of a little rising rocky ground extending about an hundred yards. That, however, is no object in a work of such magnitude. The whole expence of this undertaking I am persuaded would not exceed £. 26,000.

Let us now collect the several sums estimated:

Expence of the bank below Dallam Tower	-	£. 2,463
Ditto of the bridge at the end thereof	-	1,000
Ditto of the cut from thence to the Loyne	-	54,417
Ditto of the bridges over the cut	-	4,600
Ditto of sand banks, and purchasing ground	-	13,000
Ditto of diverting Lindlepool	-	5,300
Ditto of gaining part of Ulverstone sands	-	20,000
Ditto of gaining part of Dudden sands	-	26,000
Interest of money sunk, till the land to be gained becomes profitable; salaries of engineers, &c. with contingent expences, I shall call	-	73,219

Total expences	-	£. 200,000
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The land that might reasonably be expected to be gained upon the Lancaster, &c. sands, is

	-	Acres 32,510
Ditto upon the Dudden sands	-	4,600
Ditto upon the Ulverstone sands	-	1,600

Total number of acres	-	38,710
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" We

" We are now to consider what benefits would accrue from the execution of the above projects.

" In the first place, a regular connection would take place between Lancaster and Whitehaven, by a post road, which would doubtless be laid out between those places; by which not only these commercial towns, but all the intervening country would be much benefited. Whereas at present, a person travelling between Lancaster and Ulverstone, Ravenglass, Whitehaven, &c. must either take a very circuitous rout through a wild mountainous country, or wait a precarious, dangerous passage over the sands. A reflection on the number of unfortunate people, who are annually lost in crossing these deceitful sands, touches the nerve of humanity. That dreadful circumstance would be remedied by banishing the tide. But although the philanthropic mind may consider these matters as great grievances, others may look upon them as provincial evils only, and the effects of their removal equally confined. Another advantage that would take place would be more universally felt. Here are tracts of sand containing 38,710 acres, which at present, instead of being beneficial to the community, are a general nuisance. If this land could be recovered by laying out the sum of £. 200,000, it would be a purchase of £. 5. 3s. 3 $\frac{1}{4}$ d. per acre of land, which, I presume, by the time all the money was paid, would be worth £. 40 per acre, consequently a clear gain of £. 1,348,400.

" This would not be like a transfer of property, where one party loses what the other acquires. It would be a property really gained, the produce of which (whoever were the immediate possessors) would expand itself, on every side, to a great distance; and by causing an increase of provisions, must proportionably affect the price; whereby thousands of poor families would find an additional morsel to their daily pittance, exclusive of the employment it would afford them in the execution.

" In hopes a little farther suggestion may not be offensive, I shall observe, that, should the project be attempted, it would be prudent, or rather necessary, after it is ascertained in whom the present property of the sands abides, with the assistance of parliament, to require the proprietors either to contribute their

quota

" We

quota towards the expence of obtaining the same, or for ever to forfeit their right thereto, which should be transferred to the first who offered to make good the subscription.

"As Mr. Jenkinson, mentioned before, is perfectly acquainted with the place, and nature of the scheme, he would be a very proper person to apply to by any gentleman, wishing to have a further knowledge of the subject, in any particular."

M O S S E S.

IN the parish of Eccles, is a large tract of moss land called Chat Moss, lying between the township of Worsley and the navigable river Irwell, containing some thousand acres; and on the south side the river is another piece of land called Trafford Moss, which adjoins to the park of John Trafford, Esq; and contains about 500 statute acres.

These lands, which have hitherto been totally uncultivated and of no use whatever, except that of supplying the neighbourhood with peat or turf for fuel, are advantageously situated for improvement. The country round is populous: Chat Moss approaches within six miles, and Trafford Moss within three miles of Manchester. The Duke of Bridgewater's canal divides Trafford Moss, and terminates at some distance in Chat Moss. The lands lie upwards of thirty feet above the bed of the river; and materials for improving them, when drained, are found in many parts of the neighbourhood.

The nature of moss lands is too well known to require any description—they have probably originated from pools of water fed by adjacent springs or rain, which from the peculiar conformation of the strata below, have not been able freely to trace a subterraneous passage, and have become stagnant. In course of time, these pools admit of vegetation of various kinds, which having annually subsided, afford a proper substance for the nutriment of such other plants as are usually found in these situations,

situations, which, besides the various species of moss, the growth of some of which is astonishingly rapid, are the *erica vulgaris*, the *ornithogalum luteum*, and the different species of *eriphorum* or cotton grass.—As these plants decay and deposit their substances, a considerable addition is yearly made to the moss, in cutting a section of which it is not difficult to perceive, and to divide from each other, the vegetation of each year, which appear in lamina growing more indistinct, hard, and cohesive, according to the depth of the moss. The plants before-mentioned, and particularly the mosses, seem to find their proper nutriment in their own ruins, and grow more luxuriant as the substance of the moss increases; at length the whole takes the appearance of a large fungus or homogeneous vegetable: continuing to increase, it at length rises greatly above the level of the adjacent lands, till the weight of the surface becoming too great to be supported by the spongy substance below, it begins to overflow its banks, and cover the adjoining grounds, as happened of late years at Solway Moss, and was formerly the case at Chat Moss, a great portion of which detached itself into the Irwell; and, if we may believe our ancient chroniclers, was carried by the Mersey into the Irish sea.

In the year 1793, Mr. Wakefield, and Mr. Roscoe of Liverpool, undertook the improvement of these lands, and a contract was entered into with the proprietor, Mr. Trafford, for a lease of them for a term of years under a yearly rent. An act of parliament was obtained, enabling the proprietor to lease the same; and the improvement of Trafford Moss was immediately begun by intersecting it with drains at six yards distance, which opening into wider drains at one hundred yards distance, convey the water arising from the moss into the river Irwell.

In cutting these drains, one precaution has been found of the utmost importance. If the drain be cut to its intended depth at one operation, it will be impossible to prevent the sides from falling in, and no labour can afterwards effectually repair the damage.

It is highly necessary, therefore, to attend to the nature and consistence

consistence of the moss, and not to cut deeper at one time, than will suffer the sides to remain perfectly firm. The method adopted on Trafford Moss is, to open the drain at the first cut only about one foot deep, which is thus left to drain, and at proper intervals is cut again till it is three feet deeper, and about eighteen inches wide; by these means the sides of the drain become not only hard and finer, but are perhaps of all other materials the most durable, being unaffected either by moisture, frost, or sun. When the drain, thus cut, has remained so long as to have become tolerably dry at the bottom, a narrow drain is opened in the middle of it with a spade, about five inches wide and eighteen inches deep, which thus leaves a shoulder of about six inches on each side, intended for the sod or turf, with which the narrow drain is covered, to rest upon. The narrow or split drain is then carefully cleaned, and covered with the first sod cut from the drain, the surface or swarth being turned downwards; and the whole is then covered up ready for cultivation. A considerable part of Trafford Moss is thus drained, and the rest is intersected with drains at six yards distance, a great part of which will be covered in the present year. In consequence of these operations, the moss has sunk considerably, and acquired a great degree of solidity.

This operation being completed, the surface of the moss is to be levelled, and the sod turned under, which may be done either by the push-plow, or the spade, both of which methods have been tried at Trafford; but the latter, though a more expensive operation, is thought to be preferable, as the tough sod is thus effectually covered, and a surface produced, which admits more readily the operation of the air, and more easily mingles with the materials employed in the proposed improvement.

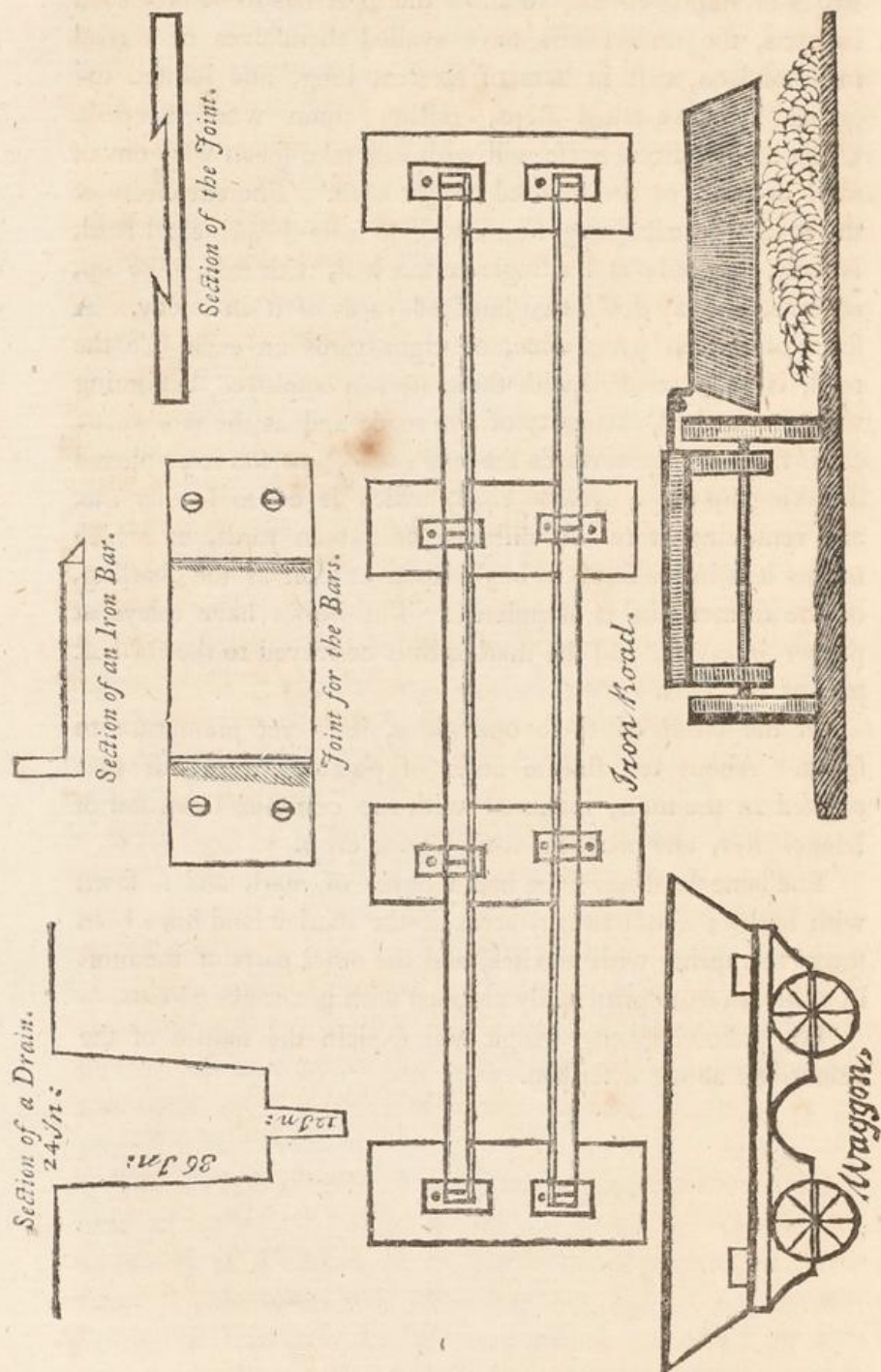
The materials which have hitherto been chiefly tried, are sand and marl, both of which are found at the southern extremity of Trafford Moss, the latter of an excellent quality. These have been used together (laying on the sand first), and separately, and it is expected the effect of each will, in some degree, be ascertained in the course of the pre-

sent year. The land not being sufficiently hard, in the first stages of improvement, to allow the materials to be conveyed in carts, the undertakers have availed themselves of a road made of iron, cast in bars of six feet long, and jointed together by dove-tailed steps, resting upon wood sleepers. Upon this road one horse will with ease take seven waggons of marl or sand, of six hundred weight each. The extremity of the road, where it diverges on each side from the principal road, is daily changed; and a single person will, with ease, take up, remove, and lay down two hundred yards of it in a day. A space of sixteen yards wide, or eight yards on each side the road, is then covered with the materials employed, beginning with the furthest extremity of the road, and as the work proceeds from thence towards the main road, a person is employed in taking up the moveable road, which is of no further use, and removing it to the distance of sixteen yards, by which means it is in readiness to begin upon as soon as the marling, or the former road is completed. The horses have relays at proper intervals, and the marl is thus conveyed to the furthest part of the moss.

Of the effect of these operations, it is yet premature to speak. About ten statute acres of potatoes were last year planted in the moss, manured with the common town soil of Manchester, and produced a very good crop.

The same land has since had a cover of marl, and is sown with barley; about twenty acres of the marled land have been sown this spring with vetches, and the other parts of the moss in cultivation are principally cropped with potatoes and oats.

The following engravings will explain the nature of the operations above described.



RAINFORD

RAINFORD MOSS.

MR. JOHN CHORLEY of Prescot, having taken a part of Rainford Moss, belonging to the Earl of Derby, upon a lease of three lives, and at a rent of eight shillings *per* acre, *per annum*, besides a small fine, began to improve the same in the year 1780. The land is a poor barren moss, not of the least value in its natural state, being so spongy and full of water, as not to admit the foot of cattle upon its surface. After draining, by open drains, three feet wide at top, to the depth of two feet, and afterwards one foot deeper, and only nine inches broad at the bottom, the interval between each drain eight yards, the expence of cutting which was three-pence for every eight yards, he began with paring and burning, with crops of oats, barley, and clover; till being convinced of its *destructive effects* (to make use of his own expression) not only upon his own, but from the experience of others in the neighbourhood*, he totally abandoned that practice in 1787, and has adopted (amongst others which he has regularly registered in a book he keeps for that purpose) the following course, copied from his memorandums. Potatoes with dung, for the first time, produce about four hundred bushels *per* large acre of eight yards; next year potatoes again without dung—produce about three hundred bushels. He is this year (1795) trying potatoes for a third time, without dung, and seems to speak with confidence of success. To return, in 1789, upon the lot under notice, he sowed Tartarian oats, the produce handsome—but Mr. Chorley thinks moss lands in general not proper for grain, being more favourable to the production of grass, which comes spontaneously, if encouraged by a little dung—and he intends to discontinue the practice of sowing grain; he sows his clover without any grain. His practice at present is to sow the clover immediately after the potatoes are taken up, if early in the

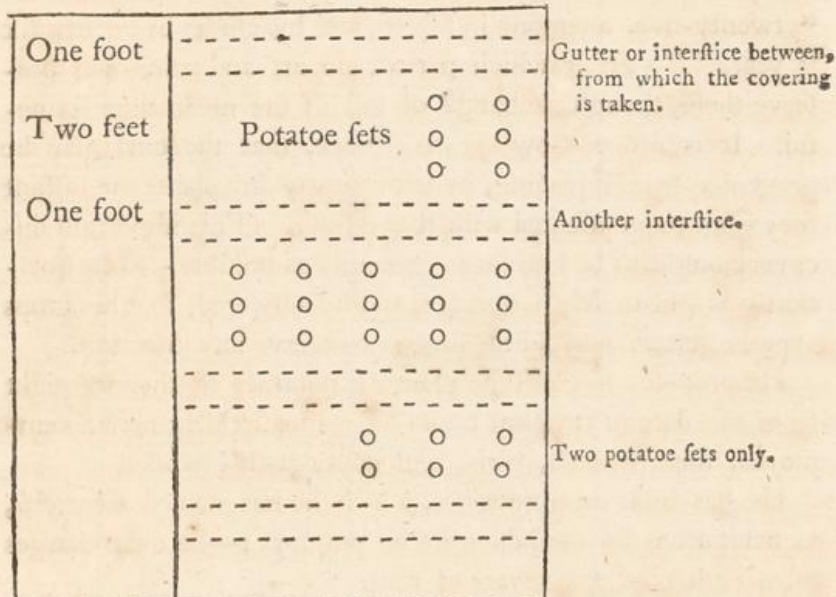
* The land he has improved without paring and burning, certainly has a superior appearance to that of his neighbours, who continue the practice; but that may be owing to their exhausting the land by too many crops of corn after they have pared and burnt.

season. Along with the oats was sown clover, and in 1790 two handsome crops were taken; 1791 mown, afterwards marled, about one rod of sixty-four cubic yards, laid upon an acre; 1792, 1793, and 1794 mown. The eddish was not eaten off, but harrowed and raked away in the spring, and used as litter for horses.

His manner of planting potatoes (which are set always the first year when the ground is broke up) is as follows:—The moss taken from the drain is put into the middle of the butt or ridge, and dug under, in order to raise it higher than the sides. The spit is about twelve inches in depth, the expence 7*d.* per rod.—After being dug and exposed to the air, the surface is broken with a spade (expence 2*d.* per rod) the butts or plots, of eight yards broad, are divided across into ridges of two feet, across which are planted three, but sometimes only two potatoe sets, upon which, or over the sets, is laid the dung; and over the whole is thrown the moss, a foot on each side being reserved for covering when first planted, and another for covering when the stems appear above the surface—the whole breadth of each being four feet.

The whole will be best understood from the following sketch :

PLOT or FIELD of 8 Yards.



The expence of draining, digging, dung, planting fets, &c. for an acre of potatoes, he estimates at £.50 *per* acre, but thinks he is repaid the whole in the course of three crops.

Mr. Chorley has about thirty large acres under cultivation, about ten more ditched out, and about twenty acres under potatoes.—He prefers good horse or cow-dung * to marl, which he thinks should not be laid on till after two or three crops—after it has lain some time under grafs, it begins to run wild, and requires turning over again.—By a change of his potatoe fets from this moss, to his old inclosed lands, Mr. Chorley preserves his crops from the *curl*.—His fets are become famous on that account, and readily purchased for the purpose of planting by his neighbours.

It is with regret we add, that the curl is a general com-

* The dung brought from Liverpool costs him 10 s. 8 d. *per* ton when laid down upon the moss.

plaint this year (1795); that there is greater appearance of this disease amongst the potatoe crops than have been observed for some years past.—Recourse must at last be had to the seed, for renewal;—bulbous roots, it has been found by experience, decay after a certain number of years—“Ranunculus in twenty-five, anemone in fifteen, and hyacinths in twenty-six years*.” After which period, no art and pains can preserve them, though a change of soil in the mean time is useful. It is proper however to remark, that the curl may be prevented from spreading, by taking away any plants the instant they seem to be affected with that disease. This important discovery ought to be known as generally as possible.—The question was put to Mr. Chorley; and he answered, that his crops appeared clear, nor did the surveyor observe any infection.

He proposes to continue planting potatoes another fortnight from this date (15th June) and has at least thirty persons employed, men, women, girls, and boys, at this work.

He has built nine cottages, which he has named *Cheapside*, as habitations for the labourers he employs;—he only charges them with 20s. *per annum* of rent.

Profit from improving Waste Lands.

Bootle Marsh, in the neighbourhood of Liverpool, was let before being improved at ten shillings per acre, and is now worth about £.3.—Trafford Moss was formerly not worth one shilling per acre; but such of it as has been drained, is now reckoned worth about £.3 per acre per annum.—Bolton Moor, after an act of inclosure in 1793, was divided into lots, and only 170 statute acres was disposed of for the immense ground rent of £.2,600 per annum. But it was in some measure intended for building. Some of the lands in this moor have since been cultivated. One inclosure was covered about two inches with soil; sown with vetches, without ploughing. An excellent crop. White clover sown amongst the vetches. The present year (1795) a very good pasture. In 1794, inclosures of 12 statute acres produced 600 bushels of oats, Win-

* See Madox's Florist's Directory, p. 91.

chester, which sold at 3 s. 6 d. per bushel. Cultivation, one furrow, manure, a compost of lime and earth. 4,000 bushels of potatoes grown upon this moor 1794. Before inclosure, the surface of insignificant value for pasture. Produce only coarse bent grass. Under stratum, clay, from which bricks were made.—Dean Moor lies contiguous, about the same size, and nearly as valuable; and near Bolton also there are other moors, capable of being improved at no very considerable expence, and rendered worth four pounds per acre.—Kearsley Moor is very extensive, some bad, and some exceeding good land; most of it capable of cultivation, and contiguous to marle and lime. At present, being overstocked, the cattle starved, and of little advantage to the owners.—An act has been obtained for inclosing Edgworth Moor the present sessions. But the vexatious trouble attending this work, operates as powerfully as the expences of obtaining the act. If inclosed and improved, it would add much to the produce of this county.

Whitworth Moor also, near Rochdale, a very large tract, is capable of improvement, and of being rendered good land.

Many of the moors, if only inclosed (which, in their present state, are of little consequence) would immediately become of very considerable value.

CHAPTER XII.

IMPROVEMENTS.

SECT. I.—*Draining.*

THERE has been much draining done in many parts of the county; but there remains much still to be done: but the spirit is gone forth, and the good effects are evident, so much so, that in many instances that have been mentioned, the land has been so far improved, as to repay the costs by the superior crops which followed this improvement, even the very first year, after the work was executed.

All draining is trifling, in comparison of the practice of Mr. Elkington, of Prince Thorp, near Coventry, who is now employed in many parts of the kingdom with surprising success.

The mosses in general might be effectually drained, and at a small expence, were the springs that feed them cut off and carried away from the high lands before they reach the mosses. Mr. Elkington has improved several as above, and rendered the lands of great value.

Were Mr. Elkington's principles of draining made public, this county would in particular be benefited by his discovery.

“The cheapest and most effectual method of improving
“moss lands, as Mr. Taylor justly observes, is that practised
“by Mr. Elkington, who discovers and carries off the springs,
“that cause the bogs.”

His system is so simple and so rational, that it strikes with immediate conviction. As the Board is already in possession
of

of the principles of his mode of draining, it is unnecessary to dwell longer upon the subject. One example of its importance, however, it may not be improper to give, though on a small scale. A single drain in a field of four acres of the large measure, was calculated to cost four pounds. The advantages to be derived might be reasonably estimated at not less than eight pounds per annum upon that field alone; but its beneficial effects probably extend beyond the limits of one single field; to what extent, further experience will prove. The source of a wide spreading evil is thus, with one stroke, diverted into another channel, and its bad effects totally cut off.

J. Wilkinson, Esq. on the borders of the county, has drained to the amount of 1,000 acres of fen lands; Warton Moss has also been drained. Trafford, and a large part of Chat Moss*, are taken by Mr. Wakefield and Mr. Roscoe, on a long lease, with intention to drain. Near one hundred acres are already cut upon Trafford Moss, upon which Mr. Wilkinson's plan is pursued, of making use of the materials upon the spot; cutting through the moss at different intervals of time; by which is given opportunity for the water to escape, the ground to acquire more firmness, the walls to grow harder; and as the ground would otherwise close, at a distance from the bottom, a large shoulder is left, whereupon a lintel is to rest, cut from some solid turf, about 18 inches in length, and 9 inches square, and which, being exposed to the sun and air, contracts its dimensions to nearly one half, acquires firmness, hardness, and ability to support the matter with which the surface of the drain is covered.

The fens or moss lands thus drained have acquired solidity, and become fertile meadow, and corn lands; and, in conse-

* "Chartley-More braist up within a mile of Morley-hall, and destroyed much ground with mosse thereabouts, and destraid much fresh water fish thereabouts, first corrupting with stinking water Glasebrooke, and to Glasebrooke carried stinking water and mosse into Murfey water, and Murfey corrupted, carried the rowling mosse part to the shores of North Wales, part to the Isle of Mann and sum into Ireland. In the very topp of Chartley-More, where the mosse was higest and brak, is now a plane valley as was in tymes past, and a rille runneth in hit, and peaces of simaul trees be found in the bottom."

LELAND, Vol. VII. p. 49.

quence of the drainage, have sunk some feet lower*. Warton moss, and Mr. Wilkinson's, are become very rich meadow and pasture land.

The only effectual means of speedily forwarding irrigation throughout the kingdom, to the utmost extent, would be to establish a company of able practitioners in that line, to whom individuals could apply for advice, to direct the works in the best and most effectual manner, or who would undertake to compleat the whole for certain sums *per acre*, according to situation, &c.

If the above assistance could be easily obtained, there is no doubt but that thousands of acres would be turned to that most valuable mode of management, in the course of a very few years.

The same may be said of draining, and were Mr. Elkington's (or any, if possible, other superior mode) made public, and a company able to direct, formed, there would not appear in this county so many thousand acres of morafs, within a very short period.

There is a variety of drains besides the above; a piece of peat, the usual shape and dimensions of the common turf, has been made use of, after piercing the turf with a kind of punch when wet, by which a hole is left about three inches square, a little arched at the top in this form , and after being hardened in the air, the two pieces of turf are placed side by side. For this the Agricultural Society at Manchester rewarded the inventor with a premium.

Common brick, with thin slates at the bottom of the drains, have been frequently used. A double brick, with a hollow through the middle, is an article cheap, soon made, durable, and sufficient for the purpose. Broken stones have been frequently used, laid loose and open, the drain first cut in this

form , and filled up as far as the dotted line. But the

* Mr. Wilkinson's moss is, in some parts, supposed to be sunk six feet lower:—before the drainage, the windows of the third story of Mr. Wilkinson's house just appeared from a certain point; but from that place, at present, the windows on the first floor are plainly seen.

Since writing the above, Mr. Wakefield observes, that an actual measurement has been made, and the fall of the moss is about four feet and a half.

cheapest are the sod drains, made by T. B. Bayley, Esq. of Hope near Manchester. The implements and manner are particularly described in Dr. Hunter's *Georgical Essays*. I viewed the drains, which have already stood twenty years. The entrances have generally a fence of brick, or stones, to secure them from the feet of cattle. This work is performed at sixpence per rod: men were employed in cutting new drains when this well-managed estate was surveyed.

More attention should be paid to draining marle-pits than is generally practised; the stagnant water frequently overflows, and starves a large space of land, till its effects are destroyed by some ditch, &c. which cuts off the nuisance by carrying the water off *, but the draining of the pits not only removes this evil, but is the means of gaining a considerable space of ground.

A good practice, by S. Fazakerly, Esq. should be noticed. When fall sufficient into the main drain, to take off the water from some particular spots, is not afforded, he sinks a kind of well where the spring arises, the side of which he secures by stones or brick, and thus collects the stagnant water into one point, and by this means he can get rid of it. Mr. Bayley of Hope mentioned an improvement upon this mode, namely, an auger-hole has been found effective if properly applied.

Mr. Eccleston has applied his miner, this present year, for the first time, with apparent success. The surveyor walked over a field where the miner had been drawn through certain intervals, only once; the run of water was not trifling, and the ground seemed firm.—The expence of this operation is very inconsiderable.

Observations on the BRICK TAX, by T. B. BAYLEY, Esq.

“ Very important and *extensive* schemes of draining *mosses*, &c. in this county are projected, and depend on taking off this tax; and I have frequent applications on the subject, as the season for making bricks approaches. The present season must surely convince every man who has eyes to

* J. J. Atherton, Esq. has done much in this way.

see, that a spirited agriculture must be our final and best resource. Perhaps the most simple mode would be to allow a drawback of the duty for bricks used in draining; though I have a great objection to the principle of drawbacks, as temptations to fraud—*effected by perjury*.

“ From the quantities of rain which fall in Lancashire, and the nature of our soil in general, draining is, of necessity, the *first* requisite step to improve our lands. Most parts of the county have not any *stone*, and the tax on *bricks* has operated as a *total prohibition* of their use in draining. This circumstance has been of the greatest possible disadvantage to our agriculture, and was communicated by our county members and other gentlemen to administration last year, when the new duty was laid on bricks. The representation was kindly received, and attended to—The impolicy of obstructing the *means* of national improvement, especially of its agriculture, was seen and acknowledged by the second section of the 34th Geo. III, chap. 15. But the great size and prescribed shape of the *tile* or brick for draining, effectually prohibits its use, and takes away the indulgence meant for us.

“ A common brick of the usual size and shape is, on every account, best adapted for *draining*, as it forms the *bottom*, the *walls*, and the *covering* of the drains *; and I really think the revenue would not be injured, if the legislature was generally to exempt bricks made for the *express purpose of draining* from the tax. To prevent frauds and abuses, persons might be still obliged to enter their bricks at the excise office, and to pay a small duty of three pence per thousand to defray the expence of the officer's attendance, and be subject to a *very heavy penalty* for applying those bricks to any other use or purpose than that of draining; they might be further required to certify to the excise officer the time, place, and manner in which these bricks are used.

“ The use of so bulky a material as brick cannot be easily *smuggled*; numbers must be privy to it, and the fear of detection, and of a heavy penalty on the owner and *workmen*, would,

* Bricks are chiefly used in main drains, or soughs laid at considerable depths, and have strength to bear a weight of earth which tiles have not.

I am persuaded, *totally* prevent all illicit attempts to defraud the revenue.

“ Should not this simple expedient be adopted, perhaps some irregularity in the sides, ends, and also the surfaces of the draining bricks may be devised, which might not at all unfit them to form the *bottoms, walls, or coverings* of a drain, and yet render their use in building difficult or impracticable, as A



“ This circumstance is worthy the IMMEDIATE attention of the Board of Agriculture as a *national* concern.

“ Or perhaps, on producing a certificate of the bricks used in draining, farm culverts, &c. to the collector of excise, the brick duties may be repaid; instead of the brick duty (which is a *VERY unequal* impost) it has been suggested to lay a tax *per foot* on all houses and walling of every description, calculated on the *mean* numbers of bricks supposed to be used, and applied to *every sort of material, always* excepting cottages and dwellings for the *labouring poor*. The excessive brick tax is a strong temptation to builders to erect slight and *dangerous* edifices, which would be obviated by the above regulation.”

SECT. 2.—*Of paring and burning.*

ON the moss-lands, where paring and burning is practised, both seed time and harvest is very late, owing to the uncertainty of the weather; if wet, the burning proceeds but slowly, the seed time is consequently retarded, and the crops are by these means so late as to become precarious, from the advanced season, being frequently exposed to frosts and snows. If the barley from the moss lands be well housed, it is in high estimation, and fetches an advanced price from the farmer, who prefers corn raised upon those lands for his seed. Mr. Eccleston sowed one year a field of barley about the middle of June, which he housed the following year, January 1; and this crop was all eagerly purchased by the farmers, in the next spring, for seed corn.

Paring

Paring and burning has been too much practised *, its destructive effects are but too apparent upon many farms where it has been frequently repeated. Great crops may have been procured, by this means, for a few years; but the soil in the end is destroyed. Upon strong bent, heath, fungous moss, matted rushes, or turfy peat lands, the practice may be good, and if only repeated till those bodies are destroyed is attended with success.

Paring, with the burning, is a laborious and troublesome mode of cultivation; its success depends upon circumstances, and one crop out of three is, in many instances, the amount of what may be expected to be reaped in security. After the sods have been dried and burned in small heaps, the ashes are spread upon the ground whilst yet warm, and the ground ploughed, sowed, and harrowed in immediately, if the weather permit. If the ashes get wet or grow cold before this operation can be effected they are injured.

Among those who have much distinguished themselves by their exertions in draining, and other improvements, James Okill, Esq. Lee Woolton, merits being noticed in the Lancashire Report. By draining and marling he has improved the value of the estate he occupies (about 60 acres, of 8 yards to the rod) to the increased amount of 30 s. per acre per annum, since the year 1780. The advance of the value of land, in this space, is, to be sure, to be taken into the account. This estate was gone over the 9th of June, 1795, and is in excellent condition. Above 1000 yards of under-draining with stone was completed in a very sufficient manner the year 1794.

At an expence of six shillings per rod of 8 yards, what a saving might have been made by Mr. Elkington's mode! Mr. Okill has filled up and drained several old marle pits, and gained, by this method only, some acres of land. It may deserve notice, that Mr. Okill stepped forward, contrary to the advice of some of his more cautious and timid neighbours, and gave excellent answers to most of the agricultural questions.

* Paring and burning is not practised in this county for green crops, but for grain.

SECT. 3.—Of Manuring.

MARLE is the great article of fertilization, and the foundation of the improvements in the agriculture of this county; and this earth, or fossil, is fortunately wanting but in few places. There are several kinds of this article, valuable in proportion to the intrinsic quality of each, or the calcareous matter which it contains, or the nature of soil to which it is applied. To the stiff clay lands, the blue or reddish slate marle, full of calcareous earth, is more beneficial; but to the light sand lands, the strong clay marle is more genial. Thus not only a calcareous stimulus is given, but additional matter is afforded, to correct the nature of the soils, by loosening the texture of the one, or giving adherence to the particles of the other, by the opposite qualities of the different marles applied. Barren sand lands, and poor heaths, in the south of this county, have been, under the effects of marle, rendered productive, but this has been done at no small expence*.

Of the beneficial effects of marle let the following fact, amongst many hundreds that might be produced, serve as a convincing proof.

There was a sandy loam land, exhausted by repeated ploughing, under the worst system of management. Major Atherton took the land under these circumstances into his own possession. After a four years lea, and the land well dunged, he gave a coat of marle, carted the distance of more than a mile at considerable expence, and laid on to the amount of $7\frac{1}{2}$ rods to the acre, of eight yards to the rod. The summer following a crop of oats was taken, and the ensuing year the ground was spring-fallowed, dunged, and cropped with turnips, which were repeatedly hoed; after which, in 1793, five acres of the large measure were cropped with barley, the produce of which was 552 bushels to the maltster, sold at 5s. 2d. per bushel, besides 24 bushels of small corn dressed out, (a very small

* Improving, marling, and fencing, of Bootle marsh, cost 22 l. 14 s. 1 d per acre, of eight yards to the rod.

proportion to the quantity) and besides the tythe, which is an eleventh of the whole. It should also be noticed, that the bushel by which it was measured was the Liverpool bushel of 36 quarts, which being reduced into Winchester bushels, and the tythe added, with 24 bushels of small corn, the total amount would be 706 Winchester bushels, or 141 bushels *per* acre, including the tythe, and value *per* acre 31 *l*.

The average produce of American lands, is said to be ten bushels wheat *per* acre.—*Information from Mr. Cooper, late of Manchester.*

At Knowsley Hall, in the year 1794, 92 bushels of wheat, of 70 lb. to the bushel, were reaped from one acre of land, of 8 yards to the rod; after a crop of pink-eye potatoes of near 700 bushels to the acre. Mr. Warling (the steward) seemed to think, that if the land had been previously marled, the land would have given 20 bushels *per* acre more. Sort of wheat, south cone.

These are two rare instances, and more than double the common average of either district; but may serve as a proof what superior culture is capable. Marle has been tried as a manure after being burned, which may be in a kiln after the manner of lime, or laid over a gutter, under which faggots, &c. for fuel, have been previously laid. It has also been burned in a common oven, and been found to answer at about ten bushels *per* statute acre, after being bruised into a kind of powder, and sown with the hand as a top dressing. Marle is an excellent improver of the soil, under so many different circumstances, that it cannot be recommended too-often, nor praised beyond its real merits. It adds to the staple of the soil, and improves its quality, and renders manure, of whatever kind, more effectual, with less in quantity; it will admit a repetition of the process, with equal advantage, again and again. In short, so far as experience proves in Lancashire, it seems the grand basis whereon every agricultural improvement should be established.

The summer is the best season * for laying marle upon the land,

* Where there is a dry head of marle, the winters in which there is a long frost is the properest time for marling, as both men and horses are less

land, sometimes immediately after a crop of hay has been taken. Its effects upon the grass are soon visible, from the rich verdure which it produces. Long experience has sufficiently proved the propriety of the general practice of the county; which is, to lay the marle upon grass lands—the older the better; the sward and grass united causes a fermentation and putrefaction, which seems necessary to produce a proper effect.

The quantity laid on is from two to three, or three and a half, cubic roods of 64 yards to every statute acre; the expence of which is, according to the distance carried, if in the same field, or within the distance of sixty rods, on the average, at about eight pounds *per* acre. It is reckoned a much better practice to have the marlings repeated, with a gentle covering, than a strong thick coat of marle, which is intended to last a number of years. If these dressings of marle were repeated more frequently (and no husbandry has been found to pay better), the lands in Lancashire, in general, would be found much more productive.

The marle should partake both of one summer's sun, and one winter's frosts, at least. After being exposed to the effects of the weather, in large lumps, it begins to fall, or melt; the particles appear unctuous and soapy, and the quality of the substance seems quite changed from its original state. Then, in the ensuing spring, it should be divided (the parts now separate with ease), and equally distributed upon every part of the surface, this is, with facility, effected by harrows, &c. after which it is usually ploughed under; but, if permitted to remain a year or two longer, the lands would be more improved in the issue, by the length of time given previous to the marle being ploughed in. But the marle does not produce its full effects upon the soil, till intermixed and incorporated by a repetition of plough-

less exhausted in that cold season by violent exertions, and the work is done at less expence to the farmer, as in most neighbourhoods, at that time of the year labourers, are most plenty. Some few individuals lay marle pits dry, and have paces or roads ready made, in order to take advantage of a long frost.

ings, and an intermixture of dung, or other manure, for marle is not effectual without such addition.

This subject cannot be too often brought under review, as from the different reports it appears so little noticed in many parts of the kingdom. The following fact may serve to prove, that whatever defects the Lancashire agriculturist labours under in his general process, he at least does not labour under a poverty of spirit.

In the year 1793, S. H. Fazakerly, Esq; of Fazakerly, purchased nine acres of land upon Warbreck Moor, being an uncultivated part of that wretched, poor, black, sandy waste, laid out for improvement so long ago as the year 1761.

In the present year, 1794, this hitherto uncultivated lot of nine acres was marled, at the rate of nearly twelve rods, of 64 cubic yards to the acre of eight rods.

Prime cost of land, £. 33. 6s. 8d. <i>per acre</i>	-	£. 300 0 0
Marling and carting, £. 27. 15s. 6d. <i>per acre</i>	}	250 0 0
- - - - -		
Extra expences, with fencing	- -	50 0 0
		300 0 0

So that it appears, the expence of improvement by marle only, and before a single crop has been taken, amounts to the purchase of the fee simple of the land; besides a most extravagant coat of dung, the expence of which is actually £. 12. 15s. *per acre*.*

1794. Nov. 14.—Major Atherton, travelling in a chaise over Bassage Heath, on the road from Colehill to Litchfield, observed a wretched gravelly common under improvement by marling, a kind of slate marle. He judged the quantity laid on was four rods, of 64 yards to the acre of eight yards. The land the property of Lord Middleton.

The above is noticed, as the road is frequently travelled, to

* A farmer who was present at this calculation said, that the real expence of dung ought to have been £. 15 *per acre*, Mr. Fazakerly having allowed himself too little in the calculation for carting six miles. The dung laid on is cow-dung, purchased at Liverpool at the rate of 5s. *per ton*.

call forth the attention of the passenger, that the effects may be hereafter observed.

The quantity laid on was less than would have been generally given by a Lancashire farmer by nearly one half: it was one third less than the coat given by Mr. Fazakerly, as appears from the preceding statement.

Anecdote.—Talking over the subject of marling one day in company, the following story was told, which ought to be preserved.

A Lancashire farmer, on observing the great advantage that might be obtained from the use of this article in a county where its use was not known, after some deliberation hired a farm, with intent to improve it by marle at his own expence. Having obtained a sufficient length of lease to be reimbursed, he began the operation at the proper season; but the practice was so novel in that neighbourhood, as to attract the attention of by-standers, and was soon conveyed to the ears of the steward, who immediately came over to stop such proceedings. Arguments were in vain; for what service could *dirt* laid upon *dirt* prove? besides the injury done to his lord's lands by the digging of holes, which, as a good servant to his master, it was his duty to prevent.

The story concludes, as the farmer's designs were thus frustrated, he, for some trifling consideration, obtained a release from his contract, and left the county.

By way of contrast, the opinion of an intelligent Lancashire farmer may be given, in his own words.

“Marle is a never-failing friend to most lands in this county; but here is a large field for improving the management of this useful article: the first and grand object is the disposition of the pits. Thousands of acres, I can safely say, are wasted, and in many places the land worse than before. It ought to be a standing rule not to suffer a pit to be made, unless it could be laid dry, which I verily believe may be done in three fourth parts of the county. One single drain in many places would lay dry fifty acres, of, from 8 to 15 feet of marle a-breast: care should likewise be taken, to take off the upper clay, which is

generally from two to three feet. Now this useless top is excellent for the making of bricks, and when stones are not to be had, a coarser kind (not paying duty) might be made to answer the purpose of draining at a very trifling expence, if nothing but sun-dried: where a pit is laid dry no land is lost, and the farmer may marle any season of the year, and besides the saving of land, and expence in many places (according to Mr. Elkington, which is the only true system) the land below would be drained, and many springs cut off."

Notwithstanding there is a general propensity to convert arable land into pasture and meadow, as most convenient to the populous state of the county, yet an intelligent gentleman* judiciously observed, that it might be occasionally necessary to break up grass lands, if only for the sake of reaping the superior effects of marle, which not only adds to the staple of the soil †, but to a certain degree improves and enriches the quality of the grass; and a greater attention to green crops during the process of the plough, would certainly afford food for a greater quantity of stock. Besides, in old lays, the grass, if for hay, becomes too soft; if in pastures, sour. Turning over the soil changes and improves the nature and quality of the grass. In

* J. J. Atherton, Esq. Walton-Hall. And likewise old meadow land, that has been a deal manured. The hay will sometimes, upon some land, grow not so good in quality, nor so saleable, if for market; but by being ploughed two or three years, more or less as occasion may require, will greatly enrich the quality. Likewise an old pasture the same, when it can be made convenient. Land that has been exhausted by long ploughing, &c. and laid down poor, is generally a long time before it will come to a proper sward of grass, if ever so well manured at the top, which the report is, let it lie and manure it well, and it will do in time; which to be sure it will. But my mode is, after it has been well manured twice, and pastured three or four years, if it then does not do as expected, to plough it again for a year or two, as may appear the best, and then let it lie again, and by so doing it will sooner come to a sward of grass, and the grass will be much richer and better; for by the manure that has been laid on the top of the land being well mixed with the soil, and ploughed as deep as the land will bear, it makes it much better, and less manure will do for the future time, and the land much improved by it.

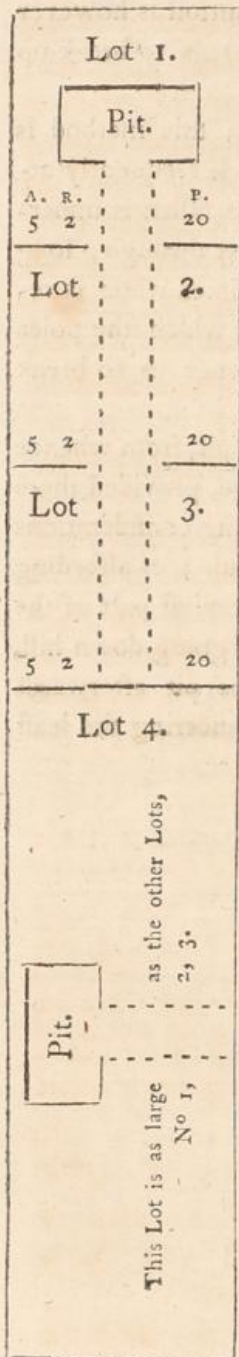
† A cubic rood of marle, of 64 yards to the rood, adds nearly half an inch to the staple of the soil to a statute acre of land.

stiff soils, the change from arable to pasture or meadow may not be so necessary to be frequently repeated. But all soils improve by a judicious change of culture. Caution is however necessary, not to yield to importunities of tenants to break up old lays, without proper restraints.

Marle is got by falling it in large clods; this method is expeditious, but requires great caution, and is frequently attended with danger; the piece intended to be fallen is undermined, and loosened at each side, by being cut through; long piles are then driven in at the top, and sometimes water is required to insinuate itself into the interstices which the poles have made. The clod falls with such violence as to break the mass into pieces.

It is no small consideration where to fix the pit, from whence the marle is to be obtained to most advantage, provided there be a choice; and when there is, the following considerations should be weighed: of destroying the least land; of affording the least length of carriage, which is the heaviest part of the expence; of affording the least draught, by going down hill, if possible; that the water stagnating in the pit afterwards may not be injurious to the land; and of rendering the least damage to the lands in future.

The expence of carting at different distances may be conceived from the following rough draught here given.



Suppose the Lot 1. be thirty rod square, and the pit right in the center, so that its greatest distance from the pit be fifteen rods every way. The cartage will be 18 s. *per* rod; and, to save fractions, call the field six acres; then the account will stand as under:

Cartage, *per* rod - 18 s.
N^o of acres - - 6

108
N^o of rods laid }
per every acre } 6

648

£.32. 8 s. Total amount
of expence
of Lot 1.

Now, if Lot 2 be marled out of the pit in Lot 1, the additional expence will be 12 s. *per* rod, or £. 54, being forty-five rods from the pit.

And, if Lot 3 be to be marled still from the same pit, the additional expence will be 26 s. *per* rod, or 44 s. the whole; the distance from the pit being seventy-five rod, and the expence £.79. 4 s.

Again, Lot 4. being as large as the other three, and the pit in the center, the extreme distance will be forty-five rods each way, and the cartage will be 21 s. *per* rod, of sixty-four cubical feet, and which will amount to £.113. 8 s.

The comparative estimate stands thus:
Lot 1, £.32. 8 s.—Lot 2, £. 54.—Lot 3, £.79. 4 s. Total amount of which is
£.165.

£. 165. 12 s.—Three times £. 32. 8 s. is £. 97. 4 s.—Balance saved by having a pit in each field would be therefore £. 68. 8 s.—The expence of Lot 4 is £. 113. 8 s.; and from which subtract £. 97. 4 s. and the balance is £. 16. 4 s.

The above will evidently prove the advantage of proximity to the marle; but a pit in the middle of a field is not only an eye-sore, but a nuisance; therefore, if possible, should be avoided. Nor is the advantage so great in the middle as at first may be thought; since, in coming out of the pit, there being only one pace, some part of the ground must of necessity be gone twice over; whereas, if on one side of the field, and Central, all the land lies immediately before the pace of the pit.

Expence of marling upon Bootle Marsh, about the year 1780, besides fencing, &c.

	£.	s.	d.	
Getting and filling, per rod of 64 cubic yards	-	0	10	0
Spreading - - - - -	-	0	2	2
Carting; the average distance from the middle of the pit to the middle of the land, 60 rods	-	1	9	0

N. B.—In this calculation there are six carts, five in motion, each goes the distance of twelve rods, whilst one stands in the pit to be filled. The size of each cart is 20,736 inches (cubical), usually drawn by three horses; the weight of the load about 15 cwt. and two cubical yards of marle make about three loads.

The number of workmen are six fillers and getters; usually two right-handed men at one wheel, and two left-handed at the other, with one filler behind—one getter is generally sufficient.

Getting, filling, and spreading, to the acre of 64	£.	s.	d.	
yards to the rod, on Bootle Marsh, was	-	3	19	1
Cartage	-	9	8	0
Digging for the marle, clearing the head, expences				
at finishing, &c. per acre	-	2	7	0
	£.	15	14	1
				There

There were about $6\frac{1}{2}$ rods laid upon the acre on this occasion.

The men got 2 s. 6 d. and the carts 7 s. 6 d. per day.

Getting and filling marle is very laborious work, and requires the utmost exertion to obtain these wages; and this work, after all, can only be effected by young men in their prime, cheered by the company of fellow-labourers, and frequent refreshments. Five working days are reckoned equal to six, for they usually begin at half past four in the morning, and rest one hour at breakfast, from eight to nine; rest again from twelve till two, and then work till six; and generally get out nine rods per week.

The present price is—				£.	s.	d.
For getting and filling, per rod	-	-	-	0	12	0
Spreading	-	-	-	0	2	6
Carting	-	-	-	1	13	0*

ADDITIONAL INFORMATION ON MARLE.

Marle is the foundation of all improvements in the agriculture of this county; and here the husbandmen of Lancashire and Cheshire may afford an useful lesson to the rest of the kingdom: so well are they convinced of the necessity of attending to this primary object, that neither labour nor expence deter them from the most vigorous application of it. There are several varieties of this fossil manure valuable in proportion to its intrinsic qualities, or the nature of the land to which it is to be applied. Shell marle or slate marle are more desirable in the stiffer and more clayey districts, inasmuch as they contain a large proportion both of calcareous matter and of sand—clay marle in an inverse ratio more ge-

* This subject has been detailed to a greater length than some may think requisite; but marling is in this county performed in a masterly manner. The particulars here collected may be useful, on future occasions, to the farmer, as the documents are only registered in the memory of old practitioners. It is with no small difficulty that the several *data* are sometimes obtained and ascertained, and it was with some labour they were collected for the present purpose.

nial to a light and sandy district, as in both these circumstances the natural defects of the soil are in some measure obviated. Undoubtedly the calcareous matter contained in either marle is of the highest importance; but obviating the natural deficiencies of the soil, by adding sand to clay or clay to sand, is of more consequence than the mere calcareous stimulus, which might be obtained at a much lighter expence. Innumerable instances are to be found in this part of Lancashire, where barren heaths and wretched sands of all descriptions have been rendered in the highest degree productive by this admirable fossil; indeed there is reason to believe that by far the greatest part of the district has been reclaimed by marle. The great consequence of making such a practice more generally known need not be expatiated upon. It is of the utmost importance to attend to the *application* of marle. The general custom is to lay upon the great Cheshire acre, of eight yards to the rood, from three to seven roods; of sixty-four square yards each. From four to five rood may be considered the average quantity to the acre (one Cheshire acre contains two acres and eighteen perches and a half of the statute measure) more and less are frequently applied, but the quantity ought indisputably to be in proportion to the quality of the soil and quality of the fossil. The general experience of this country has proved to a demonstration the propriety of its universal practice, *viz.* to lay it upon grass land which is intended to be broke up the ensuing spring. This system is however carried by some of the old farmers to an absurd length, as they will not marle any land, however necessary such an operation may be, unless it has been a given number of years under grass. Sometimes what is provincially called a *coat* of marle has been spread upon the green sward, and left unploughed many years; in this case the grass sometimes receives considerable detriment, as the marle sinks downwards in a body without incorporating with the soil; though when marle has lain several years in this state, the subsequent crops of corn have been found to be enormous.

The general rule is to begin marling about May or June, in short when spring seedings are over, continuing as oppor-

R

tunity

tunity serves throughout the summer months; it is not, however, unusual to take a crop of hay before the marling is begun; in either instance, the effects of the marle become speedily visible by the rich verdure of the grass, which affords a pasturage of the most beneficial nature. Marle is spread immediately after carting, but left in a rough lumpy form, that it may be exposed as much as possible to the vicissitudes of the seasons; if it contains a large proportion of clay it will remain for many weeks, perhaps months, in large unwieldy lumps, though in general the rains of the latter end of autumn, and the succeeding frosts of winter reduces it into the form of an unctuous but friable material, the further dispersion of which is easily effected with clotting beetles, spades, or harrows; this dispersion however ought not to be attempted till a week or a fortnight before ploughing, as the most beneficial effects are produced by alternate rains and frosts; and by this long exposure it is more than probable that the fossil * may acquire by attraction the most nutritive qualities:—the turf, when ploughed under, answers the purpose of a rich vegetable manure.

So far the Lancashire farmers have considerable merit, but their subsequent conduct deserves the highest censure; many of them taking repeated crops of oats with the interval of one summer fallow for wheat, by way of cleansing the land; after which barley and oats again, as long as the land will produce any thing; and then laid down again, as usual, with weeds and couch-grass.—The course I should recommend would be, to take one crop of oats the spring subsequent to the marling—plough the stubble immediately, in order to expose the marle again to the influence of the frost—fallow with manure for turnips, a crop that under this management is never known to fail—then barley, clover, wheat, turnips fed off with sheep, and barley again, with well-dressed hay-seeds, and white clover and trefoil, for a perennial lay, or at least for some years.—Land thus husbanded produces in a most exuberant degree, and at the same time is rendered perfectly clean from all weeds, without being in the least harassed. Poor sandy soils are thus rendered capable of producing a covering of the rich-

* See Kirwan's Dissertation on Manures, An. Ag. vol. XXIII. p. 105.

est grasses, and under proper management may be depended upon in all seasons. If this process of marling is again repeated, the nature of the land is totally altered, nor is it probable that any stranger to marle will give credit to the immense benefit to be derived from such management, without ocular demonstration.

Some time ago I gave the surveyor of this district, Mr. Holt, the particulars of a field of eight acres marled by me in 1790; as I understand he has sent an account of it to the Board of Agriculture, I cannot but add the following particulars—that it had been ploughed and harassed in the most barbarous manner for many years previous to my getting possession of it, the out-going tenant paying about £. 2. per acre for it, and under no restrictions—that some years ago one of the best acres in the field was manured for barley, which did not produce more than one quarter in return, the crop being mostly destroyed by weeds, and the land incapable of nourishing grain—that when in grass it was frequently unfit for mowing before September, and then the grass not more than six inches long—that in 1786-7, when I took possession, it was manured at the rate of 50 tons per acre of horse and cow muck and night-soils from Liverpool—that it was attempted to be pastured from that time till 1790, but that the cattle were all always discontented with the grass, and the land was returning by degrees to its original state of moor—In 1790 I marled it at the rate of seven roods and a half per acre—the expence was very great, as I carted the marle near a mile and a quarter.

1791.—Oats, 720 measures, of 36 Winchester £. s. d.
quarts each, at 3s. the measure - - 108 0 0

1792.—Turnips manured, and twice hoed—
drawn for cattle:—paid the expences of the
manure, the hoeing, &c. &c.

1793.—5 acres barley produced 576 measures,
of which 552 measures sold to a maltman
at 5s. 2d. - - - 142 12 0

3 acres oats, 330 measures, at 3s. - 49 10 0

1794.—Clover, two excellent crops, and now
in wheat.

R 2

March

124 AGRICULTURAL SURVEY

March 1795.—I sent 4 specimens of the marle from the same pit the above-mentioned eight acres were marled from, to Mr. M. Renwick, Chymist, in Liverpool, to be analysed: the products were, from 100 grains of each:

	N ^o 1.	N ^o 2.	N ^o 3.	N ^o 4.
Flinty Sand - - Gr.	40 $\frac{1}{2}$	40 $\frac{1}{2}$	34	32 $\frac{1}{8}$
Clay and filicious Earth -	39 $\frac{1}{2}$	39	44	47 $\frac{3}{8}$
Calx - - - - -	19 $\frac{1}{2}$	20 $\frac{1}{2}$	22	20
Loft - - - - -	0 $\frac{1}{2}$			
Gr.	100	100	100	100

This average, however, is not strictly just, because the depth of the strata were extremely unequal:—of 14 feet, probably there were, of N^o 1, 2, and 4, not more than 1 foot each; the remainder of N^o 3, which is beyond all comparison the best marle in itself, and best adapted to a deep loomy sand.

The reason the Leicestershire farmers object to marling, is, that it is inimical to grafs,—in Lancashire we know we can get no good grafs without it. What is the reason of this difference of opinion? It arises from the application; if marle, according to the Leicestershire system, is put upon a turnip fallow, and immediately ploughed under in its crude state, no wonder it produces no grafs and little corn.—In Lancashire, it is exposed at least five months, and always to a winter's frost: and hence arises the benefit to grafs. The sheep walks and rabbit warrens of Norfolk were reclaimed by marle; the original marlers and their successors grew rich, and the land produced

produced exuberantly: at present we are told, that the land will not bear marling twice (an *idea* utterly discountenanced by the *practice* of this country); and from this mischievous idea it arises, that the county of Norfolk is said to want another system of cropping, that turnips and clover come round too often, &c. &c. (See Kent's Survey). What are we to infer from this? that the same material which caused the original improvement will restore it to its former fertility—at any rate the experiment is worth trying.

During the late hard frost, 1794-5, I have been marling about $4\frac{1}{2}$ statute acres of sandy loam, in order to keep my labourers employed, who must otherwise have applied to the parish for assistance. I carted the marle near a mile in the large three horse carts of this country, which I should conceive brought about 26 cwt. at a load.

I find, in the Ann. Agr. Vol. XIX. p. 476. that Mr. Colhoun performs his claying in carts that cube 35 feet; my carts cube about 21 feet; of these 175 loads bring about two roods the statute acre.

$$175 \times 21 = 3,675$$

$$105 \times 35 = 3,675$$

But Mr. Colhoun prefers 80 loads per acre on a blowing sand; that is, 1,400 loads to 2 Cheshire acres—

$$2 \text{ Cheshire acres} = 4037 \text{ stat.}$$

I bring 350 loads to a sandy loam. This matter merits the attention of the Board.

Herefordshire, which is *all marle*, produces from 2 qrs. 4 b. to 3 qrs. 1 b. per acre of wheat; about 4 qrs. 5 b. of barley; about 3 qrs. of beans; peas the same*.

* Clark's Report, Heref. p. 26.

Corse Lawn, and the Forest of Dean, in Gloucestershire, are all marle. The clay pits of Feverham, and the brick earth of Kent, in general, are marle. The clays of Nottinghamshire contain excellent marle. The finest marle I ever saw in England is dug out of the coal road near Mr. Tate's house by Loughborough. Mr. Bakewell has marle upon his farm. What are we to think of the absurdity of carrying Norwich marle 40 miles by water, to a sandy country abounding with a clay, that in the open air breaks into small die-like pieces, and which, upon analysis, yields from 100 grains

Of impalpable clay	—	—	50 grains.
Of sand	—	—	7
Calx	—	—	43
			—
			100 grains*.
			—

Sea slutch, from the Ribble and Wyre, is, in some places adjacent, made use of as a substitute for marle, to which it is reckoned equal, but in general not so durable †. It is frequently used as a substratum for fruit trees at Formby. The quantity is a load to each tree; its effects are wonderful. This practice, however, may not prove beneficial where the soil is dense. At Rossal in the Filde, where there is no marle, after a stratum of strong clay under the soil, they pass through a sand with cankered veins, next a sand with sky-blue veins, with thin shells like barnacles, called in the provincial phrase henfish; and this proves a good substitute for marle. Sea-slutch, particularly at Weston, a village in Cheshire, near Frodsham, is found to be much more fertilizing and more permanent than marle, I mean that part of a salt marsh which has been grassed over for a few years; for that which is overflowed daily contains more sand, and is less enriching. I do not think that all

* See Marshall's Norfolk, Vol. I. p. 24. and Vol. II. p. 193.

† Mr. Standen, steward to Bold Fleetwood Hesketh, Esq. says, more durable than marle.

the

the manures in use in the kingdom combined could have a better effect either upon arable or grass land than the above-mentioned soil has. This manure, where the plough is not immoderately used, will last thirty years. It is used in much the same manner and quantity as marle.

Besides the dung got from the farm-yards, there are great quantities raised by the cowkeepers and stablekeepers in the large towns. At Liverpool horse-dung sells at about 5*s.* 6*d.* per ton, cow dung from 4*s.* 6*d.* to 5*s.* 6*d.* per ton, butchers' dung 6*s.* per ton, the ashes mixed with privies, scraping of the streets, &c. under the denomination of night soil, about 2*s.* 1*d.* per ton *. Liverpool also occasionally has the dregs of blubber from the whale fishery after boiling the oil, which mixed with soil, is a rich manure, but not lasting. Soap ashes also, if put upon old lays, have been found very advantageous, and very durable in pastures, but not so durable either on ploughed land or in meadow †. Soap ashes, like lime, do not at all answer upon a black soil with sand underneath, neither have they their immediate effects, like dung upon any soil, but are very fertilizing and durable after the first year, when applied upon dry pasture or meadow lands if they be fox soils, and very much change the nature of the grasses; viz. from very indifferent sorts to wild clover, trefoil, &c.—Rape dust has been found to answer, laid on at about sixty bushels to the acre, and costs about 10*d.* per bushel ‡. Soot is also used in the spring, and thrown with the hand upon the corn; this is often practised upon poor exhausted lands, and, if rain immediately ensue, with success; but there seems something at present inexplicable about the proper application of lime, or its operation upon different soils. It has been frequently tried without any apparent utility, and it should appear that lime requires some

* At Manchester, cow and horse dung are about 1*s.* per ton higher.

† Quantity 40 to 50 ton per acre, from 8*s.* to 10*s.* per ton at Liverpool.

‡ There must be an error in the price of rapedust, as it is no where to be had under 2*s.* per bushel, and some places 2*s.* 6*d.* it is a very useful tillage upon cold lands, especially upon meadows, but not durable.

particular substance in the soil whereon to act, to produce any good effect. Lime has in general not been found to answer so well a second time as at the first operation. It also requires a sward, or vegetable roots, to produce fertility *; and it more frequently succeeds when mixed properly with earth either on fallows or swards. *Lime* is the best manure for grass lands, either laid on by itself or in compost, if used in *sufficient* quantities. In a farm of a cold clay soil, after draining near twenty years, the *lime* was laid on the sward in *May and June* to the amount of two hundred bushels on a *statute* acre; the lands have not been ploughed, but have yielded the *finest* grass for hay and pasture, and yet appear to be in a state of improvement. The use of lime as a manure has nearly superseded that of *marle*. Immense quantities of lime-stone are brought by the rivers and canals from *Wales*. Great was our alarm last year when the tax on *stone* was proposed, but although the sixth section of the 34th Geo. III. c. 51, exempts our *lime-stone* imported from the tax, yet the requiring the *usual* coast dispatches, and certificates for the sloops employed in this trade, occasion great expence and delay, and operate as an heavy and unnecessary impost, without any advantage whatever to the revenue. This is an oversight easy to be remedied, and from good authority, I learn has in a great measure *frustrated* the wise intentions of the legislature relative to the taking off the duties on *coal* and *salt* exported coastwise in *Scotland*, and calls for the *especial* attention of the representatives of *North Britain*.

But neither marle nor lime produces any good effects upon the exhausted lands of the Filde, which have undergone the *centennial* ordeal. Upon these occasions the farm-yard dung seems to be principally wanted, to restore the oily part extracted by such a continued succession of exhausting crops. So great a quantity of land is ploughed without a proper rotation of green crops, for the stock which ought to be kept, there is no resource for raising dung but from the cattle, as there are no towns sufficiently large to afford proper assistance, nor yet canals to bring it from distant places.

* There are some exceptions, nevertheless, even to this.

In the Leicester Report it is mentioned, that some person had burned bones with lime for manure. In November 1794, the surveyor mixed about equal quantities of bones with lime (of the latter what is sold at Liverpool for 40 measures, at 8*d.* per measure) in different strata, and closely covered with fine mould, well closed with the spade. This heap continued burning about ten days, after which the whole was mixed together with earth, the bones being chiefly reduced into small parts, or if the parts yet adhered, flew asunder with a smart stroke. It is imagined that the most essential or oily part of the bone would escape with the smoke during this process, the smoke being great and the smell foetid. Not having convenience to bruise the bones, this method was adopted by way of experiment upon the hint given.

Bone-dust, or bones ground in a mill, have been used with success by William Mayor *, the farmer at Ashworth-hall, near Rochdale. He has two fluted iron rollers placed at the end of a corn-mill shaft, which grinds them expeditiously; he applies them to his own grounds, and disposes of them to different purchasers. Near the sea good composts have sometimes been made of land-lime, earth, dung, and sea weeds, with a species of shell-fish growing upon the rocks, which is found to be an excellent manure for barley. The scrapings from the streets, along with ashes and night soil, have by an experienced farmer † been mixed together with lime in the following proportion: to every twenty tons weight of this black muck (as it is sometimes called) he adds about forty bushels of lime, which he mixes together before the lime runs to mortar (his own expression) which destroys the good effects, and prevents a proper incorporation, and which answers well upon either dry or wet lands, particularly when laid down to either pastures or meadows. The drainings from the farm-yard have been of late, by some good farmers, collected into one place, and, if they cannot be thrown over the lands any other way, are conveyed in casks by carts, and distributed upon the land by means of a trough perforated with holes.

* And by George Clayton, Esq. Lostock, near Preston.

† Mr. Henry Harper, Bank Hall.

The skimmings of sugar under refinement, when boiling, is a rich manure; so much so, as to take three parts of soil to mix together. Three loads of earth, and one load of these skimmings, which consists of American clay and other fertile ingredients, make four loads of rich and durable manure.

Experiments on Manures, by Mr. Henry Harper.

“ The following experiments of different kinds of manure will shew the difference of both quantity and the quality of produce on the different kinds of land on my farm, on which I manured half an acre of eight yards to the rod with every kind of the following manures; and when made into hay, as nearly all alike as possible, I weighed one average square rod from every lot.

Lot the 1st.—Horse, cow, and butchers dung, all mixed together, of each about an equal quantity, which lay in that state about two months, and then turned it over, and let it lie eight or ten days, and then put it on the land before it had done fermenting, and spread it immediately. This was set on in September 1793.—The produce 3 stone 15 pound per rod, at 20 pounds to the stone.

Lot the 2d.—Horse and cow dung, mixed and turned over the same as Lot the 1st, and set and spread on the land at the same time.—Produce 3 stone 14 pound per rod.

Lot the 3d.—Horse dung, turned over and set on the land the same as Lot the 1st.—Produce 3 stone 13 pound 8 ounces per rod.

Lot the 4th.—Cow dung, turned over and set on the land the same as Lot the 1st.—Produce 3 stone 13 pound 8 ounces per rod.

Lot the 5th.—Night-soil, coal-ashes, and cleaning of the streets, and about 40 measures of lime to every ton weight, and turned over while the lime was in its floury state, and not suffered to run to mortar, for then it is of little benefit; one part of this was set on in September 1793, the other part the middle of March 1794, but no difference in the crop to be perceived.—Produce 3 stone 13 pound per rod.

Lot

Lot the 6th.—Night-soil, coal-ashes, and cleaning of streets, set on the land in the same manner and times as Lot the 5th, and no difference in the cropping part.—Produce 3 stone 2 pounds 8 ounces per rod.

Lot the 7th.—Marle fresh got, and mixed with an equal quantity of horse and cow dung, and lay about three months and then turned over, and lay a month and then turned over again, and put on the land in six or eight days, and at the same different times as the two last lots, but no difference in the cropping.—Produce 3 stone 8 pound 12 ounces per rod.

Lot the 8th.—Water from a reservoir that all the urine from the stables, cow-houses, and all drainings from the dung-hills, farm-yard, hog-styes, and all the waste water from the house runs into, and is carried on the land in a watering-cart made on purpose that holds four hundred gallons; and the water was put on the land in April, about 12,000 gallons to the acre of 8 yards to the rod, and again in May 12,000 more.—Produce 3 stone 5 pound per rod.

Lot the 9th.—Blubber, the offal of whale-oil, mixed with soil, and set on the land the 1st of April 1794.—Produce 3 stone 2 pound 8 ounces per rod.

Lot the 10th.—Soot, sowed on the land the middle of April 1794.—Produce 3 stone 1 pound per rod.

Lot the 11th.—Plaster of Paris (gypsum) sowed on the land in April, the weather then showery and favourable for it.—Produce 2 stone 2 pound per rod.

Lot the 12th.—No manure at all.—Produce 2 stone 2 pound per rod: so much for gypsum, that has been made such account of.

Lot the 13th.—Soap-ashes or muck, set on in March 1794.—Produce 2 stone 10 pound per rod.

Lot the 14th.—Lime, set on in March, clean by itself.—Produce 2 stone 8 pound per rod.

An improvement by way of experiment upon Lots the 1st, 2d, 3d, 4th, and 5th, water from the reservoir put on these lots the beginning of May 1794, at the rate of 12,000 gallons per acre.—Produce 4 stone 8 pound per rod.

132 AGRICULTURAL SURVEY

Lot the 1st.—Produce 3 ft. 15 lb. per rod, is 600 stone per				£.	s.	d.	
Horse, cow, and butchers dung.	}	acre, at $5\frac{1}{2}d.$ per stone	—	—	13	15 0	
		After-grass, per acre	—	—	2	2 0	
							15 17 0
		Manure 30 tons, at 5s. per ton				—	7 10 0
		Balance in favour of the farm				—	8 7 0

Lot the 2d.—Produce 3 ft. 14 lb. per rod, is 592 stone per						
Horse and cow dung.	}	acre, at $5\frac{1}{2}d.$ per stone	—	—	13	11 4
		After-grass, per acre	—	—	2	2 0
						15 13 4
Manure 30 tons, at 5 s. per ton				—	—	7 10 0
Balance in favour of the farm				—	—	8 3 4

Lot the 3d.—Produce 3 ft. 13 lb. 8 oz. per rod, is 588 stone									
Horse dung.	}	per acre, at $5\frac{1}{2}d.$ per stone	—	—	—	13	9	6	
		After-grass, per acre	—	—	—	2	2	0	
						15	11	6	
		Manure 30 tons, at 5 s. per ton	—	—	—	7	10	0	
		Balance in favour of the farm	—	—	—	8	1	6	

Lot the 4th.—Produce 3 ft. 13 lb. 8 oz. per rod, is 588 stone						
Cow dung.	}	per acre, at $5\frac{1}{2}d.$ per stone	—	—	13	9 6
		After-grass, per acre	—	—	2	2 0
					16	11 6
		Manure 30 tons, at 5 s. per ton	—	—	7	10 0
		Balance in favour of the farm	—	—	8	1 6

Lot the 5th.—Produce 3 ft. 13 lb. per rod is 584 stone per						
Night-soil, coal- ashes, cleaning of the streets, and lime.	}	acre, at $5\frac{1}{2}d.$ per stone	—	—	13	7 8
		After-grass, per acre	—	—	2	0 0
					15	7 8
		Manure 30 tons, at 4 s. 6 d. per ton	—	—	6	15 0
		Balance in favour of the farm	—	—	8	12 8

Lot the 6th.—Produce 3 ft. 2 lb. 8 oz. per rod, is 500 stone							
Night-soil, coal- ashes, cleaning of the streets.	}	per acre, at $5\frac{1}{2}d.$ per stone	—	—	11	9	2
		After-grass, per acre	—	—	1	11	6
					13	0	8
		Manure 45 tons, at 2 s. per ton	—	—	4	10	0
		Balance in favour of the farm	—	—	8	10	8

Lot

of LANCASHIRE.

133

Lot the 7th.—Produce 3 ft. 8 lb. 12 oz. per rod, is 550		£. s. d.
Marle, horse and cow dung. }	stone per acre, at $5\frac{1}{2}d.$ per stone	— 12 12 1
	After-grass per acre	— 1 11 6
		14 3 7
Manure 45 tons, at 2 s. 6 d. per ton		— 5 12 6
Balance in favour of the farm		— 8 11 1

Lot the 8th.—Produce 3 ft. 5 lb. per rod, is 520 stone per		
Water from reservoir. }	acre, at $5\frac{1}{2}d.$ per stone	— 11 18 4
	After-grass, per acre	— 1 11 6
		13 9 10
No expence for manure only labour, and that not so much as the other manures.		
Balance in favour of the farm		— 13 9 10

Lot the 9th.—Produce 3 ft. 2 lb. 8 oz. per rod, is 503 per		
Blubber and soil. }	acre, at 4 d. per stone	— 8 7 8
	After-grass per acre	— 0 15 0
		9 2 8
Manure, the expence per acre		— 3 0 0
Balance in favour of the farm		— 6 2 8

Lot the 10th.—Produce 3 ft. 1 lb. per rod, is 488 stone per		
Soot. }	acre, at 4 d. per stone	— 8 6 0
	After-grass, per acre	— 0 15 0
		9 1 0
Manure, expence per acre		— 2 10 0
Balance in favour of the farm		— 6 11 0

Lot the 11th.—Produce 2 ft. 2 lb. per rod, is 336 stone per		
Gypsum. }	acre, at $5\frac{1}{2}d.$ per stone	— 7 14 0
	After-grass, per acre	— 1 5 0
		8 19 0
Manure, expence per acre		— 2 10 0
Balance in favour of the farm		— 6 9 0

Lot the 12th.—Produce 2 ft. 2 lb. per rod, is 336 stone per		
No manure. }	acre, at $5\frac{1}{2}d.$ per stone	— 7 14 0
	After-grass per acre	— 1 5 0
		8 19 0
No expence for manure.		
Balance in favour of the farm		— 8 19 0

Lot

134 AGRICULTURAL SURVEY

Lot the 13th.—Produce 2 ft. 10 lb. per rod, is 400 stone per				£.	s.	d.
Soap-ashes.	}	acre, at $5\frac{1}{2}d.$ per stone	—	—	9	3 4
		After-grafs, per acre	—	—	1	10 0
					10	13 4
Manure 16 ton of soap-ashes, at 9s. per ton				—	7	4 0
Balance in favour of the farm				—	3	9 4
Lot the 14th.—Produce 2 ft. 8 lb. per rod, is 384 stone per						
Lime.	}	acre, at $5\frac{1}{2}d.$ per stone	—	—	8	16 0
		After-grafs, per acre	—	—	1	10 0
					10	6 0
Manure, 12 score measures of lime, at 13s. 4d. per measure				—	8	0 0
Balance in favour of the farm				—	2	6 0
Experiments upon Lots the 1st, 2d, 3d, 4th, and 5th.—Produce of all these five lots equal, 4 ft. 8 lb. per rod, is 704 stone per acre, at $5\frac{1}{2}d.$ per stone, is				—	16	2 8
After-grafs on all the five lots equal				—	2	5 0
					18	7 8
Amount of produce of Lot the 1st				—	15	17 —
Balance in favour of the reservoir-water				—	2	10 8

Now these lots are all in one field, which is old meadow land all of one quality, the soil 11 inches deep, and a strong loam betwixt sand and clay with a reddish cast, and is what I call fox-land; and under the soil is a black loam sand six inches deep, and then marle of four yards deep, and bottoms on a red sand.

This field is not to be considered as a poor worn-out field, but has been regularly manured every third year; which if it was worn out and kept poor it would not produce one-third part of neither hay nor after-grafs, which I daily see on some adjoining land of the same quality, for which I take one-third part of the value of Lot the 4th, both of hay and after-grafs, which is £. 5. 3s. 10d.

Lot

Lot the 4th.—The amount of hay and after-grafs, at £. 15. 11 s. 6 d. per acre for three years, is	—	—	—	£.	s.	d.
				46	14	6
Discount for three years manure	—			7	10	0
Balance to the farm	—	—	—	39	4	6

The amount of hay and after-grafs for one year, without manure, is £. 5. 3 s. 10 d.						
which say three times	—		—	15	11	6
Balance in favour of manure	—		—	23	13	0

Now it is to be considered that the farm supports the expence of all labour and other expence: but to shew the neat balance in favour of manure, say, the manure brought to this field on my farm is four shillings for every thirty hundred weight—

Thirty ton twenty load, at 4 s. per load, is	—	—	—	£.	4	0	0
To spreading on the land, allowance, &c.	—		—	0	7	6	
					4	7	6

Clear balance to the farm for three years in favour of manure, for one acre	£.	19	5	6

I approve most of the manure the five first lots are manured with, although it comes higher; they require the least labour, which mostly pays the best in the end, although it appears that some of the other lots afford more clear profit; but the most profit comes from that manure that continues its strength the longest in the land.

The most clear profit I experience is from lot the 8th, water from the reservoir, which is no cost but labour, and that not so much as any other kind of manure; but it will not answer put on in hot dry weather, for it burns up all before it,

except it was to be kept constantly wet, of which the supply is mostly scarce at that time.

Lots the 9th and 10th.—Blubber and foot I would not put on land for meadowing upon any condition, for the hay is bad; and, by a constant use of them, they exhaust the land, so that it won't produce any thing at all; and they are only manures for just the crop, with little or no after-grass.

Soot is good for wheat, and other spring corn, if it is sown in showery weather.

Lot the 11th.—Gypsum is of no use on my farm, neither for corn nor grass.

Lots the 13th and 14th.—Soap ashes and lime, they do not answer on my farm; they keep me too long out of the profit. What they might do in time, I have not experienced; but I always think the quickest return pays the best, so that the manure is not exhausting to the land.

The water from the reservoir paid not amiss, which was set on the five first lots, which was an equal improvement of 2*l.* 10*s.* 8*d.* per acre; and if the extra labour was to be charged, it would be a discount of fifteen shillings, which would reduce it to 1*l.* 15*s.* 8*d.* clear profit per acre.

Now, to try the quality of all the lots, I put a small handful from every lot in a dry clean place, where there was little or no grass, and they were laid promiscuously down, and regularly marked and numbered, to avoid mistake. And I had for the experiment six horses up in the stable, all well fed with clover fresh cut: and I turned one out, and let him go of himself amongst the lots promiscuously, and when he got amongst them, some he snelled at, and others he tasted (there were 19 different lots); the first lot that he settled at was N^o 8, and he eat it all clean up; and he then fauntered about as before, and got to lot the 5th, and eat it all clean up; and then fauntered as before, and got to lot the 7th, and eat it all clean up; he then fauntered as before he had done, and snelled, and tasted, and went off from amongst them. I then put him up, and turned another out, which did exactly in the same manner as the first had done.—*N. B.* And he then fixed upon the same lots as the first horse had done, which were immediately taken away with care,

care, so as not to disturb the horse, which through the whole of the lots were always replaced with the same kind of hay; and out of the whole six horses there was little or no variation, for the next horse that came out always fixed on the same lots as the last had eaten up, after being replaced. — And he then fixed upon lot 8, as the first horse had done, and eat it all clean up; and then upon another of the same; and continued till he had eaten four out of the five, and then went off from amongst them. I then put him up, and turned another out, and he did as the others had done, and fixed upon the first lot, N^o 8, and eat it all clean up; and then to lots the third and fourth, which he eat all up, and then sauntered off. I then put him up, and turned another out, which did exactly the same as the others had done, and fixed upon lot the 2d, and eat it up; and then he fixed upon lot the 11th, and eat it up; and then he fixed upon lot the 6th, and eat it up; and he then went off. And I put him up, and turned another out, which did exactly the same as the others had done; and he fixed upon the last experimental lot, and eat it all up; and then to lot the 13th, and eat it all up; and then to lot the 14th, and eat it all up; and he then went off. And I put him up, and then turned the last horse out, which did exactly the same as the others had done, and just tasted of lot the 12th; but the 9th and 10th lots still remained, and never a horse out of the number of six tasted of them, only smelled at them. And I then turned them all out together, and they made to where the lots had been, and eat up the remains of lot the 12th; but they all went off and left the 9th and 10th lots unnoticed.

And I still let them remain in their places till the cows came up in the evening, and never a cow, out of thirty, tasted of them (9th and 10th lots); they smelled, and even bellowed and roared, and scraped with their feet, and flung it about with their horns.

Now I will leave it to every reader to judge for himself, which of the lots were of the best quality, and the most nutritive; for myself, I prefer those that were eaten the first.

The before-mentioned statements fully prove the profits arising from manuring, to that of letting it lie by in a state to
T
produce

produce what it will do with little or no improvement, and the land to be equal as good in quality.

But the difference of improving good land, and land of inferior quality, differs from five per cent. to a hundred per cent. in its return of produce; but there is little or no land but what will answer in some degree of profit towards the encouragement of improving, except some barren mountains, and low boggy land, that lies so low that there is no fall for draining to be come at; but the naked eye is often deceived, whence I should recommend a level, for this kind of land mostly answers the best if it can be laid dry.

There is a great difference in different kinds of manures, answering in different districts; and there are several in this district that have not been brought to trial, such as burnt marle, &c. I have an experiment of it now on trial, which, as a top manure, by hand, appears to answer every expectation for grafs land.

The mode I prepare it is, to get the marle quite fresh out of the pit, not to take any that has been exposed to the weather, and burn it in a brick oven; and when burnt through, draw it out, and pound it into dust, which is done with little labour; and then sow it on the land quite dry, at the rate of about 15 measures to the statute acre; and the expence of fire, and all trouble attending it, is eight pence per measure.

But this is a new experiment with me, and I have only tried it this latter end of the year 1794; I mean to proceed with it for fresh experiments for different crops of both corn and grafs this next year 1795; and as soon as I have proved its qualities, I mean to explain them to the public.

I manured the same quantity of lots of land that had lain two years, for a third crop of hay, with the same kinds of manure as the first mentioned lots were manured with, and with the same experiments in regard to the quality, which nearly answered every description of the before-mentioned lots, only seventy stone less in quantity per acre, of eight yards to the rod.

The mode of burning marle above alluded to, and the using it when burnt as a top dressing, is particularly recommended to the attention of the Norfolk farmers.

COAL

COAL ASHES.

This sort of manure has been known to kill rushes. The surveyor has tried their effects this year (1795), not with total, but some effect. The best cure, without doubt, is draining the land. Take away the pabulum, and the plant perishes.

LINSEED.

Dr. Ormerod of Rochdale made the following trial, which he thus relates :

“ With linseed flour (it is linseed ground to powder) this I strewed on meadow ground, but so lately that I cannot perceive any evident difference in my crop of grass, but, perhaps it may answer in the fog; it appears to do well to corn, and to pasture ground, and I find the cattle extremely fond to eat where it has been, but fear the expence of it will prevent it being of any service to the society, as it cost me £. 1. 1 s. for every cwt. I used. I have also been trying the blue and white soap manure, which answers well to corn, but not better than ashes with necessary manure.

“ I have been using lime in a variety of forms, both next the soil upon black manure, and mixed intimately with mould, and laid up together.”

SEASON OF LAYING ON DUNG.

Much has been frequently said on the best season of laying dung upon the lands—the surveyor has been favoured with the following observations on this subject, by an experienced farmer *.

“ If cow-dung, the fresher the better, provided it be the proper season for putting it upon the land; which is, if meadow, from the time of getting the hay off the land, till the middle of October. For, if the grass has done springing, the dung lies exposed all the winter to rain, snow, frosts, and the vicissitudes

* Mr. Henry Harper, Bank Hall.

of seasons, which exhaust the strength, so as to destroy much of its good qualities: if it cannot be accomplished in autumn, then the ensuing spring; and if the season should not suit, the strength of the manure will be reaped the ensuing crop."—He recommends turning over the dung previous to its being put upon the land, and to lie till it begins to ferment; then to carry it upon the land, and even spread it before the heat be gone off, and by which the dung *takes* to the land the better. He prefers mixing cow-dung, horse-dung, butchers-dung, and night-soil, together, in preference to each separate; and this mixture is in its best state from six to eight months old.

SECT. 4.—Weeding.

A GOOD crop of grain and weeds cannot exist together; therefore, in order to secure the former, if the latter abound, they must either be eradicated, or the crop greatly injured. Except in the potatoe culture, and what little has been done in hoeing turnips, hand-weeding is in general alone practised. Fallows are introduced to kill weeds, where the lands are foul by ill management. When lands have been full of couch-grass, a crop of hemp upon such lands, if well dunged, has proved an effectual remedy*. But at present, there is very little of either hemp or flax sown in the county.

There are many slovens, who too much neglect clearing their foul crops; and many are as remarkable for their great attention, and employ both women and children to hand-weed the corn, when about six inches high. Many pastures and meadows are carefully overlooked that no dock, &c. appear. Mr. Bailey's estate of Hope is a specimen of cleanliness.

SECT. 5.—Watering.

WATERING Lands is much neglected in this as well as most other counties in England, but more particularly in the hilly or mountainous parts of this province, where they have the greatest abundance of water.

* This communicated by an old and experienced farmer.

Trials of throwing water over the lands, have been made in different parts of the county; and it appears, that wherever the trial has been made, and conducted upon proper principles, the attempt has proved highly beneficial to the grounds over which the water * could be thrown, except it had a mixture of metallic, or other noxious matter.

Notwithstanding the fact has been sufficiently proved, in a variety of cases, upon different soils, it is a matter of astonishment, that so rich a source of improvement has been hitherto neglected, when such an extent of ground is capable of receiving the advantage.

The value of water, in this point of view, is not yet sufficiently known †; like many other blessings of life, being, when very liberally bestowed, the less valued. Streams of water, which for ages have passed unnoticed, have within a few years proved a source of wealth to individuals beyond conception. What was probably considered a nuisance, has proved, in many instances, of more real value than the fee-simple of the whole manor, through the vales of which it had so long strayed, by turning machinery, &c.

The many rivers, rivulets, and rills, flowing through the mountainous part of the county, offer their rich streams to meliorate the lands through which they descend. Many thousand acres might partake of their fertilizing effects, at an inconsider-

* See Treatise on watering Meadows, by Mr. Boswell; and Mr. Davis's excellent account of Wilts.

† The value of water is not known in a variety of senses, as it should seem from the following fact: the same freehold had been in possession of the same family for three generations; the present possessor had enjoyed it about fifteen years; and all this while, without having a drop of water for any purpose whatever, but what was carried at great pains for a considerable distance from a stagnant pool upon the head, in a pail. A resolution was however formed, and the work begun in 1794, of sinking a well about two yards distance from the kitchen-door; and the whole work was completed for the sum of seven shillings and sixpence. For this small sum an excellent spring of water has been obtained, and no small portion of labour saved.

In some places, where they are almost drowned in winter, as in Altcar, by the overflow of the river Alt, till lately drained, the families were frequently in such distress as to flee from home, and seek refuge at the Hill-house; and yet, in summer seasons, this country is distressed for want of water, and that to a degree, as to require driving the cattle the space of a mile to drink, the springs being exhausted.

able expence; lands too, at present poor, barren, and unproductive, at a distance from other manures, might be rendered competent to maintain an increased number of valuable animals, by which the quantity of yard-dung would be increased, and applied, in much more abundant portions, to those lands which are beyond the salutary effects of the overflowing waters.

The present system of converting the arable into meadow and pasture grounds, to which the water, with peculiar propriety, may be applied, is a strong argument in favour of irrigation.

The following neat practice may be worthy of record, as the thought of an ingenious man, game-keeper to R. W. Bootle, Esq. Latham; for which he was honoured with a silver cup, by the Agricultural Society of Manchester. From the ditches above his house, he collects the water, and brings it past his buildings, from which his lands have a regular descent. This water carries along with it all the drainings from the farm-yard, which is thrown upon the lands according to the usual custom of irrigating:—but he has sunk a reservoir, the sides of which are secured with pounded clay: in this reservoir he preserves his water, sometimes till a dry season; then throws it upon the land, when the earth wants moisture. He puts marle into the rivulet through which the water runs, and finds it of great service.

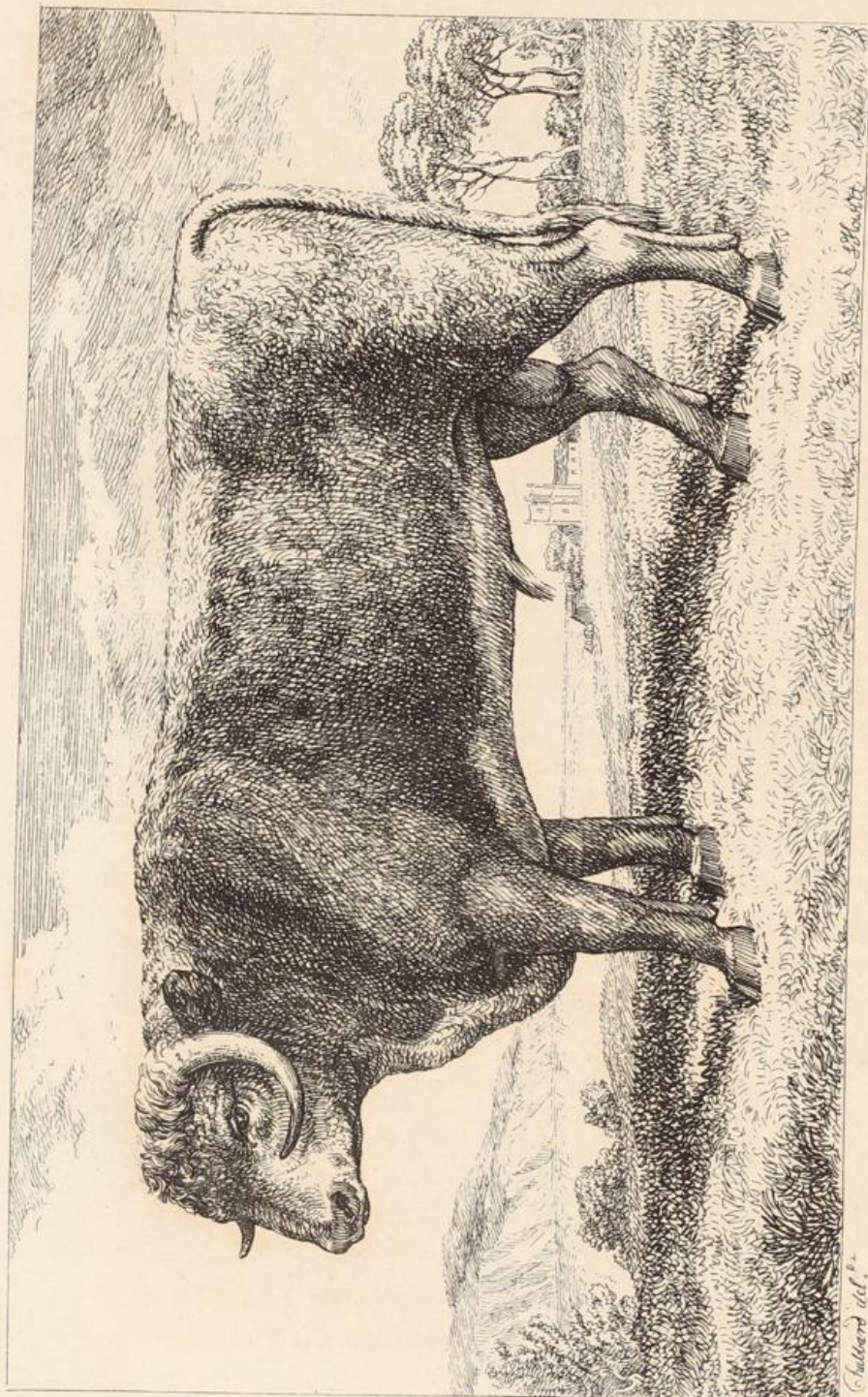
William Fitzherbert Brockholes, Esq. of Claughton, near Garstang, has made a most masterly improvement upon a large morass, by means of draining and irrigating—it is a good example, and deserves the attention of the farmers in the vicinity: also by Mr. Richard Jones, of Peel, in Little Hulton, near Bolton.

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LANCASHIRE BULL.

CHAPTER XIII.

LIVE STOCK.

SECT. I.—Cattle*.

THE Lancashire long-horned cattle are known all over the kingdom, and found in almost every part of the county, the prime stock of which is bred in the Filde, whither the purchasers from different parts of the kingdom have usually resorted; but applications have not of late been so frequent as formerly †. The breed having been almost *entirely neglected*,

* The following observations merit to be preserved.

To trace the origin of the breed of cattle now prevailing in Lancashire, would probably, at this time, be a difficult task. But that they were famous over the whole kingdom, is evident from being so frequently noticed, and in such estimation as to be sought after from all parts of the kingdom. In such repute were they, and of such superior quality, that that great judge in cattle, Mr. Bakewell, thought proper to make them the source from which he has, by crossing, &c. made such improvement. But as the breed has been under a progressive state of melioration in Leicestershire, it seems to have been in an equal state of retrogradation in Lancashire, as if over-awed by competition, has silently yielded to a conqueror.

It is not long since, however, that a celebrated traveller made the following observations in his tour through Lancashire.

“Breakfasted at Garstang, a small town remarkable for the fine cattle produced in its neighborhood. A gentleman has refused thirty guineas for a three year old cow; has sold a calf of a month’s age for ten guineas, and bulls for one hundred; and has killed an ox weighing twenty-one score per quarter, exclusive of hide, entrails, &c. Bulls also have been let out at the rate of thirty guineas the season; so that well might honest Barnaby (a) celebrate the cattle of this place, notwithstanding the misfortune he met with in one of its great fairs.

Veni Garstang, ubi nata
Sunt armenta fronte lata.
Veni Garstang, ubi male
Intrans forum bestiale,
Forte vacillando vico
Huc & illuc cum amico,
In juvenæ dorsum rui
Cujus cornu læsus fui.”

(a) Better known by the name of Drunken Barnaby, who lived the beginning of the last century, and published his four itineraries in Latin rhyme.

Pennant’s Tour in Scotland in 1784.

† Alexander Butler, Esq. of Kirkland, has frequently sold young heifers at the advanced price of 50 l. per head.

the pail is become the material object; and as it is an established fact, that animals calculated for speedy fattening are seldom if ever prime milkers, good points of shape and make are less attended to than the milk vein.

Some years ago, the Lancashire breeders suffered those of the more southern counties, as Leicestershire, Warwickshire, &c. to pick and purchase their best stock. Thus the northern breeders lessened the value of their own remainder: and the others made improvements upon that which they had obtained from them on the new principles laid down by Mr. Bakewell, and adopted by Mr. Fowler of Oxfordshire, and others. Nothing valuable is now brought southwardly, out of the more northern counties, once so famous for breeding stock.

Amongst the cow-keepers all varieties are found; they change so frequently, that when a cow, likely to be useful, and at the point of dropping calf, is brought to the market, they purchase it, without paying much regard either to the species or country.

Thomas Eccleston, Esq. of Scarbrick-hall, has introduced upon his farm the Suffolk polls; and he remarks, they stand the climate, although they have a thin skin and fine coat; and they have, upon proof, been found to answer so well in milking, that frequent applications have been made by the surrounding neighbours to purchase them*.

Mr. Wakefield of Brook farm, near Liverpool, and Mr. George Green of Aughton, have hitherto preferred the Holderness. But the long horn of the true Lancashire breed is the prevailing stock of the county, and seem in general well adapted to the soil; doing less damage to the clay lands, than the heavy Holderness; and being much esteemed by the feeder and butcher for their carcase.

Mr. Orme of Derbyshire, tried nine Holderness cows against nine Derbyshire cows of the improved sort; the former gave the greatest quantity of milk, but that of the latter was considerably more productive of butter and cheese. By the im-

* These stock seem well calculated for the spongy soft lands, being lighter upon the surface than the long-horn.

proved Derbyshire cow is meant such as was bred by crosses from Lancashire, Warwickshire, &c. and what the Leicestershire breeders and others call the old-fashioned sort, before delicacy of flesh, and the feeding properties, were so much attended to. This sort of cow is generally the home-bred stock of Derbyshire. The milch cows brought by the dealers to Derby market throughout the spring in great numbers, are chiefly of the Yorkshire kind, from the neighbourhood of Rotheram. These the farmer crosses with a Derbyshire bull of the above mixed breed. Shortly there will be few bulls in the southern parts of Derbyshire, without much of the Bakewell, or, which is the same thing, the Fowler sort in them.

More attention is requisite in Lancashire, in the choice of good bulls, than has hitherto been paid by the breeder towards the improvement of his stock. Mr. Bakewell has fully convinced the world, what may be effected by persevering attention on this subject*.

Of the importance of dairy farming, no doubt can be entertained.

It is true that cheese may be imported; but milk must be raised nearly upon the spot where it is consumed, and fresh-butter does not improve by carriage. Milk is the cheapest food, and probably the healthiest, that can at this day be purchased. It is no wonder then that the demand for this article should be great in this populous country, and near the great towns on the north-east part.

There is much cheese made in this county, and also of excellent quality; in many respects equal to the Cheshire, in some superior. The cheese made in the vicinity of Leigh, Newborough, &c. for its mildness and rich flavour, always bears an advanced price at market†; and it is somewhat remarkable that the very best dairy (as is usually reckoned) is the very worst land; the soil not being above two or three inches deep.‡ Superior, if only on the following account—

* Mr. Bakewell may have improved stock for the *grazier*, particularly where oxen are kept; but who will say he has been a friend to the dairy?

† About 10s. per cwt.

‡ The lands in West Leigh and West Houghton.

the Lancashire cheese is free from that mixture of colouring matter, which, through the artifice of factors, or the folly of the consumers, particularly those of the metropolis, is, contrary to the inclination and better judgment of the Cheshire dairy-women, infused into the milk. Nay, the factor not only refuses to purchase without, but supplies the arnotto at his own expence, which, instead of adding the least benefit, is known to injure the good quality of the cheese: such is at present the infatuating folly of fashion.

Many of the Lancashire people, as well as those of other counties, are in the habit of colouring their cheeses, and this is a very growing evil; for this purpose they use foreign arnotto, but the Cheshire people use English arnotto, which is often made of soap and Venetian red, &c.; the last article is of a pernicious quality.

Dalton, belonging to Richard Wilbraham Bootle, Esq. is unrivalled in Lancashire for cheese, and is undoubtedly the richest tract of land in the county; for, besides being rich fox land, there are infinite beds of stone, flag, slate, and coal. Timber thrives here uncommonly.

Copy of a Letter to the Surveyor, on the Subject of Leigh Cheese.

“THE Method of manufacturing Leigh Cheeses; with some Observations on the Quality of the Cheese, the Nature of the Land, and the Quantity made from a Cow.

“I suppose the method of making cheese is pretty well understood, and is nearly the same all England over; but as the cheeses of different countries differ so much in quality, it may be well to enquire from what this difference arises, whether from the method of making it, or from the nature of the land on which it is made; and if both together do not contribute to this material difference.

“The farmers in Leigh parish make their cheese of two meals

meals of milk, the night's milk and the morning's, sometimes the night's milk is skimmed, and part of the cream taken from the cheese, but this not every where, for the best dairies put all in; in the morning when the cheese is to be made, the night's milk is to be heated till it is just as warm as from the cow, and then mixed with the new milk as soon as it is milked;—into this is put a small quantity of rennet just sufficient to come the curd, and no more; for on this just proportioning of rennet and milk, they tell me, the mildness of the cheese greatly depends. The rennet is made from the stomach-bag of a calf, salted and dried, which they call a bag-skin; a piece of this, no bigger than a much-worn sixpence, is put into a tea-cup-full of water, with a little salt, about twelve hours before it is wanted, and this is sufficient for 18 gallons of milk, which it will come in about an hour and a half, if the bag-skin be good; then the curd is broke down, and, when separated from the whey, is put into a cheese-vat, and pressed very dry, and after that broken very small, by squeezing it with the hands; the new curd used is mixed with about half its quantity of yesterday's, and which has been kept for that purpose; and a part of this new curd is put by for to-morrow, if it can be spared; if not, all to-morrow's is put by to mix with new, as convenience suits, for the best cheese is always made with part old curds. Some mix the old and the new together, after both have been worked very small: others put the old curds in the middle of the cheese: either of which ways will do very well, as I have often noticed. When the curds have been thus mixed, and well pressed and closed with the hands in a cheese-vat, till they become one solid lump, it is put into a press for four or five hours; then taken out of the cheese-vat and turned, by means of a cloth put into the cheese-vat for this purpose, and again put into the press, where it stands till night; then taken out, well salted, and put into the press again till morning, when it is taken out, and laid upon a flag, or board, till the salt is quite melted, which will be in a day or two; then it is wiped, put into a dry room upon a turning board, turned every day, till it becomes dry enough for the market. The usual thickness of the cheese, when dry, is

not more than three inches, so that in five or six months it is hard enough to carry to market; and a great deal of it at this age is sent to London, by persons who are commissioned to purchase it from the farmers. At a year old I think it is in its greatest perfection, for if it is kept longer it grows too dry; and for this reason it is always sold off as soon as possible it can be carried without damaging. The cheese is mild; and when toasted it keeps all its butter within it, which makes it eat soft and rich. This property of its mixing together when hot, is said to be owing to its being put together cool when made, for this makes the curd mild and tender, and likewise the cheese, so that its more solid particles, when heated, are easily separated, and the whole so loosed and broken, that room is made for the butter, which adheres to the small particles of cheese, and forms one pulposus consistence. Not so when the cheese is overheated in making, for then more of the butter runs out, and the curd is faster bound together than before; and when toasting, the parts are loosened, the butter is run out, and the remainder of the cheese is left hard and dry.—The land round Leigh is chiefly barren, being ebb of soil and clay under, which makes it cold and wet. A few years since some of the farmers, encouraged by the high price of corn, marled and ploughed their farms, which had been grazed time immemorial; the consequence was, the plough soon wore them out, and left them poorer than ever. The grass that came was coarse and dry, and the cheese made off these ploughed farms of an inferior quality, which had like to have brought the whole into disrepute. But since the plough was laid by, the pastures have come about, and the cheese made upon them begins to fetch as much at market as the others do. Of cheese, the quantity made from a cow is about 360 lb. fit for the market; besides a small quantity made before and after the proper cheesing time, which begins when the cows go to grass, which is generally the old May-day, and ends when they are taken up for the winter, which is commonly in the beginning of November.

COW - KEEPING.

The cows kept in the neighbourhood of Liverpool, and within the compass of six miles, are, after supplying the family, principally for the purpose of furnishing the Liverpool market with milk * and butter †. There is milk, it is true, brought to town ‡ from a considerable greater distance (10 miles) but the general distance seems no more than what is above stated. In the town of Liverpool alone, there are a considerable number of cows kept, to the amount of 5 or 600. A single field, for an outlet in the day-time, is procured at a very advanced rate; but the principal food is hay, and grains from the breweries.—In the town of Manchester, at the present juncture, there are not more than six cows kept within the precincts of the town, for the supply of its inhabitants. There comes a quantity every day by the Duke's canal.

Those who are supposed to follow the best system of management, with a proper capital, seldom keep the same cow more than one calf, except some particular favourite. They are purchased at the time of calving, and the calf is immediately sold to feeders for the market, and who keep cows for that purpose, and dispose of their milk, and procure a livelihood that way. The cows, when they fail of yielding a certain quantity of milk (about 6 quarts per day) are, if in proper

* A few farmers there are that do not carry their milk to market, but dispose of it at home.

† Butter-milk is an article of food throughout the greatest part of this county. When made into porridge, and thickened with a little oatmeal, and sweetened with treacle, it becomes an agreeable, nourishing, wholesome, and cheap food: the sweet, mixed with the acid of the milk, makes it very pleasant; mixed with water it is rendered a good beverage at meals, cool, refreshing, and quenching in summer. It is sometimes mixed with butter, and thus used to potatoes.

‡ The conveyance of milk has of late years been in wooden vessels in carts, instead of the backs of horses, as formerly. One horse can convey a greater quantity in a cart, with more ease, than on his back, besides affording more comfortable accommodations to the good woman, who also can carry along with her milk some little garden-stuff, according to the season of the year; and there are but few milk-carriers that do not take a few greens, &c. from their gardens, which they can dispose of amongst their customers, whilst they are selling off their milk. Of late these milk-carts have been covered with painted canvas upon hoops, affording a very good screen from the severity of the weather.

condition,

condition, disposed of to the butcher; and, if properly kept, to advantage, *i. e.* for more than the first cost. Mr. Mayo, who has a milk farm upon the estate of T. Butterworth Bayley, Esq. of Hope, near Manchester, informed us, that he generally sold his stock off to the butcher, at an advance of two guineas more than the original purchase*. But his landlord has furnished him with the greatest conveniencies, and the completest farm-yard observed in this survey†, from which he has profited, and merits praise for his great industry and excellent system, which is to feed them with the choicest hay, and opening food in winter; tempting their appetites, by offering his cows only small quantities at once, but this is frequently repeated; and during the season they are upon grass, they eat corn, ground or bruised in a mill, of such different kinds as can best be purchased; a very small portion of time is employed in grazing, for being well supplied in the stalls, and from the luxuriant rich grass in the fields, they lie at their ease and ruminate. Mayo generally keeps his cows about 18 months, and contrives to sell off in the spring, when beef is at the dearest.

* "I do not understand the mode of Mayo's cow-keeping, to keep his cows only one note of milking, and generally to keep them 18 months; which way he keeps them to profit is a mystery to me that I cannot find out, and selling them at two guineas *per* head more than the first cost.

"The general mode with me, and the cowkeepers in and about Liverpool, when they are kept only one milking note, is from six to nine months at the longest, for that is as long as any cow can pay at one note, except a prime cow that may be kept for several calves, or as long as she does well. Cows, that only milk one note and calve, from July to November and December, are mostly turned off in the spring following, when beef begins to be more scarce, and to sell at the dearest; by which means the pasture is eased at the beginning, when milk is the most plentiful, and coming in great plenty out of the country at a far distance. Some cows that are turned off, when beef is selling the dearest, and with additional keep, may sell for more by two or sometimes three guineas than the first cost; and as that additional keep is seldom or never accounted for, it always appears as if it was so much clear profit; but without the debtor and creditor account be clearly shewn, it is not fairly explained to the public. I generally see gross amounts given of prime cows, but never the amount of an improving cow, of which there are more than prime cows, particularly for milking."—*Mr. Harper.*

† Among other conveniencies, a stream of fine water runs through the yard; and by opening a cock, he can throw a stream through the cowhouse, to wash away the dung, &c. left after emptying, and this water is obtained by draining the higher lying lands.

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LANCASHIRE COW.

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All the cow-keepers do not follow this good practice; and some, who regularly change their cows, do this frequently at the loss of two guineas *per* head. A cow at dropping calf, is generally worth, *ceteris paribus*, two guineas more to the cow-keeper than she would be to the butcher.—If she can be sold after nine months milk, for the first cost, or any advance, it must depend upon the beast being well bought, the season of the year when sold, or extra keep to promote feed.

1794. October 22d. Mr. Edward Ashcroft, farmer, at the Spellow house in Walton, sent down, for the surveyor's inspection, the butter of a prime cow, collected the preceding week, the milk kept by itself, and churned the day before: the amount of which was 16 lb. of butter of 18 oz. each. The butter had a fine yellow colour, and acknowledged by all who viewed this great curiosity an excellent specimen.

The cow which yielded this astonishing quantity of butter, has had five calves, is eight years old, calculated to weigh about five hundred. The colour a light red, a good deal of white, of the Lancashire breed, a very long horn, which was unusually thick towards the root. She had calved about a month before; her food eddish, but not of the first bite, or best quality, with grains from the brewery, or scalded bran; the quantity of milk she gives at present *per* day 22 quarts; a specimen of which accompanied the butter, and was tried by Dica's lactometer, and which was 96; after standing 30 hours, and the cream taken off, 103. There seems no superior richness in the milk, therefore the great quantity of butter arises from the large quantity of milk yielded.—But this is her prime season, she will gradually fall off in quantity, but not it is said inferior to the general quantity by the remaining stock.

It must appear astonishing that notwithstanding the progenitors of this beast possessed, and her successors still inherit, the good qualities of this prime cow, yet there appears an indolent negligence in the propagation of the breed. A bull has never yet been thought of to propagate from full blood; for, besides this disposition to milk, when that can be got rid of, there is a general disposition to fatten.

The Liverpool cowkeeper does not aim at making butter;
his

his system is, to sell milk and cream; but in the summer season, when milk flows into the town from many quarters, a market sufficient to take off the whole may not always be found, and then he is under the necessity of churning it, and making butter, or disposing of it in cheese, or some other way; but the consumption of milk and cream is universal; and to these two articles his greatest attention is directed.

A good cow should give daily 12 quarts, and the price of cream is generally 14*d.* per quart; new milk 2*d.* per quart, and inferior milk 1*d.* per quart*. A cow stands the keeper in about 1*s.* per day, for food, attention, &c. so that with contingencies, and losses that frequently happen to the stock, there is but barely a living profit † left to a business, which requires much attention, and not a little skill in purchase and management.

Mr. Henry Harper's statement of the expence of keeping, and produce of a cow per ann. averaged out of a stock of twenty-five cows, kept upon the Bank Hall estate. —The sales of produce, and expence of keep, according to the present price of the different articles mentioned, 1794.

Average butter of one cow for 52			
weeks is 4 lb. per week; 208 lb.	£.	s.	d.
of butter, at 11 <i>d.</i> per lb.	-	-	9 10 8
Milk of all kinds, 52 weeks, at 3 <i>s.</i> 3 <i>d.</i>	8	9	0
Price of calf	-	-	0 4 0
Three tons manure, at 4 <i>s.</i> 6 <i>d.</i>	0	13	6
Cartage saved, by the dung on the			
premises	-	-	0 7 6
	————— 19 4 2		

* Dearer at Manchester market a trifle; probably the quality may be superior.

† In calculations we too frequently find that no allowance is made for contingencies, or falling off of quantity. Twelve quarts per day is the prime milking quantity; and though some cows may have given more at the first, these kind of stock more rapidly fall off in quantity, whilst, at the same time, the quality was of less value, in proportion to the excess of quantity.

Expences

	£.	s.	d.
Expence of grafs for the summer -	2	5	0
Hay, 160 ftone, at $8\frac{1}{2}d.$ - - -	5	13	4
* Provender, 26 weeks, at $3s. 6d.$ -	4	11	0
After-grafs or eddilh - - -	1	10	0
Los in cattle 5 per cent. $9s.$ per head	0	9	0
Cart-horfe and keep (to carry the produce to market) - - -	0	2	6
Dairy-maid - - -	1	0	0
Attendance to milk - - -	1	2	6
Wear and tear, mugs, &c. - -	0	1	6
Salt for 208 lb. butter, 16 lb. -	0	1	9
		16	16 7
Profit per ann. -	£.	2	7 7

The average milk of Mr. Harper's stock is seven quarts of milk per day the year through; although some prime cows in their full perfection, and in the height of grafs, may yield when fresh calved eighteen, twenty-four, or even thirty quarts, of milk in a day; but this superabundance is but of short duration.—From every twelve quarts of milk is produced one pound of butter, of 18 oz. to the lb.

* The provender consists of two feeds, morning and evening, each day, half a peck of potatoes or turnips cut and given raw, value one penny halfpenny; one pint of oats and one pint of barley mixed together, and boiled with chaff, cut straw, bran, or malt-dust, mixed with the potatoe or turnip, value one penny halfpenny, or three pence each meal. The corn is boiled in plenty of water till it bursts, and the water is used in the mixture.

Average Price of BUTTER in the Liverpool market from the same, for the years 1791, 1792, and 1793.

1791.			1792.			1793.		
Weeks.	d.	s. d.	Weeks.	d.	s. d.	Weeks.	d.	s. d.
7. 12	—	7 0	16. 11	—	14 8	18. 12	—	18 0
19. 11	—	17 5	4. 12	—	4 0	8. 13	—	8 8
2. 11 $\frac{1}{2}$	—	1 11	12. 10	—	10 0	11. 11	—	10 1
1. 10 $\frac{1}{2}$	—	0 10 $\frac{1}{2}$	1. 13	—	1 1	4. 10 $\frac{1}{2}$	—	3 6
18. 10	—	15 0	9. 11 $\frac{1}{2}$	—	8 7	7. 11 $\frac{1}{2}$	—	6 8 $\frac{1}{2}$
5. 9	—	3 9	8. 9 $\frac{1}{2}$	—	6 4	2. 14	—	2 4
			2. 10 $\frac{1}{2}$	—	1 9	2. 12 $\frac{1}{2}$	—	2 1
52 Weeks	—	45 11 $\frac{1}{2}$	52 Weeks	—	46 5 $\frac{1}{2}$	52 Weeks	—	51 4 $\frac{1}{2}$
Average in 1791.			Average in 1792.			Average in 1793.		
10 $\frac{1}{2}$ $\frac{12}{52}$ per lb.			10 $\frac{1}{2}$ $\frac{42}{52}$			11 $\frac{3}{4}$ $\frac{22}{52}$		

Average price of butter for the three years is, per lb. 11 $\frac{6}{13}$ d.

The system at Manchester is nearly the same as at Liverpool, (see the preceding note upon Mayo's good management). It does not, however, appear, that so many cows are kept within that town, it being supplied by a whole circle of surrounding country; whereas Liverpool has only half the quantity of land, from its maritime situation. The price of labour too, about Manchester, is such, that the milk passes through the hands of retailers, who buy it wholesale from the farmers,—who carry it generally upon horses, and whose servant, upon discharging his load, can immediately return and become useful at home.

There have been lately introduced milk cisterns, formed out of a black close-grained stone, somewhat similar to black marble. The Rev. Mr. Johnson has one, containing 13 $\frac{5}{8}$ feet, another 15 $\frac{1}{2}$, the expence of which were 2s. 2d. per foot, these are furnished with lead pipes at that price. These cisterns are remarkably neat, and easily cleaned.

The practice of managing the milk for butter in this county, might be of service, if followed in other places. Except in the county of Chester, it should seem (as the surveyor understands) peculiar to this district. The mode is, dividing the milk into two parts; the first drawn, being set apart for family use, after being skimmed; the cream of which goes into vessels appropriated to receive it; as also the whole of the second, or last, drawn milk, provincially called *afterings**; these two being mixed together, are stirred, but not a great depth, to prevent the bad effects of foul air accumulating on the surface: and kept, according to the season of the year, exposed to the fire, to bring on fermentation and sourness; which is accelerated by that which may remain in the pores of the vessels; to prepare this fermentation, they are not scalded, except after having contracted some taint: and then to accelerate it (the quicker it is the better) the vessels are sometimes rinsed out with sour butter milk; in which state the milk is ready for the churn; and, in consequence of this treatment, more butter is obtained, and of a better quality, than if the milk was churned sweet. And the butter-milk, as it is called, after the butter is extracted, instead of being given to the hogs, as is generally the practice in many counties, becomes, under this process, an excellent food for man, both wholesome, and pleasant, as before-mentioned. This is the sort of butter-milk which, it has been remarked, is necessary for such labouring poor as live on potatoes.

EXPERIMENTS REGARDING MILK.

Thomas Wakefield, Esq. Brook-farm †, about two miles

* About one half from each cow, each meal; but the quantity taken first in some measure depends upon the consumption of milk in the family.

† Mr. Wakefield has applied the steam of warm water for some time past, in his stoves; and, by its effects has produced some very luxuriant fruit, both pines and melons. Mr. Wakefield seems to think that a new field, in the process of vegetation, may be discovered through the means of this application. But he is preparing to lay before the public the particulars of the process, and its effects.

and a half from Liverpool, keeps a regular account of the produce of his milk, butter, and amount of sales, posted up every fortnight; with remarks upon the effects of different food, change of weather, or any other particular cause, which may occasion any considerable variation in the amount of the different produce. These remarks are entered into the margin—from these registers the surveyor has been favoured with the following extracts:

1st. An experiment made on seven cows, for three successive weeks. First week, they produced 289 quarts of milk. This week he took only one pint of drippings, or afterings, from each cow, each meal; which, together with the cream of the former or fore-milk, produced $25\frac{1}{2}$ lb. of butter.

The amount of this week's sales of sweet and churned milk and butter, from this method, was £. 2. 7 s. 4 d.

2d. Second week. The same cows produced 294 quarts of milk. This week he took half of the milk each cow gave each meal, as afterings or drippings; these, with the cream of the fore-milk, produced $28\frac{1}{2}$ lb. of butter.

Amount of sales this week, from this management, was £. 2. 4 s. 2 d.

N. B.—Although there was more butter produced, there was less new milk brought to market.

3d. Third week. The same cows produced 287 quarts of milk. This week he took only half a pint of drippings from each cow each meal, which, with the cream of the fore-milk, produced $23\frac{1}{2}$ lb. of butter.

Amount of sales this week was £. 2. 5 s. 4 d.

N. B.—The fore-milk, or first-drawn milk, is put into leaden cisterns, and is found to answer best, if not above three inches deep. The amount of sales includes the amount of sweet-milk, butter-milk, and butter, as produced from new-milk.

From the foregoing experiment it appears, that though the second week's produce of both milk and butter was the greatest, yet the amount of sales was the least; which deficiency arises from the small quantity of skim milk, by churning so much afterings. Butter-milk being only $\frac{1}{2}$ d. per quart, skim-milk 1 d.

4th. From the 1st of May 1790, to 30th April 1791, 100 cows produced 271,270 quarts of new milk, 23,632 lbs. of butter, and amount of sales £. 2,854. 2s. 9d.

It would have been satisfactory if the foregoing curious statements, had been attended with a regular debtor and creditor account, with profit and loss, account of sales of cattle, with a number of other particulars; so as to have clearly stated the clear gains of such large gross receipts.

5th. The following statements may prove the advantage of regular churning, or rather disadvantage of irregular work. These operations being so very heavy, it became too much for a couple of men to support, which occasioned a machine to be procured, a cog-wheel, &c. and by which is effected, with a horse and a boy to drive, in one hour and a quarter, what was usually the labour of two men five hours*.

Quantity of new milk.		Quantity of butter by hand-churning.					
Quarts.		Pounds.		£.	s.	d.	
6,471	- -	364	- -	47	1	7	} Amount of Sales.
6,644	- -	397	- -	49	0	9	
6,995	- -	348	- -	49	0	9	
Quarts 20,110		Pounds 1,109		£. 145 3 1			

Quantity of new milk.		Quantity of butter by machinery.					
Quarts.		Pounds.		£.	s.	d.	
7,261	- -	469	- -	55	4	1	} Amount of Sales.
7,675	- -	482	- -	56	14	11	
8,120	- -	574	- -	65	3	8	
Quarts 23,156		Pounds 1,525		£. 177 2 8			

The above quantities of milk were the produce of six successive fortnights.

* *Hand Churning and Machinery.*

"There can be no difference in the churning, if the hand-churning be worked brisk till it offers for butter; if prepared in the same manner, which always may not have been the case with Mr. Wakefield, therefore machinery may have the advantage with others as well as Mr. W."—*Mr. Harper.*

There-

Therefore if 20,110 quarts yield 1,109 pounds of butter, how many pounds will 23,156 quarts yield?

Answer 1,277

1,525 produced by machinery

248 pounds more than would have been produced

by hand-churning; which, at 10*d.* per lb. is £. 10. 6*s.* 8*d.*

Quarts.	£.	s.	d.	Quarts.
Again, if 20,110 fell for	145	3	1	what will 23,156 fell for?
Answer	167	2	8	
	177	2	8	did fell for.

£. 10 0 0 profit by new mode of churning.

Again, if 23,156, gain £. 10. what will 271,270 quarts gain?

Answer - £. 117. 2*s.* 11*d.*

Hence it appears, that a churning machine, on one hundred cows, in twelve months, will gain £. 117, besides the expence of labour.

A short-horned cow, upon an average of twelve months, yields nine quarts of milk per day, and 4½ lb. of butter per week.

A Lancashire long-horn yields eight quarts of new milk per day, and four pounds of butter per week for twelve months.

N. B.—In making the foregoing experiments, the cattle have had always the same kind of food. But to know the clear result, the quantity of food consumed by the two breeds of cattle should be clearly ascertained, before any decisive conclusion can be drawn. The produce of milk and butter is in favour of the Holderness—neat balance, not yet apparent, whether in favour of long or short-horn. The flesh of the latter is said to be of inferior quality.

THE SURVEYOR'S EXPERIMENTS.

I directed the usual quantity of milk generally churned at one time, and collected according to custom, to be measured previous

vious to the operation: $15\frac{1}{2}$ gallons milk, three pints warm water added. After the butter was extracted, the milk measured again thirteen gallons five pints. Quantity of butter produced 8 lb. 4 oz.

Again, directed the cream from all the cows for the same space of time only, to be collected and churned without any other milk. Quantity, cream four gallons, and three pints of water added. Produce of butter, 4 lb. 14 oz.; of milk, after butter was extracted, four gallons one pint.

Observation. More butter, from quantity, in the last experiment; but a great deficiency of butter this week from this mode.

Less quantity is lost by extraction of butter than might have been expected, considering absorption of vessels, splashing over of milk, &c.

Both these experiments prove the great advantage of selling cream at 14 *d.* per quart, in preference to churning.

	£.	s.	d.
<i>Ergo.</i> First, say butter worth, at 12 <i>d.</i> per lb.	-	0	8 3
Butter-milk, at 2 <i>d.</i> per gallon, worth	-	-	0 2 $2\frac{1}{4}$
			0 10 $5\frac{1}{4}$
But the milk of the first 62 quarts, even at 2 <i>d.</i> per quart only, without the trouble of churning, was worth	-	-	0 10 4
Again, 4 lb. 14 oz. butter worth, say	-	-	0 4 10
Butter-milk 4 gallons 1 pint, at 2 <i>d.</i> per gallon	-	-	0 0 $8\frac{1}{4}$
			0 5 6
But 4 gallons of cream, at 4 <i>s.</i> 8 <i>d.</i> per gallon. or 14 <i>d.</i> per quart, worth	-	-	0 18 8
In favour of cream	-	£.	0 13 2

Upon his farm at Aughton Mr. G. Green observes, that the average milk by his cows has been nine quarts of milk by the short-horn, and seven quarts of milk per day by the long-horn cows; and of butter eight pounds per week by the former and seven

seven pounds per week by the latter. This quantity is three pounds per week more than either Mr. Wakefield's or Mr. Harper's cows yield, which are equal in quantity, namely each 4lb per week. The two farms are about equal distances from Liverpool, *e. g.* Bank Hall, two miles north west.—Brook Farm two miles south east.

LACTOMETER.

A lactometer, to try the different qualities of milk, has been invented by Mr. Dicas, mathematical-instrument-maker, in Liverpool, and patentee of a neat, simple, and accurate instrument to try the strength of spirituous liquors and worts.

This lactometer ascertains the richness of milk, from its specific gravity, compared with water, by its degree of warmth taken by a standard thermometer, on comparing its specific quality with its warmth: on a scale constructed for this particular purpose, and by which, if the principle be right, may be discovered not only the qualities of the milk of different cows, pastures, foods, as turnips, potatoes, grains, &c. but also probably which may be the best milk, or best pastures for butter, and which for cheese. This instrument, however, is yet in its infancy. The surveyor took one with him upon his journies, and made experiments at different places; but time sufficient for a full and complete experiment seldom offered: other circumstances intervened, and prevented a fair trial; but, at his own house, he has made a number of varied experiments, upon different milks from different farms.

Observations on the construction of the LACTOMETER for determining the goodness of Milk, and the advantages to be derived therefrom: By Mr. DICAS.

The LACTOMETER is constructed with ten divisions upon the stem (similar to the patent brewing-hydrometer) and with eight weights, which are to be applied only one at a time upon the top, to obtain the weight of the milk: an ivory sliding-rule accompanies this instrument, upon the middle or sliding part of which is laid down the lactometer weight of the milk, going from

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from 0 to 80; and opposite thereto are placed the various strengths of milk, from water to 160—100 having previously been fixed upon, from a number of experiments, as the standard of good new milk, and each of the other numbers bearing a proportionate reference thereto.

At one end of the sliding-rule the degrees of heat from 40 to 100 are placed with a star opposite, as an index to fix the slide to the temperature of the milk.

The whole being graduated to shew the exact strength of the milk as it would appear in temperature of 55 degrees of heat, although tried in any inferior or superior temperature between 40° and 100°; thus the great inconvenience which would attend bringing the milk at all times to one temperature is avoided, and a simple mechanical method of allowing for the contraction and expansion substituted.

And as skimmed milk, being divested of the particles of butter which existed before skimming, appears to have a less degree of affinity with that than the new milk has, one side of the ivory sliding-rule is adapted to skimmed, and the other to new milk.

GENERAL RULE.

First, find the temperature of the milk with the thermometer, and fix the sliding-rule so that the star shall be facing the degree of heat the mercury rises or falls to; then put in the lactometer and try which of the weights, applied to the top, will sink it to some one division upon the stem; add the number of the weight upon the top, and that of the division together, and opposite the same formed upon the side, will be shewn the strength of the milk.

EXAMPLES.

OF NEW MILK.—If in the temperature of 72°, the lactometer with the weight 40 sinks to 9 upon the stem, fix the slides so that the star shall be facing 72°; then opposite 49 will be found 100, the strength of the milk.—Again, if in 60° the lactometer with 50 on the top, sinks to 6 upon the stem, the slide being fixed for new milk so, that the star shall be at 60° of heat, then

Y

facing

facing 56 will be found 110, the strength of this milk in proportion towards the other, provided it is equally replete with cream.

To discover which, it becomes requisite these two samples should stand a certain time that the cream may rise, which being taken off, they are to be tried with the lactometer again; and as the cream is evidently the lighter part, the milk will appear by the lactometer denser or better in quality than before. Suppose the milk in the first example to be 57 by the lactometer in 60 degrees of heat, then the strength by the skimmed-milk side of the rule will be 112. And admit the second example of new milk to be 58 in 64° when skimmed, the strength would be 116.

As a comparison—

Say No. 1. New milk	-	-	-	100
Ditto skimmed	-	-	-	112
			Difference	12
No 2. New milk	-	-	-	110
When skimmed	-	-	-	116
			Difference	6

From which it appears that No. 1 has produced a larger quantity of cream than No. 2, and consequently may be deemed the better milk.

Some instances have occurred where the strength of new milk has only been about 80, and when skimmed near 100.

Thus it may, without the least impropriety, be called a milk much better adapted for making butter than cheese. And the experiment No. 2, a milk more advantageous for cheese than butter, it being considerably denser, and consequently containing a much larger portion of the curd, or more solid parts, which constitute the basis of cheese. The serum or whey in general being near the same density.

Instances;

Instances wherein the LACTOMETER may be useful.

In discovering what breed of cattle are most advantageous.

What food in the winter season, whether carrots, turnips, potatoes, &c. are best.

What the effects of different pastures may be.

How far particular farms are best adapted to making butter or cheese.

How far the inconvenience of large cheeses in some dairies being too rich to stand, may be prevented, by discovering when this redundancy of richness exists in the milk.

And in fixing a standard for the sale of this useful article of life.

A standard for skimmed milk may readily be fixed by saying what strength the common saleable skimmed milk shall be by the lactometer, or what its specific gravity shall be in relation to that of water in the temperate degree of heat, and that an easy comparison may be made between the specific gravity of any milk, and its lactometer strength: this instrument is so constructed that one of specific gravity shall exactly correspond with three of strength—that is, the strength of 90 by the lactometer is a milk whose specific gravity is 1030, to common pump-water 1000.

From a number of experiments and observations, the common saleable skimmed milk in Liverpool is from 52 to 64 of strength, and that of new milk from 70 to 80; but it would be difficult to fix any standard for the latter, unless some mode could be devised to discover whether it was mixed with old milk or not. The only method would be, after fixing the strength of it, to try, by letting it stand, to discover if it produced that quantity of cream, which, as new milk, it might reasonably be expected to do.

FEEDING CATTLE.

The following practice, by an experienced farmer, (Mr. Henry Harper, Bank Hall) is given in his own words.

" I HAD one year six cows that I house-fed, all at one time, and nearly all of an age; and by way of experiment, I fed two with turnips and ground corn; and two with boiled potatoes and ground corn; and two with raw potatoes and boiled corn: they were all put to feed at one time, and when I thought them fit for the market, I sold three, one from every lot, and went to see them dressed. In those two fed with ground corn and turnips, and ground corn and boiled potatoes, there was little or no difference; but that which was fed with raw potatoes and boiled corn, was better in flesh, and more fat within side, than the other two, by a fortnight's keep; and this was not only my opinion, but the butcher's who killed them: the other three I kept three weeks longer; and when killed, they were proportionably nearly in the same state with the others, but better by being kept the longer; so I prefer boiled corn to any sort of grain, and think it more forcing, either for milk or feeding. They had all one and the same quantity of corn, &c."

Boiling corn has been practised by some others, with good success. A little linseed improves the quality. Hay seeds, that drop out of the hay, should be carefully preserved, and worked up in mixtures of potatoes or oats, either scalded or boiled. The surveyor has experienced the good effects of hay-seeds upon his cattle, for many years; an ingenious farmer, lately talking upon this subject, observed, that the seeds of many weeds might be converted to good use; and spoke with confidence of the feeding quality of some of them.

Instead of oil cake, the lint-feed boiled, and instead of spent grains from the breweries, barley boiled and mixed together, with the addition of chopped straw, hay-seeds or chaff, have been tried by Mr. J. Balmer, of Toxteth Park, both upon milch and feeding cattle; and with more profit than with either of the residuums.

Method

Method of feeding Cows, by MR. HENRY HARPER.

There are seasons in which it is so very difficult to make good hay, that much will be damaged although the greatest attention be paid. The consequence of which is, the milk given by the same cows is less in quantity, and of inferior quality; the butter both loses its natural colour and good flavour; to remedy which, Mr. Harper takes the following method.

He provides some sort of provender for his cows; that is, some species of ground grain; and to mix with it, he procures some hay of the best quality, and from the most fertile lands, which he treats in the following manner. This rich hay is to be used as an ingredient for tea*, by pouring boiling water upon it; and the infusion he makes use of to scald his ground grain, chopping the hay, before it is infused, with an engine, designed for the purpose of cutting straw; and this hay, so cut to the size of one inch long, is to be mixed with scalded provender, to the amount of two or three quarts to every beast. This mixture of bruised grain, scalded with the infusion of rich hay, and the addition of the hay to the amount of two or three quarts to each beast, improves the flavour of the butter, and restores it to its proper yellow colour.

The milk cows in general, not in the vicinity of towns, are wintered mostly upon hay. Were they, according to circumstances, fed with turnips or cabbages, they would be kept at less expence to the farmer, and summer fallow be exploded. Some few, who have begun to sow turnips, sell the overplus to their farming neighbours at from 6*d.* to 8*d.* per bushel, which has produced from thirty to 40*l.* and upwards, per acre, eight yards to the perch.

* "If hay be damaged, it is not proper food for milk cows; and making good hay into tea is both tedious and unnecessary, as the stomach of the cow will best digest the food, and do all that is necessary; and in my opinion, the best engine for chopping hay is in the cow's mouth, which nature has provided. True it is, the better a cow is kept, the more milk and butter she will give. If damaged hay cannot safely be given to the young cattle, it may be used as litter."—*J. B.*

Vegetables boiled for Cattle.

Before concluding this article, it may be proper to observe, that a college of Roman catholics residing at Stony Hurst, near Clithero, in this county, keep their horned cattle within doors, and fed them upon boiled vegetables; amongst which were included all sorts of weeds, dock, nettles, &c. It is well known that on many parts of the continent they feed their cattle on the leaves of trees.—What a resource here opens for the attentive and skilful agriculturist!

SECT. II.—*Sheep.*

THIS is not a sheep district, therefore they cannot be any where numerous in the county.—There are, flocks (but flock is an undeterminate number) it is true of half-starved creatures upon the mountains, but in such proportion, that Mr. Eccleston is of opinion there is not a single shepherd, properly so called, in the whole county.

Those which are kept upon the feeding districts are bred in Scotland, and purchased by the Westmorland farmer from thence at a year old, and afterwards by the Lancashire grazier from Westmorland at four years old, fatted and sold for slaughtering.

There is a singular custom prevails in the northern part of the county, and which is universal amongst the mountains and waste lands, which is as follows: Whenever a tenant enters upon a farm upon which *there is a heavy-bred flock of sheep*, that the sheep are separated and sorted; viz. the wethers aged, ewes, one year old (provincially hogs) two years old (twinters) and then valued at certain but different prices; and the tenant by covenant in his lease to leave an equal number of each sort upon his farm when he quits, or to pay the value in money, according to the deficiency which may appear in each sort; but if proved, on stating a balance, that it is in favour of the tenant; he either paid for the overplus number, or his landlord takes them at a proper valuation.

The sheep are generally delivered to the coming-on tenant about Martinmas, and marked when delivered with red (a species of ochre) in the forehead. The red is provincially called *smut*; and every different farmer marks his sheep upon the back, buttock, shoulder, or in some other part, in a different manner from his neighbour, and also cuts the ear of his sheep, when lambs, different from the other, as a mark of distinction between the two flocks; these two marks, that upon the ear, and the other upon the wool, are never altered, that is, each farm preserves its own peculiar mark, although the tenant be changed, and is looked upon as hereditary to the estate. Initials of the owner's name are avoided, though sometimes practised, because the largeness of the mark depreciates the value of the wool.

In the mountainous parts of the country, fleece wool, weighing 16 lb. the stone, sells for 7 s. Skin wool at 8 s.

“ Sheep delivered to a farmer, when he enters upon a farm, are valued at about 8 s. When sold to the butcher, from the common, 10 s. 6 d. and when fatted in the inclosed ground from 16 s. to 21 s. As to the quantity kept on commons, it is very hard to ascertain, because there is so much difference between the high commons and the low; for instance, on the high commons, such as Seathwaite fell, not more than four or five upon an acre; inclosed land in Lowfurness, is allowed to fat seven or eight on an acre, but these are twice the weight of fell sheep. These are frequently sold from 32 s. to 40 s. per sheep.

There are but few sheep kept in the southern part of the county, except those purchased in distant parts, by the butchers, and kept a few weeks on grass for their own convenience—or, by a few gentlemen †, for the convenience of their families, curiosity, or occasionally to feed upon, or eat off, their turnips, previous to laying down the land. In the northern part of the county, sheep are bred and kept upon the

* Generally of Culley's breed from Northumberland.

† Mr. Eccleston, before mentioned, has a Spanish ram, a present from his Majesty, which has already improved the quality of his wool.

mountains and moorland. There is also a breed called the Warton, or Silver-dale cragg sheep, which is much esteemed for the fine flavour of its flesh, fineness of its wool, and tendency to fatten. They pasture upon very rocky lime-stone land. Their wool commonly sells at about twelve shillings per stone, of 14 lb.

Annotations.

1. The small number chiefly owing to the number of *dogs* kept in the towns, and universally by the cottagers in the manufactories.

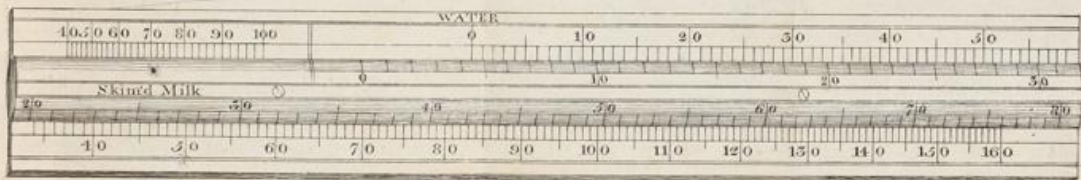
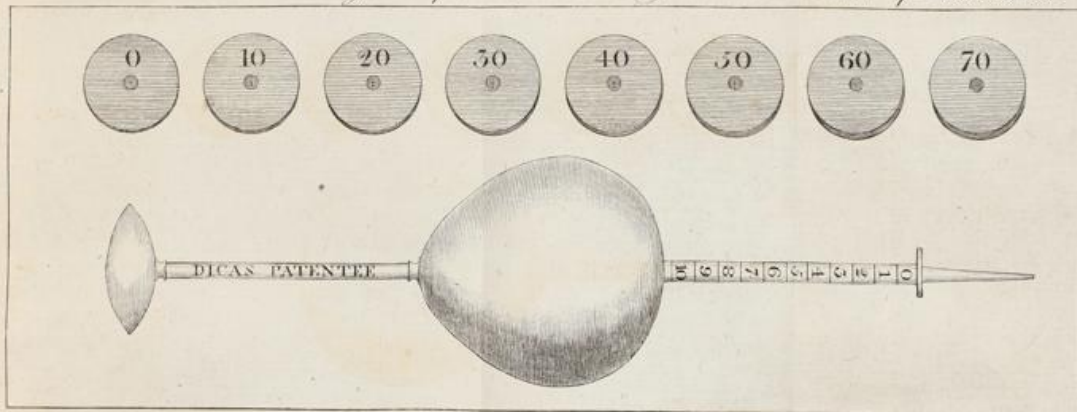
2. The practice of plashing hedges is almost unknown in the county *, and the fences are in general so wretchedly bad, as to render it impossible for the farmer to keep sheep, for which stock a great part of the county seems calculated. Another great objection to the encrease of sheep in this populous county is owing to the great number of dogs, which frequently do great damage to the flocks; but which a tax upon dogs might prevent.

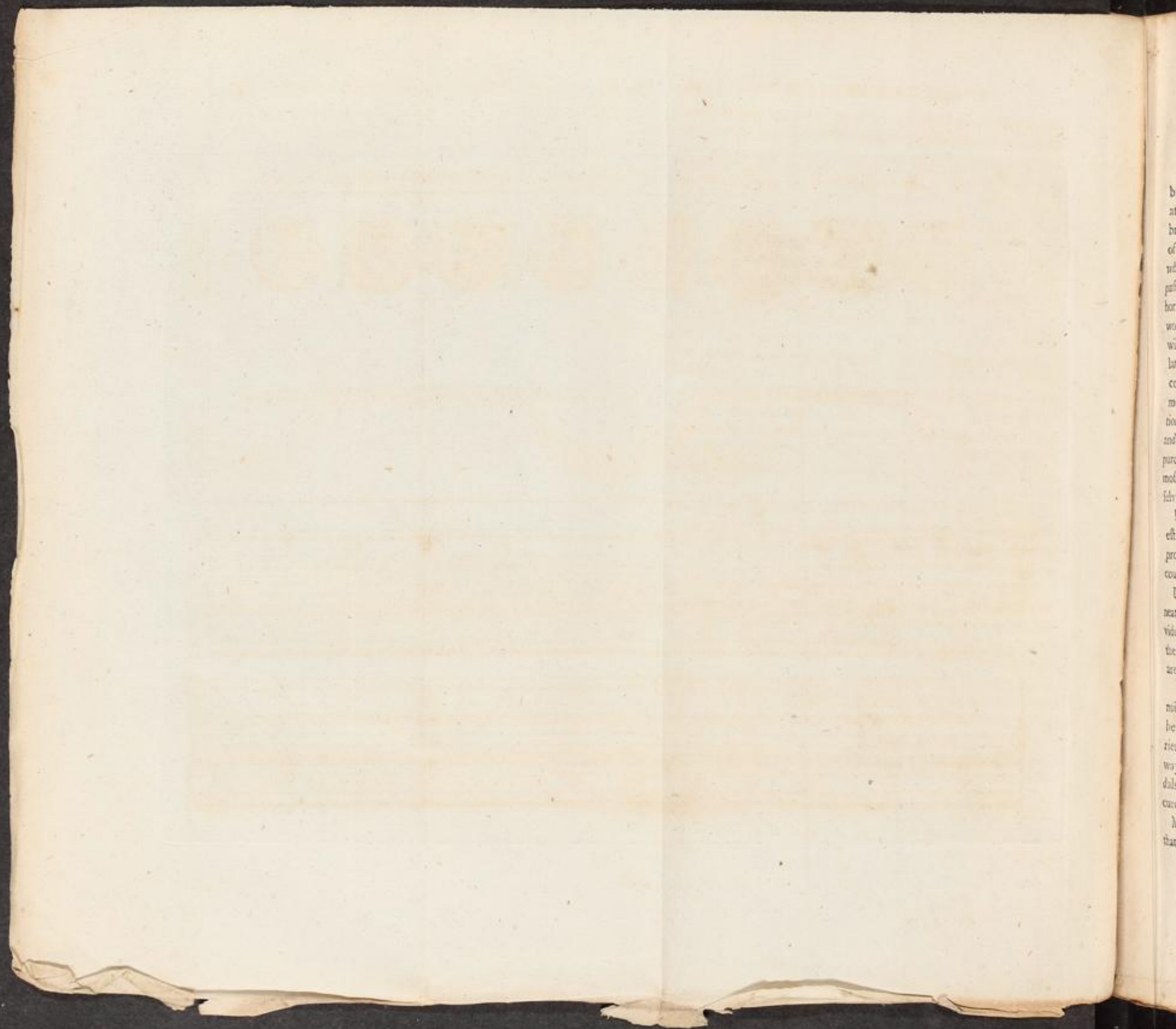
3. Sheep would answer extremely well in many parts of this county; but the Lancashire people are perfectly ignorant of there existing any other species than the black-faced Scotch and Welch sheep: animals active enough to clear a six-foot wall, consequently that cannot be restrained by such infamous fences as are prevalent throughout the county. The application of sheep to turnips, is considered as a caprice that may suit the pocket of a gentleman, but inconsistent with the finances of a farmer.

4. The lands in general, in the southern parts, are extremely proper for sheep, and produce most excellent crops of turnips; but they are not much sown, owing greatly to the common clauses in the leases, of not allowing clover stubbles to be sown with wheat, for which the soil seems very proper.

* Mr. Eccleston's plashed fences are specimens of great neatness and attention to that business.

Dicas's LACTOMETER Engraved for Mr. Holt's Agricultural Account of Lancashire.





SECT. 3. *Horses.*

A GREAT number of horses have of late years been bred, owing to the advanced price they have generally fetched at market; but proper attention in the choice of either the brood mares, or stallions, has not been paid. The stocks, both of cows, of sheep, and horses, are capable of great improvements, which merit the consideration of every breeder.—The same pasture will rear the young stock, of either cow, sheep, or horse, of the best kind, at the same cost as a stock of the very worst quality; but a three-years-old heifer, of the first kind, will sell for double the price of one of a similar age of the latter description; if a colt, the proportion is still higher, according to the superiority of its breed. If the above statement be true, is it not to be wondered at, that greater attention has not been paid by the breeder; since both the climate and lands are capable of producing good breeds, and there are purchasers enough to excite encouragement? Strong horses are most in use, except among gentlemen, who breed for themselves.

Horse-surgery of late, under Mr. Moorcroft, and by the establishment of the Veterinary College, seems making rapid progress towards a degree of perfection unknown in other countries.

Unfortunately no attention has been paid to the diseases of neat cattle, sheep, swine, &c. Were the nostrums of individuals for those animals communicated to the Board, probably there would be found sufficient remedies for the disorders they are liable to.

Should another circular letter ever be emitted by the Board, might not that be a proper article for enquiry? Or would it not be advisable to send a circular letter to practitioners in the farriery line, and farmers, &c. &c. specifying each disorder; and by way of encouragement, to grant honorary rewards or medals to such may make known the most satisfactory receipts for cure or prevention?

Mr. Eccleston suggests the following hint. He imagines, that the number of horses bred in this, surpasses that of any

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other

other county in the kingdom *. He proposes, "that a yearly tax be laid upon stallions of five times the sum † they receive for serving each mare, for the season; it would prevent the use of the inferior sort of stallions, which only serve to procreate those of small value which are nearly useless, with which almost every part of the kingdom abounds. A very considerable sum would annually accrue to government, were each stallion to pay five times the sum for a licence, that he serves each mare at, viz. a horse that covers at one guinea for the season, should pay five guineas for a licence; and others, that cover at 20% should pay one hundred ‡.

would

* The farms are exceedingly small, and each farmer almost keeps a brood mare.

† Who would venture to breed at such an expence?—A tax upon stallion horses would undoubtedly be a very great step towards improving the breed of horses in general.

‡ The improvement upon horses in the present mode of serving mares along the sea coast, 20 miles north of Liverpool, has taken place for these 30 years past, so as now to be one-third more in size and bone, and better shaped; and if the present breed had been then existing, would have then sold for double the price in any market, not saying any thing of the advanced price they have sold for of late. A tax upon travelling stallions, if ever so small, would much discourage the breed of horses, and farmers would be keeping stallions for their own use, of any breed that may fall into their hands, and the stallions that now travel the country have mostly some merits in them, either for size, bone, or good shape, or of some particular good breed; and the light breed of middling size and bone are the most useful horses for the stage coaches, and mail coaches, post horses, &c. and many other purposes that will not bear a high price: the risk of misfortune is so great upon horses that are employed in that business, and they will equally serve the purpose, as well as one of a higher price, and often much better; and I have been informed by a gentleman above seventy years of age, who lives 20 miles east of Liverpool, that he has observed that the breed of horses has much improved every seven years for half a century past; likewise by a gentleman that is a dealer in horses, who now lives in Liverpool, but who was born in a field country, that he has had perfect knowledge of that country for thirty years past, and that the breed of horses that are now in being there, are as good again as they were thirty years since. I cannot help lamenting that more attention is not paid to cows being served with bulls of good breed, and such as would best suit the district, as trials of different breeds might be made with little or no expence more than the present mode. If such a spirit could be generally excited in the district that is 20 miles north of Liverpool, and in almost every other district in the county, save the Filde and about Preston, Lancaster, and Hornby Holme, for the breed of cattle is much the same as it was thirty years since, for little or no attention is paid to the breed, neither large nor small, so the cow has a calf.—*Mr. Harper.*

Accidental

"Would the produce of such a tax be less than 50,000 *l.* *per ann.* throughout Great Britain? By the above tax, the farmer's stock, in the horse line, would in a few years become of infinitely more value. Fewer, being stronger, would be equal to his work, our cavalry better mounted, and a greater sum would annually be returned by foreign nations to this country, for the superior and fine horses we should then be able to export."—In this northern district, and mountainous country, the land is more particularly exposed, and its produce more uncertain. Therefore experiments cannot be made with equal advantage as in the more southern parts of the kingdom.

Many of the lands in this county, are suitable, and would pay well, to breeding *. An improved stock, as before hinted, would return the greatest profit.

Accidental Experiment in the Year 1792. By the same Farmer.

I had a heifer calved in the field, and it was some time before she was fetched home, which was not before the calf had suckled itself, by which means she would never give her milk to be milked by hand, for which I put calves to her. After she had fed two for the butcher, I then put two young calves on her for rearing, which were on her about ten weeks, and then weaned; at which time they were better calves than those of four months old, reared in the customary way, that is by poor milk, with the addition of water, meal, &c. The calves did not run on her constantly they were only turned on her at milking time, morning and evening; and each of them suckled about one half of her milk, as near as could be judged; and the calf that went on her first in the morning, went last on in the evening; and they are now two years old, and both in calf, and better beasts by 20 *s.* *per head* than those reared in the customary way, and equally of as good a breed; so, for the time coming, I shall conclude one quart of milk, suckled by the calf itself from the beast, to be as good as two of the same quality given any other way; for it is more natural, nourishing, and strengthening to the calf, while young, and supports it to be of stronger body, and straighter limbed. If such a spirit for rearing calves could be brought forwards with the help of such bulls as would best suit the district, the breed of cattle would soon be much improved, and with a benefit of upwards of 20 *per cent.* more than the present mode.

My opinion is, that if a medal, or a small premium, was to be given to the breeder or farmer that could shew the best stock of horses and cattle of his own rearing, it would greatly encourage the breed of both more than a tax.

* "I think not; if the land of the county was managed as it ought to be, it would soon become too valuable for breeding.

"The lands in this county, in the southern parts especially, are rented too high for breeding."—*J. W.*

There has certainly been a degree of attention paid to the breed of horses at least, for this half century past, in this county. An attentive observer on this head remarked, that within the space of thirty years, horses have doubled their value in real goodness of quality; whilst the horned cattle, instead of a progressive improvement, have been upon the decline. Mr. Bakewell has made the Lancashire breed the basis of his improvements.

Oxen have been made use of formerly, but always upon a contracted scale. Horses at present are universally preferred for husbandry business. The paved roads of this district do not agree with the feet of oxen.

An attentive farmer will make his horses pay more profit for their keep, than it is possible for the ox, though this is urged as a strong argument in favour of preferring the ox. For if circumstances permit the farmer to breed stock, he works them from two years of age, to five or six, and then sells them off. If the farmer do not breed, the process should be the same, to purchase young cattle, which the easy and slow operations of agriculture admit to grow and improve. When matured, they become fit for the carriage, road or field, and will then sell, if properly selected, at an advanced price, and so as to afford a profit for their maintenance, besides the work gained; beyond what is in the limited power of an ox, to gain in weight of carcase.

On this important subject, the following observations by Mr. Henry Harper merit to be attended to. They arose from a consideration of the comparative estimate between horses and oxen, in the Suffex Report, p. 82.—Mr. Harper's sentiments are as follow:

“ I am no advocate for horses in preference to oxen; but prefer that mode in which business can be done with most ease and least expence.

“ I have on my farm some strong heavy land as any in the kingdom, and some as light.—Three horses, with the allowance of two bushels of oats per week each horse, are able to plough an acre a day in the heaviest and strongest land (if ever broke up before) and plough it to any depth from four to eight inches
at

at a proper season of the year.—When a second ploughing is necessary, two horses will be sufficient to plough one acre and a half per day in the spring or summer months, and by which there is a spare horse, for harrowing in the seed, or any other extra work.—I plough single, or the horses abreast, as suits the nature of my work the best.

“ The average work done upon the heavy and light soils on my farm, with a three-horse team is seven statute acres per week the year through, which, at 7 shillings per acre, is 49 shillings per week *, and have a spare horse eight weeks in the year out of this team.

“ My ploughs are the common swing ploughs with cast-iron mold-boards, of different degrees of strength, according to the nature of their work and land under tillage. Single or double wheels may be used with these ploughs, as occasion requires, and drawn by a chain fixed to the axis of the plough.

“ The following is the calculation of the first purchase, and keep of three horses for one year :

	£.	s.	d.
Three horses, at £. 25 each	-	-	- 75 0 0
Harness for ditto, at £. 4. 4s. each	-	-	- 12 12 0
Oats, at 6 bushels per week, for 6 months	-	-	- 19 10 0
Oats, at 3 bushels per week, for 6 months	-	-	- 9 15 0
Hay for six months, at 1l. 1s.	-	-	- 27 6 0
Grass and green crops for six months, at 15s. per week	-	-	- 19 10 0
Wear and tear of two ploughs, per annum	-	-	- 3 3 0
Wear and tear of horse-gear, per annum	-	-	- 1 5 0
Horse-shoeing, at 10s. 6d. each horse	-	-	- 1 11 6
Farrier	-	-	- 0 15 0
			170 7 6
Prime-cost, &c. of ox-team, as stated in the Suffex report	-	-	- 147 0 0
In favour of the ox-team, balance	-	-	£. 23 7 6

* N. B. Mr. Harper observes above, that in second ploughings they are able to plough $1\frac{1}{2}$ acre per day; therefore he averages seven acres the year through, and allows nothing for loss of time by bad weather, imagining the two acres per week sufficient for that purpose.

My

	£.	s.	d.
* My horse-team will earn 49s. per week per annum	127	8	0
Profit on two young horses each per annum, besides eight weeks rest for one horse, or any extra work	2	0	0
	129	8	0
The ox-team will earn 30s. per week for nine months †	54	0	0
Profit on the oxen	8	0	0
	62	0	0
	67	8	0
Balance in favour of the ox, first purchase	23	7	6
Neat balance in favour of the horse per ann.	£.44	0	6

"The above statement is what a horse-team will do on my farm, and I think may be done upon any farm in England, where they have proper implements and properly applied."

Thus Doctors disagree in Opinions!

But since Mr. Harper's management of a horse-team is so good, might not an ox-team under his management be also more productive?

SECT. 4.—Hogs.

PORK is not an article of great consumption with any class of people in this county. The application of the best and most farinaceous kinds of potatoe being chiefly for the food of man, the refuse alone, and the coarser kinds, such as ox-noble, champion, and Surinam †, are given to the cows, horses, and poultry, and to the hogs which may be kept on the farm, which seldom amount to above four.

* An allowance is made of two acres every week to make up deficiencies for the whole year, as before stated.

† The earnings of the ox-team, as well as the earnings per acre of the horse-team, is according to the calculation made in the Sussex Report.

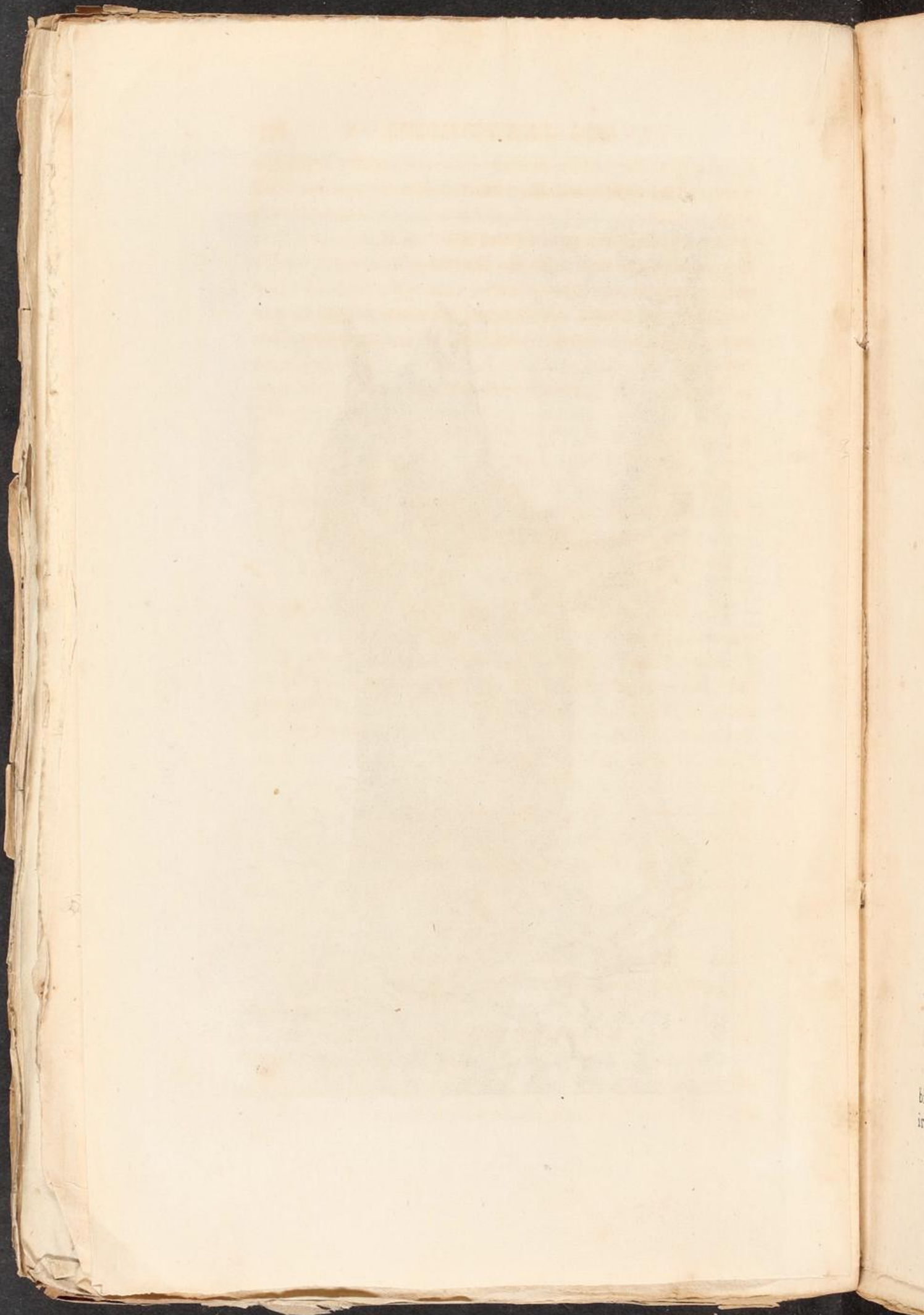
‡ It is supposed most of these coarse kinds have been raised from the seeds of the Surinam, and of which they are only varieties, indeed they bear strong resemblance to the Surinam, in leaf.

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Illustrated by
LANCASHIRE HOG
with a picture of the Cheviot and the Wiltshire Hog





The idea of hogs being numerous in a potatoe country is very natural; but the fact is not so: few are bred here, and those few that are kept are bought from itinerant drovers from Shropshire, Yorkshire, Cheshire, &c. Pork does not seem to be a favourite food with any class of people in this county, though more is used than formerly. In short, the potatoes generally grown by the lower people are of the best farinaceous kinds, which they are particularly nice in, and consume in their families, or sell to advantage in the market. Some gentlemen and farmers, who grow the ox-noble and other coarser potatoes, use them in general for cows, horses, and poultry, scarcely any one keeping more than three or four hogs, which, however, are kept in good condition, and in some degree fatted with the help of potatoes, but are fatted off at last with damaged ship's wheat, India corn, &c. which can often be procured upon reasonable terms from the *corn warehouses*. Boat loads of ox-noble potatoes are brought to Liverpool from Cheshire, which are bought up for the use of cattle, &c.

The stock of swine are in general purchased from herdsmen who travel about the country, and who bring them from Cheshire, Shropshire, Wales, and Ireland. Mr. Eccleston, however, has a breed between the wild boar and the Chinese, which have very light and small bellies. Upon the same food, Mr. Eccleston thinks, they will yield one fourth more flesh than either the large Irish or Shropshire. Their size is but small, weight from 10 to 15 score, generally about 12 score. Mr. Wakefield has the same breed: an engraving of one of which accompanies this report.

Pigs should, during the stage of their growth, be regularly turned out to graze, where there is a conveniency. This, besides the advantage of grass, which is nutritious and helps digestion, by the fresh air and exercise, causes a disposition to take their rest, and sleep after a meal, contributes to their cleanliness, and renders their flesh of superior flavour.

SECT. 5.—*Rabbits.*

THERE are some lands along the coast, employed as rabbit-warrens; but these animals make excursions into the adjoining lands, and commit depredations upon the corn: they are all capable

capable of cultivation; most of them possess marle, either below their surface, or within reach, and are not at all inferior to Bootle Marsh.

It is a fact, however, that neither cows nor sheep will produce so great a profit as rabbits will afford, on that land which is suitable for them. Their skins, when in season, are nearly as valuable as their carcase, and they are prolific to a proverb. A gentleman converted a tract of land into a warren, which answers well.

SECT. 6.—*Poultry.*

THE Filde is the principal district in this county which keeps a surplus stock of poultry. Poulterers also collect the chief part of what is brought to the Ormskirk market on Thursday, from the cottagers and farmers, and retail them out again at the Liverpool market on Saturday.

On Martin Mere, are turned a number of flocks of geese, on a certain day, brought from different parts of the county. These flocks are so marked, as again to be known. Upon this Mere they continue till about Michaelmas, and on this water they can find sufficient of food for their sustenance from the different grasses, aquatics, fishes, and insects. The proprietor of the water claims half of the stock that remains alive for their summer's keep.

SECT. 7.—*Pigeons.*

A GREAT difference of opinion is entertained in regard to the utility or the disadvantage of keeping pigeons. In general, however, it is acknowledged that their dung, in so far as it can be procured, is of the greatest importance to the farmer.

SECT. 8.—*Bees.*

THESE laborious and useful insects, have not been hitherto treated with that degree of attention they merit. The produce of their labour is not only pleasant, but nutritious; and before the introduction of sugar, by the discovery of America, honey must have been in high esteem, by enriching the flavour
* of

of many articles, which have only yielded to the introduction and superabundance of sugar*. The wax too is an useful article, and valuable in many of the arts, in which it makes a considerable part of the composition. It is almost incredible; indeed, how much can be afforded in the consumption to which it is frequently applied, that of wax lights.

Bees seem to require as little attention to their well-being, as can well be conceived. A straw-built cell, with very small accommodation, is what is commonly sufficient, and for which those industrious creatures, in a short space of time, generally repay 10 *per cent.* upon the capital advanced. The pastures from which they gather their rich stores, seem not the least injured; or, in other words they collect and deposit in their cells, and which comes out afterwards either wax or honey (whether by any process of their own, will not, on this occasion, be investigated); a substance, which, if not collected by these industrious creatures, would be a loss never to be regained.

These considerations have induced many to contrive methods to preserve their lives, at the expence of their stores, by collateral and other devices in the application of different boxes. These schemes, seemingly humane, have proved in the issue certainly cruel, as a lingering, instead of a speedy death, must be termed so. Too often a bare subsistence for the winter is collected, and if part of that is plundered, the remainder, after a short subsistence, leaves the legal possessor to famine. There-

* It is in the memory of a person (a), now living, that a family on the borders of the south east part of the county made a complaint, that their bees had not afforded sufficient honey for common use, and that they had been under the necessity of purchasing half a pound of sugar to supply the deficiency in one year.

The surveyor, when a boy, recollects that at the return of the wake (an annual festival, always highly celebrated, by procuring a few superfluities to cheer their friends, who might call upon them), a consultation was held, in a certain family, whether a pound of sugar was to be added to the articles intended to be purchased, which was decided in the negative, and another pound of beef was added to the bill of fare, instead of the pound of sugar.

N. B.—Tea not then introduced.

(a) Mr. Titus Hibbert, Manchester.

fore, if plunder be legal, immediate destruction, by fire or sulphur, is the greatest humanity*.

An accident happening to a hive of bees, belonging to Thomas Dugdale, of Walton, 1794, the honey was taken, and after being cleared from the combs was weighed, which amounted to the astonishing quantity of 18lb. in the space of twenty-one days after swarming.

* Mr. Lowas, a clergyman in this county, is at present employed in devising some means to save the lives of these hitherto devoted and industrious insects; together with some useful experiments and improvements, which, when sufficiently ascertained, will be presented to the public.

CHAPTER XIV.

RURAL ECONOMY.

SECT. I.—*Labour.*

THE price paid for different kinds of labour, varies more in this county, than probably in any other in the kingdom. An ingenious correspondent observes, “that the rate of wages is in proportion to the distance of townships from the seats of manufacturers; *e. g.* at Chorley the wages of a common labourer 3*s.* with ale; at Euxton 2*s.* or 2*s.* 6*d.*; at Ecclestone 1*s.* 6*d.* or 2*s.*; at Mawdsley and Bispham, I am told you may get them in harvest time, for 1*s.* 2*d.* and 1*s.* 4*d.* in Wrightington the price of labour was lower two years ago, than the last mentioned sum, and does not now exceed it.”

Under this head it may not be improper to give the following statement of different prices of labour, &c. at two periods; taken by the surveyor after a residence of thirty years in a village where no manufactory has yet been introduced—namely, *Walton, near Liverpool.*

A comparative Price of Labour, and other Articles, in the course of thirty years, taken April 1791.*

In the year 1761.				In the year 1791.			
£. s. d.				£. s. d.			
Head-man servant wages							
per ann.	-	-	6 10 0	—	9	9	0
Maid servant	-	-	3 0 0	—	4	10	0
Masons and carpenters, per							
day	-	-	0 1 2	—	0	2	2
Labourers wages †	-	-	0 0 10	1s. 6d. 1792,	0	1	8½
Mowing per acre	-	-	0 3 0	—	0	5	0§
Thrashing wheat per score	-	-	0 5 0	—	0	7	6
Barley and beans	-	-	0 2 6	—	0	4	0
Oats	-	-	0 1 8	—	0	2	6
Tailors wages per day and							
food	-	-	0 0 6	—	0	1	2
Thatcher per day	-	-	0 1 0	—	0	2	0
Butcher for killing and cut-							
ting up a pig	-	-	0 0 8	—	0	1	6
Ditto calf, and felling carcase	-	-	0 1 0	—	0	2	6

* At the same time was taken the number of inhabitants, under their various denominations and occupations; number of horses, cows, &c. in each village; quantity of grain grown, &c. a copy of which was lodged in the parish chest (the surveyor being churchwarden that year) in hopes that more ingenious successors in that office might improve upon the hint, and occasionally register peculiar circumstances or events. This was done without knowing that the President of the Board of Agriculture was then engaged in a similar work over the whole kingdom of Scotland; which he understands will be completed in the course of the year 1794.

† The hours in summer should be from six to six, allowing half an hour at breakfast, and one hour at dinner; but the labourer in general now comes, or rather leaves home to go to his work, about seven o'clock in the morning, nor continues his labour till the hour of six, as was the practice 30 years ago—but calculates the time to be taken in his walk home, that he may arrive at the hour of six. In the winter the hours of labour must of course be curtailed, as are yet, in some places, the wages—but this practice, of late, is become less general.

‡ And an attempt to raise them in the spring of 1793 to 2 s. per day; but the calamities, which came on at that period, produced a great change, and every effort was made to procure employment for the industrious.

§ Eight yards to the rod.

In

of LANCASHIRE.

181

In 1761.

In 1791.

Butcher for killing a cow,	£.	s.	d.		£.	s.	d.		
and selling carcase *	-	0	2	0	—	0	5	0	
Price of good cart horses	-	10	0	0	—	25	0	0	
Pair of men's shoes	-	-	0	3	6	the same person	7	s.	
						and advanced the end of that year to	7	s. 6 d.	
Sett of horse-shoes	-	-	0	1	0	—	0	1	8

Carpenters work—price of several particulars used in Agriculture.

In the year 1761.

In the year 1791.

	£.	s.	d.		£.	s.	d.
Large cart 7 feet 3 inches, wheels 5 feet 2 inches high, with flakes, com- plete, twice painted (to the carpenter)	-	-	5	0	0	—	9 4 0
Ringing a pair of wheels	-	0	18	0	—	1	15 0
New axle-tree, and work	-	0	4	0	—	0	6 6
Wheel-barrow, and trundle	0	5	0	—	0	12	0
Plough	-	-	0	7	0	—	0 11 0
Harrow, 3 feet 6 inches	-	0	3	6	—	0	5 6
Pair of homes	-	-	0	0	6	—	0 0 9
Spade shaft	-	-	0	0	4	—	0 0 6
Common five barred gate	0	5	0	—	0	10	0
Ladders, 15 staves, per staff	0	0	4	—	0	0	4
Ditto, from 15 to 30 staves	0	0	0	—	0	0	6
Swipels, stens, and sets for carts	-	-	0	0	2	—	0 0 6
Wheat per bushel	—	—	—	—	0	7	6
Barley	—	—	—	—	0	3	6
Oats	—	—	—	—	0	2	6
Beans	—	—	—	—	0	4	6

* The journeymen butchers in Liverpool, about thirty-three years ago, slaughtered at the following prices: a bull 2 s.; a cow 1 s.; a sow 6 d.; a sheep 1 ½ d.; a calf 3 d.; of the last, about twelve were one day's work; also one score, or two dozen of sheep, were a day's work. The prices are now doubled.

Wheat-

In 1761.

In 1791.

	£.	s.	d.		£.	s.	d.	
Wheat-straw per load	0	5	0	per stone of 20lb.	0	9	3½	
Barley-straw per thrave	-	0	0	2½	—	0	0	6
Oat-straw per thrave	-	0	0	5	—	0	0	9
Butter per lb. from 5d. to 8d.	-	-	-	from 8d. to 1s.	-	-	-	-
* Sweet milk per quart	-	0	0	1	—	0	0	1
Eggs, two and three for 1d.	-	-	-	from 1d. to 2d. per egg.	-	-	-	-
In the winter of 1794	-	-	-	3d. per egg.	-	-	-	-

N. B.—Expended upon the poor from Easter

1760 to Easter 1761	-	-	-	-	22	3	2½
From Easter 1790 to Easter 1791	-	-	-	-	115	14	1

There have been twenty additional houses built in the space of time betwixt 1761 and 1791.

The above statement seems to confirm the opinion of some, "that the poor-rates increase as the price of labour advances;" which in some places, (as appears from the answers given to the agricultural queries) have been as high as nine, eleven, and thirteen shillings in the pound.

Piece Work, or by the Great.

Making new fence, ditch, hedge, bank, seven fods in height, backing, and covering with these fods, planting quicksetts, bearding, from 1s. 6d. to 2s. per rod.

Cutting hedges, opening and scouring the ditches, putting fresh earth to the quicks, from 8d. to 14d. per rod.

Delving or trenching with dung, one spit or spade deep, 10d. to 1s. 3d. two spits 1s. 6d. to 1s. 8d. per rod; digging for peas and beans 6d. and 8d. per rod; double gutters 1½ foot deep, 4½d. to 6d. per rod (of 8 yards); common spade gutters 1½d. to 2d. per rod; feighing two yards deep, or if under, 2½d. to 3d. the solid yard.

Mowing from 3s. to 4s. per statute acre; reaping from 3s. 6d. to 5s. per acre.

* To what cause is the unvaried price of this valuable article to be attributed? It is flattering to the modern improvement of meadow lands, by the growth of various grasses, formerly hardly known, and by the cultivation of this land in general, if this industry and attention may have effected so essential a benefit.

Threshing is done sometimes by the thrave, and sometimes by the bushel—the price generally paid by the piece is about one twentieth of the value of the grain, or one bushel of the grain threshed at every score.

Effects of Piece Work.

In many cases Piece-work is desirable, as it encourages a spirit of dispatch, and, in consequence, proves a source of benefit to an industrious labourer; at the same time it is a temptation to labourers to over-work themselves, which ought to be avoided. Gentlemen who employ a number of workmen together, should be extremely guarded, not only in their choice of men, but also a proper inspector; since wherever one is disposed to loiter, either by telling his story to divert his companions, or by any means cause an intermission of labour, all the company must of course become listeners, and the space of five minutes, in the company of twelve, is equal to the loss of a whole hour's labour of one individual. Nor is this the whole of the evil. Bad examples are contagious. Those who might be formerly industrious, become by slow steps more indolent. The contagion spreads wider, and the evil increases.

SECT. 2.—*Provisions.*

BUTCHERS meat, like other articles in this county, varies in price. It is generally dearest towards the south and south east, many cattle being driven from the northern part to supply those districts; but still, it is there generally more than a penny per pound under the London market-price. Corn, at Liverpool, is always above the London price, nearly one shilling per bushel, as appears by the returns published. In those parts of the county where oat-meal is chiefly used for bread, &c. when enquiry was made after the price of provisions, the first answer was universally the price of oat-meal, the staff of their life.

At Manchester market, October 9, wheat sold that day from 33 to 34s. per load, as it is termed, or sack, of 16 score. Oats 33 to 34s. per load of 9 Winchester bushels. Beans 30s. per load of 5 Winchester bushels. Potatoes 4s. 6d. to 5s. per load of 12 score, 12lb. washed; unwashed, thirteen score.

Fine

Fine flour 36 s.; seconds 34 s.; thirds 26 and 28 s. per 12 score; oat-meal 36 and 37 s. per load, of 12 score.

No barley at this market.

Cheese from thirty to fifty shillings per cwt.

The price of provisions, unless the seasons are very unfavourable, is more likely to fall than to advance, if trade continues to stagnate.

In estimating the prices of meat, due regard should be paid to the qualities of the meat, different values of the different joints of meat of the same quality, and the different seasons of the year—veal being generally cheapest when beef and mutton are the dearest.

In the year 1793, the prices of beef might be from 3 d. to 5 d. per lb.; mutton from 3 d. to 6 d.; and veal from 3 d. to 6 d. per lb.

The writer of this paid the whole of that year $4\frac{1}{2}$ d. per lb. for his meat, all (except lamb) weighed together. The average consumption in his family 100 lbs. weight per week.—The meat was of the very best quality, and of which the top part of the buttock, provincially called a *round*, a shoulder of veal, and hind quarter of mutton, almost universally made three standing joints every week in the year—in the other joints sometimes the butcher and sometimes the purchaser was accommodated.

Whence the Markets are supplied.

The principal fattening districts in this county are from Cloughton to Hornby, a rich pasture there called the Holmes, and from thence through that fertile vale as far as Kirkby Lonsdale*; also some gentlemen's parks, and private inclosures, but the whole of these amount to a mere trifle, compared to the consumption requisite. The deficiency is made up from the counties of Westmoreland, Durham, Yorkshire, Lincolnshire, Derbyshire, and Shropshire; the principality of

* A calculation has been made by two persons, who seem competent for such work, by knowing every farm, its size, and nearly the number of stock kept on each; and their account is 2,000 head of horned cattle, and 5,000 of sheep.

Wales,

Wales, the kingdoms of Ireland and Scotland, are also applied to, to supply the county of Lancaster with beef and mutton. The county itself furnishes a very small proportion of the bread and meat actually consumed there. Nay, the poultry and the pigeons are supplied from distant parts. Besides what comes from the Filde (the only district in the county which, with a few trifling exceptions, has any surplus of stock) the Liverpool market has supplies from Cheshire, Wales, Isle of Man, Scotland, and Ireland. Manchester also receives great supplies from Cheshire, Derbyshire, Lincolnshire, and even Nottinghamshire. Eggs of course must be purchased, and come from the same quarters, and some at a greater distance, packed up in casks. Some come even from Kendal, and Penrith*.

SECT. 3.—*Fuel.*

COALS in general abound, and are cheap, insomuch that a small family may supply itself with fuel for about 30 shillings per annum. No wood consumed, but the refuse of ship-carpenters, and other workers in wood. Peat from the different mosses, is an article of fuel in the vicinity of those places, but seldom without the addition of some coals. Faggots, which were formerly an article of consumption among the bakers of sea-biscuit, and other bread in Liverpool, has for some years been discontinued; coal is preferred, and by experience find it more advantageous. This circumstance is well worthy the attention of other towns, as the faggots require large room, and may be attended with danger.

* Some of the eggs sold at Manchester are packed up with layers of straw between every row of eggs, about ten thousand in one cart. The man brings two carts, and comes every fortnight during the season that a sufficient number can be collected; which is chiefly done by women who travel the country with mugs and other articles, which they exchange for eggs in Cumberland, &c. There are two or more higgles (*qu. eggles*?) who follow this practice, besides the old man who gave the information above, and who was counting them out to the hucksters. Few eggs are broken by the carriage. The man is four days upon the road. It seems the collectors of the eggs are paid 6*d.* per hundred for collection.

CHAPTER XV.

POLITICAL ECONOMY.

SECT. I.—*Roads.*

MR. YATES observes, that there is a greater length of roads in this county, in proportion to its extent, than in any other county in the kingdom, and of so little public utility, that many might be spared; and he also remarks, that if early exertions had been made upon this head, land sufficient in value, might by that means have been obtained, to have kept the whole remaining roads in proper repair.

This opinion may have been too sanguine, and the best opportunity for accomplishing so desirable a work, may have now passed. But, no doubt, much advantage to the county might yet be obtained by proper exertions, if roads, that at present are of little public utility, were stopped, the lands sold, and the cash arising appropriated to support the remainder.

In proof, however, of this assertion, of the vast length of roads in this county: the parish of Goosnargh contains 3703 acres, and the length of the roads in that parish is nearly forty miles, besides three miles of bridle road, and three miles of road repaired by certain individuals.

The township of Walton, near Liverpool, which only contains 1988 statute acres, has a public road two miles and a half in length; parochial roads, eleven miles two furlongs, besides occupation roads.

In the northern and north-eastern parts of the county, materials for making roads are found upon the spot, the limestone, which, when broken, binds together, and makes an excellent road; but in the midland and southern parts, the materials, except what the rivers afford, are brought from the Welsh and Scotch coasts, and at considerable expence.

These are Boulder stones, and they are not broken, but
† paved.

paved. The whole expence of which is from 1*s.* 2*d.* to 2*s.* per square yard, according to the distance of the materials to be carried. Two quarries of pebbles have lately been discovered. Copper scoria or slag, from two works, Ravenhead and Liverpool, have been successfully tried. This article makes an excellent side road to the pavements, and is preferred to pavement both by the horseman and drivers of carriages.

Great exertions have been made of late years, at very considerable expence*, to improve the roads; the effects of which are very apparent, both upon those which are public and parochial.

Pavements are the most expensive, and most disagreeable of all roads, but we have no other material that will stand heavy cartage.

Near Warrington, Mr. Kerfoot, who undertook the management of the Prescot and Manchester turnpikes, has made admirable roads with the copper slag.

Mr. Holt, who is surveyor for one parish, made an attempt with copper slag, but it is difficult to get the slag sufficiently broken.

The town of Liverpool is a great enemy to turnpikes. There are only three toll-gates within eight miles of it, none within four.

Commercial and manufacturing towns have a *system* of throwing every possible burden upon the land.

The toll-bars here, as well as in other parts, from private views and interest, are improperly placed—should they not in each act, be placed in the most advantageous situations for the benefit of the road by strangers, commissioners appointed for that purpose, and private interest totally be laid aside? Most of the great towns have had sufficient interest to place the toll-bars at some miles distance from them. The toll-bar on the road to the south from Liverpool is placed at 5 miles distance from the town. Would it not be a fair clause in the general

* So great, that at the time when Mr. Yates took his survey, about ten years since, the average paid through the county, was not less than eighteen-pence in the pound.

act of parliament, when the inhabitants of a town object to a bar being placed near to the town, that they should engage to keep in repair the road from the town to the bar (which is in general the most expensive part of the whole) without receiving the least benefit from the money collected? The distance the bars are placed from the great towns in this county, is almost the sole cause of the wretched condition of the turnpike roads.

An ingenious road-maker in the neighbourhood of Warrington, has of late exploded the common *convex* form, and adopted that of *one inclined-plane*; the inclination just sufficient to throw off occasional water. By this alteration he finds that a road becomes more durable; for when it is *convex*, all heavy carriages use the center of it, and keep in the same track; therefore the center is soon destroyed, and the sides seldom used: but when a road has only one small inclination, the whole surface is used, for, in this case, you will seldom see two carriages take the same line.

With respect to improvements, an ingenious gentleman observed, that the tolls in general ought either to be raised, or the number of bars increased, in order that the public at large might contribute a proper quota, for their ease in travelling, by the improved state of the road, and the farmer, &c. of course eased; and candour must allow, that the facility, expedition, and security of travelling over the roads, in their present state, is worth more than double the money paid for this convenience. Some method should be devised to ease the labourer, and lay the burthen upon the traveller. The tenant has frequently been charged with an unexpected tax, amounting to 4 or 5s. in the pound, upon a short lease, when a fine has been levied; and though, in the issue, this class receives as great benefit as any other, still some method should be devised to ease those contingent possessors, by more heavily taxing the travelling stranger.

Under this head, the indulgence shewn to the mail coaches in their exemption from tolls, merits reprehension.

In

In the first place, the object is too trifling and mean, for the interference of government. It is also an encroachment upon private property, and upon a capital, the interest of which was expected to be paid upon the credit of certain tolls, with an accumulating surplus, to repair the damage done to the roads by the passing of these carriages—and with the remaining portion, to liquidate the principal advanced to accommodate the public in the execution of these undertakings *. But here is a check upon these spirited endeavours by encroachment. If the price at present paid for the carriage of the mail be not sufficient, it should be increased by an addition taken from the common stock.

But the profit arising to the proprietors of mail coaches is at present great. The surveyor was informed lately of the following statements as proofs of the assertion: The receipts of the mail coach from London to Liverpool, and backward, amounted, in the course of one month, in the spring of the present year, to twelve hundred pounds †. The other statement is—that the profits arising from the length of one stage (10 or 12 miles) were lately sold, and transferred, for the neat sum of three hundred pounds.

As this business is, at present, conducted in a spirited manner, and probably the most expeditious, safe, and neat conveyance in the world, the proprietors and conductors of such public accommodations, ought to have, not only certain, but handsome profits. What is here objected to, is the infringement upon private property. And if these tolls were not allowed, they would be charged at last upon the passenger, upon whom they ought certainly to fall.

But again, the tolls allowed to be taken for this species of carriages, if they were even extended to the mail coaches, are

* Mail coaches prevent much travelling post—consequently injure the toll-bars more ways than one.

† These statements are here given as related to the surveyor, and are not to be depended upon as authenticated facts. When a subject becomes a topic of conversation, there are generally some grounds for the assertions, which should however be received, till fully authenticated, with diffidence.

not sufficient for the damage done by them, in proportion to the rates paid, and the damage done by other carriages to the roads.

The weight of a mail coach, loaded with passengers and parcels, may be near two tons, the heavy coach nearly three tons.

The effects of four horses, scampering and pulling with all their might, are very injurious to the roads; for, after the stones have been nearly displaced by this exertion of the horse-feet (very different to the effect of a road-horse), followed by a heavy carriage, supported and dragged upon four narrow wheels, every obstruction is displaced by the violence of the motion. The slow pace of a waggon, moving upon a nine-inch surface, or a heavy-loaded cart, under two or three tons burden, upon six-inch wheels, makes a comparison strongly in favour of these carriages.

Again, the tolls arising from many turnpikes are very insufficient to maintain the roads. The township of Walton, at the present juncture, is meeting the trustees of the public road, which runs through that district, with not a less sum than four hundred and thirty pounds, besides statute labour, upon a length of two miles and a half; whilst the same township is burdened with other roads of the length of eleven miles two furlongs and a half, as before observed.

All the townships through which this turnpike passes are, at present, contributing their aid, and that to a degree in some places not a little burdensome to both tenant and freeholders; of which the township of Aintree is a strong example*.

The properest roads for this part of the county, particular the neighbourhood of Manchester and Liverpool, and all the coal district, would be roads similar to those of France and Flanders: a pavement in the center, made of large fragments of granite (which might be imported from Scotland, at no

* "The remarks which the surveyor makes on turnpike roads, are worthy the observation of the honourable Board, for they are stubborn facts."

great expence) on each side of this pavement should be a gravel road, of the best material the country could afford, and made of sufficient breadth, and kept in such good repair as to induce all light carriages to prefer it to the pavement in the center: I prevailed upon the surveyor of this township to make an experiment of backing up a high pavement with copper slag (scoriæ) some years ago, and to cover it with the loose sandy rock of the country. It is now the best part of the turnpike.

* In addition to the above, it may be necessary to state that from the vast increase of carriage in this county, and the general use of waggons, carts, &c. with *excessive weights*, it is become almost impossible, by any means, and at any expence, to support the public roads. The climate is wet, the soil soft, the stone and gravel found in the county are not hard or lasting, and the only materials that have strength and durability are the paving stones imported from the coasts of Wales, at the heavy price of six shillings per ton. Some of the turnpike roads in the neighbourhood of Manchester, paved with these stones, cost from £. 1500 to £. 2000 per mile. Fortunately these stones were exempted, in the act of last sessions, from the tax on stone exported, or Lancashire must have been at once reduced to a miserable situation. Yet the obliging the sloops employed in collecting and carrying these paving stones, to take out *coast dispatches and certificates* (as in the case of coal and salt exported coastwise in Scotland) by the delays and expences hereby incurred, adds a very considerable impost on these articles, without any benefit to the revenue; and this hardship is too apparent not to be immediately remedied. The legislature has at all times been wisely provident, not only to authorize and require the making of good roads, (which are unquestionably the first improvements in any country) but also to enact rules for their *preservation*.

The encouragement of broad wheels, or rolling wheels, or carriages so constructed, "*as to enable them to carry great*

• By T. B. Bayley, Esq.

weights,"

weights," was always a doubtful measure. Experience now puts it out of question, that these *heavy weights* soon destroy the best constructed roads, and exhaust all the common materials for their reparation. The turnpike trusts are thus more deeply involved in debts inextricable, or disproportionate tolls are levied to support an injurious system, oppressive to the country, and ruinous even to the carriers and waggoners, who pursue this *mistaken* scheme of business.

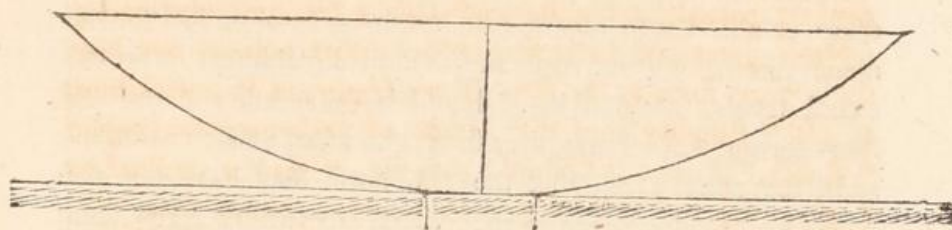
The restraints of weighing machines are found to be expensive, partial, and quite ineffectual; and the only remedy for this great and increasing evil, is that pointed out near thirty years since by the Rev. Henry Homer, of Warwickshire, in his "Enquiry into the Means of preserving the public Roads," printed at Oxford 1767, viz. "*such a construction of carriages as will oblige them to carry LIGHT loads.**"

In support of this scheme of preserving our roads, and of saving an immense sum of money now annually squandered away, there is a vast body of evidence in the excellent volumes of the Statistical Account of Scotland, and the Surveys of Counties, reported to the Hon. Board of Agriculture. These all prove what is stated in the Survey of Cumberland, page 48, that "two horses, yoked in *single* horse carts, will draw as much "as three horses yoked in one cart."

The general use of *single horse* carts would be a vast saving in the number of horses kept for labour, and of hay and corn expended in their maintenance, would be gainful to the carriers, &c. and would preserve the roads, and take off the increasing and oppressive burden of taxes now raised (but ineffectually) for their support. The exemptions from toll, or being weighed, given to carriages employed in *husbandry*, are in most places (especially in the neighbourhood of great towns) very injurious to the roads, and not warranted by any fair analogy of taxation, which ought equally to affect all who are benefited by it, and by what mode soever. The regulation respecting the flat construction of wheels, so as to present an

* See also Mr. Jacob's Treatise on Broad Wheels, &c. (Dilly, 1774) and Annals of Agriculture, vol. xviii. p. 178.

even surface to the road, also of the flat tire and countersunk nails, are ill defined in our general turnpike act, and worse in practice. By the 16th Geo. III. c. 39. sect. 2. it is enacted, "that six inch wheels shall be deemed *flat*, as shall not deviate more than one inch from a flat surface." This figure will shew on how few points of a good road this *flat* wheel will bear, and how more injurious it must be than a common narrow wheel.



The truth is, this *important* subject is little understood, or attended to, and requires a careful revision. This may speedily be hoped for from the exertions of the Board of Agriculture. The act of the last sessions (34th Geo. III. c. 74.) seems to be formed on the old mistaken principle of *fixing* what from situations and times must ever be various and fluctuating, viz. *the price of labour*. Parliament cannot fix its maximum or its minimum. The highest price for composition for a team per day is fixed now at 6*s.* whereas eight or ten shillings per day is paid in many parts of this county for the labour of such team. The better way would be to leave the prices to be annually settled, and published by the magistrates of the several divisions when they appoint surveyors of the highways.

The statute duty, or composition, taken from labourers renting under *five* pounds a year, had better be *wholly* *abrogated*. It is an odious burden, is rarely collected, and with difficulty and expence (in counties like this) not to be conceived.

The relief proposed to these poor people in the fifth section

C c

would

would be attended with so much loss of time and money to them, and so much inconvenience to the surveyors of the highways, that it is plain it *never can* have any operation.

We have generally, during the two last years of distress, omitted to call for the statute duty or composition from this description of inhabitants; and by law to free them from the obligation would, at this season especially, be a just and a *popular* measure, which I earnestly recommend.

With respect to *turnpike roads*, in this, as in other counties, there is not a due regard paid to the general public convenience, in making the roads in the most direct lines, or on the easiest levels. And if there should be a necessity of making short turnings or elbows, they should be at least twice as broad as in the other parts, that the *thill* horse may have not the whole load to draw, whilst the others are turning; and such place should be made level as possible:—but hills of even one furlong in length, are sometimes so steep as to require an additional horse for that short space; and if the road is often to be passed, the additional expence of keeping one horse, one might imagine, need only be pointed out to obtain their removal. There is indeed scarce any part of the kingdom that might not have been laid out, so as to supersede the necessity of using that badge of barbarity a chain to a waggon-wheel. — “ When
“ our descendants shall become more sensible than we seem to
“ be of the advantage of level roads; no expence will perhaps
“ be considered too great, to remove an evil, which nothing but
“ habit could render sufferable *.”

The obligation on *parishes* to repair roads by prescription (see Hawkins’s Pleas of the Crown, part 1st, page 202) wants to be limited by *statute*.

This plan has, under the late great change of circumstances, brought an intolerable burden on the *parish* of Manchester, which includes a great extent of country, and an immense

* Herefordshire Report.

population, to repair ways, hitherto little known or used, but now become *public streets in the town itself*.

I would propose a clause to limit to 30 years back the proof of use and repair by the parish, and to allow parishioners to be competent witnesses on either side.

Amongst the various objects of enquiry, and to which answers have been returned to the Board of Agriculture, there is none of more general importance than the state of the *public roads*. As a measure of *national police*, this has not hitherto been sufficiently attended to by the legislature: the 13th Geo. III. chapter 84, commonly called the *General Turnpike Act*, is very inadequate and greatly mistaken in many of its provisions. The introduction of *turnpikes* into England is of a very late date; they were at first established for the confined limits of local convenience; and have gradually been so multiplied and extended, as to form almost an universal plan of communication through the kingdom, supported by a *public tax* of vast amount.

In this *national* view of the subject, connecting the public convenience and prosperity, and the large sums raised throughout the kingdom to render the general communication easy and certain, it cannot be denied, that the revision of the general law, the adoption of a better system for making roads, is now become necessary; a system founded, *not* on speculations of mere local or private convenience, and as affecting particular towns, districts, or even counties, but on the more extended considerations of general intercourse and common benefit. In fact, we may observe in every part of England the *jobbing trade*, as it respects turnpike roads, very industriously pursued. The old course is generally followed, however circuitous or difficult.

Heavy carriages are still to be dragged over the summits of steep hills, formerly scarcely accessible to the pack-horses of the country, whilst the easy and obvious levels of the adjoining vallies are overlooked. Happy would it be for the country, if all plans, for *turnpike roads* were settled in the manner described by Dr. Anderson in his "*View of the Agriculture of Aberdeenshire*," p. 135.

As turnpike bills have been usually too much considered as *private* bills (though none are of more *public* concern) the committees of the House of Commons have usually done little more than confirm the agreements of the meetings previously held in the country, in which personal and local interests frequently supersede a due consideration of general benefit. The experience which these committees have had on various occasions of this selfish spirit, has produced some very salutary "orders relating to bills for making turnpike roads."

To enable these committees more accurately to judge of the propriety of future application for making new or *amending* *old* turnpike acts, I would suggest another standing rule and order; viz.

"That, together with the estimate of expence, and the account of the money subscribed (as ordered by the 3d rule) there be delivered to the committee an exact plan of the proposed road, on a scale of _____ to a mile, shewing its connection with the neighbouring towns; together with an accurate *section* of the whole line of road."

SECT. 2.—*Canals.*

IN granting new bills for cutting navigable canals, care should be taken by the legislature, that lime or manure be carried upon low terms. The introduction of wealth, in consequence of superior cultivation, by the means of manures, &c. will introduce the carriage of more bulky articles, and soon repay the proprietors the trifling indulgence. A gentleman observed, that, as a certain portion of land was lost to the community, either for tillage or pasture, by cutting canals, care ought to be taken in the banks to preserve as much grass as possible, by burying the rubbish under ground, and applying the best soil to cover the surface of the banks; trifling as such an object may be, as canals are daily increasing, the amount, in the issue, would be something, and would repay to the public a sum sufficient for the general attention requisite.

The many canals already begun, and intended, have had considerable

considerable effects both upon the agriculture, manufactures, and general state of the country *.

The Sankey canal was the first inland navigation in the kingdom, and was opened in the year 1756; after which the Duke of Bridgewater's canal; and then the Leeds canal, as far as Wigan, were completed. The canal from Kendal, through Lancaster, to Westhoughton, is a great undertaking, ten miles of which are already completed. The Bolton canal, already begun, the Rochdale canal intended, with the navigable rivers Mersey, Douglafs, Ribble, Wyre, and Loyne, render the carriage of heavy articles, through the internal parts of the county, more easy and less expensive, than where such channels of conveyance are not found. They have no small effects upon the agriculture of the county, in conveying dung, lime, and other articles, into parts whither, without their assistance, they could hardly have been transmitted; as also upon the manufactures, by the conveyance of coal and raw materials, the gross weight of which would have been too expensive upon carriage by land.

SECT. 3.—Fairs.

IN the year 1780, August 2, a fortnight fair was established at Harrington, near Liverpool, opposite St. James's church, by the north-country graziers, to shew fat cattle and sheep, which was encouraged by the butchers in Liverpool and the neighbourhood. Accommodations for the cattle and sheep were effected by Mr. Samuel Sandys, who then held upwards of forty Cheshire acres of land, which was appropriated to the purpose, and was continued every fortnight until the 12th of February, 1783; when it was removed to Kirkdale, for convenience to the butchers in Liverpool; during which period there were exposed for sale 39,160 sheep, and 8,309 head cattle, and upwards: in the year 1781, at one show, in September, were 1,489 sheep and 279 head cattle; and in October, 1782, at another fair were 1,691 sheep and 343 head cattle, which was thought very con-

* Particulars of what business is done in each, and their connections with the trade of Liverpool, will be given in the intended history of that town.

considerable. After the dissolution of this market, Mr. Sandys had applications from cow-keepers for the land, which was much improved by the pasturage of drovers, sheep, and cattle; also by the quantity of manure which was collected from his stall-feeding thirty head in shades built on the premises, which was declined on removal of the fair; therefore Mr. Sandys proposed finding milk cows, and keeping them at grass or hay for 5*d.* per head per week at his own risk, or keep *their* cows at 4*d.* per week at their risk; and when any cow declined so much as not to pay the farmer, he had a fresh cow found, or an abatement in proportion to her decrease: this mode kept the land in high condition from the quantity of dung collected on the estate, &c.

The old established fairs are not here noticed, since they are published in the usual kalendars of these things.

SECT. 4.—*Weekly Markets.*

THERE are said to be twenty-six market-towns in the county, which are supposed sufficient for the inhabitants, because in every little village or hamlet of houses, there are retailers of the different articles, which are of daily consumption, in great abundance. The two large towns, Manchester and Liverpool, have each two market days every week; but of late years, butchers meat, garden-stuff, and a number of the necessary articles of life, are exposed to sale, and may be purchased any day in the week, Sundays excepted.

SECT. 5. *Commerce.*

THE foreign commerce carried on by the county of Lancaster, is extremely considerable, but its nature and extent does not come within the object of this Report. It is material, however, to collect information respecting that great branch of the trade of the county, which interferes with its agricultural interests, namely, the importation of corn; some idea of the extent of which, may be formed from the following statements of the quantity of corn imported to and exported from Liverpool alone, in the years 1791, 1792, &c.

WHEAT,

WHEAT, FLOUR, &c. imported into Liverpool during the years 1790, 1791, and 1792, from Foreign Parts.

Year.	WHEAT	FLOUR	&c.
1790			
1791			
1792			

WHEAT, FLOUR, &c. imported into Liverpool during the years 1790, 1791, and 1792, from Foreign Parts.																
Year.	WHEAT.		BARLEY.		OATS.		BEANS.		RYE.	PEASE.	Wheat Flour*.		Oatmeal.			
	Qrs.	Bu.	Qrs.	Bu.	Qrs.	Bu.	Qrs.	Bu.	Qrs.	Bu.	Cwt.	Qu.	lb.			
1790	68,260	4	14,404	5	204,154	1	17,492	4	13,288	0	69	6	22,000	2	11	Qrs. Bu. lb. 6,874 7 33
1792	164,311	1	8,213	1	171,591	7	4,467	1	5,520	2	17	1	51,654	0	25½	Bolls. 41,208 5 0
1793	8,369	0	19,489	4	228,737	3	27,821	1	2,576	3	1,287	3	6,489	2	9	Cwt. lb. 9,125 1 8

GRAIN exported coastwise.										
Year.	Wheat.	Barley.	Meal.	Rye.	Oats.	Wheat.	Barley.	Meal.	Rye.	Oats.
1791	31,273	63,305	46,927	2,290	9,667	30,912	6,597	2,942	3,975	12,292
1792	71,236	6,597	35,375	3,456	38,797	5,148	3,052	4,197	3,440	16,078

WHEAT, and other GRAIN, imported into Liverpool, coastwise, in the years 1791 and 1792.									
Year.	Wheat.	Barley.	Meal.	Rye.	Oats.				
1791	31,273	63,305	46,927	2,290	9,667				
1792	71,236	6,597	35,375	3,456	38,797				

* Notwithstanding the quantity of fine flour, both imported, and at present consumed in this county, Robert Winstanley, a miller, now resident in Liverpool, aged about seventy, says, that he remembers the first dressing-mill fitted up in this county, which was at Walton, near Preston; and which, at the time of a scarcity, was threatened to be demolished by the mob, for dressing fine flour to feed the rich (a); and on which occasion the mill was converted to another use, to which it is applied to this day. That afterwards he, with an elder brother, who had learned the art of dressing fine flour, fixed up a dressing machine at Bootle-mills, near Liverpool;

(a) There was more waste then, than there is now; too great a portion of flour being left in the bran: the improvements in this art have since caused it to be more effectually extracted, and that to a degree, as to grind almost the whole of the bran with the flour.

(b) The stone first made use of for grinding fine flour in preference to the grey-quarry stone, was the blue boulders, fawn and cemented together; but this stone acquiring a polish after some usage, was insufficient; afterwards the French stone, a porous, keen, hard stone, was introduced, and has been since used.

This

which was the second mill in the county, where fine flour was ground upon blue stones (b), and afterwards dressed through a cloth. Before this, the flour was dressed, and sifted at home in sieves, after being ground at the mills, and the fine (or London flour as it was then termed) was purchased, on extraordinary occasions, at the grocers shops, made up into pounds, similar to the present mode of making up sugars in blue papers. These facts are confirmed by a letter from Sir H. Hoghton, Bart. to the surveyor, dated Dec. 1, 1793; and that mill was then the property of his uncle, Sir H. Hoghton.

This extract from the Custom-House books, with both the imports and exports, will shew the great consumption of grain in this county, and how inadequate the land, in its present state, is to the supply of its inhabitants.

The exportation of corn is trifling; and, except upon the western borders of Yorkshire, upon the eastern boundaries of Cheshire, and some parts of Derbyshire, the corn imported into Liverpool is chiefly for the consumption of Lancashire.

The average of the Liverpool import of grain
for the last three years is - - - 78,980

The average of the Norfolk export for last three
years is - - - - - 63,046

Liverpool import at £. 1. 4 s. - is 173,211

Norfolk export at - £. 1. 4 s. - is 138,701

34,510 more value

imported into Liverpool, than exported from Norfolk.

There are about 1,500 tons of sea-biscuit manufactured for the different vessels that sail from the port of Liverpool, which is estimated to take about 60,000 bushels of wheat, and to require the labour of about fifty men with boys. This is about the average in the year 1792.

Observations by Major Atherton.

Mr. Kent, in his Report to the Board of Agriculture, having stated that the four Norfolk ports export as much corn as all the rest of the kingdom put together, and having entered into an accurate detail from the Custom-House books, it occurred to me that a comparison between the exported produce of the county of Norfolk and the corn imports of the town of Liverpool might eventually be of some use to the Board, I have therefore taken some pains to obtain intelligence upon this subject; and here lay the result of my inquiries before them. The Liverpool prices were taken from the average prices of one of the first houses in the corn-trade belonging to the port. More difficulties have however arisen than I was at first aware of, and I am confident that it is still extremely defective; such

such as it is, however, it may be the cause of further enquiries from those who are better calculated than myself to examine a matter which is certainly of high importance. The difference of weights and measures produce endless and almost insuperable difficulties in enquiries of this nature.

TABLE of Comparison between the IMPORTS of the Town of *Liverpool* and the EXPORTS of the County of *Norfolk*, on the Average of the Years

1790, 91, and 92.

1790, 1791, and 1792.

Exportation from NORFOLK, according to Mr. KENT's Report.

Importation of LIVERPOOL, according to Mr. HOLT's Report, calculated at Norfolk Prices, from Foreign Parts only.

	£.	s. d.		£.	s. d.
Wheat - 63,046 Quarters, at 44 s. per Quarter	138,701	4 0	Wheat - 80,313 Qrs. - at 44 s. per Quarter	176,688	12 0
Wheat Flour 37,135 Do - at 56 s. per Do -	103,978	0 0	Wheat Flour - 26,714 Cwt. 1 qr. 24 lb. which equal 8,311 qrs. 43 lb. reckoning 45 lb. to a Winchester bushel		
Barley - 360,380 Do - at 24 s. per Do -	432,456	0 0	Barley - 14,035 Qrs. - at 56 s. per Quarter	23,271	3 0
Malt - 90,271 Do - at 42 s. per Do -	180,542	0 0	Oats - 201,494 Qrs. - at 24 s. per Quarter	16,842	0 0
Rye - 14,056 Do - at 25 s. per Do -	17,570	0 0	Rye - 3,128 Do - at 10 s. per Quarter	17,269	2 0
Pease - 13,361 Do - at 28 s. per Do -	18,705	8 0	Beans - 16,593 Do - at 25 s. per Quarter	3,910	0 0
Verches - 15,148 Do - at 24 s. per Do -	18,177	12 0	Pease - 458 Do - at 24 s. per Quarter	19,911	0 0
Beans - 73 Do - at 30 s. per Do -	109	10 0	Oatmeal - 7,111 107 Loads, at 23 s. 3 d. per Load	641	0 0
Rape Seed - 2,423 Do - at 56 s. per Do -	4,361	8 0		8,267	10 9
	914,601	2 0	Total Foreign Importation - £.	420,800	7 9
Deduct 15,389 Qrs. Oats imported more than exported, at 17 s. per Quarter -	13,079	13 0			
Total neat Exports -	901,521	9 0	Balance of Grain imported Coastwise, after deducting the whole Exports of the Port,		
Deduct not brought into Liverpool Account,			Wheat - 33,224 1/2 Qrs. - at 44 s. per Qr. -	73,093	18 0
Malt - 180,542 0 0			Barley - 30,125 Qrs. - at 24 s. per Do -	36,150	0 0
Verches - 109 10 0	185,012	18 0	Oats - 10,047 Qrs. - at 17 s. per Do -	8,539	19 0
Rape Seed - 4,361 8 0			Wheat Flour 37,581 Qrs. 4 Bushels - at 56 s. per Do -	104,728	4 0
	£. 185,012	18 0		222,512	1 0
Liverpool Import -	716,508	11 0	Foreign Importation, as above -	420,800	7 9
Balance in favour of Norfolk Exportation - £.	643,312	8 9		643,312	8 9
	73,196	2 3			

643,112 8 9
 73,196 2 3
 643,112 8 9

SECOND TABLE of Comparison between the IMPORTS of the Town of *Liverpool* and the EXPORTS of the County of *Norfolk*.

Exportation of the County of **NORFOLK**, according to Mr.
 KENT's Report,
 On the Average of the Years 1790, 91, and 92.

	£.	s.	d.
Wheat - - 63,046 Quarters, at 44 s. per Quarter	138,701	4	0
Wheat Flour - 37,135 Quarters, at 56 s. per D ^o	103,478	0	0
Barley - - 360,380 Quarters, at 24 s. per D ^o	432,456	0	0
Malt - - 90,271 Quarters, at 42 s. per D ^o	180,542	0	0
Rye - - 14,056 Quarters, at 25 s. per D ^o	17,570	0	0
Peas - - 13,361 Quarters, at 28 s. per D ^o	18,705	8	0
Beans - - 15,148 Quarters, at 24 s. per D ^o	18,177	12	0
Vetches - - 73 Quarters, at 30 s. per D ^o	109	10	0
Rape Seed - 2,423 Quarters, at 36 s. per D ^o	4,361	8	0
	914,601	2	0
Deduct 15,389 Quarters of Oats imported more than exported, at 17 s. per Quarter	13,079	13	0
	901,521	9	0
Deduct Malt - - 180,542 0 0 } Not brought in			
Vetches - 109 10 0 } Liverpool ac-	185,012	18	0
Rape Seed - 4,361 8 0 } count - - -			
	716,508	11	0
£. 185,012 18 0			

Importation of **LIVERPOOL**, according to Mr. HOLT's Report,
 valued at Liverpool Prices,
 On Average of the Years 1790, 91, and 92, from Foreign Parts only.

	£.	s.	d.
Wheat - - 80,313 Quarters equal 523,181 Bushels of 70 each, at 7 s. 2 d. reckoning 57 lb. to a Winchester Bushel	187,473	9	8
Wheat Flour - 26,714 Cwt. 1 qr. 24 lb. at 38 s. 6 d. per pack of 280 lb. or 16 s. 6 d. per Cwt.	20,568	15	5 $\frac{1}{2}$
Barley - - 14,035 Quarters, at 32 s. per Quarter	22,456	0	0
Oats - - 201,494 Quarters, at 18 s. per Quarter	181,344	12	0
Beans - - 16,593 Quarters, at 33 s. per Quarter	27,447	18	9
Rye - - 3,128 Quarters, at 32 s. 4 d. per Q ^r .	5,056	18	8
Peas - - 458 Quarters, at 42 s. per Quarter	961	16	0
Oatmeal - - 7,111 $\frac{1}{2}$ 0 6 - - at 25 s. 4 d. per Load of 5 Bushels	9,007	17	0
Balance imported Coastwise more than exported.	454,317	0	6 $\frac{1}{2}$
Wheat - - 33,224 Quarters equal 216,433 $\frac{1}{2}$ 0 2 70 lb. at 7 s. 2 d.	77,555	9	7
Barley - - 30,125 Quarters, at 32 s. per Quarter	48,200	0	0
Oats - - 10,047 Quarters, at 18 s. per Quarter	9,042	6	0
Wheat Flour - 37,581 Quarters, 4 Bushels, at £. 3. 1s. 7d. per Quarter of 44 lb.	115,719	14	0 $\frac{1}{2}$
Total neat Import	704,834	10	2 $\frac{1}{4}$

I have many powerful reasons to believe that the account of the corn, &c. imported into Liverpool, as stated in the first report, is erroneous, that the importations are much greater, and, at any rate, that it is extremely defective. The article malt is entirely omitted; now in the year 1794, from the 1st of January to the 28th of April, say four months, there were imported at Liverpool coastwise, 9,070 qrs. 7 bushels, or 72,567 bushels Winchester. In the same four months were imported 105,726 bushels of barley, and 46,072 bushels of big, coastwise; and 44,635 bushels of barley, from 5th January to 5th April 1794.

In the week ending March 12th 1795, Liverpool imported from Ireland only 45,627 quarters of oats, besides 1,699 quarters from English and Scotch ports. In all,

47,326 Quarters	-	-	-	at 20 s.	-	£. 47,326	0	0
				at present price - 24 s.	-	£. 56,791	4	0

Imports of the town of Liverpool at Liverpool prices	-	£. 704,834	10	2
Do - - - - - at Norfolk prices	-	643,312	8	9

Superior value at market or profit to corn-dealers, after deducting freight, insurance, interest, &c. &c.	-	-	£. 61,522	1	5
---	---	---	-----------	---	---

Norfolk exports annually,

Wheat	-	63,046 Quarters, at 44 s.	-	-	£. 138,701	4	0
Wheat Flour	-	37,135 Quarters, at 56 s.	-	-	103,978	0	0
Beans	-	15,148 Quarters, at 24 s.	-	-	18,187	12	0
In all	-	115,329 Quarters	-	-	£. 250,856	12	0

Liverpool imports annually,

Wheat, Foreign	80,313 Quarters,	-	at 57 s. 4 d.	£. 187,473	9	8
Wheat Flour, Do	26,714	1	14 at 38 s. 6 d.			
per peck	-	-	-	20,568	15	5½
Wheat - - - Coastwise	33,224 Quarters, at 57 s. 4 d.	-	-	77,555	9	7
Wheat Flour, Do	37,581	4,	at £. 3. 1 s. 7 d.			
per Quarter	-	-	-	115,719	14	0½
Beans	16,593 Quarters, at	-	-	27,447	11	9
				£. 428,765	0	6

It

It appears from hence that there is a market in beans and wheat alone to the annual value of £.428,765. 0s. 6d. more than the entire district produces, and for nearly £.177,908. 8s. 6d. more than the whole county of Norfolk exports.

Is this, or is it not, an argument for converting the unprofitable grass land of this county (of which, I am sorry to say, the quantity is immense) into good cultivation?—Is it a reason for marling?—Will it pay for manure and tillage?

Beans, managed in the Kentish manner (see Ann. Agr. vol. ii. p. 70, &c.) are amongst the best of preparations for wheat. Few or none are grown in Lancashire and Cheshire, and those few universally broadcast.

At this moment, wheat is selling at Liverpool and at Warrington for 10s. and 10s. 6d. per bushel, of 70 lb. The common preparation for wheat in this district is a summer fallow, even upon light sands.

For clover the sale is ready, and the consumption profitable; and it ought to precede wheat upon all barley lands.

No county can produce better barley, or in larger quantities, when properly cultivated. It always fetches a fair price, being not only used for malting, but made into bread, either by itself, or mixed with wheat.—The great mistake of this district is, sowing it too late, and sowing it after wheat.

There is no better or surer land for turnips in England than in this county; and there is every where a good market for them, where it is not convenient to eat them off the land with sheep.

Marle and manure are every where to be had in great abundance.

The material obstacles to improvement are tythes, poor rates, and the immoderate wages to be obtained at the manufactories.

A quarter of wheat-flour in Norfolk, weighing 448 lb.
is worth - - - - - £.2 16 0

At

At Liverpool the same weight and quantity may average - - - - - £. 3 1 7
2 16 0

Superior value at Liverpool - 0 5 7
or per bushel, nearly - 0 0 8½

Say 7 *d.* per bushel wheat, equals 8½ *d.* flour; and say 32 bushels, of 70 lb. each, is an average crop upon a statute acre; the superiority of market is, per acre, then £. 0 18 8

Double it, per Cheshire acre - 0 18 8

Advantage per Cheshire acre - £. 1 17 4

At five quarters per acre, it is - £. 2 6 8

There are vast tracts of land in this county, rented at less than 40 shillings per Cheshire acre, capable of producing the above quantity. This country then has three powerful incentives to improvement,

Manure, Manure, and Markets.

I have heard it confidently asserted that this district (the counties of Lancaster and Chester) do not supply the consumption for more than six weeks in the year, and that the county of Lancaster in particular, does not grow more grain than would feed or be consumed in it in two weeks.

I am sensible of the great imperfection of many of the above statements; and possibly there may be many notorious errors in the calculations: I hope, however, the subject will be taken up by some person whose talents are equal to the task.

Such are Major Atherton's intelligent remarks on the table inserted in the original report; but that the best authority might be gained, application has been made by the Board to the Inspector General for an account of three years, which is also inserted, and in addition to it the value, at the Liverpool prices.

An AC

Wheat	.
D ^o Flour	.
Barley	.
Beans	.
Oats	.
Oatmeal	.
Pease	.
Rye	.
D ^o Flour	.
Indian Corn	.
Foreign Wheat	} Warehouse.
D ^o W. Flour	
D ^o Beans	
D ^o Oats	
D ^o Pease	
D ^o Rye	}
British Malt	

An ACCOUNT of the EXPORT and IMPORT of all Sorts of CORN and FLOUR, Foreign and Coastways, at the Port of *Liverpool*, in the following Years.

	1791.				1792.				1793.				1794.			
	FOREIGN PARTS.		COASTWAYS.		FOREIGN PARTS.		COASTWAYS.		FOREIGN PARTS.		COASTWAYS.		FOREIGN PARTS.		COASTWAYS.	
	Imported.	Exported.	Brought in.	Carried out.	Imported.	Exported.	Brought in.	Carried out.	Imported.	Exported.	Brought in.	Carried out.	Imported.	Exported.	Brought in.	Carried out.
Wheat	Qrs. 150,311 0 Cwt. qr. lb. 45,834 3 5	Bo. 2,147 0 0 Cwt. qr. lb. 15 0	31,273 0	9,192 0	8,137 4 Cwt. qr. lb. 6,489 2 9	3 0 Cwt. qr. lb. 4,283 0 14	71,236 0	5,148 0	96,149 7 Cwt. qr. lb. 33,468 3 5	—	16,462 0	13,013 0	122,212 2 Cwt. qr. lb. 511 2 26	—	5,499 0	11,020 0
D ^o Flour	—	—	—	—	—	—	—	—	4,693 3 11	—	—	—	15,439 2	—	14,124 0	6,275 0
Barley	9,947 6	15 0	18,300 0	9,597 0	19,250 0	27 3	23,308 0	3,052 0	10,385 4	—	37,115 0	3,424 0	17,123 5	461 0	—	—
Beans	4,137 0	87 0	—	—	28,607 7	94 0	—	—	6,045 7	28 0	—	—	—	—	—	—
Oats	170,930 0	322 4	9,670 0	12,273 0	239,008 3 Bolls. lb. 7,509 36	392 0	7,719 0	21,050 0	127,230 5 Bolls. lb. 6,001 13	133 0	3,623 0	8,610 0	228,647 4 Bolls. lb. 2,611 19	150 0	9,491 0	2,459 0
Oatmeal	771 7	302 0	—	—	1,547 6	41 1	—	—	484 6	1 5	—	—	3,041 5	7 0	—	—
Pease	72 3	34 0	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rye	6,975 2 Cwt. qr. lb. 338 3 21	—	—	3,075 0	2,576 3	—	16 0	3,416 0	9,946 2	—	—	7,136 0	2,273 2	—	17 0	3,361 0
D ^o Flour	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Indian Corn	329 0	—	—	—	5,095 0	—	—	—	—	—	—	—	—	—	—	—
Foreign Wheat	—	2,477 6 Cwt. qr. lb. 4,724 0 1	—	—	—	2,662 3 Cwt. qr. lb. 8,523 0 26	—	—	—	2,315 0 Cwt. qr. lb. 4,630 3 9	—	—	—	22,184 7	—	—
D ^o W. Flour	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
D ^o Beans	—	204 4	—	—	—	459 2	—	—	—	44 4	—	—	—	—	—	—
D ^o Oats	—	—	—	—	—	2,159 4	—	—	—	—	—	—	—	25 1	—	—
D ^o Pease	—	—	—	—	—	436 4	—	—	—	43 6	—	—	—	—	—	—
D ^o Rye	—	—	—	—	—	2,076 6	—	—	—	955 1	—	—	—	—	—	—
British Malt	—	—	43,237 0	2,042 0	—	—	45,975 0	1,197 0	—	—	26,632 0	130 0	—	—	21,533 0	130 0

Inspector General's Office,
Customs House, Liverpool,
June 28th 1795.

THOMAS IRVING,
Inspector General.

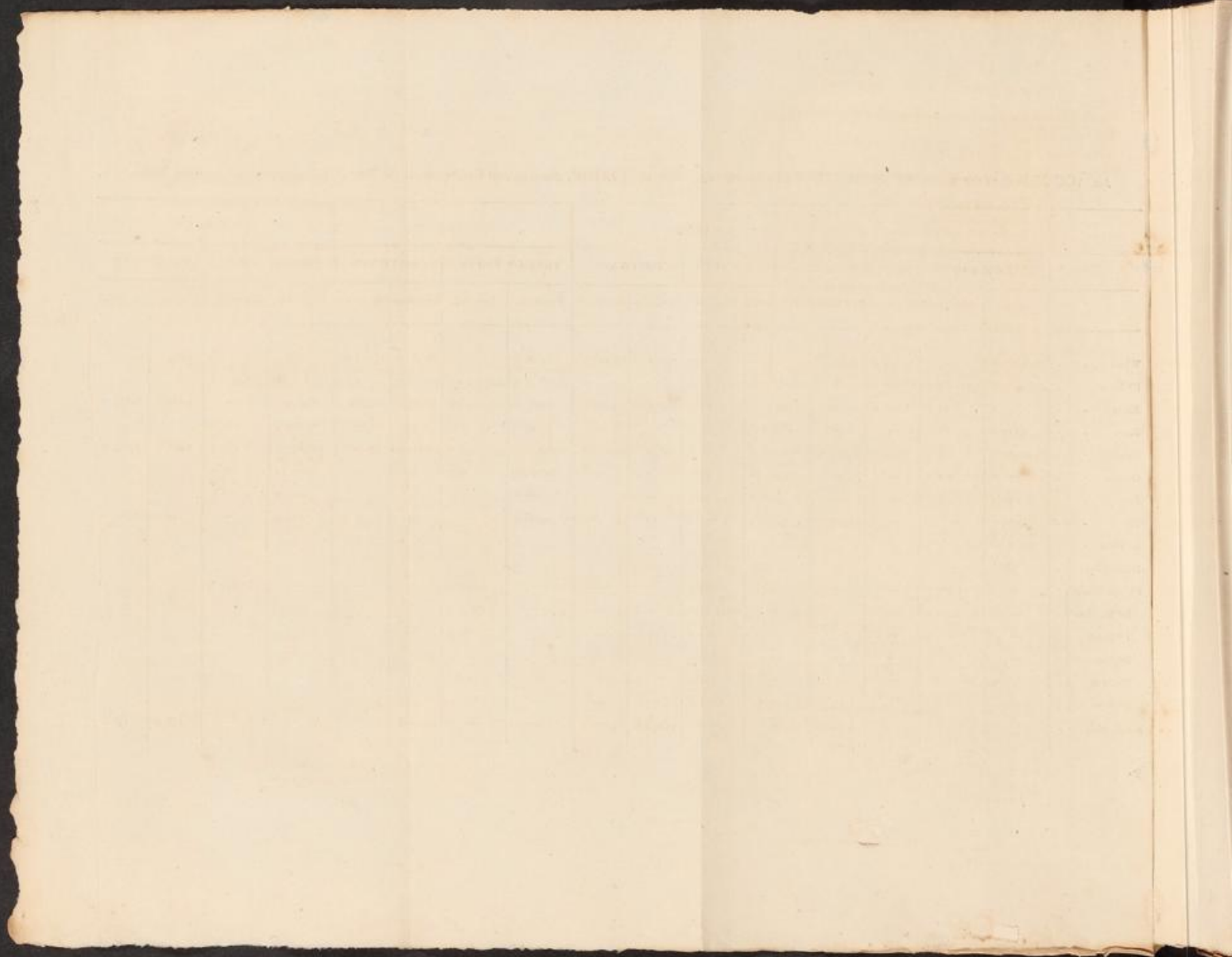
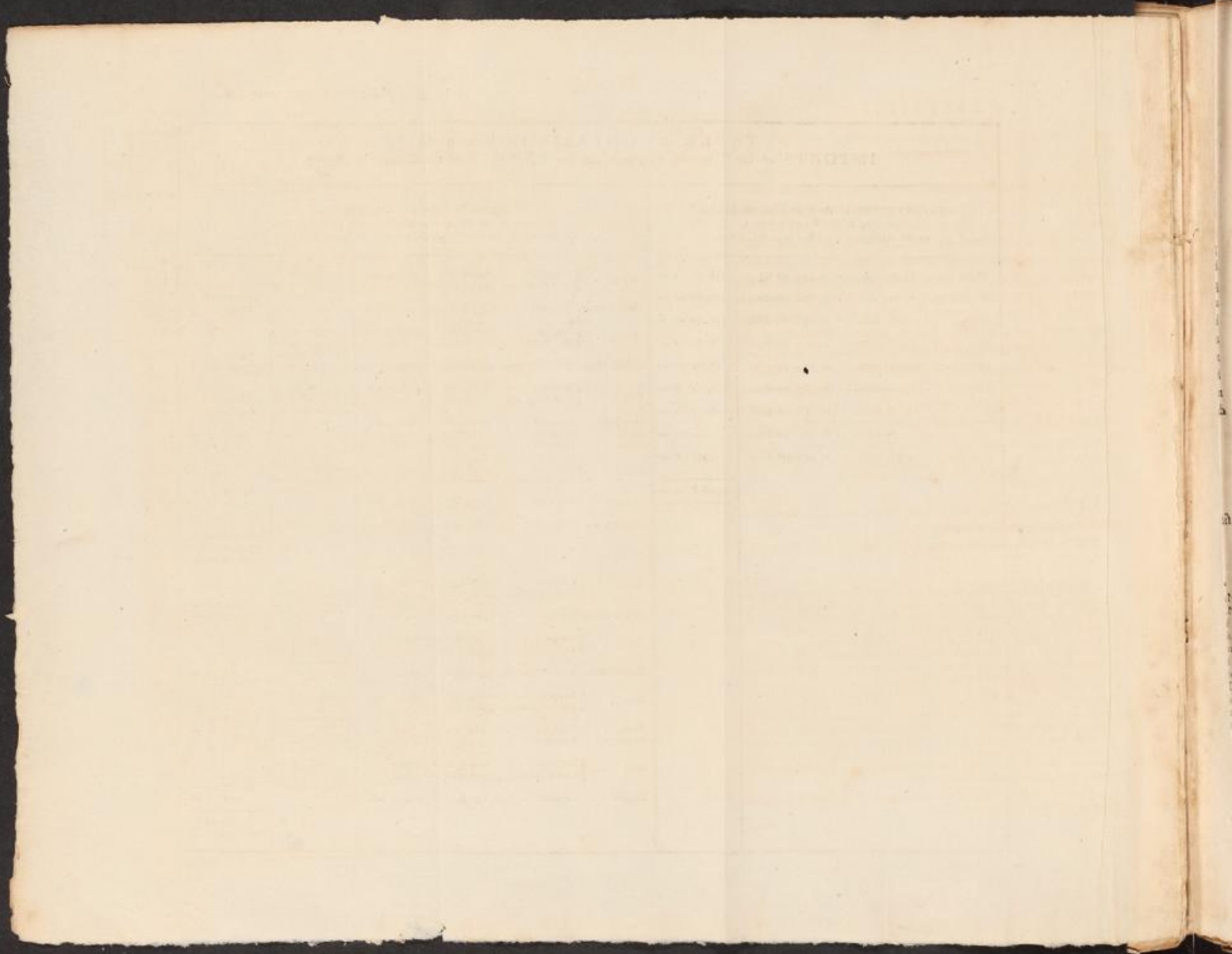


TABLE of COMPARISON between the
IMPORTS of the Town of *Liverpool*, and the EXPORTS of the County of *Norfolk*.

EXPORTATION of the County of NORFOLK, according to Mr. KANT's Report, on the Average of the Years 1790, 91, and 92.			IMPORTATION into LIVERPOOL, according to the Account furnished from the Custom House, for the Average of the Years 1791, 92, and 93; and valued at <i>Liverpool</i> Prices.		
	£.	s. d.		£.	s. d.
Wheat - 63,046 Qrs. - at 44 s. per Qr.	138,701	4 —	Wheat - { Imported - 24,866 Qrs. - at 57 s. 4 d. Bro ^d Coalways, 39,657 ditto - ditto	241,282 10 8 113,683 8 —	356,965 18 8 23,592 10 6
Wheat Flour - 37,135 ditto. - at 56 s. per ditto.	103,978	— —	Wheat Flour, Imported - 28,557 Cwt. - at 16 s. 6 d.	— —	— —
Barley - 360,380 ditto. - at 24 s. per ditto.	432,456	— —	Barley - { Imported - 13,194 Qrs. - at 32 s. Bro ^d Coalways, 26,308 ditto - ditto	21,110 8 — 42,092 16 —	61,203 4 — 81,380 16 —
Malt - 90,771 ditto. - at 42 s. per ditto.	189,569	2 —	British Malt, Bro ^d Coalways, 38,848 Qrs. - at 42 s.	— —	— —
Rye - 14,056 ditto. - at 25 s. per ditto.	17,570	— —	Rye - { Imported - 6,499 Qrs. - at 32 s. 4 d. Bro ^d Coalways, 5 ditto - ditto	10,566 14 4 8 1 8	10,514 16 — 181 13 8
Pease - 13,361 ditto. - at 28 s. per ditto.	18,705	8 —	Rye Flour, Imported - 113 Cwt. - at 30 s. 4 d.	— —	— —
Beans - 15,148 ditto. - at 24 s. per ditto.	18,177	12 —	Pease - Imported - 701 Qrs. - at 42 s.	— —	— —
Vetches - 73 ditto. - at 30 s. per ditto.	100	10 —	Beans - Imported - 12,930 Qrs. - at 33 s.	— —	21,334 10 —
Rape Seed - 2,423 ditto. - at 36 s. per ditto.	4,361	8 —	Oats - { Imported - 179,056 Qrs. - at 18 s. Bro ^d Coalways, 7,004 ditto - ditto	161,150 8 — 6,503 12 —	167,654 — — 5,009 17 —
	923,628	4 —	Oatmeal - Imported - 2,474 Qrs. - at 40 s. 6 d.	— —	— —
			Indian Corn, Imported - 1,808 Qrs.	— —	— —
				£.	73,1310 7 10
			Wheat - { Exported - 2,487 Qrs. - at 57 s. 4 d. Car ^d Coalways, 9,217 ditto - ditto	71,129 8 — 26,135 8 —	33,264 16 — 7,083 9 —
			Wheat Flour, Exported - 8,586 Cwt. - at 16 s. 6 d.	— —	— —
			Barley - { Exported - 14 Qrs. - at 32 s. Car ^d Coalways, 5,357 ditto - ditto	22 8 — 8,571 4 —	8,593 12 — 2,988 6 —
			British Malt, Car ^d Coalways, 1,423 Qrs. - at 42 s.	— —	— —
			Rye - { Exported - 1,000 Qrs. - at 30 s. 4 d. Car ^d Coalways, 4,876 ditto - ditto	1,632 16 8 7,882 17 4	9,515 14 — 390 12 —
			Pease - Exported - 186 Qrs. - at 42 s.	— —	503 5 —
			Beans - Exported - 305 Qrs. - at 33 s.	— —	— —
			Oats - { Exported - 676 Qrs. - at 18 s. Car ^d Coalways, 13,977 ditto - ditto	608 8 — 12,579 0 —	13,157 16 — 263 5 —
			Oatmeal - Exported - 130 Qrs. - at 40 s. 6 d.	— —	— —
				£.	75,750 13 —



Three acres of wheat straw have been sold for the enormous sum of six guineas the acre of large measure by Mr. Harper.

The improved mode of cultivating potatoes has reduced their price of late years, notwithstanding the consumption by cattle has been so great. The laws admitting importation of grain prevent the farmer gaining an advance of price when there is a failure of crop; and the value of corn is, by this means, kept within some bounds. But the methods sometimes taken, as is said, on the opening and shutting the ports, stand in great need of regulation. The only advantage the farmer reaps, is, from additional quantity, never from advanced price; which is not the case in regard to hops, or sugar, or other articles produced by the soil, either at home, or in our colonies.

SECT. 6.—*Of Manufactures.*

MANUFACTURES have been carried on to a very considerable extent in Lancashire.

The cotton *, silk, and wool †, through all their branches,

* The first piece of cotton, manufactured from British growth, was at Manchester, from cotton grown in the grounds of J. Blackburne, Esq. M. P. of Orford, in Lancashire; seven yards and a half, of one yard and a half yard-wide muslin, from four ounces of raw material, raised I suppose in a hot-house. It was a most beautiful piece of cloth, proposed to have been made up into a dress, for Mrs. Blackburne, in which she intended to have appeared at Court, June 4, 1793; but was prevented by a change of dress, occasioned by the loss of a relation.

To what a degree of perfection the muslin manufactory is arrived, the following may serve to convey some idea. In the year 1791, a single pound of cotton was spun to a fineness of ninety-seven post miles in length: the muslin, after being spun, was sent to Glasgow, to be wrought, and after which was presented to her Majesty. The pound of cotton, which, in its raw state cost 7 s. 6 d. cost the sum of 22 l. in this stage, when it was wrought into yarn only. It was spun by one Lomax, at Manchester, upon the machinery called mules.

† Woollens have of late been manufactured without either spinning or weaving, and after the manner of hats.

†

from

from the raw material; and these leading articles include a number of subordinate branches or trades; *e. g.* spinners, bleachers, weavers, dyers, printers, and tool-makers for the different artists, which, if separately enumerated, would in the aggregate extend to an amazing amount.

There are also manufactories of hats*, stockings, pins, needles, nails, small wares, tobacco and tobacco-pipes, snuff, earthen-ware, English porcelain; clocks and watches, and tools for the artists in these two branches, not only for the neighbourhood but for all the world; long bows, steel bows, paper, &c.

There are large works for the smelting of iron and copper †, of casting plate-glass, and the fabrication of blown glass; the process of making white lead, lamp-black, vitriolic acid, and fossil alkali, the refining of sugar, &c.

The several modes of accelerating labour have been always stoutly resisted by the labouring class, when the different machinery was first introduced; but the issue has hitherto proved a source, from which not only employment, but the price of labour has increased, notwithstanding that labour has been so much abridged.

* A patent has been obtained, and a work established, to manufacture hats, by machinery; moved by water.

† The consumption of coal at Ravenhead is, seven hundred tons per week; and however destructive the smoke may be to vegetable life, it seems more favourable to animal; since, in the space of fourteen years, notwithstanding between two and three hundred people are constantly employed in the copper-works there, belonging to the Paris Mine Company, not one person, employed in the works, has died. One reason, why persons in large manufactories in Lancashire, do not as frequently die in great numbers as in other counties, is that they have (in general) been *inoculated* in their infancy.

Inoculation is the most effectual of all expedients for preserving the short-lived race of man—many gentlemen pay for the inoculation of the children of the poor in their own neighbourhood.

Saddleworth,

Saddleworth, which borders upon the county, and which formerly only wrought coarse woollens, has gained lately, and now works, the fine western woollen cloths.

A large manufactory for the fabrication of fancy goods, has lately been established at Tildesley, by Thomas Johnson, Esq; where a village has been built since the year 1780, which had then only two farm-houses and nine cottages; has, in 1793, 162 houses, and a new chapel erected. The village contains nine hundred and seventy-six inhabitants, which employ three hundred and twenty-five looms.

Manchester being the principal repository for these manufactures, has become the great center, to which not only the country retailers, but merchants, from all quarters of the kingdom, and foreign parts, resort; and this has induced several capital woollen houses to settle at that town; and this mart is chiefly confined to one street, in which a single room frequently lets very high.

The trades and different occupations upon which the maritime state depends, have not, on this occasion, been noticed; because they are the same in all counties where navigation is carried on*.

The good or bad effects which manufactures may have had upon agriculture, is an important question, which merits much attention; the answers to which, in some letters, have been concise, and discharged by one single word, *e. g.* one answer has been "advantageous;" another answer "injurious;" but without either argument or proofs to support these laconic assertions.

The more extensive answers, however, shall be faithfully stated.

Manufactures have wrought a change in the agriculture of the county; the growth of grain is annually and gradually on the decrease. The importation from foreign countries is, of course, upon the advance; the diminished state of cultiva-

* A sketch of some of which will be given in the intended History of Liverpool.

tion is one cause of this, and the increasing population is another; and by the joint operation of these two, the importation of grain and flour, used chiefly in this county, is almost incredible. To prove which, the surveyor has been favoured with extracts from the custom-house books, faithfully, and with no small trouble, collected for this occasion, by Mr. Yates.

The advance of wages, and the preference given to the manufacturing employment, by labourers in general, where they may work by the piece, and under cover, have induced many to forsake the spade for the shuttle, and have embarrassed the farmers, by the scarcity of workmen, and of course advanced the price of labour.

The poor rates fall, with equal burden, upon the farmer, as upon the master manufacturer; and the manufacturers encourage settlers, and consequently increase the number of paupers.

The water is sometimes so damaged by dye-houses, and other works, erected upon rivers, as to be rendered not wholesome to the cattle, and destructive to fish. The heat necessary for the business of printing debilitates the strongest constitutions.—Damps from obstructed water;—pestilential air from crowded rooms;—effluvia from acids and different preparations;—down from cotton; all operate as pestilences to the human constitution.

On the other hand, the advantages that have been held forth, have been an increase of population; as that which constitutes the riches and strength of a country.

Increase of the value of lands, and also of provisions. The farmer particularly has an advance on the price of his cheese, his butter, his fatted cattle, his milk; also straw, which, in 1790, sold at the advanced price of 8*d.* per stone in the spring at Liverpool; dearer, probably, than ever was known, even in the London market. Hay is little dearer than thirty years ago, except on extraordinary occasions;—hay is, at present, about 8½*d.* per stone, owing to a slight crop;—thirty years ago 6*d.* per stone.

Capitals, labour, ingenuity, and attention are in this county diverted from agriculture §. It is much to be lamented that the Board of Agriculture have not employed some persons of extraordinary talents and superior industry, to examine, in the different manufacturing districts, the actual effects of manufactures upon agriculture *. This county, as Mr. Young himself observes in his most valuable reflections upon this subject, subjoined to his Tour into France, carries on manufactures to a greater extent than any other county in the kingdom, and is at the same time nearly the worst cultivated.

By way of illustrating this remark, which is equally true and important, let us examine the chief articles of cultivation, and the method of management adopted in this great manufacturing and commercial county, where the land is capable of producing every vegetable and every grain in great perfection and abundance :

Beans and Peas.—As preparation for wheat, seldom.—Always broadcast.—Hoed by horse or hand, never.

* The following are the observations of a practical farmer upon this important subject.—“ From various circumstances it evidently appears, that trade is injurious to agriculture, and in the end to landed property, unless it could be restricted ; for whenever a stagnation in trade happens, the poor rates rise, and the land pays for it. Poor rates and other taxes in West Houghton have amounted this year to 16 s. in the pound. Corn is not so much grown, for though the farmer can get in his grain, he cannot raise hands but at an enormous price to reap it : if mowing corn were more practised, it would be better.”

Another farmer says, “ Never enquire about the cultivation of land, or its produce, within ten or twelve miles of Manchester ; the people know nothing about it : speak of spinning-jennies, and mules, and carding machines, they will talk for days with you.

“ There are people about Ashton that give £. 6 for a summer's grafs for horses to work carding engines, and will give from £. 12 to £. 15 for hay and after-grafs, that they may not be troubled with cultivating land to hinder them, as they say. If land were attended to, and improved, for ten to fifteen miles round Manchester, as it is in Derbyshire, the lower parts of Yorkshire, Nottinghamshire, &c. it would be as productive as any land in any part of England ; for it all inclines to marle, and is naturally a strong soil, not only fit to carry manure of any kind, but hold it for a sufficient time.

Cabbages.—Plentiful and abundant, and luxurious in gardens; but as an arable crop in fields, unknown.

Turnips.—Never hoed.—Never fed off upon the land with sheep.

Vetches.—Winter vetches unknown.—Summer ones sown when the land will produce nothing else; not eat green, but made into hay.

Fallows.—Seldom ploughed before winter, but kept to starve horses and young cattle.—Green, with couch-grass, in June.

Oats.—Sown perpetually upon the same land, consequently deficient in quantity and quality.

Barley.—Sown in May and June.—Never weeded.

Wheat.—Universally fallowed for, even upon light sands.—Upon clover lay, seldom if ever.—After beans, never.—The bean-stubble is too weedy.—Never weeded or hoed. Though the land is every where admirably adapted to the cultivation of wheat, not a hundredth part grown that ought to be, that the poorer class of people from Lancaster to Preston, Chorley, Blackburne, &c. &c. seldom taste wheat, though they inhabit as good wheat lands as any in the kingdom.

In the vicinity of Manchester, Wigan, Warrington, Orm-kirk, Prescot, and Liverpool, there are many large tracts, to which the above assertions will not apply; and every where there are interspersed both professional men, and gentlemen whose management is correctly just:—I speak of the generality of the county.

There are many just observations upon this subject in Mr. Campbell's Account of the Fille, "the Granary of Lancashire," printed in Ann. Agr. vol. xx. p. 109; they merit general attention, and have more justice than superficial observers would allow.—There needs little to prove the importance of manufactories in a national view; and their effect upon agriculture, theoretically speaking, seem immense, in as much as they form the best and most certain markets:—But, practically speaking, they are baneful to agriculture.

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The immediate wages to be obtained in the manufactories rob agriculture of its most valuable supporters;—the yeoman and the labourer are both tempted from the plough;—all competition is precluded.—Who will work for 1 s. 6 d. or 2 s. a day at a ditch, when he can get 3 s. 6 d. or 5 s. a day in a cotton work, and be drunk four days out of seven?—But their most destructive effect are the increase of the poor rates. In winter many hands are turned out of employment, who must be supported by parish rates; the labourer at cotton must, when sick or ill or aged, be supported by taxes levied upon agriculture. — Manufactories encourage settlers of all descriptions.—Above 5,000 Irish were settled at Manchester in the year 1787, and I am told that number was afterwards doubled.—The poor laws in this circumstance are extremely defective.—The law decrees, “that if any person who shall
“ come to inhabit in any town or parish, shall be charged with
“ and pay his share towards the public taxes or levies of the
“ said town, he shall be adjudged to have a legal settlement
“ in the same, though no notice in writing shall be delivered
“ and published.” (See *Burn's Justice*.)—By way of a commentary upon this law, there is a manufacturer at this time at Preston, who has refused to pay his parish rates and taxes, unless they are lowered.

Another evil arising from manufactories is, the propagation of vice, insubordination, and diseases.—What else can arise from the multitude of people of all descriptions pent up in printing-houses, from which it is necessary to exclude all exterior air, and to keep up an artificial heat, which must of course debilitate the strongest constitutions?—Add to this, effluvia from acids, paints, minerals, and charcoal.

In the neighbourhood of Bolton, bleaching of the very best quality in the kingdom is performed; and of late has been introduced by M. Vallete (an ingenious Frenchman) a more expeditious method of bleaching, so much that a piece of calico which would have required by the customary process three weeks in the most favourable season, may now be rendered perfectly white in the space of one hour, and that, as it is said,
without

without the least injury sustained by the cloth. The new process, is somewhat more expensive than the old. And there is as much ingenuity displayed amongst the artificers in Bolton, and its neighbourhood, as in any part of the county. Bolton has been long celebrated.

“ Bolton upon Moore market stondith most by cottons and cawse yorne. Divers villages in the moores abowte Bolton do make cottons. Nather the scite nor ground aboute Bolton is so good as at Byri. They burne at Bolton sum canale, but more se cole, of the wich the pittes be not far of. They burne turfe also.” *Leland's Itinerary*, vii. p. 49.

Upon the subject of manufactures, a celebrated agriculturist observes “that you must not go for agriculture to Yorkshire Lancashire, Warwickshire, or Gloucestershire, which are full of fabrics, but to Kent, where there is not a trace of a fabric; to Berkshire, Hertfordshire, and Suffolk, where there is scarcely any. Norwich is an exception, being the only great manufacture in the kingdom, in a thoroughly well cultivated district, which must very much be attributed to the fabric being kept remarkably within the city, spreading (spinning excepted) not much into the country; a circumstance that deserves attention, as it confirms strongly the preceding observations. But the two counties of Kent and Lancaster, are expressly to the purpose, because they form a double experiment. Lancaster is the most manufacturing province in England, and amongst the worst cultivated; Kent has not the shadow of a manufacture, and is perhaps the best cultivated*.”

SECT. 7.—*Poor.*

WHATEVER may be the state of the poor, they are most liberally provided for, not only by legal assessments, but liberal contributions—when particular seasons, or calamitous circumstances, may call forth the humanity of those who, on such occasions, give without sparing. Yet, with all the aid

* Travels through France, by Arthur Young, Esq. vol. ii. p. 508.

of large assessments, and liberal contributions, it is truly lamentable to witness such appearance of poverty, exemplified in nakedness, dirtiness, and the different garbs which indicate distress. There are mendicants of all ages and sexes, but more particularly in the country villages; the exerted police of well-governed towns restrains these wanderers.

In brief, it may be asserted, that from appearances, the *state of the poor* is not so comfortable as might be wished; and yet from the sums levied and contributed, if properly applied, their situation might be meliorated.

Friendly societies seem the guides which point out radical cures for the existing evils. When a man once gets into the habit of *laying up* in store, however small the capital, he feels a satisfaction which stimulates exertions to increase his stock; and that pride of independence which ensues from an enjoyment of the acquisition of his well-deserved, however hard-earned substance, render his meals sweet, his family regular, clean, and decent, and his spirits cheered by the fruits of his own labours. Friendly societies have been the means of causing all this among many of their members; they are numerous in this county; they are increasing, and ought to be encouraged.

SECT. 8.—*Population.*

LANCASHIRE was formerly supposed to contain 40,000 houses and 240,000 inhabitants, but it must be now much more considerable; and Dr. Wilkinson, an inhabitant of Essex, but who is a native of the county, and has several estates in it, particularly Morley Hall, near Leigh, the place where the celebrated Leland took some of his distances, and who was a relation to a former possessor, a well-informed man, seemed to think that Lancashire contained as many inhabitants as the county of Middlesex *, which he estimated at about a million.

* “The idea of Lancashire containing as many inhabitants as Middlesex, and which is there estimated at a million, ought certainly to be qualified and corrected, as it can by no means be admitted by the Political Arithmetician, without the most authentic and unequivocal proof; for, supposing
its

lion. In a circle of three miles around Tildesley, Thomas Johnson, Esq. informed the surveyor there were 10,000 weavers.

Though this estimation may be overcharged, still the population is great. The towns of Manchester and Liverpool, from the most authentic information, together contain 140,000 inhabitants. The roads from manufacturing towns are a continued street, house adjoining to house. From authenticated lists it appears that 22,000 men have been enlisted in the towns of Manchester and Salford only since the commencement of hostilities with France, and from the whole county of Lancaster not less than 27,000 have been enlisted in the space of eighteen months.—The Lancashire Fencibles have been raised since this account was published.

The work just published by Mr. Stockdale, under the title of *A Description of the Country from 30 to 40 Miles round Manchester*, affords various documents respecting the population of some of the most important districts of Lancashire; but any conclusion drawn from them, as to the whole county, must be in great measure conjectural. Dr. Aiken however has been so good as to draw up the following observations, stating the grounds on which such conjecture may be formed.

“Actual enumeration having but in few instances taken place within late years, the principal data for the purpose of calculation, are *bills of mortality*. The proportion which the articles in these bills bear to the number of people is a matter somewhat difficult to determine; but fortunately we have an unusually accurate standard in the bills of the parish of Eccles, in which, along with the annual returns of christenings, burials, and marriages, there is an annual enumeration of the families and individuals. From an average drawn from the comparison of these articles for several years, it appears, that

its two great towns, Liverpool and Manchester, to contain 75,000 each, its four other principal towns 50,000 amongst them, 50,000 more in its manufacturing parts, and 50,000 more in its remaining parishes, this would give only 300,000; nor will any probable data give a number bearing any considerable proportion to a million.”—*W. Pitt, of Pendergry, Staffordshire.*

the

the christenings have been to the whole number of people as 1 to 26; the burials as 1 to $28\frac{1}{2}$, and the proportion of persons to a family, as 5.6 to 1. The much higher proportion of this last, than what has usually been found in other places, must probably be owing to the great influx of children from London and other parts to work in the cotton mills, who are apprenticed and boarded with the inhabitants, and thus augment the number in each family. For the same reason the deaths run higher than in country parishes in general. The article of christenings seems most to be relied upon as a common standard of population; and it will probably be a calculation near the truth to multiply the registered christenings in any town for a term of years by 25 or 26, in order to gain the existing number of people. In Eccles, the returned christenings are only those of the establishment, but the return of families and people includes dissenters.

“ Before we proceed, it is to be remarked, that from the year 1792, a very considerable reduction appears in the bills for almost all the manufacturing towns; but as this is owing to causes, it is hoped, merely temporary, particularly the absence of a great number of men in the army and navy, it would be unfair to take the last year or two as the existing standard. I have therefore, in the following calculations, made an average of the christenings during the last three years, in order to estimate from them the actual population.

“ To begin at Manchester, the center of the most populous part of the county, and of the cotton manufactory. It's inhabitants, by the above rule, would amount to about 63,000. But by an actual enumeration in 1788, the *townships* of Manchester and Salford were found to have only 50,000, and the increase of births since that time, upon the average of the last three years, would only augment the number about 800. The return of births must therefore comprize a part of the *parish*, and yet only a part, since at the enumeration in the year 1773, the parish was found to contain 13,786 inhabitants, and it may be presumed that the number is nearly doubled since that period. On the whole, it will probably not be too much to

set down the population of the whole parish of Manchester at

That of Eccles is about	—	—	—	—	75,000
Ashton under Line	—	—	—	—	14,000
Prestwich	—	—	—	—	13,000
Oldham	—	—	—	—	6,600
Middleton	—	—	—	—	17,000
Rochdale	—	—	—	—	6,000
Ratcliffe	—	—	—	—	15,500
Bolton	—	—	—	—	2,000
Bury	—	—	—	—	12,000
					12,500
					173,600

“ The above parishes are the whole, two inconsiderable ones excepted, in the hundred of Salford, which occupies all the south-eastern part of Lancashire, undoubtedly the most populous of its districts. If the number be raised to 180,000, it is supposed that all deficiencies in the calculation will be sufficiently provided for.

“ The next hundred in size and population is that of West Derby, comprizing all the south-western part of the county, and containing the great port of Liverpool. This town, including all the new buildings within the limits of its township, probably contains about

“ Of other parishes within this hundred, we have the following estimates :

Wigan	—	—	—	—	15,400
Leigh	—	—	—	—	9,900
Warrington	—	—	—	—	12,000
					97,300

“ Though these are the most populous places, yet as there are many large and well peopled parishes, of which we have no account ; it will probably not exceed the truth to state the population of West Derby hundred at 140,000.

“ Having thus made a rough estimate of all the southern part of Lancashire, the chief seat of its trade and opulence, the remainder

mainder can only be the subject of mere conjecture. Of the towns, we have documents to state

Preston, at about	—	—	6,000
Chorley	—	—	4,200
Blackburn	—	—	12,100
Haslingden	—	—	5,400
There are no other towns of consequence, but			
Kirkham, which may possibly contain	—	—	5,000
and Lancaster	—	—	10,000
			42,700

“ The remainder of the population of the county is divided over a large tract, generally thinly peopled, where trade and manufactures have not made their advances, as may be concluded from the small number of parishes into which the county is divided. The tract called the Filde, between the Ribble and Wyer, is almost entirely agricultural, and has the scattered population usual to such districts. The part bordering on Yorkshire mostly consists of wild uncultivated moors, supporting a very thin population. The detached part across the Lancaster sands is a rough and hilly region, little peopled, except in its lower grounds near the sea, and the neighbourhood of its mines. On the whole, if the number of 362,700 stated in the preceding estimates be raised up to 425,000, by allowance for all the small towns and villages in these remote parts, it is supposed that the full population of this county will be given.

“ One circumstance, however, ought to be mentioned, which may raise higher the idea of the population of Lancashire in the minds of some persons. In the assessment of men for the navy, laid by a late act of parliament on the several counties of the kingdom, and said to be calculated according to the number of *rated houses* in each, Lancashire is placed higher than London and Middlesex together, the number for the first being 589, and for the latter 552. Now, if this gives the true proportion of the *rated houses* in each, that of the *unrated* must probably be much larger in Lancashire than in London and Middlesex, the rent of houses being on an average much greater in the

latter than the former. It is not in my power to ascertain how the fact stands in this particular, or whether any different rule was followed in the assessment for London from that observed in the country. But it is to be remarked, that the Borough of Southwark, and the parishes within the bills of mortality on that side the water, are not included in the above assessment for London and Middlesex; and at any rate, it may be more just to lower our notions of the population of the metropolis, than without due grounds to raise those of the population of Lancashire."

Thus far Dr. Aikin, whose sentiments upon the subject are intitled to great weight. Mr. Yates, on the other hand, who had an opportunity, when drawing up his map, of minutely examining the state of the county (who is a man of keen observation, and lets few circumstances escape him) is of opinion that the population is considerably higher.

A gentleman calculates; that if Yates's map was divided into squares, and the houses in a certain number of squares counted, and a medium taken, by allowing so many persons to each house, a tolerable estimate might by this method be made. But Mr. Yates himself thinks such a medium would be much below the true state, since from the scale of the maps, many houses and cottages were unavoidably omitted; besides, the number of people in each house of manufacturers, contains a greater number of inhabitants than are generally imagined, some small buildings contain, it may be, two or more families, and the families not the least numerous.

If the clergy would afford their assistance in so important a business, (and there scarcely remains a doubt but they would contribute their aid, if requested, in circular letters directed to the rector or vicars of parishes by the Board of Agriculture,) an estimate might be obtained of the real state of population at a trifling expence.

CHAPTER XVI.

OBSTACLES TO IMPROVEMENT;

*Including General Observations on Agricultural Legislation
and Police.*

THE obstacles to improvements are so many, that it is doubtful whether the whole can be here enumerated.

The grand obstacle is the want of a general inclosure act.

The great expence in obtaining particular acts, for certain districts; the odium, and ill-natured reflections, cast upon individuals who take an active part in promoting these good works, with the vexatious delays of frivolous obstructions, and many other causes, are obstacles of such magnitude, as to prevent even an attempt at an inclosure-bill, by the means of which many thousand acres of land, which lie waste and unprofitable, either to individuals or the public, might bear the richest grains, or fatten the choicest bullocks.

The corn laws have hitherto operated most essentially against improvements. If these matters were left to the simple operation of merchandize, and to find their own level by abundance, or deficiency, the farmer and the public would generally be benefited. Apprehensions of famine, under the present enterprising system of merchants, is entirely vanished. There will always be people bold enough to speculate in such an article of universal consumption, as to prevent a scarcity. The laws have hitherto afforded no assistance to the farmer. If there be a general failure of crops, the loss falls totally upon himself; he cannot avail himself of advancing the price, as a recompence for the failure of quantity*. The ports are opened for farmers or merchants to send in their produce from foreign nations,

* The question under consideration at present, is not what may most be conducive to the general good of the community, but what may be most advantageous to the farmer and fair trader. It is, in general, some adventurous speculator who reaps the most advantage, by artfully evading, or turning the law to his own favour,

whose

whose lands pay no taxes to support our government, and some of which are exempt from tythe laws.

Thank God that these laws have not hitherto wanted active opposers, to whom the landed interest lie under unspeakable obligations. The averages, to govern the exportation and importation of corn, are formed from the mere declarations of *interested* dealers, and cannot be just grounds to regulate so important a branch of commerce, which perhaps had best be free, reserving to the king in council, a power to interfere in cases of great and sudden emergency. The expence of the corn returns throughout England, is very considerable. In *Lancashire*, a burden of near 600 *l. per annum* is sustained for the salaries of corn-inspectors; although from the *corn act* it was supposed, the duties on *foreign corn* imported, were appropriated to pay all *these* salaries.

Tythes * are universally acknowledged to operate as obstacles to improvements; and they fall more heavily upon the spirited agriculturist, than upon the indolent farmer. The greatest service the Board of Agriculture can perform to their country, will be to devise and carry into execution some reasonable plan for their commutation.

The prohibition from exporting wool, in its raw state, is another obstacle against encouraging the increase of stock, or paying that attention to the quality of sheep, so as to produce the finest wool; and sheep are reckoned the best stock for enriching either the arable or pasture farm. If liberty were given to export the raw material, under certain duties and restrictions, the farmer would be benefited, the manufacturer would not be injured, and the revenue increased.

The high duties upon salt operate as great obstacles to the application of this article to the advantage of their cattle, in certain cases. It is an article most cattle are fond of. It assists digestion; promotes a disposition to fatten; prevents certain disorders; and, in foreign parts, they use it in large quantities, not being loaded by high duties. And, it is asserted, entirely

* Should not the incumbent of the day have a power to grant a lease for 21 years certain, on supposition even of his dying the day after?

prevents that fatal disease among sheep, the rot*.—The refuse salt (an excellent manure) is thrown away, not being permitted to be used without paying the full duty!!!

Glebe, or church lands, or any other appropriated to the support of the meeting-houses, and those lands which appertain to small livings, purchased by the bounty of Queen Anne, are generally under a bad state of cultivation; the uncertainty of lease, depending upon contingency of a single life, operating as strong obstacles to any degree of even moderate improvements; and in consequence they are, in general, under the very worst state of management.

Short leases, most certainly, are grand obstacles. The farmers would merit harsher epithets, than they are at present loaded with, were they to venture upon spirited improvements for a short term.

Another obstacle to improvements is frequently occasioned by the obstinacy of an adjoining neighbour; *e. g.* one is disposed to drain his lands, but cannot effect this without the concurrence of a second, or probably a third and fourth, to assist in scouring ditches, opening water-courses, and obstructions to the drains intended; and the difficulty of enforcing this concurrence, is, I say, a great obstacle to many improvements. Where water proves injurious to roads, an opening may be effected, by application to justices of the peace, and by indictment.—Why not admit of a similar operation, so simple and easy to effect, in the practice of agriculture?

* It is to be lamented, that some better method has not hitherto been devised, to secure the duties upon this article of salt, different from the expensive mode of collecting it, by numerous officers; and, at the same time, to take off the check given to the fisheries, and agriculture, by the high duties.

The money raised upon the public, on the article of salt, in Great Britain, is £. 900,000, of which only one-third is received at the Exchequer.

The gross revenue, in 1776, was	-	-	£. 895,489
Drawbacks, bounties, and discounts	£. 622,865		
Charge of management	-	-	26,410
			649,275

Neat produce - £. 246,214

Vide *Knox's Tour*, p. cxlviii.

Vermin.

Vermin.—This is an object that requires more general attention than has hitherto been paid to it.

Individuals may have exerted themselves, and incurred great expence; but these exertions are of small avail, whilst surrounding neighbours are harbouring nurseries, to make future depredations upon those premises which they find untenanted. Several townships have, of late, associated together, and engaged a mole-catcher, at the rate of four-pence per acre, for a term of seven years; in which period of time the mole-catcher imagines he can nearly have destroyed the race of those animals in the district. This effort, towards a total extirpation, must be more efficacious than the greatest exertions of individuals. It is a doubt, after all, whether moles may not be useful animals in the destruction of certain noxious earrh-worms.

Rats are a very destructive animal, not only amongst grain, but other articles; they are frequently brought in abundance into the sea-ports in corn, and other vessels. The same mode has been very lately adopted, by particular townships, towards a general destruction of these very troublesome and voracious animals*.

Sparrows

* SIR,

“ THROUGH the vehicle of Mr. Young’s useful Annals, I am informed of the establishment of a most excellent and honourable Board of Agriculture, under whom, I find, you are appointed to the survey of this county. To you therefore, I beg leave to address this, though it is not a direct answer to any of the queries proposed by the Board; yet, I trust, it may be considered, as having some relation to the former part of the last. This country is, to a very great degree, infested with that most destructive vermin, rats: I shall not, now, attempt any statement of the probable damages they may be supposed to do us; but the annual losses we sustain by them in our buildings, corn, and other goods, is very considerable. I, and most of the principal farmers, and others, for a circuit of about 20 or 30 miles, have, for some time, employed Edmund Heathcote, of Ormskirk, who has a very expeditious, effectual, and safe mode of destroying them; but this affords us only a temporary relief, for we are, (perhaps from our neighbours, who had not theirs destroyed) before long, again infested.

“ In some townships they have employed him to clear the whole for a stipulated sum, paid annually, out of some pound-rate-ley, which is so trifling, as not to be felt by any individual: and has, I hear, nearly the wished-for effect (a). But even this is certainly a plan too circumscribed to answer any great end. My reason, therefore, for troubling you with this,

(a) About one halfpenny in the assessed rates.

Sparrows, and small birds, destroy great quantities of corn; and sums of money have been annually paid, in this neighbourhood, towards their destruction, for many years past; and although the amount of the sum, from the number of years the custom has obtained, is become pretty large, no decisive effects have been produced; the premiums paid may have been too trifling to effect a total cure, and the measures, hitherto taken, too languid. In this work, there ought to be an association, to declare war against the common enemy; and vigorous exertions should be enforced, by sufficient premiums—for the destruction occasioned by these small creatures is of greater extent than many people could imagine. The amount of a hundred loads, sacks of wheat, have been calculated to have been destroyed by these diminutive devourers, in the course of one season, in a township of no very large extent, besides the oats and barley. Magpies, carrion-crows, kites, hawks, and jays, should be included amongst the common enemy.

Dogs are in general a nuisance. The butcher frequently suf-

is, in hopes, through you, to obtain, from the wisdom of the Honourable Board, some suggestions for the most eligible plan of extending the employment of this person; or otherwise, for the extirpation of this most destructive pest.

I am, SIR,

Your very humble Servant,

WIGAN, in the County of

LANCASTER, Dec. 15,

"OSKILL SUMNER."

1793.

The surveyor hath employed Mr. Edmund Heathcote, the person mentioned in the letter, who always effected a present cure; but, after some space of time, the vermin returned from other quarters. The man he believes to be very sober and attentive to his business; possessed of much civility, and has already obtained a certificate of his success, in places where he has been employed—a considerable number of the gentlemen in the neighbourhood. J. H.

It is greatly to be lamented that Mr. Heathcote's method of destroying rats and mice is not generally known and practised; if it was, there would be a total extirpation of those obnoxious and destructive animals, for in one night he totally destroys them (where he is employed) be they ever so numerous, as can be well attested by hundreds in the neighbourhood of Ormskirk, who have employed him.

The composition he makes use of he puts in their holes or burrows, and from the very small quantity he uses, it is astonishing it should have such an effect: it will keep good two years. A farmer recommends for the destruction of rats, one ounce of pounded quick-lime to four ounces of tallow cake, to be beaten together and made into balls, and placed in their runs, which has cleared many buildings. But it has been proved by experience, that an ounce of aerated barytes finely powdered, mixed with the tallow, in place of lime, is more effectual.

tains heavy losses, in the destruction or dispersion of his sheep, in the vicinity of great towns, by marauding dogs; and those who breed sheep frequently complain of their flocks being greatly annoyed by the yelping of curs, and who will sometimes wantonly encroach upon their borders. The passenger is but too often attacked by their troublesome and vociferous salutations. They are certainly a fit object of taxation, if those of real use could be excepted.

Dogs are so great a nuisance in many parts of this country, as totally to prevent all ideas of keeping sheep.—I wish to Heaven we had a dog-tax.

Six persons have *lately* died in the neighbourhood of Manchester, from the bite of a *mad-dog*, and with dreadful sufferings; and twenty persons, under the apprehension of being affected, were received into the Manchester infirmary in *one week*.

T. B. Bayley.

Nothing can be more desirable for this populous county, than an universal tax upon dogs.

Mr. Taylor.

Weeds, especially those which bear winged seeds, as the thistle, dandelion, &c. should be declared common enemies, and treated accordingly. It is to no purpose that a neat farmer cleanses his ground from such noxious enemies, if a less attentive neighbour permit them to flourish in the adjoining premises; the winds will disperse the floating emigrants over the well, as the ill-cultivated field, where they will take possession, without the permission of the owner.

Another destructive species of vermin is a kind of snail or slug, which, during the day-time in April and May lies under ground, devouring the roots of corn; in the evening comes out, and attacks the blade. Three or four may be found sometimes upon the same plant, and this is the time that should be seized for their extirpation; by drawing a heavy roller over these lands whilst the enemy is at work, particularly in a moon-light night, they may be effectually destroyed. By this step, a crop of corn may sometimes be preserved.

When the air is warm, and the atmosphere moist, the greatest slaughter may be made, the whole family being then abroad. They skulk under ground on any approach of cold.

CHAPTER

CHAPTER XVII.
MISCELLANEOUS OBSERVATIONS.

SECT. I.—*Agricultural Societies.*

MANCHESTER SOCIETY.

THERE has been a society of agriculture established at Manchester, for a number of years, which is conducted with spirit; and the several premiums offered annually, have been frequently claimed, and adjudged. A report is annually published, with the premiums, which are offered for the ensuing year, and a list of the persons to whom they have been already adjudged, is made public; but they have not yet published any volume of papers which they may have received on different subjects; and of which they are in possession. The surveyor, when at Manchester, waited upon the secretary, and examined these papers, with a view of collecting something that might be of service to him in this Report. The papers are many of them upon important subjects.

The Rev. Mr. J. Stainbank, of Halton-hall, writes, "That the principal great towns, through the different counties, at least where they choose to form themselves into societies, should be connected with the Board of Agriculture, as emanations from that great body, and be supplied thence with books of instructions, and other assistance during their infant state; and that each society should adapt such a system of premiums, as would be most conducive for exciting a spirit of agriculture in, and promoting the greatest possible improvement of, its respective district."

Similar hints have been dropped by other correspondents, but not so fully explained.

Mr. Eccleston conceives, " that a spirit for improvement might be excited amongst the farmers, by occasional tours, every three or five years, undertaken by a person appointed by the Board, whose report should be printed, the names of the improvers and improvements to be inserted, with proper eulogiums for their industry and ingenuity, in order to excite, by emulation, others to similar exertions."

The same gentleman observes. " The most certain way to bring the cultivation of this isle speedily to the utmost degree of perfection would be to establish a school or college where the elements of Agriculture, with its necessary attendants, chymistry, botany, &c. should be taught, and the most approved principles of draining, floating, fencing, plowing, sowing in drill and broad-cast, the difference of manures ascertained, and their excellencies pointed out. Each operation to be shewn the pupils in practice, on a farm established for the purpose, under the Board of Agriculture.

" Were such an establishment in being, and properly attended to, most men of fortune would wish their sons to go through a course of the just principles of a science the most beneficial to mankind, which would give a turn of mind to the first class of men in the kingdom, to encrease its resources, by ameliorating their private fortunes, and greatly add to the comforts of the labouring class of people. The agents or stewards of large estates, who at present, from want of early instruction, are unequal to their situation, from the confined ideas of their education, would be able, along with the opulent farmers, to send their sons with advantage, to receive all necessary and solid instruction, requisite for their line in life, besides *Arithmetic, Planning, and Surveying*, which at present is all that has been taught, even to the most enlightened of that class, I may almost say of opponents (from want of better education) to modern improvements.

" The most essential objects for the improvement of this county, are, the improved method of draining: the plashing or making good fences: the introduction of green fallow crops, and the stocking with sheep, for the security of which stock, in these populous parts, a dog tax would be highly advantageous.

advantageous. All other improvements would of course follow."

OLDHAM SOCIETY.

There is a society of botanists in Oldham, established about twenty years ago, begun originally by Dr. Haulkyard, George Hyde, and John Newton.—The society meets nine months in the year, and each member contributes six pence a month, (the present members are all artificers) two pence of which is reserved for the purchase of books, and the remaining four pence spent in liquor.—They have purchased by this means about twenty volumes, and are possessed of 1,500 specimens of plants, properly classed.

The time by many dedicated to pastime, or sometimes to worse purposes, is by the members of this society usually employed in the pursuit of their favourite amusement of either selecting or arranging their specimens.

In collecting plants different members have gone as far as Liverpool, Lancaster, Chester, Nottingham, Hull, &c. and one of the members has undertaken a voyage, and to proceed as far as the western parts of America, to botanize, under the patronage of John Lee Philips, esquire, of Manchester.—On the 21st of June, in the present year, one of the members being upon the mountains near Oldham, discovered for the first time the *uva ursa*.

This society is not unknown to Sir Joseph Banks, Dr. Withering, and others, from whom they have been favoured by correspondence of letters.—They are a wonderful and respectable society for their perseverance, sobriety, and the great knowledge acquired in the pursuit of this study.

Their great ambition is to visit the botanical gardens at London; for which purpose the sum of five guineas, they think, would suffice: but alas! that sum is not to be found *!

* As a proof of the zeal of these industrious people, it may be mentioned, that upon Mr. Philips noticing to one of the members, that he had observed a certain rare plant whilst riding on the northern coast of Liverpool, he immediately set out in search of it, and brought it to Mr. Philips; and the plant is now growing in his gardens at Mount-pleasant.

Names of the GRASSES most common in the neighbourhood of Oldham, given by two members of the Botanical Society there:

- | | |
|------------------------------|--------------|
| 1. Anthoxanthum, very common | } Hay grass, |
| 2. Alopecurus, - - D° | |
| 3. Dactylus, - - - D° | |
| 4. Poa, - - - - D° | |
| 5. Festuca, - - - D° | |
| 6. Bromus, - - - D° | |
| 7. Avena, - - - D° | |
| 8. Holcus, - - - D° | |

Weight of crops is in general
Alopecurus, Poa, and Bromus.]

- | | |
|------------------------------|-----------------|
| 1. Aira, - very common | } Pasture land, |
| 2. Agrostis, - D° | |
| 3. Secale, - not very common | |
| 4. Arundo, - D° | |
| 5. Lolium, - very common | |

SECT. 2.—Weights and Measures.

THE difference of weights and measures in this county are so many, that if they cannot with propriety be called obstacles, they may with truth be termed incumbrances to the general intercourse of business, and clear comprehension of what time an under similar terms, but with different ideas annexed to them, according to the object.

The rod in Lancashire is of no less than six different lengths in different parts of the county; namely, the statute or $5\frac{1}{2}$ yards, 6, $6\frac{1}{2}$, 7, $7\frac{1}{2}$, and eight yards, to the rod, pole, or perch*.

The

* To hazard a conjecture upon the etymology of the word, and the various lengths of the measure, the rod or pole got out of an adjoining forest, was most probably the primitive measure, but without any certain standard. A straight rod or pole, of $5\frac{1}{2}$ yards long, presented itself; and this served to measure a certain district. Another rod, or pole of a different length, presented itself to a different measurer, and that became his standard.

The measures are equally variable. At Lancaster a load of wheat, beans, and pease, is four and a half bushels (Winchester); barley, six Winchester bushels; oats, seven and a half Winchester bushels *.

N. B.—Wheat has been sold lately by the weight of 280 lb.

At Ulverstone, a load of wheat is $4\frac{1}{2}$ Winchester bushels; oats, six Winchester bushels.

At Manchester, a load of wheat is sixteen score; a load of oats nine Winchester bushels; a load of beans five Winchester bushels; a load of potatoes twelve score and twelve pounds, washed; unwashed, thirteen score.

At Liverpool, the town's bushel is $34\frac{1}{2}$ quarts for oats, barley, and beans, making exactly 36 quarts Winchester, or one-eighth more than a Winchester bushel; and by the custom of trade, one given in at every score, or twenty-one bushels; of late wheat, barley, and oats have been sold by weight, but never yet beans: wheat 70 lb. to the bushel, barley 60 lb. and oats 45 lb.; and probably this mode by weight is the fairest for both buyer and seller; for, besides the difficulty of getting a true standard bushel or measure, the dexterity of corn-meters is such, that it is asserted † they can gain either to the buyer or seller from 10 to 20 per cent. in different modes of measurement; that 5 per cent. can be obtained by this practice by even bunglers in the business: this is an enormous profit, and the unfairness of such practices merits the severest reprehension ‡.

ard for another district. These rods, or poles, being set apart for that purpose, and used again when occasion called; and in time became the established standard of the district. Hence, *fall*, from the fall of the pole, which covered a certain length.

* A load, so denominated, it should seem, from the horse load, in a sack, the weight a horse could conveniently carry on his back. Every kind of grain, &c. was conveyed this way till very lately. The load is the lightest in the mountainous parts.

† By a considerable corn-merchant.

‡ It is enacted by 31 Geo. III. that a Winchester bushel of corn should weigh as follows:

	lb.				lb.		
Wheat	57	avoirdupoise.	—	Wheat meal	56	} Flour, 45 lbs. of which should be equal to a Winchester bushel, unground.	
Barley	49	-	-	-	Flour		48
Bigg	42	-	-	-	ditto		41
Oats	38	-	-	-	—		32
Rye	55	-	-	-	—		53

Flour, 45 lbs. of which should be equal to a Winchester bushel, unground.

§

At

At Lancaster they have a measure called a *windle*, which is three Winchester bushels.

At Preston the windle of wheat, beans, and barley is three and a half Winchester bushels; but of late 220 lb. has been reckoned a windle of wheat; they have also a measure at Preston called a peck, which is twenty-eight quarts, four of which are called a windle.

Weights.—There are three different weights expressed under the general term, *hundred weight*; namely, 100 lb. 112 lb. and 120 lb. The stone varies. In Liverpool 20 lb. is the weight allowed for the several articles under that denomination, as beef, hay, straw, &c. and probably all the articles produced from land.

Butter is required to weigh 18 ounces, avoirdupoise, or may be seized by the magistrates.

CONCLUSION;

*Means of promoting the Improvement of the County of Lancaster;
and Hints thence to be derived for the Improvement of other
Counties.*

A REPORT formed on so great a scale, as those which are drawn up for the consideration of the Board of Agriculture, ought to conclude with a general view of those measures, which are best calculated for the improvement of the district to which the survey relates; and also with a state of those improvements which have taken place there, and by adopting which, other districts might be benefitted.

I. *Considerations respecting the farther
Improvement of the County of Lan-
caster.*

IN the preceding observations, a number of hints have been given, pointing out the improvements of which this country is capable; and it is only necessary to recapitulate some of the most important.

I. *WASTE LANDS.*—The cultivation of the waste lands in this county, is undoubtedly the first object that ought to be attended to. A county like that of Lancaster, distinguished for the opulence and spirit of its inhabitants, should never rest, whilst a single acre remains, that does not yield some valuable production. There is scarcely a rood in it, that might not yield some species of grain, or some sort of useful pasture, or some kind of valuable timber. Were those waste lands made

as productive as they ought to be, there would probably be no occasion for the importation of grain from other countries; and thus the manufacturing industry of Lancashire, instead of being a market to encourage the agricultural exertions of other countries, would be the means of promoting those domestic improvements, which, in every point of view, are so much entitled to be preferred.

2. *DRAINING*.—In a wet climate this must be the basis of all improvement. Much in this respect has been already done in Lancashire, but much still remains to be effected, particularly where the soil is of a clayey nature. The perfection however to which this art will probably be brought, in consequence of the attention which has been lately paid to it, and the discoveries which have been made by Mr. Elkington, will soon enable the people of this county, to clear their lands of superfluous water, whether it arises from what falls upon the surface, or is occasioned by subterraneous sources.

3. *GRAINS*.—Oats seem to be the natural grain to be extensively cultivated in this part of the island: and as in all countries an early species is desirable, it may not be unworthy of the Lancashire farmer, to try a species of oat that has lately been much cultivated in the neighbourhood of Edinburgh, known under the name of *the Red Oat*. It is remarkably early, being ripe before almost any other sort, and produces more meal than any oat of the same size; its straw also is good for cattle, and it is not liable to shake. It is probable, on the whole, that it is one of the greatest means of improvement that could be introduced into Lancashire.

4. *TURNIPS*.—An increased culture of this valuable root, is an object well entitled to the particular attention of those, who wish to promote the improvement of this county. A great part of the soil of Lancashire is supposed to be particularly well calculated for the culture of turnips. The advantages which other counties have reaped from this culture, ought to induce the Lancashire farmers, to pay particular at-

x

tention

tention to this source of improvement, the nature and principles of which are too well known to require any elucidation in this place. There are two modes of cultivating turnips; the one is by the broad-cast, the other by the drill system of husbandry. Which is the most productive, has not yet been decidedly ascertained; but the drill system is the most easily introduced, on the account of the greater facility of hoeing.—For the broadcast system of turnip husbandry, the survey of the county of Norfolk may be consulted;—for the drill system, that of Northumberland.

5. *CATTLE*.—It is acknowledged that the Lancashire breed of cattle, do not equal what they were some years ago, and are certainly much inferior to the improved flock of the same breed (namely, the long-horned) in other parts of the kingdom. As Lancashire must always be as much of a grazing, than of an arable country, it is particularly desirable, for the advantage of its inhabitants, that the herbage it produces, should feed as profitable a species of stock as possible; and hence particular attention to its breed of cattle cannot be too strongly recommended.

6. *SHEEP*.—It is impossible to see without regret, that so valuable an animal, should hitherto have had so moderate a share of the attention of the Lancashire farmers, as there is none by means of which such great improvements might be effected. Notwithstanding the humidity of the climate, where the soil is dry, or capable of being drained, no apprehension need be entertained of this animal's succeeding to a wish. At present, the greater part of the county seems to be principally devoted to the most unprofitable of all that species of stock, namely, the black-faced Scotch, whose fleece is of little or no value, whose restlessness renders it difficult for them to be confined in any common inclosure, and the wildness of whose disposition makes it extremely difficult to fatten them. Instead of these, there are two sorts of sheep, the Cheviot for the hilly parts of the country, and the Bakewell or Culley breed, for the lower district, which cannot be too strongly recommended to the people of Lancashire.

The Cheviot are to be found on the borders of England

and Scotland, and are the most valuable breed, for a mountainous district, perhaps any where to be met with; but for a manufacturing country, where the pasture is sufficiently rich, the Bakewell breed is, undoubtedly preferable to every other; producing, from the same extent of herbage, a greater quantity of meat, and of a sort peculiarly well calculated for general consumption. In a manufacturing district also, it is extremely desirable, to have a raw material of such value as wool, on which the industry of the people may be exercised, should other branches fall off.

These General Observations might be extended to a much greater length, and might include a number of other particulars: but if the *waste lands* of the county are properly cultivated—if *draining* is properly attended to—if the best species of *oats* and other grains are propagated—if the culture of *turnips* is carried to that extent of which it is capable—if the *cattle* of the country are improved, and regain their ancient estimation—and, above all, if the best sorts of *sheep* are spread over the county, Lancashire will have no reason to regret the attention that has been paid to its improvement by the Board of Agriculture.

II. *Hints for the Improvement of other Counties.*

THE attention of the people of Lancashire, has hitherto been principally devoted to the extension of manufactories; at the same time, an active and intelligent race of people, must always discover a number of particulars, by which its own agriculture, and that of its neighbours, may be improved. A variety of hints to that effect, will be found in the preceding pages of this Report; but there is one point which requires to be particularly adverted to, namely, the management of marle, in which this county seems to excel every other, and by imitating whose practice, there is no part of the kingdom, where
marle

marle might be found, that might not be brought into a high state of cultivation. The quantity laid upon an acre seems very great, but is amply repaid by the lasting benefit that results from it. It is probable indeed, that a small quantity may do little good, whilst a great load may produce the most important benefits. The marling also a second time with great advantage, is a circumstance entitled to very particular attention; and the burning of marle, and using it when burnt as top dressing for corn, is a mode of improvement which cannot be too strongly recommended to the attention of the industrious farmer, who has an opportunity of putting it in practice.

On the whole, it is believed, that no man can read over the preceding pages, without being satisfied, that great pains must have been bestowed in collecting and arranging such a mass of valuable information; and if a similar account is drawn up and printed of every other district in the kingdom, there can be no doubt of its proving in the highest degree serviceable to the country.

APPENDIX.

N° 1.

THE following description of the Lancashire cattle, &c. will serve to explain the engravings which accompany this Report.

LANCASHIRE BULL,

Was bred at St. Michael's in the Filde, and is now the property of Edward Ashcroft, Spellow-house farm, in Walton.

DIMENSIONS.

	Feet.	Inches.
Length of the head - -	1	8
Depth from shoulder to breast-bone	2	7
Breadth from hip to hip - -	2	6
Height from shoulder to fore-foot -	4	7
Length from root of horn to rump -	8	1

LANCASHIRE COW,

Purchased, when in the possession of James Balmer, Toxteth Park, for exportation to America, as one of the best specimens of the Lancashire breed.

DIMENSIONS.

	Feet.	Inches.
Length of the head - -	1	4
Depth from shoulder to breast-bone	2	3
Breadth from hip-bone to hip-bone	1	11
Height from shoulder to fore-foot -	4	2
Length from root of the horn to rump	7	4

LANCASHIRE MARE,

Bred at West Derby; is of the usual breed of cart-horses in that vicinity, strong and bony; the colour black, not so heavy but that it might occasionally be used upon the road, or to draw in a chaise.

The

The Mare from which the original drawing was taken, is in her 22d year, notwithstanding which the teeth are yet good, eyes clear, and perfectly sound. It has been one of the best of servants, to its present master, for the space of nineteen years.

MIXT BREED OF HOGS.

The Hog, an engraving of which is inserted in this work, is a boar belonging to Thomas Wakefield, Esq. Brooke Farm, near Liverpool. There is a mixture of the Chinese and of the wild boar in this breed. Its chief properties are a large carcase, short legs, small entrails, and great weight of meat, in proportion to its size.

DIMENSIONS.

	Feet.	Inches.
Length of head - - -	1	0
Depth from shoulder to breast -	1	4
Breadth from hip to hip - -	1	0
Height from shoulder to fore-foot	2	6
Length from ear to rump -	4	0
Girth round his body - -	5	2

N^o 2.

Mode of preserving CRÉAM, for several weeks or months; particularly calculated for sea voyages.

TAKE 12 ounces of white sugar, and dissolve it in some ounces of water, over a moderate fire. After the sugar is dissolved, boil it for about two minutes in an earthen vessel; after which add immediately 12 ounces of fresh cream, and mix the whole uniformly over the fire: then suffer it to cool, pour it into a quart bottle, and cork it carefully. Keep it in a cool place, and it will continue fit for use for several weeks, or even months.

N^o 3.

N^o 3.

SINCE the above Report was drawn up, the following paper was transmitted, by an active and intelligent magistrate for the county of Lancaster.

Observations on the Corn Act, 31st Geo. III. chap. xxx. respecting the Salaries of the Corn Inspectors.

It is insisted, that the clear meaning of the legislature was, to defray the expences of its execution, and amongst these the salaries of the corn-inspectors, from the duties to be paid on the importation of foreign corn.

In proof of this—

I.

Be it observed, that by the 15th, 16th, 17th, and 18th clauses, various duties are imposed on foreign corn imported; and are put under the management of the commissioners of the customs.

2. That by the 74th clause, and the two following ones, express provision is made for the *re-payment* of the monies paid by the county treasurers, viz. (5s. for each return) charging *also* the deficiency (if any) to the general custom-house account to make good.

3. That the regulations for the port of *London*, in clauses 43, 44, 45, and 46, provide for the salary of the corn-inspector *there*, from the duty of one penny on *British* corn, and two pence for foreign corn imported.

This is plainly done from the just view of the subject—as of *national*, and not of *local* concern; and therefore no partial burden is thrown on the city of *London* to pay their corn-inspector; and there can be no doubt, that on the same principle of equity, all other parts of the kingdom were intended to be equally exempted from *local* impositions.

4. That

4. That the reason of the allowance made to the Scotch counties (by the 33 Geo. III. c. 65. sect. 20.) is declared to be, that the former allowance of twenty shillings for each return (by 31 Geo. III. c. 30. sect. 74.) was not sufficient to defray the expences, &c. This fully explains the meaning of the legislature in the corn act, *not* to burden the particular "counties" by the payment of extra salaries, &c. The act of 33 Geo. III. c. 65. puts it out of all question, with respect to the counties in *North Britain*; and as both parts of the united kingdom are under the regulation of this corn act, the same measure of equity *must* apply to both.

5. It was calculated when the act passed, that the duties on foreign corn imported would be more than sufficient to defray the expences of the act; for the "surplus" is ordered to be paid to the receiver-general of the customs. And the sums *actually* remitted *on this account* from Liverpool, will prove that there is no necessity (if that were to be admitted as a plea) to burden the county rates of "Lancashire" with the payment of £. 500 per annum for the salaries of the corn-inspectors within *that county*.

6. If it was judged proper to order the *small payments* "of five shillings" for each return to be *repaid* to the counties, it must follow that the legislature never meant *locally* to burden, and to so great an extent, any districts within the united kingdom, to support a system of *general regulation*; and for which adequate provision was intended to be made in the corn act, by the small duties laid on foreign corn imported; and which in fact, are sufficient for this purpose.

Hope, near Manchester,
April 1795.

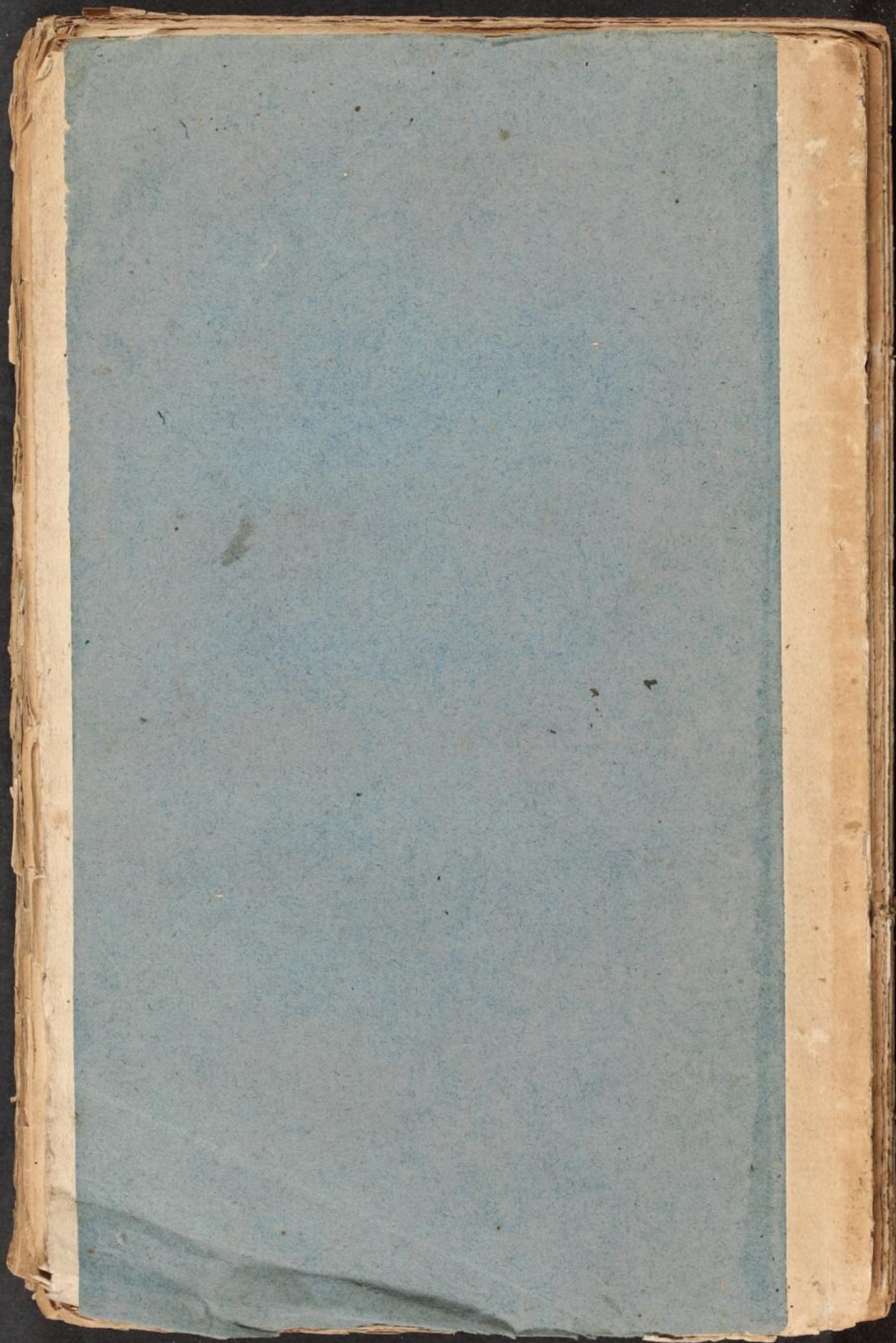
T. B. BAYLEY.

THE END.

Directions to the Binder.

Map of Lancashire	-	-	-	-	-	<i>to front the title.</i>
Lactometer	-	-	-	-	-	<i>to face p. 160</i>
Lancashire Bull	-	-	-	-	-	<i>p. 143</i>
D - - Cow	-	-	-	-	-	<i>p. 151</i>
D° - - Mare	-	-	-	-	-	<i>p. 169</i>
Mixt breed of Hogs	-	-	-	-	-	<i>p. 174</i>

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...ce p. 160
- p. 143
- p. 151
- p. 169
- p. 174







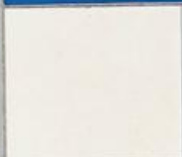
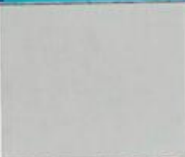
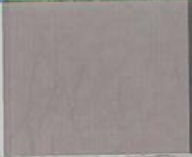






Colour & Grey Control Chart



Blue	Cyan	Green	Yellow	Red	Magenta
White	Grey 1	Grey 2	Grey 3	Grey 4	Black
					
					



564